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एन सी ई आर टी
NCERT

National Curriculum Framework for School Education 2023

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NCERT
राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
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Foreword

It is with a great sense of pride and satisfaction that I submit this National Curriculum Framework for School Education (NCF-SE), on behalf of the National Steering Committee for National Curriculum Frameworks to Dharmendra Pradhan, Hon'ble Minister of Education, Government of India.

The National Education Policy (NEP) 2020 is a transformative initiative to usher India to prepare itself to meet the challenging demands of a twenty first century knowledge society. The NCF-SE is one of the key components of NEP 2020, that enables and energises this transformation, informed by its aims, principles and approach. Its objective is to realise the highest quality education for all our children, consistent with realising an equitable, inclusive, and plural society as envisaged by our Constitution.

This is the first ever integrated Curriculum Framework for children between ages 3–18 in India. It is a direct outcome of the 5+3+3+4 'curricular and pedagogical' structure that NEP 2020 has come out with for School Education. To ensure appropriate focus and fillip to the Foundational Stage (ages 3–8), the detailed National Curriculum Framework for Foundational Stage (NCF-FS) was released on 20 October 2022, by the Hon'ble Minister of Education, which is integrated within the NCF-SE. The National Curriculum Frameworks for Teacher Education, and for Adult Education, will follow shortly.

To ensure that this NCF is responsive to the needs and aspirations of our people and the nation, and is also informed by the very best experience and knowledge we have conducted widespread consultations across the country. This process has benefited from the engagement of over 13 lakh interested citizens, including students and parents, and over 1.5 lakh teachers and educationists from across the country, over 1550 district level consultations from 32 states and Union Territories, and 35 groups of institutions. These consultations are in addition to over 600 papers on 25 specifically relevant themes written by groups constituted by the states and UTs, which all together had over 4000 experts, and 25 papers on these themes developed by expert groups with over 175 members, constituted by the National Council of Educational Research and Training. The pre-draft of the NCF-SE was placed for public comment on 6 April 2023, and over 100 institutions and educators gave more than 1500 detailed comments.

While the NCF-SE is informed by this collective knowledge and wisdom, the real challenge has been to analyse these inputs and develop a cogent, pragmatic, and effective synthesis that will enable changes in practices on the ground. This, in turn, has called for the NCF-SE to be presented in a language, structure, and with a variety of illustrations, such that practitioners, including most importantly Curriculum and Syllabus Developers, Teaching-Learning-Material Developers, and Teachers, should be able to relate it to their current realities. I emphasise this aspect of the work of this Committee, primarily, to highlight the several challenges arising from the needs of developing innovative methods and approaches.

We have been able to deal satisfactorily with the extraordinarily challenging task of developing this NCF-SE, because of the vibrant teamwork and dedication of my colleagues in this endeavour.

I must express my personal gratitude to all of them— the members of the National Steering Committee for the National Curriculum Frameworks, the Mandate Group for the

National Curriculum Frameworks, and the Technical Secretariat Group, and equally to the team members from the National Council of Educational Research and Training, and from the Ministry of Education.

Together, we are grateful for the opportunity to contribute to the Indian education and to the country through the NCF-SE, which will influence not just today, but also the coming decades.

K. Kasturirangan
Chairperson
National Steering Committee for National Curriculum Frameworks

Bengaluru
29 July 2023

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National Focus Groups for the NCF

State Focus Groups for the NCF

SCERTs and State Departments of Education

Central Board of Secondary Education and State Board of Secondary Education

Large Number of Teachers, Civil Society Organisations, and Schools

Participants of the District-level Consultations and Mobile Survey at the State Level

Participants of Consultations with Universities and Several Other Higher Education Institutions

Large Number of Stakeholders who Provided Feedback on the Pre-draft of NCF-SE

Over 13 lakh Other Stakeholders who Participated in Online Survey for the NCF

All names are in alphabetical order of their last name within groups, other than the Chairperson.

Conventions and Styles Used in This NCF

1. The first letter of Teachers and Principals is uppercase throughout the document, wherever required.
2. Wherever a reference is made to either a Curricular Area (e.g., Languages, Mathematics, Art Education) or a discipline (e.g., Languages, Mathematics), the first letters are uppercase.
3. The first letter of key terminology (e.g., Curricular Goals, Competencies, Learning Outcomes, Learning Standards) and the names of Stages (Foundational, Preparatory, Middle and Secondary) are uppercase throughout the document.
4. All through this document, the word 'Grades' have been used to denote 'Classes' (e.g., Grade 5 instead of Class 5).
5. This NCF uses the gender-neutral pronoun they or them.

THE CONSTITUTION OF INDIA

PREAMBLE

WE, THE PEOPLE OF INDIA, having solemnly resolved to constitute India into a [1]**[SOVEREIGN SOCIALIST SECULAR DEMOCRATIC REPUBLIC]** and to secure to all its citizens :

JUSTICE, social, economic and political;

LIBERTY of thought, expression, belief, faith and worship;

EQUALITY of status and of opportunity; and to promote among them all

FRATERNITY assuring the dignity of the individual and the [2][unity and integrity of the Nation];

IN OUR CONSTITUENT ASSEMBLY this twenty-sixth day of November, 1949 do **HEREBY ADOPT, ENACT AND GIVE TO OURSELVES THIS CONSTITUTION.**

---

1. Subs. by the Constitution (Forty-second Amendment) Act, 1976, Sec.2, for "Sovereign Democratic Republic" (w.e.f. 3.1.1977)
2. Subs. by the Constitution (Forty-second Amendment) Act, 1976, Sec.2, for "Unity of the Nation" (w.e.f. 3.1.1977)

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How to Read the National Curriculum Framework for School Education

The National Curriculum Framework for School Education (NCF-SE) is best read from the beginning to the end — the entire volume. This is because the NCF-SE is an integrated framework where each part has implications on the other.

However, if there is a need to be selective, then it is recommended that Part A must be read along with whatever may be the matter of interest from the subsequent parts. This is because Part A lays the foundations of the NCF-SE.

For example, if a Science Teacher wants to focus only on her subject, she should read the entirety of Part A and then the chapter on Science Education in Part C. Education Administrators may want to focus on School Culture and Practices which is in Part D and on Creating an Enabling Ecosystem which is in Part E, but these must be read along with the entirety of Part A.

Curriculum and syllabus developers must read the entire volume, while content developers may adopt the approach as mentioned for Teachers and administrators above.

Other interested stakeholders of the education system may read the summary and then the chapters of their interest; however, even for them, glancing through Part A would be useful.

It is also important to keep in mind that the NCF-SE has many illustrations. These have been used to bring to life the principles and approach of the NCF-SE for the practitioner. The user of this NCF-SE is certainly not bound in any way by these illustrations. Similarly, the level of detail articulated in this NCF-SE is to bring clarity to the principles and approach in the reality of practice, and not to be prescriptive in any manner.

Since the explicit objective of this NCF-SE is to help improve the practice of education in the reality of our schools, it has attempted to be as relatable as possible to the practitioner, by the use of illustrations, by going into details, and other methods. It is this choice that has made this volume fairly lengthy.

An Artificial Intelligence-based virtual assistant has been trained to help users navigate through the NCF-SE and which surely will continue to improve.

Caution: The one thing that people who work in education, from teachers to the highest-level administrators, must not do is to read just the summary and think that the NCF-SE is read.

Introduction

The National Education Policy 2020 (NEP 2020) called for a complete transformation of India's schooling system to make it of the highest quality for all students equitably, and to serve the needs and aspirations of the country and its people, today and for the future. The purpose of this National Curriculum Framework for School Education (NCF-SE, in short NCF) is to help in bringing about such changes by effecting corresponding positive transformations in India's school curricula.

In this NCF, 'curriculum' refers to the overall goals, plans, arrangements, and practices that shape the experiences of students in schools. Thus 'curriculum' does not just refer to the subject content of textbooks and other Teaching-Learning Materials (TLMs) and their pedagogy, but also includes aspects, such as, school environment and culture. It is indeed only through such holistic and integrated changes across all these key aspects of the curriculum that we will be able to positively transform the overall learning experiences of our students.

Because it is the teacher, who must be the torchbearer for these changes, this NCF aims to see and present matters from the perspective of a teacher's reality. For that reason, this NCF contains the kinds of details, suggestions, and illustrations that would clarify its approach and principles at the level of practice of a teacher and the school. The teachers and schools are not bound by these illustrations, but the level of detail provided would hopefully make this NCF more graspable and usable.

This approach of detailing should also make this NCF more useful and readable not just to teachers, but to all the practitioners of education including school leaders and academic and administrative functionaries, such as, cluster and block resource persons, BEOs, teacher educators, examination boards, and curriculum or syllabus or textbook development teams, as well as to those who have the greatest stake in education, namely, parents, community members, and of course, the students themselves.

This NCF aims to provide each such interested reader a reasonable understanding of what education should be like in the vision of this NCF, and why, and what role they could play.

Vision of the National Curriculum Framework

The NEP 2020 called for the development of a new National Curriculum Framework (NCF) and new State Curriculum Frameworks (SCFs) as the bases for transforming school education in the country. This is in consonance with the empowerment of states in our federal structure with education as a concurrent subject. This NCF would aim to help bring consonance and harmony across the curricula in the country.

In this spirit, it is of the utmost importance for all our children of today and of tomorrow, and for the future of India to develop an educationally robust and aspirational, yet practically implementable, NCF as well as SCFs, that will ensure that all students no matter their circumstances of birth or background, have the best possible education, with complete support from the system.

At the level of the individual, the goal of the new curricula must be to foster a school education system that builds character and enables learners to be well-rounded, healthy, ethical, creative, rational, compassionate and caring individuals, while also preparing them well for higher education as well as for gainful, fulfilling employment. It must aim

not only for all students to learn, but more importantly for learning how to learn, so that they may become lifelong learners and also have the ability to constantly adapt to changing times. The new curricula must enable and inspire students to participate in and contribute to society culturally, economically and democratically.

At the level of society, the goal of the new curriculum must be to transform our society into one that is more just, equitable, humane, prosperous, sustainable, and rooted in Indian ethos and culture. It should enable India's continued ascent and leadership on the global stage in terms of economic growth, social justice and equality, research and knowledge creation, scientific and technological advancement, environmental sustainability, and cultural preservation and vibrancy. The education system must ensure that the actual practice of the curricula, including content, pedagogy, environment, and culture in schools, clearly promote these individual and societal goals.

Curriculum Content

The world is undergoing rapid changes in the knowledge landscape. With various dramatic scientific and technological advances, such as, the rise of big data, machine learning, and artificial intelligence, many jobs worldwide may be fundamentally affected, while the need for a workforce with deep human capacities, including those involving multidisciplinary capacities across languages, mathematics, sciences, social sciences, vocational education, art, and those that involve empathy, care, communication, and ethical reasoning, will be in increasingly greater demand.

With climate change, environmental degradation, and depleting natural resources, there will also be an increasing demand for capacities for environmental sustainability; indeed, mere environmental sustainability may not be sufficient any longer, environmental restoration and regeneration will be required to save our planet.

The health and well-being of individuals remains a key aspect for success in all other aspects of life. Education across all subject areas, as well as in physical education, health, and well-being, is also critical for the holistic development of the individual.

For these reasons, it is very important for students to receive a multidisciplinary education that includes art and craft, physical education and well-being practices, vocational education, languages and literature, as well as mathematics, science, and social science; this will help to ensure the development of all aspects and capabilities of learners, and help to make education more well-rounded, useful, engaging, and fulfilling to the learner.

Certain key capacities, values, and dispositions, which include, what are sometimes called 'twenty first century skills', should also be acquired by all students across subject areas to become good, fulfilled, and productive human beings in today's rapidly changing world. These capacities, values, and dispositions include: scientific temper and evidence-based and critical thinking; creativity and innovativeness; sense of aesthetics and art; oral and written communication; multilingualism; health and nutrition; mental and physical fitness and well-being; collaboration and teamwork; problem solving and logical reasoning; ethical and moral reasoning; digital literacy, coding, and computational thinking; knowledge and practice of human and constitutional values; empathy, inclusion, and pluralism; fundamental duties; citizenship skills and values; environmental awareness and sensitivity; cleanliness, sanitation and hygiene; cultural literacy and identity; rootedness and pride in India while being a productive global citizen; and knowledge of current affairs and critical issues facing local communities, states, the country, and the world.

To enable the development of the aforementioned Knowledge, Capacities, Values and Dispositions, it will be necessary to reduce the content load in each subject to the core essentials in order to make time and space for more effective pedagogy, including where relevant more multi and inter-disciplinary, experiential, discussion-based, and activity based learning. All of this together would result in a deeper disciplinary understanding of the subjects as well as develop these important capacities, values, and dispositions.

Pedagogy

To enable deeper understanding of concepts across subjects and their interrelations, and to enable the acquisition of the various aforementioned values, dispositions, and capacities, pedagogy in the classroom must become more effective. Depending on the matter of study, context, and stage of the student, these effective pedagogical approaches would be of a wide range, including pedagogy that is more experiential, integrated, inquiry-driven, discovery-oriented, discussion-based, project-based, arts-based, sports-based and activity-based. Such pedagogy will not only be more effective, but also more engaging and enjoyable.

In general, more participation, questioning, discussion, debate and writing, including creative writing, by all students in the classroom in all subjects will help ensure the acquisition of capacities in languages, communication, and logical reasoning that are considered essential for effective exchanges of ideas across disciplines over a lifetime.

Assessment too will be transformed in parallel to the changes in pedagogy, from primarily testing facts, to testing core capacities and competencies. The 'assessment culture' must change too, so that assessment is conducted increasingly *as learning* and *for learning.* There must also be periodic assessment *of learning* to ensure readiness for the next phase of learning, and to arrange suitable support for students when this readiness is not achieved.

The Board examinations for Grades 10 and 12 will also be substantially reformed. These will be made 'easier', the Board examinations will primarily aim to assess understanding and achievement of competencies rather than months of coaching and memorisation. To further eliminate the 'high stakes' aspect of Board examinations, all students will be allowed to take Board examinations on at least two occasions during any given school year, with only the best score being retained. In the long term, being able to take a subject Board examination immediately after the 'school term' (i.e., 'semester-wise' or 'on-demand' Board examinations) will be made available.

Environment, Practices and Culture

The overall learning experience of students lies not only in the curriculum content and pedagogy, but is also determined by the school environment, practices and culture. The culture of schools will be transformed to maximise the ability of teachers to perform their roles effectively, and to ensure that all members of the school are the part of vibrant, caring, and inclusive communities of teachers, students, parents, principals, and other support staff, all of whom share the clear common goals; to ensure that our students feel safe and comfortable, are cognitively, emotionally and physically healthy, and are enjoying the learning process.

A nurturing school environment and culture of this type can be developed through the leadership of teachers, principals, and other school functionaries who can act as role models to students. Inclusive, caring, and nurturing practices at the school by teachers and other staff can help develop corresponding values and dispositions in students, e.g.,

not publicly sharing or displaying student information about their socio-economic backgrounds, not treating students any differently regardless of caste, gender, religion, disability, etc., fostering a sense of community, respecting students' home languages in cases where they are different from the main school languages, nurturing and valuing the natural environment, reducing and recycling, keeping the school building and surrounding areas clean and tidy, etc., will help develop corresponding desirable values and dispositions in students that may not be developed as effectively through 'curriculum content' alone.

Effecting these Curricular Changes

In order to enable these transformations of the curriculum in practice, this NCF aims to account for the reality of the average teacher and school, such as, the widespread existence of multigrade and multilevel teaching, and provide a realistic pathway to the ideal from the current reality, in steps, taking into account the resources available to the teacher, the capacities of the teacher and the surrounding system, and the environment that the teacher has to operate in, in terms of school and system culture, school and class size, and the community and socio-economic backgrounds of the students.

This NCF briefly touches upon the actions and practices of the various actors of the education system and its stakeholders, to enable its implementation this includes not only teachers, but also educational administrators, academic support institutions, schools and their leadership, and the families and communities of students.

The NCF aims to be unambiguous and unhesitating in confronting the key problems and realities facing the schooling system, without which real change in the educational lives of our teachers and students would not be possible.

Organisation of this NCF

This NCF is organised into five parts:

- **Part A** articulates the broad aims of School Education, and the desirable Values and Dispositions, Capacities and Skills, and Knowledge that are required for achieving these aims. It also lays down the principles and approaches for content selection, pedagogy, and assessment and gives the rationale and design principles for the four stages of schooling.
- **Part B** focuses on some of the important cross-cutting themes of NCF, specifically, rootedness in India, education for values, learning and caring about the environment, inclusive education, guidance and counselling, and use of educational technology in schools.
- **Part C** has separate chapters for each school subject. Each of these chapters have Learning Standards defined for all the relevant stages of schooling along with specific guidelines for content selection, pedagogy, and assessments appropriate for that subject. The part also has a chapter on the Foundational Stage and one on design and range of subjects in grades 11 and 12.
- **Part D** handles school culture and processes that enable a positive learning environment and inculcate desirable values and dispositions.
- The last part, **Part E** outlines the requirements for an overall ecosystem of schooling that would enable the achievement of the aims of NCF. This includes aspects of teacher capacities and service conditions, physical infrastructure requirements, and the role of the community and family.

Summary

The National Education Policy 2020 (NEP 2020) is an ambitious policy document aiming to improve educational outcomes in the country for all children. It has been more than three decades since the publication of the previous National Policy on Education in 1986. A lot has transformed in this period, significant changes in demography and in educational access and attainments; an information revolution; the expansion of knowledge particularly in domains, such as cognitive neuroscience, computer science, deep learning and artificial intelligence; global economic and health shocks (2008, 20); and challenges of climate change and environmental degradation. NEP 2020 aims to respond positively to these changes and makes clear recommendations for education at all levels, starting with education for children of age 3 to higher education.

Some of the key highlights of the policy in the context of school education are:

a. **5+3+3+4 stage design:** Schooling has been divided into four stages based on the styles of learning best suited for those age groups: Foundational Stage for ages 3–8, Preparatory Stage for ages 8–11, Middle Stage for ages 11–14, and Secondary Stage for ages 14–18.

b. **Early Childhood Care and Education (ECCE):** The policy has laid significant emphasis on ECCE. It is now well recognised that early educational intervention, along with nutrition, is foundational for future positive outcomes. A holistic curriculum has been developed keeping in consideration all the relevant developmental domains of early childhood.

c. **Foundational Literacy and Numeracy:** The policy gives the highest priority to achieving universal Foundational Literacy and Numeracy. The abilities to read and write, and perform basic operations with numbers, is seen as a necessary foundation and indispensable prerequisite for all future schooling and lifelong learning.

d. **Curricular Aims:** Emphasis on conceptual understanding rather than rote learning and development of capacities and values, such as, critical thinking, decision making, creativity, and ethical, human and constitutional values.

e. **Multidisciplinary, Holistic and Integrated Education:** Focus on this across the Sciences, Social Sciences, Art, Humanities, and Sports for a multidisciplinary world in order to ensure the unity and integrity of all knowledge.

f. **Reduced Curriculum Content:** The policy makes clear recommendations to reduce the content load in each subject to its core essentials and thereby make space for critical thinking and holistic learning.

g. **Flexibility and Choice in the Secondary Stage:** The policy recommends increased flexibility and choice of subjects of study, particularly in secondary school, including subjects in Physical Education, Art and Crafts, and Vocational Skills, so that students can design their own paths of study and life plans.

h. **Integrating Vocational Education:** The policy aims to overcome the social status hierarchy associated with Vocational Education and requires integration of Vocational Education programs into mainstream education.

i. **Multilingualism:** Given the multilingual heritage of India, and the cognitive benefits of learning multiple languages, the policy gives strong emphasis towards learning multiple languages including languages native to India.

j. **Rootedness in India:** The vision of the policy is to instil among the learners a deep-rooted pride in being Indian, not only in thought, but also in spirit, intellect and deeds, as well as to develop knowledge, skills, values, and dispositions that support responsible commitment to human rights, sustainable development and living, and global well-being, thereby reflecting a truly global citizen.

The policy recommends the formulation of a new and comprehensive National Curriculum Framework for School Education (NCF-SE) to realise the above vision for school education.

This NCF-SE thus aims to continue the transformative journey initiated by NEP 2020. This chapter is a summary of the NCF-SE. It outlines the core principles adopted for the formulation of the NCF-SE and then summarises the key chapters.

1.1 A Few Preliminary Points

To read this NCF-SE or in short NCF, it is useful to have a common shared understanding of the most basic terms being used.

1.1.1 Curriculum

Curriculum refers to the entirety of the organised experience of students in any institutional setting towards educational aims and objectives.

The elements that constitute and bring to life a Curriculum are numerous, and include goals and objectives, syllabi, content to be taught and learnt, pedagogical practices and assessment, Teaching-Learning Materials (TLMs), school and classroom practices, learning environment and culture of the institution and more.

There are other matters that directly affect a Curriculum and its practice or are integrally related while not being within the Curriculum. These include the teachers and their capacities, the involvement of parents and communities, issues of access to institutions, resources available, and administrative and support structures.

1.1.2 Curriculum Framework

The Curricula across our country must be informed by and be fully responsive to the glorious unity in diversity of India. The imagination of NEP 2020, where institutions and educators are highly empowered, including the development of the curricula, is energised by this unity in diversity and the nurturing of it.

States have the Constitutional mandate to provide high-quality education to all children, and their own unique state contexts inform their own approaches to Curricula.

This NCF must aim to support exactly that it is a framework to help develop all the diverse Curricula in the country, while enabling consonances and harmony across the country, and providing a basis for quality and equity.

Thus, this NCF aims to provide the guiding principles, goals, structure, and elements for the development of Curricula, informed by which the syllabi, TLMs including play materials, workbooks, textbooks, and assessment methods will be developed by the relevant functionaries including teachers in the states, boards and schools.

1.1.3 What does this NCF aim to achieve?

The overarching objective of this NCF is to help in positively transforming the school education system of India, through positive changes in the curriculum including pedagogy. In particular, this NCF aims to help change practices in education and not just ideas; indeed, since the word 'curriculum' encapsulates the overall experiences that a student has in school, 'practices' do not just refer to curricular content and pedagogy, but also include school environment and culture. It is this holistic overall transformation of the curriculum that will enable us to positively transform overall learning experiences for the students.

1.2 Core Principles of this NCF Design

This NCF has adopted some core principles in designing the curriculum framework to realise the vision of NEP 2020:

a. **Guide for Practitioners:** The intent of this NCF is to be a valuable guide to practitioners of education, whether they are syllabus or content developers or school teachers. The language used and style of articulation is such that it is easily comprehensible and relatable to practitioners.

b. **Specificity:** To be relatable to practitioners, this NCF has gone into specific, nonbinding suggestions and illustrations, wherever they may be useful, and used examples from ground experiences to illustrate concepts and the principles. There is often concern in the educational domain that being specific means being prescriptive, thus robbing the autonomy of the practitioners. However, this NCF is guided by the belief that being specific is a virtue, helping to provide a good starting point for practitioners. They can still always innovate, using the specifics provided only as a starting point or as an idea to be modified or replaced in a manner that is appropriate to their contexts and circumstances. The ground realities in the country indicate that practitioners are often left confused and directionless with only generalities and broad visionary statements on education.

c. **Pragmatic Considerations:** This NCF has considered ground realities, such as time available during the school day, resources available in most school contexts in India, and teacher availability and preparation. While it is true that all educational endeavours are exercises of hope, this NCF has consciously maintained an appropriate balance between idealism and pragmatism, providing in many cases both short and long-term solutions to problems being faced. Thus, the reforms suggested are expected to be within the Zone of Proximal Development (ZPD) of the current education system as a whole.

d. **Learning Standards:** This NCF has set clear and specific Learning Standards (Figure 1.1) in order to bring clarity to all stakeholders, policymakers, educational administrators and functionaries, syllabus and content developers, parents, teachers, and students on the intended educational outcomes of the curriculum. Since school education is a public good, it is hoped that such clarity among all stakeholders will bring more accountability and effectiveness to the education system as a whole.

1.3 Learning Standards

Education, in a very fundamental sense, can be defined as the attainment of valuable knowledge, capacities, values and dispositions. If that is so, one of the key questions for any curriculum framework is: which knowledge, capacities, values and dispositions are valuable? In other words, what is worth teaching? This NCF responds to this question very specifically through a clear and precise set of 'Learning Standards.'

These 'Learning Standards' and the processes associated with them, for example, the 'flow-down' from 'Aims of Education' to 'Learning Outcomes,' is central to this NCF, to ensure alignment and integration of the different components of the design and practice of curricula, such that our school education achieves what we want for our children. All stakeholders of school education must give the greatest of attention to the 'Learning Standards.'

1.3.1 Broad Aims of School Education

The Learning Standards are guided by certain widely agreed upon broad Aims of School Education that are articulated in this NCF. These aims have been arrived from the vision and purpose of education as envisaged by NEP 2020:

a. **Rational Thought and Autonomy:** Schools should aim to develop independent thinkers who make well-informed decisions based on a grounded understanding of the world around them.

b. **Health and Well-being:** School education should be a wholesome experience for students. Therefore, students should acquire knowledge, capacities and dispositions that promote mind-body wellness.

c. **Democratic and Community Participation:** Democracy is not just a form of governance; it is a 'mode of associated living,' a sense of collaborative community. School education should aim to develop such knowledge, capacities, values and dispositions that enable students to participate and contribute to the democratic functioning of India.

d. **Economic Participation:** School education should aim to develop such knowledge, capacities, values and dispositions that enable students to participate and contribute to the economy. Effective participation in the economy has a positive impact both for the individual and for society as a whole.

e. **Cultural Participation:** Understanding the culture and heritage embedded in the family and community is at the core of cultural participation. School education should promote cultural literacy, and enable students to acquire knowledge, capacities, values and dispositions to participate meaningfully and contribute positively to culture.

1.3.2 Values and Dispositions, Capacities and Knowledge

The broad aims of education are best achieved through:

a. Developing appropriate values including traditional values of Indian heritage; ethical and moral values, democratic values and epistemic values.

b. Acquiring positive dispositions; positive work ethic, curiosity and wonder, and pride and rootedness in India.

c. Developing capacities; for inquiry, effective communication, problem solving and logical reasoning, creativity and aesthetic expression, maintaining health, productive work, and effective social engagement.

d. Acquiring knowledge in breadth and depth. The seven Curricular Areas of Languages, Mathematics, Science, Social Science, Art Education, Physical Education and Well-being, and Vocational Education, along with interdisciplinary areas, develop multidisciplinary and interdisciplinary knowledge in students. Such knowledge allows students to develop a well-grounded understanding of the world.

These values and dispositions, capacities and knowledge are often developed together, and the content, pedagogy and assessments aim to weave them together seamlessly.

1.3.3 Curricular Aims, Goals, Competencies and Learning Outcomes

The Learning Standards to achieve the above values and dispositions, capacities and knowledge are articulated at four levels:

a. Curricular Aims: Curricular Aims have been articulated within each of the Curricular Areas. These aims are to be achieved by the ends of each of the four stages of schooling. The aims of all the eight Curricular Areas put together should result in the achievement of the broad Aims of School Education as articulated above.

b. Curricular Goals: Curricular Goals are more specific statements that give direction to curriculum development and implementation in order to achieve the Curricular Aims. They are also specific to a School Stage (e.g. the Foundational Stage) and a Curricular Area (e.g. Mathematics).

c. Competencies: Competencies are specific learning achievements that are observable and can be assessed systematically. In this NCF, competencies (which are only suggestive and may vary in different contexts) are directly derived from a Curricular Goal and are expected to be attained by the end of a stage. Summative assessments at the end of each stage of schooling should be based on these competencies.

d. Learning Outcomes: Learning Outcomes (LOs) are granular milestones of learning and usually progress in a sequence leading to the attainment of a competency. These LOs enable teachers to plan their content, pedagogy, and assessments towards achieving specific competencies. Syllabus and content developers would have to adapt these LOs based on the contexts in which they are applicable.

Thus, in this NCF, there is a clear flow of increasing specificity from the broader Aims of Education to specific LOs. Through these clear linkages, all stakeholders can observe and evaluate the educational achievements of students that should lead to meeting the broad Aims of School Education. An illustration of such a flow, in Language Education, is given in the following:

Figure 1.1

Aim of Education

Rational Thought and Independent Thinking/Autonomy: Making choices based on rational analysis, creativity, a grounded understanding of the world, and acting on those choices, is an exercise of autonomy. This indicates that the individual has gained the capacity for rational reasoning, critical thinking, knowledge with both breadth and depth, and discernment to understand and improve the world around them. Developing such independent thinkers who are curious, open to new ideas, think critically and creatively, and thereby form their own opinions and beliefs is thus a very important aim for school education.

⇩

Language Education

Curricular Aim

Effective communication skills: Students should develop their language capacities to think critically, identify real-world problems, analyse them, make rational arguments, and work out solutions. The capacity to use language to think and communicate well in a variety of situations is critical for effective democratic, social, and cultural participation.

⇩

Curricular Goal

Language 1 (R1), Secondary Stage

CG-3: Uses language to develop reasoning and argumentation skills by engaging with a variety of audio and written material.

⇩

Competency

Language 1 (R1), Secondary Stage

C-3.2: Argues with proper rationale by carefully evaluating premises

⇩

Learning Outcomes

Language 1 (R1), Secondary Stage (Grades 9 and 10)

Grade 9	*Grade 10*
Evaluates the premises of an argument for its clarity, relevance, and reliability (of evidence).	Lists premises (reasons and evidences) that are useful for an argument.
Recognises own emotional biases while reading and listening.	Makes logical connections between premises and conclusion in speech and writing.

1.4 Stage Design

This NCF has divided the school curriculum into four stages as per the recommendation of NEP 2020:

1.4.1 Foundational Stage

a. This stage is for students aged between 3 and 8.

b. The Learning Standards for this stage has been set based on domains of development; Physical Development, Socio-emotional and Ethical Development, Cognitive Development, Aesthetic and Cultural Development, and Language and Literacy Development. In addition to these domains, it is important to set Learning Standards for developing positive learning habits that serve as a foundation for all further school learning.

c. Developing Foundational Literacy and Numeracy finds adequate emphasis in this stage. Children learn two languages (R1 and R2) and are expected to achieve Foundational Literacy in R1 by the end of this stage.

d. The content to achieve these Learning Standards are predominantly concrete play materials, such as, toys, puzzles, picture books, and manipulatives during the first three years. Textbooks, playbooks, workbooks are recommended only from Grade 1. Children's literature is particularly an important source of content for this stage.

e. The pedagogy is largely play-based and emphasises nurturing, caring relationships between the teacher and the children. There should be a balance between self-paced individual learning and group activities. Systematic guidance is required for developing Foundational Literacy and Numeracy.

f. Assessments are conducted largely in the form of qualitative observations by teachers. In Grades 1 and 2, worksheets can be a source of information on children's learning for the teacher. Explicit tests and examinations are deemed to be inappropriate for this stage.

1.4.2 Preparatory Stage

a. This stage is for students aged between 8 and 11.

b. The Learning Standards for this stage have been set for two languages within language education (R1 and R2), Mathematics, Art Education, Physical Education, and The World Around Us (as an interdisciplinary area of study). Work and pre-vocational skills are included as part of The World Around Us curriculum.

c. Content can be presented slightly more through textbooks while concrete materials and experiences still form the core of content presentation. The World Around Us (TWAU), in particular, should rely more on activities and experiences, rather than presented as inert facts in textbooks. To take children well beyond Foundational Literacy and develop a genuine interest in independent reading, children's literature will need to play a major role in the content for Language Education in the Preparatory Stage.

d. Activity and discovery-based pedagogy should continue to play a big role in the Preparatory Stage classroom. But students should be encouraged, gradually, to be active participants in more formal classroom settings. Practice and other activities to develop fluency should find a place during school hours and as homework.

e. Short formal written assessments are appropriate for this stage. Teachers' observation of students' work continues to form an important assessment mechanism. Periodic summative assessments can be utilised to supplement the more regular formative assessments. Summative assessments at the end of this stage should be based on the competencies defined in the Learning Standards.

1.4.3 Middle Stage

a. This stage is for students aged between 11 and 14.

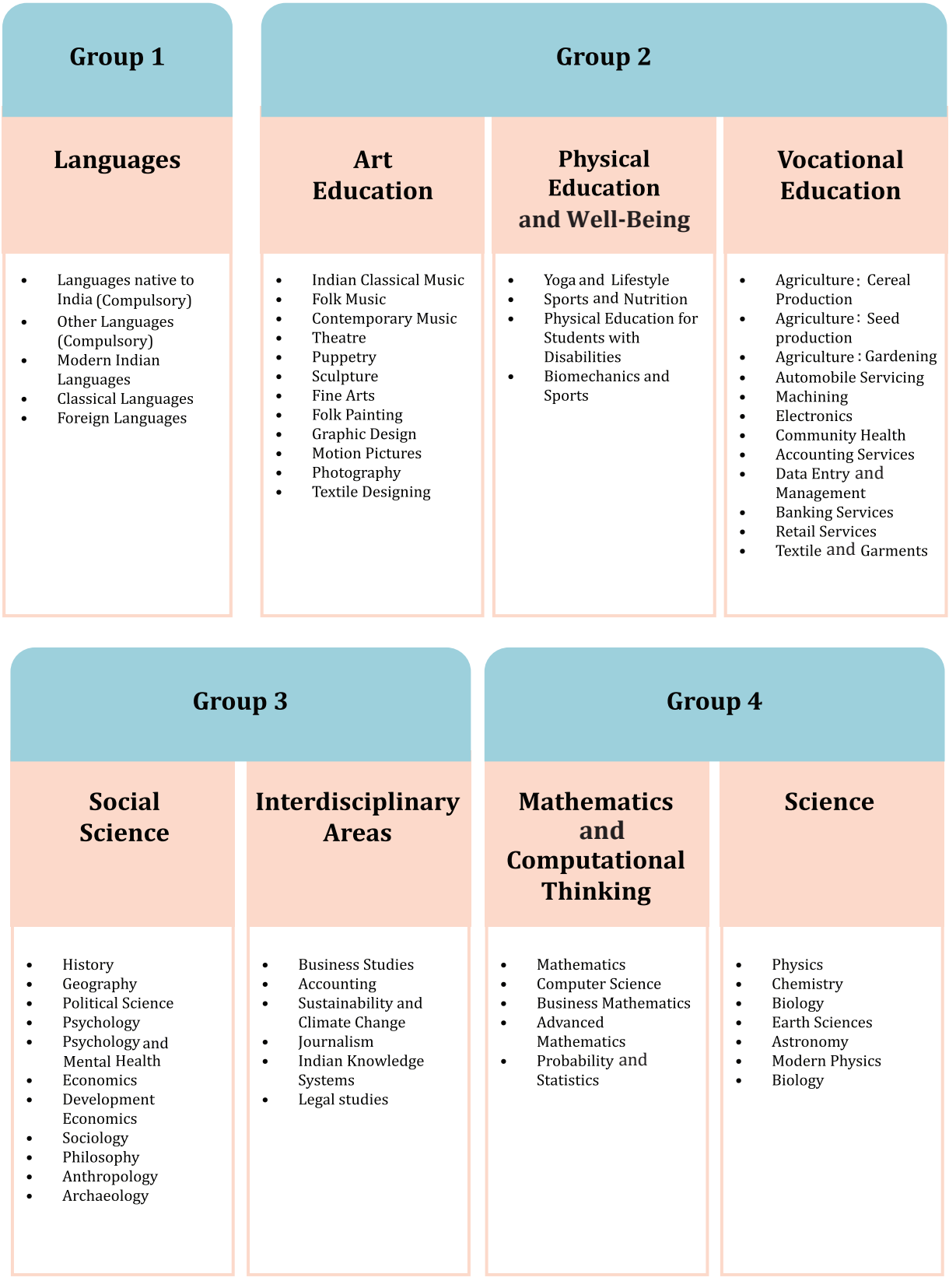
b. Students need to learn three languages (R1, R2 and R3) in this stage. Learning Standards are set for these languages as well as for Mathematics, Art Education and Physical Education. Science Education and Social Science Education have separate sets of Learning Standards, and Vocational Education finds its own curricular space and Learning Standards. These areas represent different forms of knowledge and students are expected to gain a more formal understanding of the nature as well as methods of the inquiry in each form.

c. The content in the middle stage needs to reflect the engagement with theoretical concepts and the introduction of theories and conceptual frameworks specific to each form of knowledge. There is a shift to more abstract ideas and the students are expected to engage with unfamiliar contexts and situations. The language used in the content should assist students in developing academic linguistic proficiency. Such expansion, both in the different forms as well as abstraction, can pose challenges to students. Well-designed textbooks that reflect the specific goals of the Learning Standards have a very significant role to play in presenting content in easy and comprehensible formats in this journey from concrete to abstract.

d. The pedagogy adopted in this stage should be a judicious balance of direct instruction, as well as opportunities for exploration and inquiry. Building on prior knowledge and opportunities to learn from errors become important considerations for instructional strategies. There should be a constant focus on the methods of inquiry within each curricular area.

e. Assessments can be more formal and explicit. Assessment design has a very important role to play in shifting the focus from content retention to conceptual understanding and fluency in the methods of inquiry. Students should be given opportunities to engage with higher-order capacities of analysis and synthesis through meaningful, yet challenging, assessments. Summative assessments at the end of this stage should again be based on the competencies defined in the Learning Standards.

Figure 1.2i


Group 1
Languages
Languages native to India (Compulsory)
Other Languages (Compulsory)
Modern Indian Languages
Classical Languages
Foreign Languages
Group 2
Art Education
Indian Classical Music
Folk Music
Contemporary Music
Theatre
Puppetry
Sculpture
Fine Arts
Folk Painting
Graphic Design
Motion Pictures
Photography
Textile Designing
Physical Education and Well-Being
Yoga and Lifestyle
Sports and Nutrition
Physical Education for Students with Disabilities
Biomechanics and Sports
Vocational Education
Agriculture: Cereal Production
Agriculture: Seed production
Agriculture: Gardening
Automobile Servicing
Machining
Electronics
Community Health
Accounting Services
Data Entry and Management
Banking Services
Retail Services
Textile and Garments
Group 3
Social Science
History
Geography
Political Science
Psychology
Psychology and Mental Health
Economics
Development Economics
Sociology
Philosophy
Anthropology
Archaeology
Interdisciplinary Areas
Business Studies
Accounting
Sustainability and Climate Change
Journalism
Indian Knowledge Systems
Legal studies
Group 4
Mathematics and Computational Thinking
Mathematics
Computer Science
Business Mathematics
Advanced Mathematics
Probability and Statistics
Science
Physics
Chemistry
Biology
Earth Sciences
Astronomy
Modern Physics
Biology

1.4.4 Secondary Stage

a. This stage is for students aged between 14 and 18.

b. Phase 1: Grades 9 and 10

i. All students would continue to engage with all the Curricular Areas as in the Middle Stage.

In addition, students would study Environmental Education as an interdisciplinary area of study. They would develop capacities for reasoning and argumentation for issues in the public sphere along with ethical and moral reasoning. They would use these capacities in the context of Environment Education. Learning Standards have been set for these areas of study.

c. Phase 2: Grades 11 and 12

i. Choice-based courses are to be offered to enable flexibility and choice for students and to remove hard separations between disciplines and academic areas.

ii. Students need to study two subjects from Language Education (**Group 1,** Figure 1.2i), at least one of which must be a language native to India. Literature subjects are also contained in Language Education at this level.

iii. Students need to choose four subjects (with an optional fifth subject) from at least two of the three groups mentioned in Figure 1.2i.

iv. This scheme allows for both breadth of study as well as gaining disciplinary depth. To allow for interesting combinations, there should be no further restrictions for students to choose specific streams.

v. An illustrative list of subjects that can be made available within each group is given below:

Group 2: Art education, physical education, vocational education

Group 3: Social science and humanities, interdisciplinary areas

Group 4: Science, mathematics and computational thinking

vi. Some illustrative combinations possible with this scheme are given in Figure 1.2ii.

d. Textbooks play a significant role in organising content in Grades 9 and 10. In Grades 11 and 12, students should be encouraged to source content from multiple channels. Course compendiums can be utilised in Grades 11 and 12 to make the choice of content more dynamic and flexible.

e. Pedagogy at this stage should expect more independent learning from the students. More opportunities for self-study and group work should be encouraged. Classroom interactions should also be diverse, didactic, socratic, and inquiry-based methods are all appropriate for this stage.

f. Assessments and Board Examinations

i. Students should be given opportunities to engage with higher-order capacities of analysis and synthesis through meaningful yet challenging assessments.

Figure 1.2ii

Combinations for Commerce	Combinations for Science	Combinations for Social Science	Multidisciplinary Combinations
Combination 1	**Combination 1**	**Combination 1**	**Combination 1**
Hindi, English Business Studies, Accounting, Economics from Group 3 Business Mathematics from Group 4	Classical Telugu, Sanskrit Mathematics, Physics, Chemistry from Group 4 Sustainability and Climate Change from Group 3	Marathi, French History, Economics, Psychology from Group 3 Contemporary Music from Group 2	Classical Tamil, Hindi Gardening from Group 2 History, Journalism from Group 3 Mathematics from Group 4
Combination 2	**Combination 2**	**Combination 2**	**Combination 2**
Bengali, English Business Studies, Accounting from Group 3 Business Mathematics from Group 4 Fine Arts from Group 2	Gujarati, English Biology, Physics, Chemistry from Group 4 Indian Classical Music from Group 2 Mathematics from Group 4 [Optional]	Assamese, Sanskrit Geography, Political Science from Group 3 Indian Classical Music from Group 2 Mathematics from Group 4 [Optional]	Pali, Malayalam Folk Music from Group 2 Automobile Servicing from Group 2 Business Studies from Group 3 Business Mathematics from Group 4 [Optional]

ii. Board examinations for Grade 10 should be based on the competencies set for each of the curricular goals in that area. Art Education, Physical Education, and Vocational Education would have local assessments with Board certification.

iii. To get a Grade 12 certificate, the students should pass the following board examinations:

1. 2 examinations in Languages
2. 4 examinations from at least 2 Groups, with one additional optional exam
3. Subjects in Group 2 (Art Education, Physical Education and Vocational Education) would have local assessments with Board certification.

g. Implications for Schools and Boards of Examinations

i. Schools and Examination Boards should be prepared to offer and assess subjects from all the ten Curricular Areas for Grade 10 right from the beginning of the implementation of this NCF.

ii. Schools and Examinations Boards should be prepared to offer a minimum of two languages for Grades 11–12 from the beginning of the implementation of this NCF.

iii. All Board examinations must move towards becoming 'easier' without any compromise on assessing genuine learning, by testing basic concepts and competencies across subjects, rather than rote learning.

iv. Schools should be prepared to offer subjects from at least two Groups amongst Groups 2, 3, and 4 immediately. Within 5 years, schools should be ready to offer subjects from all four Groups. Within 10 years, schools should offer many more subjects covering all Curricular Areas, and students should study subjects across all four Groups.

v. The Secondary Stage has been divided into two Phases: Grades 9 and 10, and Grades 11 and 12. In 10 years, all school systems should move to a single Secondary Stage, where students have choice and flexibility right from Grade 9, following the current curricular structure of Grades 11 and 12. Thus, realising the NEP vision of the Secondary Stage as being 'four years of multidisciplinary study' across all Curricular Areas.

vi. The current system of study in annual and two-year patterns should move to a semester and/or annual design. This would allow for greater flexibility in the design of courses as well as course options for students.

vii. In ten years, Boards of Examination should be prepared to offer certification through modular examinations that 'each test far less material and are taken immediately after the course is taken in school.' [NEP 2020, 4.38]

1.5 Few Thrust Areas of this NCF

In this section, highlights of few thrust areas of this NCF have been summarised. It must be noted that these are not the only 'thrust areas' in this NCF; however, these are being highlighted in the summary because often these are given inadequate importance.

This NCF renews the focus on Art Education, Physical Education and well-being, and Vocational Education, and brings them into the core curriculum. The need for environmental education has been systematically addressed. These focus areas also aim to be rooted in India and in knowledge of India including Indian Knowledge Systems.

1.5.1 Art and Physical Education

Art and Physical Education are given their due emphasis in this NCF. Specific Curricular Aims and Learning Standards have been set in these Curricular Areas too, so that education in these domains is carried out with the same rigour and expectations as other school subjects. To give a holistic education to students, it is important to see these areas as part of the main curriculum and not just as 'co-curricular' or 'extra-curricular' activities.

a. The aim of Art Education is to promote joy in exploring and creating artwork; develop imagination and creativity; and develop empathy and sensitivity and a sense of belonging to our culture. The processes of creating, as well as appreciating art are given equal emphasis.

b. The aim of Physical Education is to promote love for physical activity and sports; develop capacities for skilful engagement in physical activity and sports; and develop resilience, empathy and cooperation. India has a wonderful tradition of Yoga which is a wholesome experience for maintaining mind and body wellness. Physical Education gives Yoga and overall mind-body wellness its due place.

c. The Learning Standards for Art and Physical Education have been set as 'Nested Learning Standards.' It is recognised that schools and school systems would need time to get prepared to achieve the complete learning expectations in these domains. The first set of Learning Standards, called Learning Standards 1; details the full range of Curricular Goals and Competencies for this Curricular Area. All schools should accomplish these as soon as they are able to add the required resources for Art or Physical Education. Nested within Learning Standards 1 is a subset called Learning Standards 2; which can and should be accomplished by all schools from the very initiation of the implementation of this NCF.

d. Art Education introduces visual arts, music, dance and movement, and theatre. In the Foundational Stage, the Arts contribute towards the sensorial, physical, socio-emotional, aesthetic, and cultural development of young children. In the Preparatory Stage, students develop the skills for making art and also develop a curiosity towards local art forms and artists. The objective of Art in the Middle Stage is to help students develop an appreciation for the artistic and cultural diversity of their region and other parts of India. In the Secondary Stage, students should develop an awareness of the wide scope of applications in the visual and performing arts.

e. In Physical Education, at the Foundational stage, the focus is on the development of gross and fine motor skills through free play. In the Preparatory Stage, local games are introduced, but maintain fluidity and not specific rules of play. The Middle Stage contains more structured sessions and skill development. The Secondary Stage provides opportunities and choices for gaining depth in specific sports. Throughout all stages, mind-body wellness is promoted through activities and practices, such as, Yoga, as well as through education in healthy lifestyles and good nutrition.

f. Assessments are more performance-based in these domains. Thus, a wider variety of assessment tools need to be employed including detailed observation reports and student portfolios.

g. The last period in the Secondary Stage timetable is recommended to be an optional extra time for students to engage in their preferred art or sports activities. Local artists, artisans, and sportspersons can engage with the students in schools to give a wider exposure, including leading to participation in interschool sports competitions and other clubs or interschool activities.

1.5.2 Vocational Education

School education should prepare students not just to understand the world around them, but also to do productive work. These capacities for work would enable students to be productive members of their households as well as participate in the economy. Thus, this NCF sees vocational education as an integral part of the curriculum.

a. Through the Curricular area of vocational education, students would be exposed to and develop basic skills in three forms of work: work with life forms, work with machines and materials, and work in human services.

b. The school curriculum at the Preparatory and Middle stages would endeavour to build relevant capacities in the above mentioned three forms of work. As we can easily observe, these forms of work not only provide the necessary breadth in capacities for productive work, but they also become the foundation for developing capacities in vocations in primary, secondary, and tertiary sectors of the economy, thus meaningfully contributing to the aim of economic participation.

c. In the Secondary stage of four years, the first two years would work towards consolidating these capacities to develop transferable skills that serve students well in any vocation. In the last two years of schooling in the Secondary stage, students will be given opportunities to specialise in specific vocations of their choice.

d. The content of vocational education should be locally relevant as far as possible, and at the same time, respond to the aspirations of students. In the Secondary stage, the learning standards should align with the National Skills and Qualifications Framework (NSQF) levels.

e. The content must instil respect for the dignity of labour.

f. The pedagogy should balance 'making and thinking' in a manner that is relevant for vocations. Workshops and projects are effective ways of teaching vocational capacities. Internships and apprenticeships are encouraged while taking safety considerations into account.

g. Assessments should be based on observations, portfolios and projects, and should not just focus on capacities and skills, but also values and dispositions.

1.5.3 Environmental Education

One of the biggest challenges in the twenty first century is the conservation of the natural environment. Even when looked at purely from a human point of view, environmental degradation becomes a justice and equity issue. NEP 2020 recognises this challenge and the need for a meaningful educational response. This NCF gives the required emphasis to

develop knowledge, capacities, values, and dispositions that would create both awareness and abilities to act responsibly in environmentally sustainable practices.

Students also need to develop capacities for interdisciplinary thinking, since most real-life problems need interdisciplinary solutions. Understanding and responding to the problem of environmental degradation and climate change needs interdisciplinary thinking too. Thus, this NCF focusses on environmental education as part of the education in interdisciplinary areas of Grades 9 and 10.

a. India has had a long tradition of understanding the intimate connection between nature and human life. However, the pressures of modern life have fractured the bonds between the natural environment and human beings. Ideally, knowledge from ancient times to the modern should converge towards sustainable solutions to the growing environmental challenges. Environmental education constitutes an important step in this direction. By incorporating topics from various subject areas, students will learn to appreciate the nuances and complexity of the human-nature equilibrium and the impact and trade-offs of different decisions taken at a societal or even individual level.

b. The main aims of Environmental Education are to:

   i. Create a strong foundation of environmental literacy, which includes understanding the interlinkages between ecological, social, economic and political factors.

   ii. Develop a more compassionate attitude towards the natural environment, drawing upon teachings from ancient Indian traditions and practices, the Indian Constitution, as well as scientific research on the effects of modern human activity on the environment.

   iii. Develop an action-oriented mindset and skillset so as to promote environmental causes with a solid understanding of how individual, societal, national, and global actions can help us restore the balance between humans and nature, and thereby save our planet and ourselves.

c. In the Foundational stage, spending time in nature is an integral part of pedagogy, encouraging children to observe and interact sensitively with plants, animals, insects and birds. Stories, poems, and songs should have elements of the environment and appreciation of nature.

d. In the Preparatory stage, through the study of The World Around Us, students begin to appreciate the interdependence between human society and the natural environment.

e. In the Middle stage, concepts related to the environment are integrated into Science and Social Science. The interactions between the natural world and the human world are understood through both scientific and social scientific models of inquiry.

f. In Grades 9 and 10 of the Secondary Stage, Environmental Education is part of interdisciplinary areas. Students will view Environmental Education from a social-ecological perspective, as opposed to a perspective informed primarily by either Science or Social Science. They would develop capacities for reasoning and argumentation including ethical and moral considerations. They would use these capacities in the context of debates around environmental conservation and

protection that integrate understanding from the sciences on ecological and climate processes and understanding from the social sciences on ideas of justice, equity, and human well-being.

1.5.4 Rootedness and Pride in India

Our country possesses a rich cultural and civilisational heritage with varied traditions within and across local communities. Contemporary India is equally vibrant, taking its place in the modern world. Our country is home to deep knowledge and extensive practice in a variety of disciplines and fields from Literature to Mathematics, Philosophy to Art, Grammar to Astronomy, Ecology to Medicine, Architecture to Agriculture, Ethics to Governance, Crafts to Technologies, Psychology to Politics, Literature to Music, and Economics to Education.

As recommended by NEP 2020, this NCF is strongly rooted in India's context, Indian thought, and Indian Knowledge and Knowledge Systems. This rootedness of this NCF is manifested in the following ways:

a. The holistic vision of education and its aims, from our ancient heritage to our modern thinkers, informs the overall approach of this NCF.

b. The vibrant epistemic approach of Indian schools of thought towards knowledge and how we know.

c. The core of the *Guru-Shishya* tradition as a base for the centrality of the teacher-student relationship for effective learning; correspondingly, the tradition of dialogue and debate as a tool towards the discovery of the truth.

d. The use of local resources of learning, including language, practices, experts, histories, environment, and more, as rich sources of illustrations or case studies.

e. The rich history of Indian contributions to various fields not only develops pride and self-confidence, but also enriches learning in those areas. For example, the approach to Environmental Education is deeply enriched by the range of nature-conservation traditions across India, the approach to values and ethics is rooted in Indian concepts and practices of respect and compassion for fellow humans and all creatures.

f. The importance of the involvement of parents and communities in education.

1.6 Other Curricular Areas

While the curriculum is divided into eight Curricular areas, the approach of this NCF ensures that there is no hard separation between 'science' and 'art,' between 'streams,' of 'vocational' and 'academic,' between 'curricular' and 'co-curricular,' etc. The previous section highlighted the summary of Art Education, Physical Education, Vocational Education, and Education in interdisciplinary areas, including Environmental Education. These have found the necessary focus as part of the curriculum. In this section, key highlights of the other Curricular areas are summarised.

1.6.1 Language Education

a. The rich multilingual heritage of India is given its due place in the Language Education curriculum. The curriculum aims at developing linguistic proficiency for academic

use in three languages by age 15 (Grade 10). At least two out of these three languages should be languages native to India. At least one language native to India will be studied at the 'literature level.'

b. At least one language native to India will be offered as an option for the medium of instruction to all students up to Grade 12.

c. The language in which literacy is first learnt in school (R1) should be a language that is most familiar to the student. Usually, this is the mother tongue of the student or the language that is prevalently used in the neighbourhood.

d. Since it is in R1 that literacy is first attained, it must be used as the Medium of Instruction (MoI) for other subjects, at least until literacy in another language is attained.

e. In Grades 11 and 12, at least two languages will be studied, at least one of which is a language native to India.

f. Language Education in all these languages would not just aim for oracy and literacy. Students should develop effective communication, discussion, and writing skills in these languages along with capacities for literary appreciation and creative use of language.

g. Learning a language is learning a culture. Language Education aims to enable the student to immerse and participate in the linguistic heritage and culture of India, including through participatory engagement with the rich written and oral literature of India such as stories, poems, songs, epics, plays, films, and more.

h. Developing a lifelong interest in reading is an important Curricular Goal in Language Education. The use of library resources plays an important role in achieving this goal.

i. The pedagogic strategies pay attention to developing digital reading skills. 'Deep reading' instead of 'shallow reading' is emphasised in the context of an attention economy where there are strong incentives for constant shifts in attention.

1.6.2 Mathematics Education

a. Mathematics Education has never been more important globally for students and for society. The close connection between Mathematics and artificial intelligence, machine learning, data science, climate modelling, infrastructure development, and the numerous other related scientific issues faced by India and all nations today makes Mathematics a particularly crucial area of school education.

b. The Mathematics Education curriculum not just aims for capacities in foundational numeracy, mathematical thinking, and problem solving in students, but also intends to nurture joy, wonder, and curiosity and the ability to see patterns and appreciate the elegance and aesthetics of mathematical concepts and ideas, while at the same time eliminating the fear of Mathematics that is widely prevalent today.

c. In the Foundational Stage, attaining foundational numeracy represents the key focus of Mathematics Education. For example, understanding, and adding and subtracting with Indian numerals, a sense of basic shapes and measurement using non-standard tools, and early mathematical thinking through play.

d. In the Preparatory Stage, while the focus is on building a conceptual understanding of numbers, the four basic operations, shapes and spatial sense, measurement (standard tools and units), and data handling, the objective is to develop capacities in procedural fluency and mathematical and computational thinking to solve problems from daily life.

e. In the Middle Stage, the emphasis moves towards abstracting some of the concepts learnt in the Preparatory Stage in order to make them more widely applicable. Algebra, in particular, is introduced at this stage through which students are able to form rules to understand, extend, and generalise patterns. More abstract geometric ideas are also introduced at this stage and relations with algebra are explored to solve problems and puzzles.

f. Finally, the Secondary Stage focusses on further developing the ability to justify claims and arguments through logical reasoning. Students become comfortable in working with abstractions and other core techniques of Mathematics and Computational thinking, such as, the mathematical modelling of phenomena and the development of algorithms to solve problems.

g. Mathematics has an extremely rich history in India, spanning thousands of years from Vedic times to the modern era. By learning about the development of Mathematics in India as well as throughout the world, a rootedness in India can be enhanced along with a more general appreciation of the history of Mathematics and of the remarkable evolution and development of mathematical concepts through time, and India's critical role in these developments.

1.6.3 Science Education

a. Science Education gives equal emphasis to acquiring capacities for scientific inquiry and conceptual understanding of theories, laws, and principles in science. Through these capacities and concepts, students are expected to develop a scientific understanding of how the physical natural world functions.

b. While scientific knowledge has exploded, expecting to include all this knowledge in the school curriculum, where time and space are limited, results in unnecessary burden on students. Content for Science Education is chosen to be limited to its essential core to give adequate space and time for developing important capacities for scientific inquiry, such as, the ability to put forth questions, observations, hypotheses, experiments, arguments, predictions, and data analysis.

c. In the Foundational stage, Science Education begins as part of the cognitive development of the child. Making sense of the world through observation and logical thinking is an important Curricular Goal at this stage.

d. In the Preparatory stage, the understanding of the physical world is acquired in an interdisciplinary manner through the study of the school subject The World Around Us. Students will be encouraged to ask questions, observe, experiment, make connections, analyse, and make explanations of phenomena in their immediate environment (both social and physical), thereby discovering for themselves the basics of the scientific method.

e. In the Middle Stage, Science Education focusses on the scientific exploration of concrete experiences of the students. They begin to use mathematical and schematic representations to model and analyse phenomena. By engaging with the evolution of scientific theories, students begin to appreciate the nature of scientific knowledge and methods of scientific inquiry. Students also develop the ability to communicate their understanding effectively.

f. In Grades 9 and 10 of the Secondary Stage, more abstract scientific theories and conceptual structures are introduced with increasing methodological sophistication in the disciplines of Biology, Chemistry, Physics and Earth Science, and their interrelations with each other and with other subjects.

g. In Grades 11 and 12, students can choose specific disciplines within Science, such as, Biology, Chemistry, Physics, and Earth Science. They can thereby delve further into these disciplines and engage with theories, laws, principles, concepts, and methods of inquiry specific to these disciplines.

h. In the Middle and Secondary Stages, students also explore the relationship between Science, technology, and society. They understand and appreciate the history of Science and the contributions of India to the overall field of Science from ancient to modern times.

1.6.4 Social Science Education

a. Social Science is the systematic and scientific study of human societies that explores the relationship between the individual and society, social institutions and organisations. In this NCF, the term Social Science is also used to include those branches of the Humanities that involve the more qualitative study of human society, culture, thoughts, creations, development, and actions in the past and present.

b. The purpose of Social Science Education is to help students learn about the society in which they live, e.g., how members of their society live, interact, behave, eat, speak languages known by them, express themselves through art, the traditions they follow, what they wear and their aspirations.

c. Social Science Education also helps students develop pride in their culture and their country with a forward-looking spirit to continuously improve as individuals, as a society and as a nation.

d. The approach to the study of Social Science aims to develop an interdisciplinary perspective rooted in disciplinary knowledge that enhances the students' capacities to understand social processes in a holistic manner.

e. In the Preparatory Stage, the students study society as part of their local environment through the interdisciplinary subject of The World Around Us.

f. In the Middle Stage, Social Science becomes a separate school subject, and the content is organised in a thematic manner. Each theme would be studied through an integrated view of History, Geography, Political Science, Economics, and other relevant disciplines, such as, Psychology, Philosophy, Anthropology, and Sociology. Additionally, each theme will be studied at the local, regional, national and global levels.

g. While students study History, Geography, Political Science, and Economics as separate subjects in Grades 9 and 10 of the Secondary Stage, a complete picture is attempted by ensuring that the same concept is also considered through the lenses of other disciplines in an integrated manner. This approach builds disciplinary depth while ensuring a holistic interdisciplinary perspective.

h. In Grades 11 and 12 of the Secondary Stage, Social Science is a choice-based option for students where they can choose to do an in-depth study from a range of disciplines that constitute the Social Sciences, such as, History, Geography, Political Science, Philosophy, Economics, Psychology, Sociology and Anthropology.

i. Social Science Education aims to enable students to:

- Understand how societies function by developing awareness of how there is continuity and change in human civilisations; the interaction between nature, natural resources, and human beings; the commonness and unity in diversity among people and their practices; and the transformations over time of various social, political, and economic institutions.
- Develop capacities for inquiry in Social Science; sourcing, verifying, and cross-validating evidence through multiple sources; creative and critical thinking; forming coherent narratives based on available evidence; forming informed opinions and demonstrating logical thinking; and proposing meaningful responses to contemporary concerns of society based on these methods of inquiry.

j. While the entire Social Science curriculum would be strongly rooted in India from the local to the national level, students would also learn and understand the significant contributions of India to the concepts and methods in the disciplines within Social Science from ancient to modern times.

1.7 School Culture and Processes

School Culture and Processes have a direct and significant influence on learning of students. Thus, these must be nurtured and shaped systematically and carefully to enable achieving the aims of education.

1.7.1 School Culture

School Culture influences learning in two significant ways. First, it enables an effective learning environment for all students. Second, it has a significant influence on the development of values and dispositions.

a. School Culture has two aspects. The first aspect is values, norms, and beliefs, which form the school culture; and the second aspect is behaviours, relationships, and practices in which the culture is manifested and experienced. The elements that form the culture and its manifestation are deeply integrated. The students learn from and are influenced by the manifestations.

b. These manifestations can be seen in three categories; relationships amongst the people in the school, symbols that are displayed and celebrated, and arrangements and practices of the school.

Systematic and deliberate effort must shape these manifestations to develop an enabling learning environment and the development of desirable values and dispositions amongst students.

c. To achieve the Aims of Education, the constituent elements of School Culture must have certain characteristics.
   i. Relationships must have mutual trust and be respectful with openness, communication, and collaboration, as well as care and responsibility.
   ii. Symbols must thoughtfully highlight and celebrate the desired values and dispositions.
   iii. School arrangement and practices must manifest these desired values, including in classroom practices, school assembly, mealtime arrangements, distribution of work, sports activities, and in the engagement with parents, family and the community.

1.7.2 School Processes

School processes must ensure two things; the smooth functioning of day-to-day activities and enabling progress towards the achievement of the Curricular Goals. School processes can be broadly divided into the following categories:

a. Curricular processes, which includes school timetable, assembly, library related, student committees, forums, events and celebrations.
b. Curriculum-associated processes, which include those related to teacher collaboration and professional development; engaging with parents, families, and communities; and mealtime, health and hygiene.
c. Organisational processes, which includes school development plans, time and resource allocation, student safety, resolving differences and disciplinary issues, and data management and reporting.

1.8 Creating a Supportive Ecosystem

This NCF only touches briefly upon the kind of ecosystem required for its implementation; these matters would be detailed in other relevant documents and forums.

1.8.1 Capacity Building for Implementation

Speedy and systematic capacity development of all stakeholders must occur to enable implementation of this NCF. This includes teachers, head teachers, principals, syllabus and TLM developers, teacher educators and other functionaries of the education system. Parents and community members must also be familiarised with this NCF.

Relevant programmes must be designed and implemented by institutions, such as, the SCERTs. Particularly for teachers, rigorous programmes would be required to help them bring this NCF to life in the classroom.

1.8.2 Ensuring an Appropriate Environment for Learning

Schools must be welcoming spaces that attract students. These must be safe and secure. They must also be supportive of and address the needs of the teachers. Quality, adequacy, and maintenance of infrastructure are often the differentiators between a good school and a not-so-good one, especially in the eyes of parents and the community.

a. Outdoor infrastructure must be ensured, which includes boundary or compound wall; basic school structure; open space for play and assembly; trees and plants; and accessibility for the inclusion of all.

b. Indoor infrastructure must include clean, spacious, well-ventilated classrooms; libraries and laboratories; dining area and drinking water facilities; toilets; semi-open and partially shaded areas; and uninterrupted supply of water and electricity.

c. Infrastructure must ensure safety and inclusion.

1.8.3 Enabling and Empowering Teachers

Teachers must be the torchbearers of all educational improvement. Thus, teachers must be enabled and motivated in every way possible. Some key points for teachers' engagement and motivation are:

a. Teachers must have autonomy to respond to the reality of the classroom in the best possible manner to achieve the aims of education. For this, they must be enabled with the right teaching-learning resources, physical environment, and professional development. Along with this autonomy, teachers must have accountability, fully recognising that accountability is a complex matter in education.

b. Appropriate PTR must be maintained to enable student engagement and achievement.

c. TPD is a very important aspect of the education system, ensuring continuous improvement, and will be important in implementing this NCF.

d. Pre-service Teacher Education will be transformed to achieve the objectives of this NCF, as mentioned in NEP 2020. The National Curriculum Framework for Teacher Education (NCF-TE) associated with this NCF will be released shortly.

e. Head teachers and school principals have a central role in ensuring the ethos and educational practices in their school that can ensure high-quality implementation of this NCF.

f. Academic and administrative functionaries of the education system would have to fully own the spirit of this NCF for its implementation.

1.9 Community and Family Engagement

For more holistic learning and upbringing of children, parental and community participation is necessary. Parents and the community must be deliberately and systematically engaged, including through orientation meetings, regular Parent-Teacher meetings, and continuing dialogues to build perspective. Parents and members of the community can also act as resource persons. School Management Committees (SMCs) are formal structures, and these must be nurtured to play a vibrant role.

Part A
Approach

This part of the NCF lays down the basic structure of the curriculum.

Any curriculum should be a response to some fundamental Aims of Education. ***Chapter 1*** *articulates the* ***Aims of School Education*** *as well as the broad curricular design to achieve these aims. This Curriculum Framework has another unique responsibility. It must respond to the 5+3+3+4 School Stage design as envisioned by NEP 2020.* ***Chapter 2*** *gives the logic and thinking behind this* ***four-stage design*** *and the curricular considerations specific to each Stage.* ***Chapter 3*** *gives the overall approach to the curriculum. This includes the approach to defining Learning Standards, principles for content selection, pedagogy, and assessment. Any curricular imagination is necessarily constrained by the overall time available for teaching and learning. The last chapter,* ***Chapter 4****, engages with considerations related to time allocation for different areas of the curriculum.*

Chapter 1

Aims and Curricular Areas of School Education

Education must have clear aims, and the curriculum and the overall education system must strive in every way to achieve these aims. This first chapter of this NCF describes the Aims of School Education and outlines the elements of the curriculum that enable the achievement of these aims. For our country's education, these aims are derived from NEP 2020.

This chapter begins by reiterating the vision of Indian education as envisaged by NEP 2020, including the purposes of education and the characteristics of individuals that such an education would strive to develop.

The chapter then organises this vision provided in NEP 2020 into specific Aims of School Education that provides clear direction for the NCF, aligns its curricular elements, and also guides other elements of the education system. These aims are to be fulfilled by developing appropriate knowledge, capacities, values, and dispositions in the students which this chapter articulates.

School curriculum consists of all the deliberate and organised set of arrangements, mechanisms, processes, and resources in a school of any kind that are intended to help achieve the Aims of Education. These include the subjects that are taught, the pedagogical and classroom practices, books and other Teaching-Learning Materials (TLMs), examinations and other forms of assessment, and school culture and processes. The last section of the chapter gives a brief outline of these arrangements that are appropriate for achieving these aims.

There is a range of matters that are not a part of the curriculum, but directly affect the curriculum in practice and therefore learning, such as, the appointment of teachers and their professional development, admission of students and the composition of students, engagement with parents and the community, and physical infrastructure. These aspects are thus touched upon in this NCF, but are not addressed comprehensively.

Section 1.1
Vision of Education Drawn from NEP 2020

Education is, at its core, the achievement of valuable knowledge, capacities, values, and dispositions. Society decides the knowledge, capacities, values and dispositions that are 'valuable' enough to be developed through education, and so they are informed by the vision that the society has for itself. Hence, it is through the development of knowledge, capacities, values, and dispositions in the individual that education contributes to the realisation of the vision of a society.

The overarching vision of India is articulated in the Constitution of India and is also informed, therefore, by the civilisational heritage of India. Drawing from this vision of India, the vision of education in India is enunciated in NEP 2020 as follows:

> *This National Education Policy envisions an education system rooted in Indian ethos that contributes directly to transforming India, that is Bharat, sustainably into an equitable and vibrant knowledge society by providing high-quality education to all, and thereby making India a global knowledge superpower.*
>
> *[NEP 2020, The Vision of this Policy]*

The vision is, thus, of an education system that contributes to the development of an equitable and vibrant knowledge society. Education can achieve this by developing appropriate desirable qualities in the individuals who participate in the education system as students. These qualities of individuals, along with their contribution to society are further enunciated in NEP 2020:

> *The purpose of the education system is to develop good human beings capable of rational thought and action, possessing compassion and empathy, courage and resilience, scientific temper and creative imagination, with sound ethical moorings and values. It aims at producing engaged, productive, and contributing citizens for building an equitable, inclusive, and plural society as envisaged by our Constitution.*
>
> *[NEP 2020, Principles of this Policy]*

> *The aim of education will not only be cognitive development, but also building character and creating holistic and well-rounded individuals equipped with the key twenty first century skills.*
>
> *[NEP 2020, 4.4]*

Thus, the development of well-rounded individuals capable of rational thought and action, equipped with appropriate knowledge and capacities, and possessing desirable moral and democratic values, is at the core of the vision of education.

Section 1.2
Aims of School Education

School Education must develop in students appropriate values, dispositions, capacities, and knowledge required to achieve the above vision of education.

A curriculum, therefore, must systematically articulate what these desirable values, dispositions, capacities and knowledge are, and how they are to be achieved through appropriate choice of content and pedagogy and other relevant elements of the education system, and present strategies for assessment to verify that they have been achieved.

Box 1.1

Definitions

Before we elaborate on the Aims of School Education, it is useful to clarify the meanings of the words; knowledge, capacities, values, and dispositions as used in this document. Here is a brief explanation of what is meant by these words in this NCF:

a. ***Knowledge*** *refers to descriptive knowledge, i.e., 'knowing that', for example, knowing that the earth revolves around the sun or knowing that Mahatma Gandhi played a central role in India's independence movement. A very large part of the understanding of the world is attained through this form of knowledge. This form of knowledge is expressed through theories, concepts, and principles. In a way, this form of knowledge reveals to us the truths about the world. While knowledge of this form might appear to be factual, the focus of acquiring such knowledge is not merely on remembering these facts, but also on the ability to think about why these facts are true, to inquire further, to connect together pieces of such knowledge, and to foster the development of new knowledge and insight and use such knowledge in life. For example, how can we know if the statement 'Earth and other planets of our solar system revolve around the Sun' is true? What are the sources of evidence? What are the methods of justification? Where can this knowledge be used? School education must focus on all these aspects of knowledge.*

b. ***Capacities*** *refer to procedural knowledge, i.e., 'knowing how', for example, knowing how to communicate effectively or think critically or how to play Kho Kho. The abilities and skills acquired through this form of knowledge enable us to act based on our understanding. Usually, procedural knowledge is used in the context of embodied abilities, such as, the ability to drive a car; however, problem solving and reasoning, for example, are procedural knowledge too. We refer to such broad know-how, such as, critical thinking, problem solving, and effective communication as capacities, and these capacities can be broken down into narrower skills, such as, addition or decoding. Often, acquiring descriptive knowledge requires capacities too; for instance, in Science, the capacities and skills of observation and experimentation are central to building descriptive scientific knowledge. For example, without the skills of observation, it is difficult to truly justify that the Earth and other planets revolve around the sun. For a student to attain a capacity or a skill, the ability needs to be consistent and repeatable, and it also needs to be adaptable to different situations. For instance, to be skilled in making pots or performing addition, the student should be able to exercise that ability successfully not just once, but multiple times consistently and accurately, and should be able to work with different materials or numbers.*

   Capacities are broader and deeper than skills. A capacity often consists of multiple skills. Thus, skills are sub-elements of capacities. In other contexts or documents, 'skills' and 'capacities' may have been used interchangeably or 'skills' would have been used for what is classified as 'capacities' in this NCF. This NCF should be read with these distinctions in mind.

c. ***Values and Dispositions*** *are effective action that needs strong motivation in addition to knowledge and capacities. Our values and dispositions are the sources of that motivation. Values refer to beliefs about what is right and what is wrong, while dispositions refer to the attitudes and perceptions that form the basis for behaviour. Thus, in addition to developing knowledge and capacities, the school curriculum should deliberately choose values and dispositions that are derived from the Aims of Education and devise learning opportunities for students to acquire these values and dispositions.*

1.2.1 Aims of School Education in This NCF

The Aims of Education in this NCF are derived from the vision and purpose of education described above and are organised into five Aims. These five Aims give clear direction to the choice of knowledge, capacities, values, and dispositions that need to be included in the curriculum:

a. **Rational Thought and Independent Thinking or Autonomy:** Making choices based on rational analysis, creativity, and a grounded understanding of the world, and acting on those choices, is an exercise of autonomy. This indicates that the individual has gained the capacity for rational reasoning, critical thinking, knowledge with both breadth and depth, and discernment to understand and improve the world around them. Developing such independent thinkers who are curious, open to new ideas, think critically and creatively, and thereby form their own opinions and beliefs is thus a very important aim for school education.

b. **Health and Well-being:** A healthy mind and a healthy body are the foundations for an individual to pursue a good life and contribute meaningfully to the society. School education should be a wholesome experience for students, and they should acquire knowledge, capacities, and dispositions that keep their bodies and mind healthy and free from any forms of abuse. Health and well-being thus also include, in particular, the ability and inclination to help ensure the health and wellness of others, of one's surroundings, and of the environment.

c. **Democratic and Community Participation:** The knowledge, capacities, values and dispositions developed are to be oriented towards sustaining and improving the democratic functioning of Indian society. Democracy is not just a form of governance, but it is a 'mode of associated living,' a sense of collaborative community. The goals articulated in NEP 2020 point to the development of an individual who can participate and contribute meaningfully to sustaining and improving the democratic vision of India and the Indian Constitution.

d. **Economic Participation:** A robust economy is a critical aspect of a vibrant democracy, particularly for achieving dignity, justice and well-being for all. Effective participation in the economy has positive impacts on the individual and on society. It provides material sustenance for the individual and generates economic opportunities for others in society, while also contributing to purpose and meaning for the individual.

e. **Cultural Participation:** Along with democracy and the economy, culture plays an important, if not central, role in the lives of all individuals and communities. Cultures maintain continuity as well as change over time. NEP 2020 expects students to have a rootedness and pride in India, and its rich, diverse, ancient and modern culture, and knowledge systems and traditions. Culture is thus not seen as merely an ornament or a pastime, but an enrichment which equips the student, and teacher alike to face many challenges of life, challenges which may be personal or collective in nature. Understanding the culture and heritage embedded in the family and community and relatedness to nature is at the core of cultural participation. Students should also acquire capacities and a disposition to contribute meaningfully to culture. In a globalised world, understanding and engaging with other cultures from a position of being confident and deeply rooted in Indian culture is very desirable.

A society with individuals who are healthy, knowledgeable, and with capacities, values, and dispositions to participate effectively and meaningfully in a community, economy, culture, and democracy would make for a pluralistic, prosperous, just culturally vibrant, and democratic knowledge society.

Section 1.3
Knowledge, Capacities, Values and Dispositions

The five Aims of Education as articulated in the previous section would be achieved by schools by developing relevant and appropriate knowledge, capacities, values, and dispositions in their students. The knowledge, capacities, values, and dispositions that are to be developed in students to achieve the five aims, are described in this section.

1.3.1 Values and Dispositions

India has been a significant contributor to the discourse on values and of their practice, from ancient times to today. The exploration of humanistic and pluralistic values is embedded in our civilisational and local cultural traditions, and our Constitution is a beacon of democratic values. NEP 2020 derives its values from our heritage and traditional sources, from broad humanistic values, and from our Constitution.

Attaining the aims of rational thinking, health and well-being, and democratic or economic or cultural participation require the following broad categories of values in the individuals and society:

a. **Ethical and Moral Values:** The 'values of *Seva, Ahimsa, Swacchata, Satya, Nishkam Karma*, tolerance, honest hard work, respect for women, respect for elders, respect for all people and their inherent capabilities regardless of background, respect for environment, etc., will be inculcated in students.' (KRCR 2019, 4.6.8.2) These values are virtues that students need to develop, and these are beneficial to the individual, in terms of their health and well-being, as well as to society as a foundation for democratic values.

b. **Democratic Values:** These values include 'democratic outlook and commitment to liberty and freedom; equality, justice and fairness; embracing diversity, plurality and inclusion; humaneness and fraternal spirit; social responsibility and the spirit of service; commitment to rational and public dialogue; peace; social action through constitutional means; unity and integrity of the nation…' (KRCR 2019, 4.6.8.3)

c. **Epistemic Values:** These are values that we hold about knowledge and truth. Developing a scientific temper is as much a value orientation towards the use of evidence and justification, as much as understanding current scientific theories and concepts. 'Inculcate scientific temper and encourage evidence-based thinking throughout the curriculum'. (KRCR 2019, 4.6.1.1) Recognising the sources of knowledge and truth in different domains and having the integrity to adhere to the relevant and acceptable methods of finding the truth is an important value orientation.

Along with the above values, the NCF would intend to develop the following dispositions in students:

i. **A Positive Work Ethic:** Any form of achievement, if it needs to be achieved through just and equitable means, requires honest, deliberate, and sustained work. This includes learning achievements too. While hardwork and perseverance are important, being responsible and taking up and completing an honest share of work are equally so, especially in situations where work is accomplished collectively. Respect towards all modes of work that include: with hands, with technology, household work, office

work, outdoor work or factory work, is very desirable. Developing these dispositions in students becomes a very important goal for school education.

ii. **Curiosity and Wonder:** Curiosity and wonder are at the core of learning, and with this disposition, students can become lifelong learners. The very young child comes with natural curiosity to engage with the social and practical world around them. This needs to be sustained, extended, and expanded. If knowledge needs to be active and alive and not passive and inert, students have to approach knowledge with curiosity and wonder. The World Around Us is a limitless source for developing this disposition.

iii. **Pride and Rootedness in India:** The Aim of cultural participation indicates that students should develop dispositions that make them rooted in the overall Indian context and in their local context, while being an engaged citizen of the world. The vision of NEP 2020 states that

> *The vision of the Policy is to instil among the learners a deep-rooted pride in being Indian, not only in thought, but also in spirit, intellect, and deeds, as well as to develop knowledge, skills, values, and dispositions that support responsible commitment to human rights, sustainable development and lifestyles, and global well-being, thereby reflecting a truly global citizen.*

The notion of *Vasudhaiva Kutumbakam*, the world as one family, emerges from this rootedness along with a sense of justice, service, self-discipline and self-fulfilment, compassion and empathy, and acceptance of unity in diversity. With the vibrancy, range, and the depth of our culture and heritage, indians must engage with the rest of world with assurance and confidence and with empathy and openness.

1.3.2 Capacities

While values and disposition are sources of motivation to act, acting effectively requires students to have specific capacities. These capacities can be developed through deliberate and conscious engagement and practice. The Aims of rational thought and independent thinking, health and well-being, and democratic or economic or cultural participation necessitates the following broad set of capacities:

a. **Inquiry:** To act rationally, we need an understanding of the world around us. This understanding requires the abilities of observation, collection of evidence, analysis, and synthesis. Experimentation and innovation are the practical aspects of this capacity. Beyond these general capacities of inquiry, there are discipline-specific skills, such as laboratory skills or field techniques, which assist in the process of inquiry. These capacities of inquiry are fundamental in achieving all five aims.

b. **Communication:** The abilities to listen, speak, read and write in multiple languages are also indispensable capacities. To be able to express oneself, both orally and in writing, in a lucid, well-articulated, and coherent manner, is very important throughout life; this also includes the skilled use of digital media. The ability to use varied forms of communication in different contexts that are appropriate for the intended audience is very valuable in achieving all the Aims.

c. **Problem Solving and Logical Reasoning:** The ability to formulate problems, develop many alternative solutions, evaluate different solutions to choose the most optimal solution, and implement the solution is again indispensable in achieving all five Aims.

Problems that require quantitative models require the mastery of various mathematical procedures, starting from simple arithmetic skills of addition and subtraction to more complex solving of algebraic equations. The use of computational models for solving problems would require computational skills. Skills for logical reasoning include constructing and evaluating arguments, both formally and informally.

d. **Aesthetic and Cultural Capacities:** The Aims emphasise creativity, aesthetic and artistic expression. Creating works of art requires skills specific to different forms of art, visual arts, music, dance or movement and theatre. Culturally relevant skills in art forms enable effective cultural participation. Aesthetic and cultural capacities also help strengthen creativity across domains and thus strengthen the capacities of inquiry and problem solving and also improve language and communication, and therefore they are also critical in achieving all five Aims. Artistic skills further enable students to effectively express emotions and thoughts through art, thus improving their sense of health and well-being.

e. **Capacities for Health, Sustenance, Self-management and Work:** Developing skills and practices that enable students to lead a healthy life is one of the important aims. Developing strength, endurance, and perseverance is not just in terms of physical capacities, but also related to the capacities of the mind. Capacities of self-management, including emotional capacities are important. Such capacities are foundational for not just well-being, but also contribute positively towards autonomy and democratic participation. These capacities, along with the disposition of a positive work ethic, should enable students to participate in the economy meaningfully and significantly.

f. **Capacities for Social Engagement including Affective Aspects:** Empathy and compassion are not only values or dispositions, these are capacities that are developed through deliberate practice. Cooperation, teamwork, and leadership are fundamental capacities for social engagement. Along with the capacities for logical reasoning and problem solving, these capacities are crucial for democratic participation. And these capacities have an affective (emotional) aspect which too needs to be addressed.

Indeed, all capacities enumerated above promote the five Aims; Rational Thought and Independent Thinking, Health and Well-being, and Democratic or Economic or Cultural participation. With the desirable values and dispositions and equipped with appropriate capacities, it is expected that students will live healthy, independent lives and participate actively in the community, economy, culture, and democracy. But these values and capacities do not operate in a vacuum, they must be based on a clear understanding of the world. This understanding is gained through the achievement of knowledge in breadth and depth.

1.3.3 Knowledge

Education is often thought of and practised only as the acquisition of knowledge. While this is an inadequate view, without a doubt knowledge has a central role and place in education.

Knowledge about the self, others, the social world, and the physical and natural world is at the base of all the five Aims of Education. The achievement and practice of values, dispositions, and capacities, which are also equally important aims of education, are not primarily about acquisition of knowledge, but intrinsically depend on knowledge.

The vast and ever-increasing knowledge of humanity is and should be made available to all. All that human knows has developed over history through specific modes of inquiry, both through more formalised methods of knowledge development, and also through less formalised, more experiential and organic approaches. The theories and concepts within a mode of inquiry have emerged sometimes through incremental explorations of a whole community, and sometimes through dramatic insights of a few remarkable individuals. Equally, knowledge has developed through the accumulated experience and wisdom of ordinary people. There are no neat divisions on how human knowledge develops, formal inquiry and knowledge through life experience merge and reinforce each other. Our accumulated and expanding knowledge is a human heritage and it is the responsibility of schools to share this heritage with every new generation.

Given the centrality of knowledge to education, there are many matters related to knowledge that have a deep implication on curriculum. Some of these matters are:

- How does something become knowledge? In other words, how do we know that something is true and valid?
- How do we search for, discover and build more knowledge?
- What are the interconnections within knowledge? What knowledge becomes the basis for some other knowledge and why?
- Can there be contradictions in knowledge? Why and how do they arise? How are these resolved?
- How is knowledge acquisition by humans influenced by context and by values?
- What are the ethical and moral issues associated with the pursuit of knowledge?

These matters may seem esoteric and more suitable for a Philosophy book than for school education. But the reality is that teachers, curriculum, syllabus developers, and others grapple with these very issues in school education every day. The implications of these matters directly influence many aspects of the curriculum. For example:

- What should be taught? What should be the content of subjects?
    - What ensures that content is true and valid?
    - What should be included to give adequate understanding of a subject area?
    - What should be the sequence of teaching concepts, considering the interconnections?
    - How should the developmental stage of the students be accounted for?
    - How should knowledge that is yet uncertain or has many alternative perspectives be included?
- How should we teach? How should we assess? How can we make TLMs effective?
    - Which pedagogical approach is best for which kind of knowledge? What are the options?
    - How should we teach so that the integrated, holistic nature of human knowledge and experience is developed?
    - How should we teach so that students form a full picture and are also able to apply their knowledge?

- How do we know that a student has truly 'learnt' something?
- What TLMs are best suited to what knowledge? How should we develop them?

- What are the ways to ensure that students learn existing knowledge while also discovering new things?
  - Since no one can be taught 'all the knowledge,' how can students be encouraged to continue to search for and learn existing knowledge from the wider world, at present and later in their lives, and also gain the capacity to develop new knowledge?
- What kind of knowledge is required to develop the capacities and values that are aimed for?
  - How are moral and ethical capacities best developed?
  - How are cognitive and socio-emotional capacities, such as critical thinking, empathy and wonder, best developed?

While this is a long list of direct curricular questions that arise from questions related to the nature of knowledge, this is not an exhaustive list.

We must also note that many of these matters have subject-specific implications in school education. For example, the nature of knowledge in Mathematics is such that many topics must have a certain sequence; the nature of knowledge in Social Science is such that it requires many perspectives; and the nature of knowledge in Science is of a kind where learning by doing experiments is particularly useful.

Thus, in this NCF, each subject's chapter (*Part C, Chapters 2–9*) has a section on the **'Nature of Knowledge'** particular to that subject. However, a vast amount of human thought and discourse related to knowledge has a common base across all spheres, including school education. The subsection that follows discusses this common base.

1.3.4 Knowledge: the Foundations

India has a vibrant tradition of thought and discourse on the theory and practice of knowledge. Without doubt, other cultures too have had rich traditions on this matter and both are widely recognised, such as, the Greeks and the Japanese, and the less recognised, such as, the Native Americans. However, the richness, nuance, and range of Indian thought on this matter is very special, if not unique.

If we consider the most current thoughts on knowledge, anywhere in the world, one can often observe similar ideas in Indian thought from two millennia earlier, in many senses directly anticipating it and perhaps having deeply influenced it through cultural transmission. Thus, it is both important and useful to ground our thinking and practice on this Indian heritage.

The nine 'Schools of Thought' in Indian philosophy (Box 1.2) form an important source of views and discourse on the nature of knowledge.

Box 1.2

Indian Schools of Thought: A Brief Glimpse

There are nine main Darsanas or world views (sometimes translated as 'schools of thought') in classical Indian philosophy: (i) Nyaya; (ii) Vaisesika; (iii) Sankhya; (iv) Yoga; (v) Mimamsa; (vi) Vedanta; (vii) Buddhist; (viii) Jaina; (ix) Lokayata or Carvaka all of which date back to at least a few centuries BCE.

The Nyaya Darsana was founded by the sage Gautama. This Darsana was primarily occupied with formal reasoning, rhetoric, and epistemology, although it also made substantial contributions to metaphysics. The Vaisesika system was founded by Kanada. This Darsana was known for its efforts to make sense of the material world, the various categories and components of matter and their properties, behaviour, etc. It has similarities with Nyaya, but its focus was more on metaphysical questions and less on principles of reasoning. At a later stage, some Nyaya and Vaisesika authors became increasingly syncretistic and viewed their two schools as sister Darsana.

Sankhya is the oldest of the systematic schools of Indian philosophy and dates back to the Vedic period. Its views are heavily based on the Upanisads. Sankhya argues for a dualistic ontology comprising Prakrti (nature) and Purusha (person). Just as Nyaya and Vaisesika are sister Darsana, so too are Yoga and Sankhya. Yoga accepts the Sankhya dualism and calls on the practitioner to disentangle the Purusha from the Prakrti, thus freeing the former to achieve its full dimension and powers. Their main difference becomes evident in the relative importance of mind and body, as well as in their accounts of how liberation (Moksa) is attained.

The Mimamsa Darsana concerns itself largely with ethical questions and takes as its main goal the elaboration and defence of the contents of the early, ritually-oriented part of the Vedas. This school also contributed a great deal to the philosophy of language. Unlike the four Darsana discussed previously, Mimamsa holds that the Vedas are epistemically foundational. This founding principle is shared by the Vedanta Darsana. The Vedanta Darsana concerns itself, however with the latter part of the Vedas, where the principal concern is knowledge and Moksa.

The Lokayata were materialists who denied the existence of an atman that persisted through many lives. The Buddhists denied the existence of such a thing as a coherent self. The Jainas argued for a variety of jiva, so that even nature and not just human and Gods were seen as ensouled.

Despite this apparent split, all these different Darsana influenced and were influenced by each other and, for the most part, classical Indian philosophy is best seen as a series of complex dialogues within and between these Darsana. For example, Jainism was very influential for the Yoga Darsana. Nyaya and Buddhist thinkers were in continual, spirited dialogue. The Nyayasutra itself is one of our best sources for Lokayata thought and presents and responds to a series of Lokayata objections.

Beyond these nine schools, many others developed, which is a reflection of the acceptance of multiple paths and the freedom of thought that prevailed in early India.

The theory of knowledge or *Pramana-shashtra*, is one of the richest areas of classical Indian philosophy, spanning several centuries and with the liveliest of debates. Indeed, claims about 'how we come to know' is often the principal criterion that distinguishes different schools or *Darsana* of Indian philosophy. For example, the *Vaisesika* philosophers argue that validity arises from the right source, whereas the *Yogacara* argue that validity is that which guides successful action. Furthermore, questions about knowledge are also related to other fundamental questions about the nature of reality and language. The *Pramana-shashtras* are a key basis for Indian Knowledge Systems and are described in greater detail below.

1.3.4.1 *Pramanas*: Vibrant Tradition of Epistemology

While there are many similarities and vibrant dialogues amongst them, these different *Darsana* (*Box 1.2*) represent a wide range of views on what constitutes an appropriate *Pramana* (evidence) or basis for knowledge. The main *Pramana* used are: (i) perception; (ii) inference; and (iii) testimony.

A brief description of the range of views on this matter follows, merely to give a flavour of the vibrant nature of this Indian discourse.

a. The different *Darsana* are all in agreement about the fact that we attain knowledge through perception (*Pratyaksha*). However, there are considerable debates about the nature of perception. According to the *Nyaya*, all perception requires a sensory connection with an object that gives the perception its content *(Nirakara-Vada)*; for instance, in *Nyayasutra*, it is stated, 'Perception is an awareness which, when produced from the connection between sense organ and object, is non-verbal, accurate and reliable and definite.'

   According to early *Mimamsa,* perception essentially happens through language; there is no such thing as concept-free perception. Not only do later *Mimamsa* thinkers, such as Kumarila Bhatta, disagree with this, the *Yogacara* do as well.

   Many Buddhist thinkers argue that we do not perceive any object at all, but only bundles of sense data, such as, colour, sound, and smell, in opposition to the realist *Nyaya* doctrine.

b. Different kinds of inferences were considered in *Pramana-shashtra.*

   i. *Anumana:* Using inferences to come to new conclusions from observations is one way of coming to know.

   ii. *Upamana:* Knowing through analogy and comparison is *Upamana*. Relating to existing knowledge and identifying the similarities and differences and, thus, coming to know new things or experiences is another valid way of knowing.

   iii. *Arthapatti:* Knowing through circumstantial implication is *Arthapatti*.

   iv. *Anupalabdi:* Perception of non-existence is considered a valid form of knowledge. Observing that the well is empty of water is knowing something about the well. People have come to significant conclusions because 'the dogs did not bark that night.'

   In general, inference is accepted as a secondary knowledge source in cases where what is known cannot be evident through perception alone. Unlike western philosophy, logic is an essential part of the theory of knowledge in the Indian tradition and not a separate discipline. Its value is in its ability to help us arrive at truth. Logic and inference are also understood in a much broader sense, including not just rules of reasoning, but also as a psychological process that allows us to know, via *Hetu* (a sign), indirectly.

   The *Nyayasutra* has many examples of how we come to know through hypothetical induction. The *Vaisesikasutra* spells out how we can infer through extrapolation, e.g., through the presence of its horns, we can know through inference the presence of an entire cow. It provides us with a series of rules for when such extrapolation is warranted. On the other hand, some in the *Lokayata* tradition deny that we can ever know via inference, because inference is prone to mistakes.

c. Testimony (*Sabda*) is a highly debated source of knowledge. Not just *Lokayata*, but also *Vaisesika* and Buddhist schools, deny that testimony in general can be an independent source of knowledge. The *Lokayata* accept only perception, whereas Buddhism is founded on the idea of experience and reasoning as the only ways of learning anything, while *Nyaya* and *Mimamsa* thinkers argue for use of testimony under specific conditions and from specific sources.

This brief glimpse points to the significant contribution of Indian thinkers to the field of epistemology and the understanding of the nature of knowledge.

1.3.4.2 Implications on Curriculum

The depth and range of thought on the matter of knowledge in India, including contemporary Indian thought, along with relevant thinking from across the world, must inform our curricula. This is operationalised by a method of organising knowledge which is on sound foundations and is useful for curriculum.

Informed by these range of discourses, school knowledge for practical purposes, has been organised into different kinds or forms. Each kind has its own conventions on:

a. The scope of inquiry (what questions to explore)

b. Specific ways of giving meaning to concepts

c. Specific methods of validating the truth of the claims being made (how to answer those questions)

Each form of knowledge has distinct but related methods of reasoning and justification, procedures and protocols, and what is to be admitted as evidence. In a way, each form of knowledge has its own kind of 'critical thinking' and its own ways of being 'creative.'

Mathematics, Sciences, Social Sciences, Arts and Aesthetics, and Ethics are some of these kinds of knowledge that have their own sets of concepts and theories through which we make meaning of our experiences. These forms give clear direction as to what knowledge all students in schools should acquire. They help, in part, determine the different Curricular Areas of this NCF.

Through engagement with these kinds of knowledge, students develop 'disciplinary knowledge'. While the capacity for problem solving depends heavily on such disciplinary knowledge, often real-life situations pose problems whose solutions are informed by many disciplines that need to be integrated. For instance, the problems of sustainability and climate change are not merely informed by Science, but also by our understanding of Social Science and Mathematics. Thus, engagement with interdisciplinary knowledge becomes an important goal for school education along with disciplinary knowledge.

Section 1.4
Towards a Curriculum

Schools must arrange to develop in students the desirable Values, Dispositions, Capacities, and Knowledge. As mentioned before, these arrangements range from the selection and appointment of teachers to school culture and the actual subjects that are taught in the school.

The curriculum includes all those arrangements that directly impact the engagement and learning of students. While the curricular imagination for a school is often restricted to the arrangements of classroom interactions, the school culture, practices, and ethos also play a very important role, both in enabling a positive learning environment as well as promoting desirable values and dispositions.

In this section, the specific curricular arrangements that schools must organise, so that students gain the desired Values, Dispositions, Capacities, and Knowledge are explored.

1.4.1 School Culture

Schools achieve educational aims not just through teaching within the confines of the classroom, but also through the inclusion and assimilation of the students into the extant culture and ethos of the school.

Values and dispositions, in particular, are deeply influenced by immersion in the school ethos and culture, and so forms an integral part of the curriculum. Thus, to develop specific values and dispositions, there has to be a deliberate shaping of the school culture and ethos. In the absence of such deliberate shaping, whatever be the school culture that has emerged will have significant influence on the students, which may even be at odds with the Aims of Education.

Values and dispositions are also profoundly shaped by the family, community, religion, local and popular culture, art, literature, media, and other influencers. The school is somewhat different from many of these influencers because it has clearly articulated goals for the values and dispositions and presents the opportunity to work towards them systematically and methodically.

Hence, it is equally important for a curriculum framework to explicitly articulate the arrangements and organisation of the school in terms of its culture and ethos that would promote the desired values and dispositions. This NCF has made specific recommendations for school culture and ethos in *Part D, Chapter 1*.

1.4.2 School Processes

In addition to school culture, more formal and well-defined school processes have a significant role to play in both ensuring the smooth functioning of the school, as well as enabling the achievement of Curricular Goals. Processes for maintaining academic accountability towards achieving the aims, both from the teachers and students, are important to be articulated, understood, and followed. Thoughtfully designed school processes are required to address simpler matters, such as maintaining the cleanliness of the school premises, and more complex matters, such as, responding to Learning Outcomes of students. This NCF makes specific recommendations related to school processes in *Part D, Chapter 2.*

1.4.3 Curricular Areas

Box 1.3i

எண்ணென்ப ஏனை யெழுத்தென்ப இவ்விரண்டுங்
கண்ணென்ப வாழும் உயிர்க்கு

Ennenpa enai yeluttenpa ivvirantun kannenpa valum uyirkku.

The learning of numbers and letters;

these are the two eyes of the living person...

(Tirukkural 392, Tiruvalluvar. Transliteration and translation by Narayanalakshmi)

Ancient Indians had clear conceptions of what is valuable in education. As the above couplet from the ancient Tamil poet Tiruvalluvar indicates, Language and Mathematics were seen as two eyes through which we make sense of the world. It is not surprising than that Language and Mathematics continue to be two of the most important Ccurricular Areas, even many centuries since this verse was written.

To achieve the aforementioned Knowledge, Capacities, Values, and Dispositions, the curriculum also needs to enumerate specific Curricular Areas. This division is not just a pragmatic necessity for organising classrooms, timetables and teachers.

While pragmatic considerations are equally relevant, these distinct Curricular Areas have an internal logic. The internal logic is determined by the conceptual structures and methods of inquiry that are specific to that 'kind of knowledge.' Each Curricular Area has interconnections within, arising from specific methods used to arrive at the knowledge, as well as aspects and perspectives on the world that they highlight. Pragmatically, each Curricular Area leads to its own time slot in the timetable, as well as its own textbooks and other TLMs, Teacher allocations, and so on.

Box 1.3ii

*This NCF uses **'Curricular Area'** as a broader category, to distinguish it from 'discipline,' 'field' and 'subject':*

- ***'Discipline'** is a branch of knowledge, for example, sociology, economics, biology, mathematics.*
- ***'Field'** is used with the connotation of being focussed on application and use in the world and is often informed by multiple discipline, for example, engineering, public health, sustainability.*
- ***'Subject'** is most often used in the context of schools and is what students 'study', it could be a discipline, a field or a combination or part thereof.*
- ***'Curricular Area'** is a group of disciplines and/or fields with an underlying logic for grouping them together, for example, Science, Social Science.*

In this NCF, 'subject' will continue to be used for what the students study. Subjects will be grouped within 'Curricular Areas' in the NCF for practical purposes.

'Disciplines,' 'fields' may be used only to refer to the sources of knowledge for the construction of subjects, where required. The usage of this terminology (and nested hierarchy) is not a conceptual matter, but is merely for the ease of communication of the design of certain critical aspects of this NCF.

1. **Languages:** Language is not just a medium of thinking, nor merely a tool for acquiring different forms of understanding. Language education makes effective communication possible and equally develops aesthetic expression and appreciation. Analytical reasoning and critical thinking are very closely linked with language use, and these are valuable capacities to be developed through the learning of languages. Particularly in the context of India, multilingualism, sensitivity to and appreciation of a diverse set of languages, and cultural literacy and expression are desirable outcomes of language learning as articulated in NEP 2020.
2. **Mathematics and Computational Thinking:** Mathematics is a form of understanding the world through patterns, measurements and quantities. Mathematics education also develops capacities for problem solving, logical reasoning and computational thinking.
3. **Sciences:** Science (also sometimes referred to in this NCF as Natural Sciences) is a form of understanding the natural world. It has its own specific methods of inquiry, reasoning, theories and concepts. Beyond aiding in gaining an understanding of the natural phenomena around us, Science Education helps develop rational thought and scientific temper.

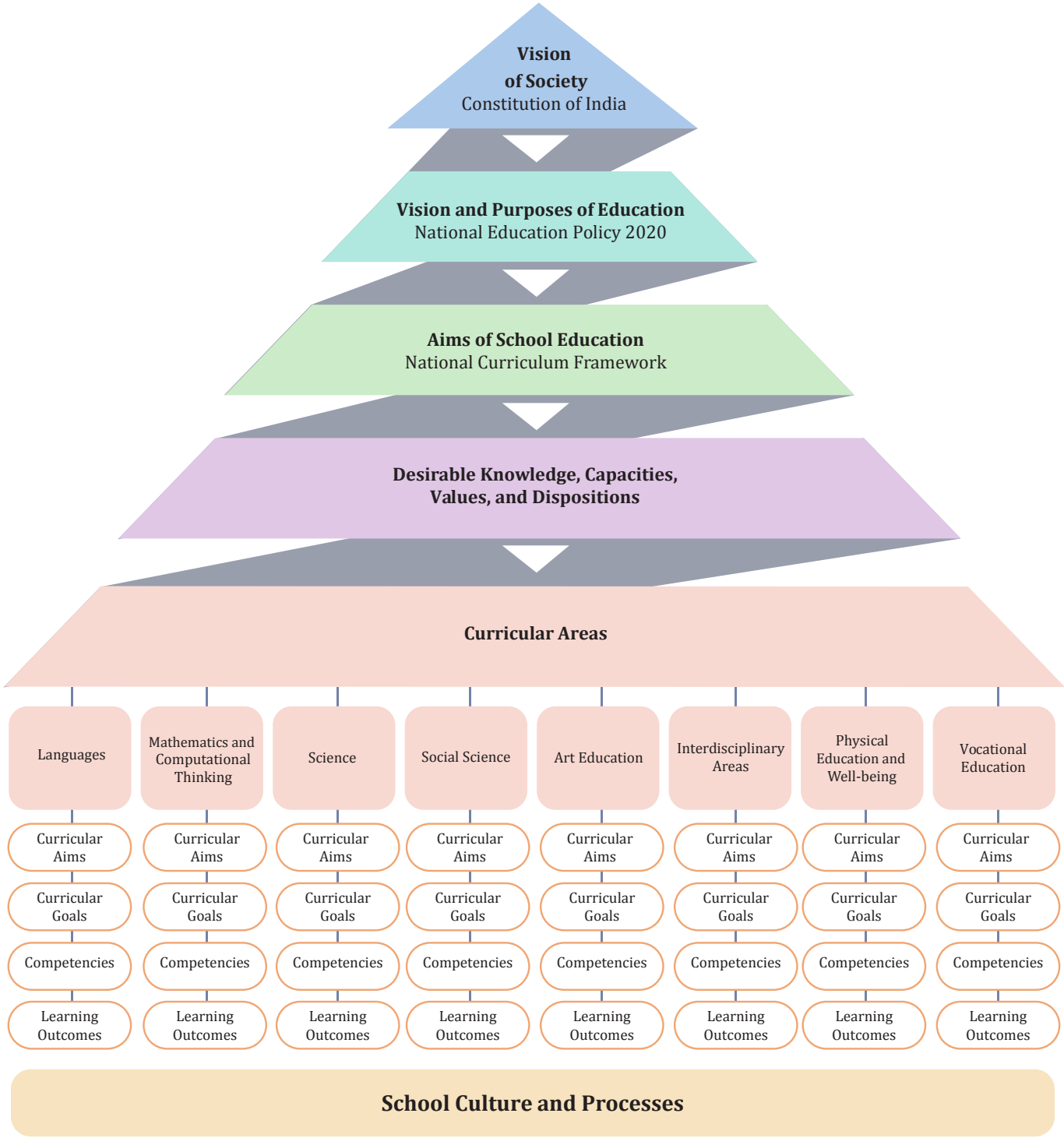
4. **Social Sciences:** Social Science (which, in this NCF, includes the Humanities) aims to understand the human world. The methods of inquiry in the Social Sciences are evidence based and empirical through specific methods of reasoning. Social Science also promotes rational thought and scientific temper, as well as an understanding of one's community and society. Additionally, subjective experiences are analysed through interpretation and reflection. Social Science helps in promoting students' effective cultural or economic or democratic participation.
5. **Art Education:** Art is a form of understanding through which we make aesthetic sense of our experiences. Engagement with art also builds our capacities for being creative across subjects and develops cultural sensibilities. Learning art allows students to engage and participate meaningfully in our culture and, because art involves the physical, emotional, aesthetic, and intellectual parts of ourselves, learning it also helps contribute to the student's general well-being and integrated development.
6. **Interdisciplinary Areas:** While forms of understanding give disciplinary knowledge and depth, interdisciplinary knowledge and thinking is also an important goal as discussed earlier. Engagement in interdisciplinary areas develops capacities for interdisciplinary thinking and problem solving. This Curricular Area therefore complements the disciplinary thinking of the aforementioned five disciplinary Curricular Areas.

   Beyond these forms of understanding, Physical Education and Vocational Education are important Curricular Areas. These areas become important due to the specific Curricular Aims of health and well-being and economic participation. NEP 2020 has given specific directions for Physical and Vocational Education.
7. **Physical Education and Well-Being:** Physical Education and Well-being focusses on developing capacities for maintaining health, well-being and emotional balance. Through engagement in sports, games, yoga, and other techniques, important ethical, moral, constitutional, and democratic values are also developed.
8. **Vocational Education:** Vocational Education intends to develop capacities for sustenance, work, and economic participation. It also develops values and sensibilities towards physical work and an appreciation of the dignity of all labour. NEP 2020 has given a strong emphasis to giving vocational exposure and developing vocational skills from the very early stages of school through higher education.

These eight Curricular Areas have their own specific Learning Standards, and have specific recommendations for content selection, pedagogical approaches and methods of assessment. These details have been outlined in *Part C, Chapters 2–9.*

Figure 1.3 depicts how the NCF, which includes the Curricular Areas (its goals, pedagogy, books, assessment, etc.), school culture, and school processes necessary to achieve Aims of School Education, flow from the vision of society that is envisaged in our Constitution.

Figure 1.3


Vision
of Society
Constitution of India
Vision and Purposes of Education
National Education Policy 2020
Aims of School Education
National Curriculum Framework
Desirable Knowledge, Capacities, Values, and Dispositions
Curricular Areas
Languages
Mathematics and Computational Thinking
Science
Social Science
Art Education
Interdisciplinary Areas
Physical Education and Well-being
Vocational Education
Curricular Aims
Curricular Goals
Competencies
Learning Outcomes
School Culture and Processes

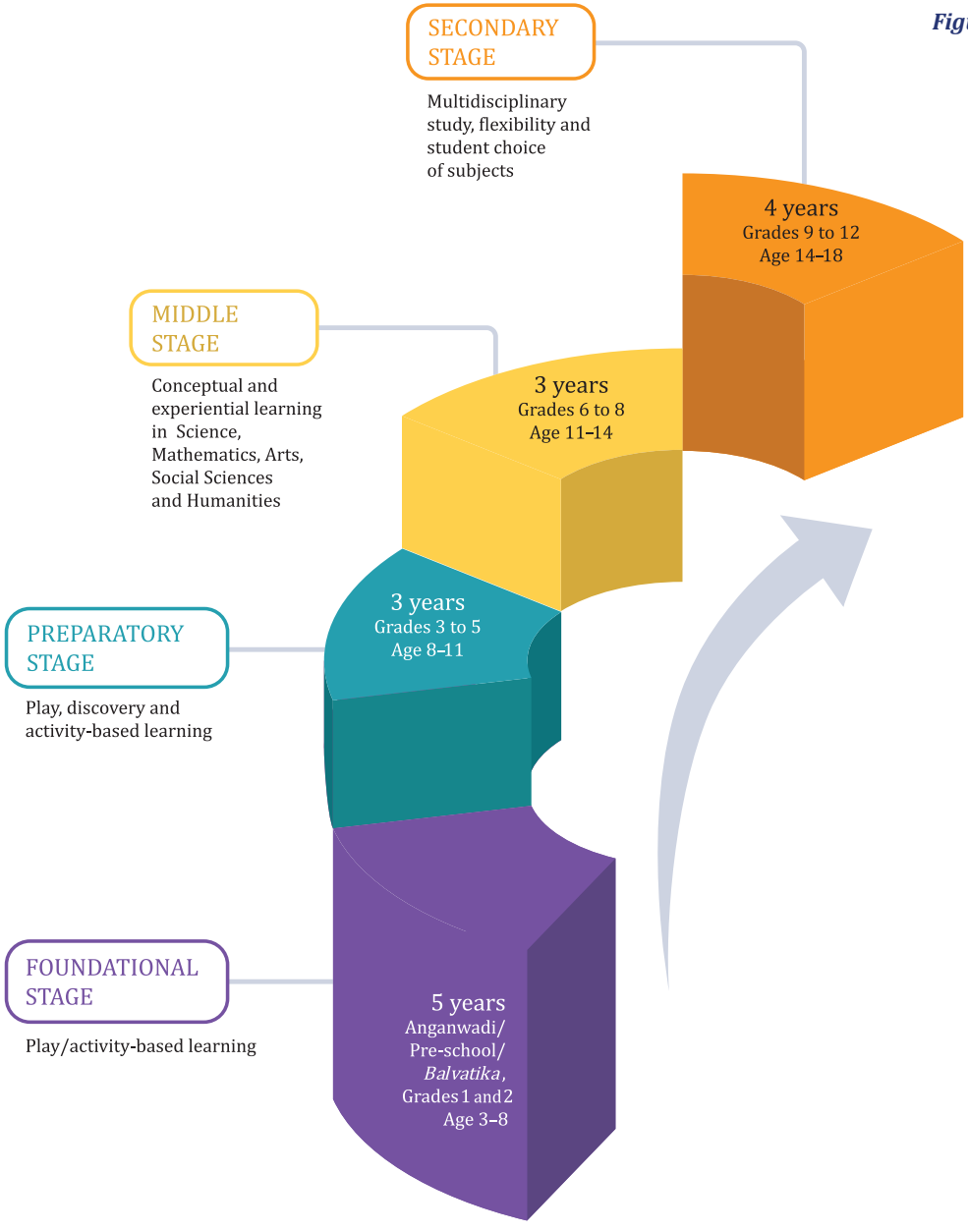
Chapter 2

School Stages: Logic and Design

The previous chapter articulated the Aims of School Education for this NCF, and the corresponding set of desirable Values, Dispositions, Capacities, and Knowledge required to achieve these aims. The chapter also touched upon the curricular arrangements required to achieve these Aims, including the different Curricular Areas that are part of this NCF.

NEP 2020 recommends that schooling will now be imagined in four stages in a new 5+3+3+4 design covering ages 3–18, which is based on the stages of physical, cognitive, and socio-emotional-ethical development of children or students.

Figure 1



The Policy states:

> *The curricular and pedagogical structure and the curriculum framework for school education will therefore be guided by a 5+3+3+4 design, consisting of the Foundational Stage (in two parts, that is 3 years of Anganbadi or pre-school + 2 years in primary school in Grades 1–2; both together covering ages 3–8), Preparatory Stage (Grades 3–5, covering ages 8–11), Middle Stage (Grades 6–8, covering ages 11–14), and Secondary Stage (Grades 9–12 in two phases, i.e., 9 and 10 in the first and 11 and 12 in the second, covering ages 14–18).*
>
> *[NEP 2020, 4.1]*

Thus, the aims of education are to be achieved in a 5+3+3+4 structure in schools, covering ages 3–18. This chapter outlines the logic of these four stages of schooling, the specific considerations for curricular structure, content, pedagogy, and assessments for each of these stages, and their relevance for achieving the Aims of School Education.

The central logic of dividing schooling into the four stages is based on our current understanding of child (human) development and the increasing complexity of concepts and requirements of capacities in different curricular areas. The first two sections of this chapter describe the process and stages of child development and development of complexity in concepts and requirements of capacities in the different Curricular Areas. The last section elaborates on the four-stage design of this NCF.

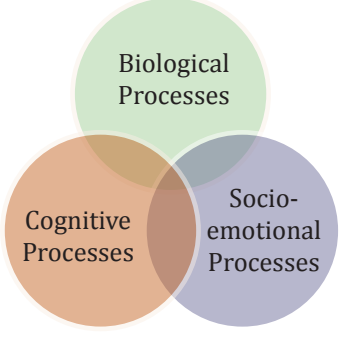
Section 2.1
Child Development

Around the world, the experiences of children growing up are different, depending on various circumstances including social, cultural and economic. But there are some common processes and stages in the maturation and growth of the child. It is critically important to understand the development of a child to have appropriate educational expectations at a particular age. Understanding the trajectory of child development helps in developing a quality curriculum with developmentally-appropriate pedagogy and assessment.

Child development is influenced by the interplay of three different processes, namely, biological processes, cognitive processes, and socio-emotional processes. These processes are intricately interwoven with each other. Each of these processes play a role in the physical, cognitive, linguistic, socio-emotional and moral development of a child.

Figure 2.1i

Genetic and epigenetic factors and material conditions have an impact on a child's body, such as, height, weight, and development of the brain.



Cognitive experiences and stimulation affect a child's thought processes, intelligence and the use of language.

Socio-emotional experiences and stimulation affect a child's relationships with adults and peers, emotional regulation and personality.

A child's development is usually described in terms of periods corresponding to approximate age ranges.

a. **Infancy:** This period ranges from birth to 3 years. A child in this period is highly dependent on adults. Children are beginning to learn about the things around them and to focus their vision and explore.

b. **Early Childhood:** This period begins around age 3 and usually extends upto 6–7 years of age. Children begin to become more self-sufficient and spend more time with peers. This is also a period of intense exploration through play.

c. **Middle to late Childhood:** This developmental period is roughly from 8 years to 11–12 years of age before they hit puberty. During this period, children master the fundamental capacities and understanding for survival and growth. They grow physically, emotionally, and cognitively through exposure to the wider world around them and their culture.

d. **Adolescence:** This period is the transition period from childhood to early adulthood. A child enters adolescence approximately at the age of 12. Adolescence begins with rapid physical changes; gains in height and weight, changes in body contour, and development of secondary sex characteristics. At this stage, the development of identity and the quest for independence is the central theme in children.

2.1.1 Development Across Domains

2.1.1.1 Physical Development

- **Height and Weight:** These increase rapidly during infancy. By their first birthday, infants nearly triple their weight. As the child reaches early childhood, the percentage growth of height and weight decreases with each additional year. Growth patterns vary individually, while some variation is due to hereditary factors, certain environmental factors have significant influence as well, such as, nutrition and stress. Middle and late childhood is the calm before the rapid growth spurt in adolescence. It involves slow and consistent growth in height and weight. There is improved muscle tone, and the strength capacity also doubles during these years. Adolescents experience a growth surge during puberty. Puberty occurs approximately two years earlier for girls than boys. The features and proportions of the body change as the individual becomes capable of reproduction. Among the most important factors that influence the onset and sequence of puberty are heredity, hormones, weight and body fat.
- **Sensory and Motor Development:** Infants and children begin rolling, sitting, standing, and develop other motor skills in a particular sequence and within specific time frames. Infants are also born with certain **reflexes**, which are built-in reactions to stimuli. Reflexes govern the newborn's movements, which are automatic and beyond their control. Reflexes are genetically carried survival mechanisms. They allow infants to respond adaptively to their environment before they have had an opportunity to learn. They include sucking, rooting, and moro reflexes (when the baby gets startled by an unexpected sound, light or movement), all of which typically disappear after three to four months. Some reflexes, such as, blinking and yawning, persist throughout life. Components of other reflexes are incorporated into voluntary actions.

- **Gross Motor Skills:** These involve large-muscle activities. Key skills developed during infancy include control of posture and walking. Mastering a motor skill requires the infant's active efforts to coordinate several components of the skill. Infants explore and select possible solutions to the demands of a new task; they assemble adaptive patterns by modifying their current movement patterns. Gross motor skills improve dramatically during the childhood years. Boys usually outperform girls in gross motor skills involving large-muscle activity.
- **Fine Motor Skills:** These involve finely tuned movements. The onset of reaching and grasping is a significant accomplishment. Fine motor skills continue to develop throughout the childhood years and, by 4 years of age, are much more precise. Children can use their hands as tools by middle childhood and start to show fine motor skills similar to those of adults at 10 to 12 years of age.

2.1.1.2 Cognitive Development

Children construct their own cognitive worlds, building mental structures to adapt to the world. They actively construct their meaning and understanding. The progression of cognitive development from infancy to adolescence can be seen as described below:

- **Infancy:** The infant organises and coordinates sensory experiences, such as, seeing and hearing) with physical movements. They quickly learn and are able to understand that things they see continue to exist even though these things are no longer around them. They can scan patterns actively and display a growing capacity for remembering in ways that current neuroscience is still exploring.
- **Early Childhood:** The child's mental life is becoming more expansive with experiences. They have pictures in their minds about various things in the world. Their capacity for new vocabulary and making mental pictures allows for more learning about the world and other people. They begin to make sense of others, getting a sense of how people and things work. Their memories can hold much more than adults sometimes give them credit for.
- **Middle Childhood:** By now, the child can think through reasons using language and ideas, understand well how people and things work around them, and give order to these things in terms of value and size. Their capacity to remember and use what they remember to engage in activities grows in leaps and bounds. They even devise ways to remember better and are able to analyse, solve problem, and imagine alternatives.
- **Adolescence:** The adolescent individual thinks in diverse and complex ways with a growing capacity for working with ideas and logical analysis. This enables them to plan, solve problems, and systematically test solutions. They are able to mentally look back at their own actions and evaluate, form a sense of themselves as different and similar to others, and are able to engage with ideas of right and wrong. They can be focussed and flexible in their thinking and make decisions with reasoning.

2.1.1.3 Language Development

The development of language is a significant aspect of a child's development. The trajectory of this development across the age ranges is described below:

- **Infancy:** Among the milestones in infant language development are crying (birth), cooing (1 to 2 month), babbling (6 months), using gestures (8 to 12 months),

recognition of their name (as early as 5 months), first word spoken (10 to 15 months), vocabulary spurt (18 months), rapid expansion of understanding words (18 to 24 months), and two-word utterances (18 to 24 months).

- **Early Childhood:** Young children increase their grasp of language's rule systems. In terms of phonology, most young children become more sensitive to the sounds of spoken language. Children learn and apply rules of syntax and of how words should be ordered. Vocabulary development increases dramatically during early childhood, and their conversational skills improve. They increase their sensitivity to the needs of others in conversation, and they learn to change their speech style to suit the situation.
- **Middle Childhood:** Children gradually become more analytical and logical in their approach to words and grammar. They become increasingly able to use complex grammar and produce narratives that make sense. Improvements in metalinguistic awareness and knowledge about language have become evident as children start defining words, expand their knowledge of syntax, and understand better how to use language in culturally appropriate ways.
- **Adolescence:** In adolescence, language changes include more effective use of words; improvements in the ability to understand metaphor, satire and adult literary works; and improvements in writing. Young adolescents often speak a dialect with their peers, using jargon and slang.

2.1.1.4 Socio-emotional Development

A child's socio-emotional development impacts the other domains of development. Physical, cognitive, and language development is highly influenced by how children feel about themselves and how they are able to express their ideas and emotions.

a. Emotional and Personality Development

i. **Infancy:** Emotions are the first language with which parents and infants communicate and emotions play a key role in parent-child relationships. Infants display a number of emotions early in their development. Crying is the most important mechanism that newborns have for communicating with the people in their world.

ii. **Early Childhood:** Advances in young children's emotional development involve expressing, understanding and regulating emotions. Young children's range of emotions expands during their early childhood as they increasingly experience self-conscious emotions, such as, pride, shame, and guilt. They also show a growing awareness of the need to manage emotions to meet social standards.

iii. **Middle Childhood:** Self-understanding increasingly involves social and psychological characteristics, including social comparison. The development of self-regulation is an important aspect of this stage. Developmental changes in emotion include increased understanding of complex emotions, such as, pride and shame, improvements in the ability to suppress and conceal negative emotions, and the use of strategies to redirect feelings. Children use a greater variety of coping strategies.

iv. **Adolescence:** Identity development is complex and takes place in bits and pieces. Some researchers have found that self-esteem declines in early adolescence for both boys and girls, but the drop for girls is often greater perhaps due to unfortunate and asymmetric societal expectations that need to be broken. Self-esteem reflects perceptions that do not always match reality.

b. Role of Families

i. **Infancy:** In infancy, contact comfort and trust are important in the development of attachment. Infants show a strong interest in their social world and are motivated to understand it. Infants orient to the social world early in their development.

ii. **Early Childhood:** Families play a significant role in the socio-emotional development of the child. The child takes emotional cues from the family and the socio-emotional state of family interactions. The sense of emotional security and comfort in interactions largely depends on the family environment.

iii. **Middle Childhood:** Children begin to form strong bonds with peers, while families continue to play a significant role in their emotional development. The socio-emotional state of peer groups and social groups also has a strong influence on the child's socio-emotional dispositions.

iv. **Adolescence:** There is a significant shift in the influence of peers. Identity formation, rebelling against authority, conflict, and aggression are sometimes markers of this age. Families' influence is often significantly lower on socio-emotional development, but the way conflicts are handled within the family has a significant impact.

c. Role of Peers

i. **Early Childhood:** Peers are powerful socialisation agents. Peers provide a source of information and comparison about the world outside the family. In early childhood, children distinguish between friends and non-friends, a friend often described as someone to play with. Rough-and-tumble play is more likely to occur in peer relations, whereas, in times of stress, children often turn to parents rather than peers for support.

ii. **Middle Childhood:** Children form stronger bonds with peers that go beyond play. Friendships are formed and friends' groups become an important source for emotional development. Children continue to seek confirmation from adults at home and in school.

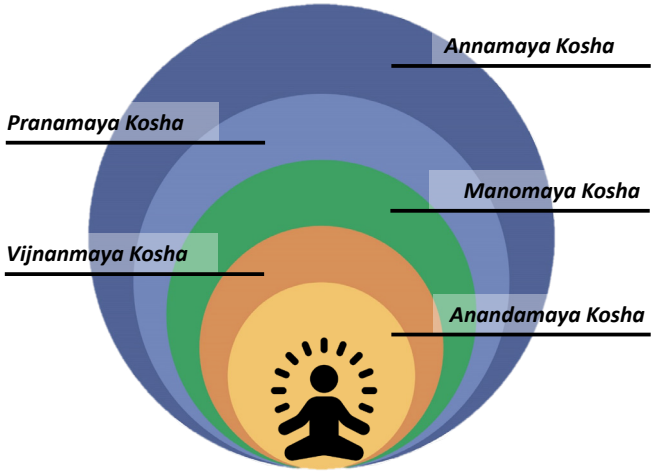
iii. **Adolescence:** There is a significant shift in the influence of peers. Identity formation, rebelling against authority, conflict, and aggression are sometimes markers. Fitting in and receiving confirmation from peer groups often becomes a priority at this age.

2.1.1.5 Moral Development

- **Infancy:** The sense of right and wrong in infants depends on their feelings and desires. Their sense of rightness depends on whether their needs are met or not.
- **Early Childhood:** Children think of justice and rules as unchangeable properties of the world and beyond the control of people. They judge the rightness of behaviour by considering the consequences and not the intentions of the individual.
- **Middle Childhood:** Children begin to express objective ideas on fairness. They believe that equity can mean that people with disabilities or merit need special treatment.
- **Adolescence:** Closer to adulthood, children begin to develop their own moral values while questioning and analysing the ones set by their parents or society. They value rules, but also negotiate. As they develop abstract reasoning abilities, they display interest in the larger good for society.

2.1.2 *Panchakosha Vikas* (Five-fold Development) A Keystone in Indian Tradition

Figure 2.1ii



Panchakosha Vikas

Panchakosha Vikas (Five-fold Development) is a keystone in the Indian tradition of the imagination of the development of human beings. The child is a whole being with *Panchakoshas* or five sheaths. The layers are *Annamaya Kosha* (physical layer), *Pranamaya Kosha* (life force energy layer), *Manomaya Kosha* (mind layer), *Vijnanamaya Kosha* (intellectual layer), and *Anandamaya Kosha* (inner self). Each layer exhibits certain distinct characteristics. The holistic development of a child takes into account the nurturing and nourishment of these five layers.

Specific types of practices are designed to enable the development of each of these *Kosha*. However, the practices are designed keeping in mind that each *Kosha* is interconnected and so activities that focus primarily on one would also contribute to the development of the others.

For example, the physical dimensions are developed through a focus on a balanced diet, traditional games, and adequate exercise, as well as *Yoga Asana* (at the appropriate ages), which build both gross and fine motor skills. Learning to breathe in a way that provides necessary oxygen for the entire body is important; it trains the voice and provides direction for increased self-awareness. A wide variety of stories, songs, lullabies, poems, and prayers enable children to not only develop a love for their cultural context, but also provide value-based insights. This contributes to language development beginning with listening or *Shravana*, as well as the ability to focus and concentrate. The senses, *Indriyan*, are to be sharpened to be able to experience the world around in all its beauty and wonder. *Seva* integrated into everyday life enables the experience of joy of relationships along with being a part of and doing good for one's community.

The *Panchakosha* concept and imagination also maps into the different Curricular Areas as envisaged in the NCF.

a. **Physical Development *(Sharirik Vikas)* and Development of Life Energy *(Pranik Vikas)*:** Age-specific balanced physical development, physical fitness, flexibility, strength, and endurance; development of senses; nutrition, hygiene, personal health, expansion of physical abilities; building body and habits keeping in mind one hundred

years of healthy living in a human being. Balance and retention of energy, positive energy and enthusiasm, smooth functioning of all major systems (digestive, respiratory, circulatory and nervous systems) by activation of the sympathetic and parasympathetic nervous system. Physical Education and well-being as a Curricular Area play a vital role in this development.

b. **Emotional or Mental Development *(Manasik Vikas)*:** Concentration, peace, will and will power, courage, handling negative emotions, developing virtues *(Mulyavardhan)*, the will to attach and detach from work, people, and situations, happiness, visual and performing arts, culture, and literature. This aspect of socio-emotional development needs to be addressed in almost all Curricular Areas, particularly in Art and Vocational Education.

c. **Intellectual Development *(Bauddhik Vikas)*:** Observation, experimentation, analytical ability, abstract and divergent thinking, synthesis, logical reasoning, linguistic skills, imagination, creativity, power of discrimination, generalisation, and abstraction. The knowledge and capacities developed in all the Curricular Areas lead to intellectual development in breadth and depth.

d. **Spiritual Development *(Chaitsik Vikas)*:** Happiness, love and compassion, spontaneity, freedom, aesthetic sense, the journey of 'turning the awareness inwards'. A healthy body, with appropriate emotional balance and knowledge in depth, allows human beings to explore the wonders of the Universe. This exploration in its ultimate form, done with appropriate humility and curiosity, often reveals the true nature of the individual and the Universe, which indeed is a spiritual experience.

Panchakosha is an ancient explication of the importance of the body-mind complex in human experience and understanding. This non-dichotomous approach to human development gives clear pathways and direction for meaningful education. The NCF, through the eight Curricular Areas outlined, inspired by the concept of *Panchakosha,* aspires towards a more holistic education.

Section 2.2
Development of Concepts in a Curricular Area and Requirements of Capacities

Child development describes the process of growth and maturation of children in different domains and associated faculties, which have a direct implication on what can be learnt by children in each stage and how they can learn it, thus informing the 5+3+3+4 structure. The other matter that directly informs this curricular structure is the nature of the 'what', its complexity, its demands on faculties, and its other characteristics. The nature of knowledge and capacities to be learnt have implications on the sequence in which such learning and development of concepts and skills can occur. This section explores some of these sequences and their implications for the four stages of schooling.

2.2.1 Reading Development

Reading has become central to education and schooling. Most learning materials, whether in the form of textbooks or worksheets, have printed text in them and students are

expected to read and comprehend them. So it is important to consider the stages of reading development in the design of the School Stages. Reading develops in the following stages (Chall. J.S, 1983):

a. **Stage 1— Pre-reading**: Children develop oral language capacities and begin to recognise individual sounds in parts of speech. Exposure to rich language use, specifically directed at children, is critical for developing oral language and vocabulary that are necessary for initial reading. Exposure to the use of printed texts by adults helps develop the concept of print.
b. **Stage 2— Initial Reading**: Children start making connections between oral sounds and the visual symbolic form of the written system. This aspect of reading is termed as 'decoding', where the effort is focussed on establishing letter-sound relationships and using this understanding to read familiar and unfamiliar words.
c. **Stage 3— Fluency and Ungluing from Print**: Their decoding abilities become fluent and, thus, place low cognitive demand on the process of converting the textual symbols to sounds. With the release of this burden, their focus shifts to grasping the meaning in the text.
d. **Stage 4— Reading for Learning the New**: In this stage, children are not just reading familiar texts and engaging with familiar ideas in a textual form. They are able to learn new ideas and concepts through the process of reading. They are not relying only on their concrete physical experience, but are able to imagine possibilities based on what they read. Reaching this stage is especially important for students to become independent learners.
e. **Stage 5— Multiple Viewpoints**: In this stage, a more critical understanding of the text being read becomes possible. The students can understand that the author of the text has a specific viewpoint and that there are possible other viewpoints. They can bring in their own understanding and critically evaluate the piece of text.
f. **Stage 6— Construction and Reconstruction**: The reader forms a worldview based on what they are reading. They consciously choose books to further deepen their worldview or challenge the worldview that they hold. They are able to identify the core thesis of the author(s), identify their agreements and disagreements with that thesis, and are able to synthesise and construct a new thesis through this process.

In this approach to stages of reading, by the end of the Preparatory Stage students should be reaching stage 3, and by end of the Middle Stage they should be at stage 4. In the Secondary Stage, they should achieve stage 5 and begin stage 6.

2.2.2 Perceptual, Practical and Theoretical Concepts

Concept formation is at the core of the cognitive development of the child. A concept is a mental model that we make to understand the world. These models are created by a process of abstraction and categorisation. Understanding different kinds of concepts is very relevant for curricular planning.

a. **Perceptual concepts** are concepts formed through our perception or senses. Very young children can start differentiating objects based on their colour, shape, texture, and perhaps even taste and smell. More complex concepts, such as, birds having feathers and dogs having legs and bark, are perceptual concepts too. They are formed through careful observation and the use of the senses. Children almost automatically form these

concepts through their experiences. By giving names to objects and experiences, language plays an important role in developing and expressing these concepts.

b. **Practical concepts** are concepts formed not just by perception, but the practical use that is embedded. For example, a table or a chair is not a mere perception of the colour or shape of the object, but the practical use of the object. While the chair is an object on which people sit, a table is not usually used for sitting but to put objects on it or use for work. To form practical concepts, children need to have some understanding of social life. To understand a practical concept, one must grasp what people do with an object and what they use it for (Dearden. R.F., 1968). Again, through engagement and exposure to exercises in practical life, children develop practical concepts.

Language development plays a very important role in the development of perceptual and practical concepts. Language enables us to check our experiences with others and ensure we have a shared meaning emerging from these experiences. This ensures that we grasp the socially accepted use of the practical concept or the socially accepted vocabulary that represents the perceptual concept.

c. **Theoretical concepts**, on the other hand, explore in highly systematic ways our ordinary 'common sense' experience. These concepts make sense only within a form of understanding. While a spherical or rectangular shape can be perceived, the mathematical understanding of a sphere or a rectangle has a very precise meaning. A rupee coin might perceptually mean a shiny, round object. The practical use of it can also be grasped. But to understand money as an economic concept, children need an introduction to a whole lot of theories and conceptual structures in economics.

While perceptual and practical concepts require not much more than a normal intuitive mind, theoretical concepts often are counterintuitive. To grasp that the earth is rotating around the sun at 30 kilometres per second, and we are standing on a spinning orb rotating at the speed of 460 metres per second, we cannot rely on our perceptions, nor can ordinary practical experience be of any assistance. We need an understanding of physics and mathematics. There is often a discontinuity between our intuitions and ordinary practices and the nature of reality.

Thus theoretical concepts cannot be acquired merely through experiences or learning by doing. They need a more deliberate attempt of the teacher and the student to grasp the meaning behind the experience by connecting it to various conceptual structures and the methods of inquiry specific to a form of understanding.

This indicates that very young children can grasp and develop perceptual and practical concepts through experience and human interaction along with effective use of language. Theoretical concepts, on the other hand, make sense only through the introduction of a form of understanding and perhaps can wait till the Middle Stage. In the Secondary Stage, students gain deeper disciplinary knowledge and methods. This enables them to grasp the deeper meanings of theoretical concepts by placing the concepts within the overall framework of the disciplines, explaining them using the current valid theories of the discipline, and also by linking these concepts to theoretical concepts in other disciplines.

2.2.3 Modes of Inquiry

The modes of inquiry used by children to develop conceptual understanding play a very important role in the selection of content, pedagogy, and assessment. The progression of these modes of inquiry also has implications for the different stages of schooling.

2.2.3.1 Play and Exploration

Young children learn various concepts, particularly perceptual and practical concepts, largely through play and open exploration. Their incredibly curious and absorbent minds are constantly exploring the natural and social world around them. They are intuitive problem solvers and grasp conventions of language use and social behaviour through observation and imitation. At this stage, a stimulating environment and the freedom to explore and play are the biggest and most effective sources of learning. The stimulation does not come only from the material environment, but also from an attentive and active adult and peer group.

2.2.3.2 Capacities for Inquiry

From a broad and free exploration, children need to acquire more specific capacities that have an important role in further inquiry. In addition to the foundational capacities of literacy and numeracy, they acquire skills of observation, data collection, analysis and more. Gross motor and fine motor skills relevant to Physical Education, Art Education and Vocational Education are developed. Further, capacities for attention, perseverance, and memory are also developed. These capacities are utilised in informal methods of inquiry to make sense of the world around them and to respond to the practical necessities of life. These capacities can be developed by giving learning experiences that are practical and within the social context of the student. The opportunities for learning can be guided explorations with the specific intent to develop these capacities.

2.2.3.3 Methods of Inquiry

To gain a deeper understanding, particularly of theoretical concepts, students need to gain knowledge and capacities for specific methods of inquiry. These methods are particular to different types of knowledge. Mathematics, Science, and Social Science have their own methods of inquiry and logic of reasoning. They have specific theories and a web of concepts, the understanding of which gives insight into a new way of thinking about the world. These methods, theories, and concepts increase the depth of inquiry within a specific convention or tradition.

Similarly, Art has its specific forms and traditions in visual art, music, dance and theatre. Understanding these forms and acquiring the relevant practices enables the students for a deeper exploration of aesthetic experiences. Specific forms of sports and practices, such as, Yoga, have their own methods.

By getting introduced to these methods, students gain capacities for systematic and rigorous methods of inquiry in specific forms of understanding.

Teaching, in this stage, is more formal and the emphasis is on understanding the conventions and the 'rules of the game' of each form of understanding, and the necessary capacity to 'play' within these 'rules'.

2.2.3.4 Disciplinary Exploration

In this stage, students gain disciplinary depth within each type of knowledge. The mode of inquiry becomes exploratory again like in the first stage, but within a framework of a discipline or a form. For example, a student with sufficient capacities or skills for dancing and a grounded knowledge of *Bharatanatyam* as a form of dance can now use these capacities and knowledge for creative expressions through dance. Similarly, after gaining

sufficient capacities for scientific inquiry through experimentation and instrumentation in Biology, students can pursue interesting and challenging questions about life forms and attempt to answer these questions within the discipline of Biology. A more sophisticated form of exploration would be to utilise their knowledge in multiple disciplines and approach problems with interdisciplinary solutions.

Section 2.3
Stage Design

The curriculum for the four stages of schooling has been designed based on the vision of NEP and on the considerations of child development, conceptual nature (complexity abstraction) of subjects, and the appropriate modes of inquiry at each age range.

2.3.1 Foundational Stage

The Foundational Stage is for children of ages between 3 and 8. Children start schooling in the Foundational Stage. The design is based on the principles of Early Childhood Care and Education (ECCE). NEP 2020 states:

ECCE ideally consists of flexible, multi-faceted, multi-level, play-based, activity-based, and inquiry based learning, comprising of alphabets, languages, numbers, counting, colours, shapes, indoor and outdoor play, puzzles, and logical thinking, problem-solving, drawing, painting and other visual art, craft, drama and puppetry, music and movement. It also includes a focus on developing social capacities, sensitivity, good behaviour, courtesy, ethics, personal and public cleanliness, teamwork and cooperation. The overall aim of ECCE will be to attain optimal outcomes in the domains of physical and motor development, cognitive development, socio-emotional-ethical development, cultural or artistic development, and the development of communication and early language, literacy and numeracy.

[NEP 2020, 1.2]

a. **Curricular Structure:** The Foundational Stage curriculum of the NCF is divided into domains that are closely linked to the developmental domains of the child which include Physical Development, Socio-emotional-ethical Development, Cognitive Development, Language and Literacy Development, and Aesthetic and Cultural Development. The mother tongue is emphasised for language and literacy development and to ease, and make more effective, learning in other domains as well. The five domains of development are also informed by the *Panchakosha* imagination.

b. **Content:** Textbooks are used only from Grade 1 and most of the content consists of concrete materials, such as, toys, puzzles and manipulatives. Along with these materials, learning experiences organised through physical exploration of the classroom and outdoor space becomes the most appropriate content. In later years of this stage, worksheets can start playing a bigger role. Children's literature is a very important source of content for language and literacy development.

c. **Pedagogy:** The pedagogical approach suggested is play based and emphasises the nurturing, caring relationships between the teacher and the children. The pedagogical design should allow for a balance between self-paced individual learning to a more social group-based learning. Development of foundational capacities in literacy and numeracy would require systematic guidance from the teacher, as well as adequate

time for the child to practise and repeat on their own. Whole class instruction should be balanced with time for children to work on their own, either with materials or with worksheets.

d. **Assessments:** Most assessments are observations made by teachers and not explicit testing of abilities of students. Worksheets used by children can give information to teachers about the progress in learning.

e. **Classroom Arrangement:** Children at the age group of foundational stage need to move freely and have adequate opportunities for engaging their natural curiosity and exploration. Classroom arrangements should reflect this need of the children and should not restrict their movement, through the placement of play or activity or learning corners that keep the centre of the room free and open.

f. **Teachers**: Since the relationship between children and the teacher is critical for this stage, the same teacher would engage in all the domains and there would not be any subject or domain-specific teacher. The Pupil-Teacher Ratio (PTR) is also expected to be lower since individual attention and assessment through observation are necessary.

The Foundational Stage bridges the divide between the home environment of the child and the formal school environment. It develops capacities in Foundational Literacy and Numeracy that enable the students to learn all other subject areas. In addition to these capacities, it develops valuable dispositions for active learning and enables students to become engaged learners in formal school environments. Play and exploration are the natural modes through which children learn and the Foundational Stage utilises these modes to promote valuable capacities and dispositions.

2.3.2 Preparatory Stage

The duration of the Preparatory Stage is three years and includes Grades 3, 4 and 5.

The Preparatory Stage will comprise three years of education, building on the play, discovery, and activity-based pedagogical and curricular style of the Foundational Stage, but also gradually beginning to incorporate textbooks as well as aspects of more formal classroom learning. There would mostly be generalist teachers during this stage, with the possible exception of some specialist language and art teachers (who may be shared across the school or school complex). The aim of this stage will be to lay the general groundwork across subjects including reading, writing, speaking, physical education, art, languages, science, and mathematics, so that students are prepared to delve deeper into learning areas through specialised subjects and subject teachers in the stages that follow.

[KRCR 2019, 4.1.1]

a. **Curricular Structure:** The Preparatory Stage curriculum of the NCF is divided into the following Curricular Areas: at least two Languages, Mathematics, Art Education, Physical Education and Well-being, and The World Around Us. The World Around Us is an interdisciplinary area that encourages exploration and understanding of both the natural world and the social world. Aspects of work in Vocational Education are also incorporated into this Curricular Area. The preparation is largely focussed on capacities and dispositions at this stage.

b. **Content:** Textbooks start playing a bigger role in the areas of Language and Mathematics. A variety of children's literature should complement the Language

textbook to consolidate students' literacy capacities. Materials and manipulatives continue to play a role in Mathematics, though emphasis shifts to symbolic representation in correspondence with concrete materials. The World Around Us should rely less on the textbook and more on experiential learning with physical exploration as the main source of content. The content needs to be within the familiar contexts of the student.

c. **Pedagogy:** Activity and discovery based pedagogy continues in this stage, gradually encouraging students to be active within a formal classroom arrangement. The ability to concentrate and pay continuous attention to classroom lectures and discussions needs to be encouraged. Some proportion of the self-paced individual work should be part of the classroom activity, while some amount of homework can be included.

d. **Assessments:** Assessments in this stage are a combination of observation of students' activity, correcting their worksheets, and short, formal written evaluations. Periodic summative assessments should supplement the more frequent formative assessments.

e. **Classroom Arrangement:** The classroom setting is a balance between a formal environment and an arrangement that encourages movement and exploration. Students sitting and working in groups should be encouraged.

f. **Teachers:** Teachers continue to be generalists and teach across Curricular Areas. For Art and Physical Education and Well-being, specialists from the school complexes can be invited for the development of specific capacities and skills, but the class teacher should continue to be present and mediate these interactions with the students.

The Preparatory Stage consolidates the capacities and dispositions that begin to develop in the Foundational Stage. Students are expected to develop fluency in literacy and numeracy and develop further capacities that are helpful in a systematic exploration of the natural and social world around them.

2.3.3 Middle Stage

The duration of the Middle Stage is also three years and includes Grades 6, 7 and 8.

The Middle Stage will comprise three years of education, building on the pedagogical and curricular style of the Preparatory Stage, but with the introduction of subject teachers for learning and discussion of more abstract concepts in each subject that students will be ready for at this stage across the sciences, mathematics, arts, social sciences and humanities. Experiential learning within each subject, and explorations of relations among different subjects, will be encouraged and emphasised despite the introduction of more specialised subjects and subject teachers.

[NEP 2020, 4.2]

a. **Curricular Structure**: The Middle Stage expands the Curricular Areas to include Science (the study of the physical and natural world) and Social Science (the study of the human world), and students also get exposure to Vocational Education. Based on the capacities and dispositions in the Preparatory Stage, students engage more formally with knowledge and values in the Middle Stage. Curricular Areas are dealt with as 'forms of understanding' with explicit engagement with paradigmatic theories and conceptual structures that frame each area. The more generic capacities, such as, observation and data collection, developed in the Preparatory Stage are now

specialised into specific methods of inquiry that are appropriate for each form of understanding. For example, students gain an understanding of the methods of inquiry in Science and also contrast them with the methods of inquiry in History or in Arts. The conventions and protocols of each form of understanding are also introduced in the Middle Stage.

b. **Content:** The content in the Middle Stage needs to reflect the engagement with theoretical concepts and the introduction of theories and conceptual frameworks specific to each form of understanding. There is a shift to more abstract ideas and the students are expected to engage with unfamiliar contexts and situations. The textbooks begin to play a central role in mediating the content in the Middle Stage. Both the expansion of Curricular Areas and the engagement with abstract ideas and unfamiliar contexts could be challenging for students. Well-designed textbooks with clear expectations and specific learning goals would support students in entering these forms of understanding in a structured and systematic manner.

c. **Pedagogy:** Pedagogy is a judicious balance of direct instruction and opportunities for exploration and inquiry. As mentioned before, the expansion of content areas and the abstract nature of theories place a heavier cognitive demand on students. The focus on concept development indicates that the teacher must pay attention to the prior concepts that students might already have and how to use those concepts to bring about active learning. The emphasis is not on accumulating facts, but on becoming fluent in the methods of inquiry within each form of understanding.

d. **Assessments:** Assessments can become more formal and explicit. The focus of assessments should be on the specific ways of reasoning within each form of understanding and not primarily on the recall of facts. Formal tests and examinations play a role with the expectation that students can process larger chunks of information together for analysis and synthesis. Periodic summative assessments should again supplement the more frequent formative assessments.

e. **Classroom Arrangement:** The classroom is increasingly a formal space allowing for group work and peer interactions. Subject-specific classrooms become effective when equipped with appropriate TLMs and other resources.

f. **Teachers:** Subject-specific Teachers handle different Curricular Areas in this stage. Teachers need a profound understanding of the Curricular Area in terms of vertical connections of concepts within the subject and horizontal connections with concepts in other areas. Students of this age benefit from engaging with a diverse set of adults who have their own personalities and interests. Art Education, Physical Education and Well-being, and Vocational Education can have visiting faculty who have specialised knowledge and skills.

The Middle Stage utilises the capacities and dispositions developed during the Preparatory Stage and introduces the students to different forms of understanding. Students gain systematic knowledge through rational thought and enquiry. The capacities for critical thinking and problem solving are consolidated in this stage and they acquire the desirable values and dispositions for democratic or economic or cultural participation.

2.3.4 Secondary Stage

2.3.4.1 NEP 2020: Considerations

a. **No Hard Separation:** NEP 2020 gives clear mandate to move away from the current practice of streaming into science, arts or humanities, and commerce. Instead, students can choose subjects across Curricular Areas. Thus, the Secondary Stage design should enable both breadth through engagement with a variety of subjects across streams including Art Education, Physical Education and Well-being, and Vocational Education, as well as depth in areas chosen by students.

b. **Breadth and Depth:** Students should have breadth and depth across multiple disciplines and depth in chosen subjects.

c. **Choice and Flexibility:** Students should have flexibility and choice across subjects and Curricular Areas.

d. **Reduced Content Load:** "Curriculum content will be reduced in each subject to its core essentials, to make space for critical thinking and more holistic, inquiry-based, discovery-based, discussion-based, and analysis-based learning." (NEP 2020, 4.5)

e. **Reduced Exam Pressures:** "Board exams will also be made 'easier', in the sense that they will test primarily core capacities or competencies rather than months of coaching and memorisation." (NEP 2020, 4.37)

2.3.4.2 Curricular Structure

a. To enable the vision of NEP 2020, the Secondary Stage will be designed in two phases: Grades 9 and 10, and Grades 11 and 12. In Grades 9 and 10, students engage with a breadth of curriculum across Curricular Areas. In Grades 11 and 12, more specialisations and choices are available to students while still maintaining significant breadth.

b. Grades 9 and 10 will ensure breadth, building on the learning achieved in the Middle Stage with clear continuity between the two stages.

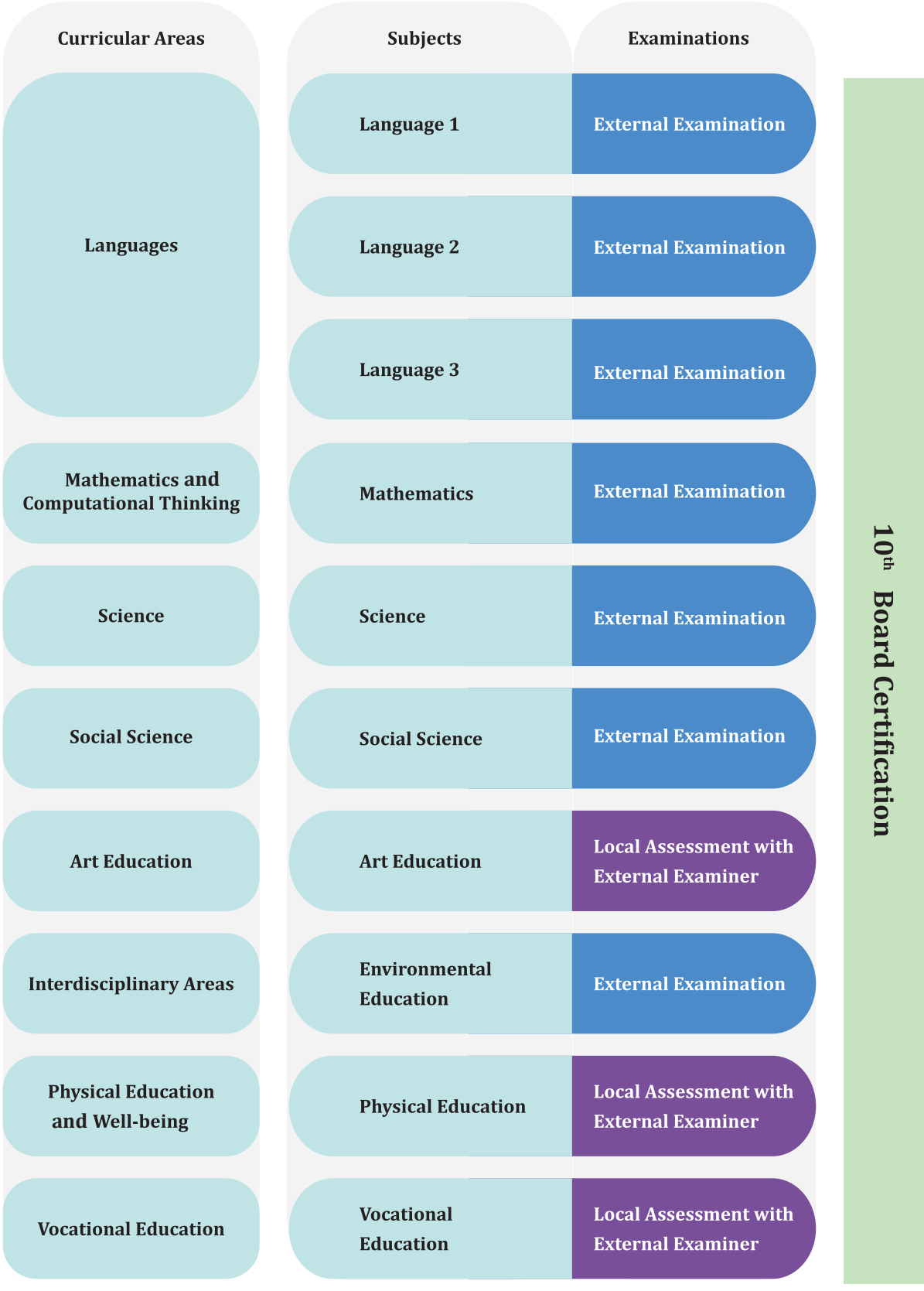
   i. Study 3 Languages: R1, R2, R3, at least two of which are native to India.

   ii. Study 7 subjects: Mathematics and computational thinking, social science, science, art education, physical education and well-being, vocational education, and interdisciplinary areas. Each of these subjects will be a well-integrated and coherent study of multiple disciplines; for example, in Science: biology, chemistry, physics, and earth science. Again, the emphasis would be on learning core concepts or competencies rather than the memorisation of facts. (*Figure 2.2i*)

   iii. Learning Standards for these subjects are articulated in the corresponding Curricular Areas for this phase in this NCF, and it is expected that all students attain these Learning Standards. (*Part C, Chapters 2–9*)

   iv. All Secondary Schools will need to offer 3 Languages as well as all the 7 subjects, so that all students are able to complete Grade 10. Out of these, art, physical education and well-being, and vocational education would be examined locally. (*2.3.4.7 on Assessment*)

Figure 2.2i


Curricular Areas
Subjects
Examinations
Languages
Language 1
External Examination
Language 2
External Examination
Language 3
External Examination
Mathematics and Computational Thinking
Mathematics
External Examination
Science
Science
External Examination
Social Science
Social Science
External Examination
Art Education
Art Education
Local Assessment with External Examiner
Interdisciplinary Areas
Environmental Education
External Examination
Physical Education and Well-being
Physical Education
Local Assessment with External Examiner
Vocational Education
Vocational Education
Local Assessment with External Examiner
10th Board Certification

c. Grades 11 and 12 will enable depth of study based on choices that students make.

i. To ensure that students have a depth of learning across a range of human knowledge, students will have to:

1) Choose two Languages from Group 1, at least one of which is native to India.

2) Choose four subjects, with an optional fifth subject, from at least two of the following groups:

- **Group 2:** Art Education, Physical Education and Well-being, Vocational Education
- **Group 3:** Social Science and Humanities, Interdisciplinary Areas
- **Group 4:** Science, Mathematics and Computational Thinking

(*Figure 2.2ii*)

These Groups have been created to address the requirement of breadth of study in NEP 2020, which is why there is a requirement to choose subjects from at least two groups. In the longer term, as schools develop the requisite capacity, it will be desirable for students to have to take subjects from all three groups above to develop well-rounded thinking. (For more details on Groups, Curricular Areas, and Subjects *Figure 2.2ii*)

The following are some of the key considerations for designing the subject courses in Grades 11 and 12:

1) In the case of subjects based on academic disciplines, the intent would be to give adequate exposure to the key conceptual structures and theories of the discipline and develop capacities of inquiry in that discipline. The students would develop an understanding of how this discipline behind the subject fits within the Curricular Area and the open questions that the discipline is currently engaging with. This would enable students to make informed decisions about the pursuit of this discipline in the higher education or to study it on their own.

2) In case of Interdisciplinary Areas, a very wide range of subjects can be offered. Art Education can offer specific forms of art as subjects, while Physical Education and Well-being can offer specialisations based on practices, such as, Yoga. In the case of vocational areas, the subject should equip students to enter the world of work in a particular vocation. Contemporary subjects, such as, Artificial Intelligence, Design Thinking, Holistic Health, Organic Living, and Global Citizenship Education, as recommended by NEP 2020 can be offered as courses in appropriate groups. An illustrative list of subjects is given in *Figure 2.2ii*.

3) This NCF states the broad aims for the Curricular Areas and does not specify the Learning Standards for Grades 11 and 12 that must be achieved in each subject. These have to be articulated specifically in terms of Competencies and Learning Outcomes for each subject by syllabus developers. However, this NCF has specific illustrations of a few disciplines (*Part C, Chapter 10*).

4) Since students would have a wide choice, syllabus or course designers of subjects should not assume that students would choose a 'complementing' subject. For example, the Biology courses in Grade 11 and 12 cannot be designed on the assumption that students are enrolled in Chemistry in their Grade 11 and 12.

Figure 2.2ii

Group 1

Languages

- Languages native to India (Compulsory)
- Other Languages (Compulsory)
- Modern Indian Languages
- Classical Languages
- Foreign Languages

Group 2

Art Education

- Indian Classical Music
- Folk Music
- Contemporary Music
- Theatre
- Puppetry
- Sculpture
- Fine Arts
- Folk Painting
- Graphic Design
- Motion Pictures
- Photography
- Textile Designing

Physical Education and Well-being

- Yoga and Lifestyle
- Sports and Nutrition
- Physical Education for Students with Disabilities
- Biomechanics and Sports

Vocational Education

- Agriculture: Cereal Production
- Agriculture: Seed production
- Agriculture: Gardening
- Automobile Servicing
- Machining
- Electronics
- Community Health
- Accounting Services
- Data Entry and Management
- Banking Services
- Retail Services
- Textile and Garments

Group 3

Social Science

- History
- Geography
- Political Science
- Psychology
- Psychology and Mental Health
- Economics
- Development Economics
- Sociology
- Philosophy
- Anthropology
- Archaeology

Interdisciplinary Areas

- Business Studies
- Accounting
- Sustainability and Climate Change
- Journalism
- Indian Knowledge Systems
- Legal studies

Group 4

Mathematics and Computational Thinking

- Mathematics
- Computer Science
- Business Mathematics
- Advanced Mathematics
- Probability and Statistics

Science

- Physics
- Chemistry
- Biology
- Earth Sciences
- Astronomy
- Modern Physics
- Biology

5) Subjects can be offered at different levels. For example, there can be a basic Mathematics subject as well as advanced Mathematics. Students will be given the choice of opting for different levels.

ii. Students are expected to make their choices on the basis of their passions and interests, and their future plans either in the world of work or in higher education after their school completion. See *Figure 2.2iv* for some illustrative combinations that students may choose.

2.3.4.3 Implications for Schools and Boards of Examination

a. For Phase 1: Grades 9 and 10

i. Schools should offer all the ten subjects required for 10th grade certification. (*Figure 2.2i*)

b. For Phase 2: Grades 11 and 12

i. Schools should offer a minimum of 2 languages.

ii. Schools should, at a minimum, offer subjects from at least two Groups amongst Groups 2, 3 and 4.

iii. In 5 years, schools should offer subjects from all four groups.

iv. Within 10 years, many more subjects should be offered within Groups to give more choice and flexibility to students and all Curricular Areas should be covered.

c. Boards of examination

i. Boards of examination should offer all subjects for Grade 10.

ii. For Grade 12, Boards should not restrict students to choose subjects within streams, such as, Science or Commerce, and instead allow flexibility to choose from different Groups.

iii. A wide range of examinations for different subjects within Groups should be designed to increase choice and flexibility for students and schools.

iv. Subject examinations at different levels (e.g., basic and advanced) should be offered.

v. Processes for empaneling external examiners for art education, physical education and well-being, and vocational education should be defined.

vi. Board examinations should be made 'easier', in the sense that they test primarily core capacities or competencies rather than months of coaching and memorisation.

2.3.4.4 Implementation in Phases

The NCF 2023 aims to respond meaningfully to the recommendations of NEP 2020 in giving more flexibility and choice to students and not creating hard separations between disciplines. Along with these responses, the Curricular Areas of Art Education, Physical Education and Well-being, Vocational Education, and Interdisciplinary Areas have received additional attention. In order to fully realise the vision of NEP 2020 in a practical manner, the NCF 2023 recommends a phased approach towards implementing the curriculum.

a. Schools and Examination Boards should be prepared to offer and assess all the ten Curricular Areas for Grade 10 right from the beginning of the implementation of this NCF.

b. Schools and Examinations Boards should be prepared to offer a minimum of two Languages for Grade 12 from the beginning of the implementation of this NCF.

Figure 2.2iii

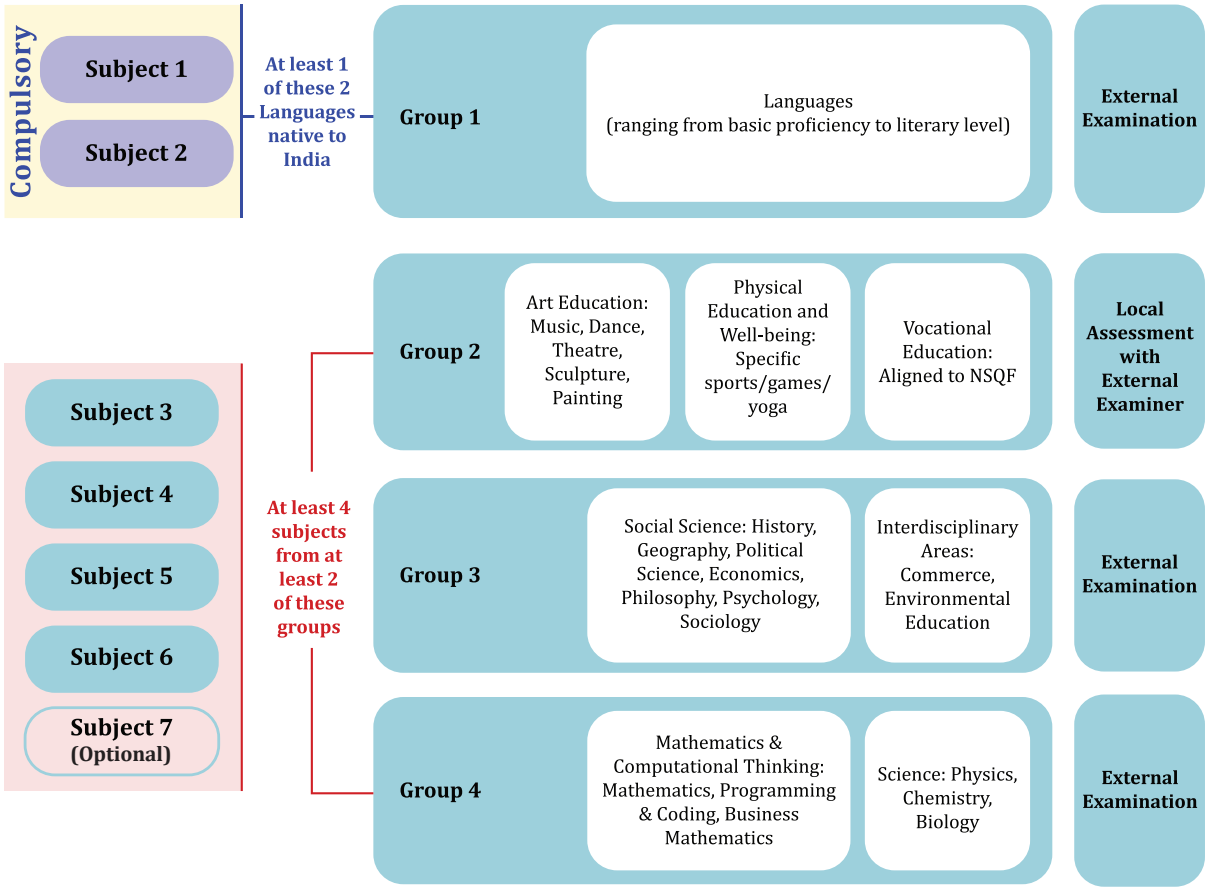


Figure 2.2iv

Combinations for Commerce	Combinations for Science	Combinations for Social Science	Multidisciplinary Combinations
Combination 1	**Combination 1**	**Combination 1**	**Combination 1**
Hindi, English Business Studies, Accounting, Economics from Group 3 Business Mathematics from Group 4	Classical Telugu, Sanskrit Mathematics, Physics, Chemistry from Group 4 Sustainability and Climate Change from Group 3	Marathi, French History, Economics, Psychology from Group 3 Contemporary Music from Group 2	Classical Tamil, Hindi Gardening from Group 2 History, Journalism from Group 3 Mathematics from Group 4
Combination 2	**Combination 2**	**Combination 2**	**Combination 2**
Bengali, English Business Studies, Accounting from Group 3 Business Mathematics from Group 4 Fine Arts from Group 2	Gujarati, English Biology, Physics, Chemistry from Group 4 Indian Classical Music from Group 2 Mathematics from Group 4 [Optional]	Assamese, Sanskrit Geography, Political Science from Group 3 Indian Classical Music from Group 2 Mathematics from Group 4 [Optional]	Pali, Malayalam Folk Music from Group 2 Automobile Servicing from Group 2 Business Studies from Group 3 Business Mathematics from Group 4 [Optional]

c. Schools should be prepared to offer subjects from at least two groups amongst groups 2, 3, and 4, immediately. Within 5 years, schools should be ready to offer subjects from all the four groups. Within 10 years, schools should offer many more subjects covering all Curricular Areas.

d. The Secondary Stage has been divided into two phases, Grades 9 and 10, and Grades 11 and 12. In 10 years, all school systems should move to a single unified stage for secondary, where students have choice and flexibility with breadth right from Grade 9 through 12, thus realising the NEP vision of the Secondary Stage as being 'four years of multidisciplinary study'.

e. The current system of study in annual patterns should move to a semester design. This would allow for greater flexibility in design of courses.

f. In ten years, Boards of Examination should be prepared to offer certification through 'easier' modular examinations "each test far less material and are taken immediately after the course is taken in school", (NEP 2020, 4.38) in order to eliminate the need for studying large amounts of material at once and to thereby further reduce coaching culture and the need for coaching.

2.3.4.5 Content

For Grades 9 and 10, textbooks can continue to be an important source of content. For Grades 11 and 12, each semester-long course can have its own specific course compendium. At this stage, a variety of content addressing specific concepts and methods of inquiry should be made available to teachers and the teachers should choose appropriate content packages to meet the learning objectives of the courses.

2.3.4.6 Pedagogy

Pedagogy, at this stage, should take into consideration the knowledge and capacities that students will bring from the previous stages of schooling. The pedagogy should encourage more self-study and exploration, with a focus on becoming fluent in the methods of inquiry specific to the Curricular Area. At this stage, students can be reasonably expected to become independent learners and the pedagogy in the classroom should reflect this expectation. Classroom interactions should be a judicious mix of more direct instruction from the teacher with discussion, seminars for discussion, exploration and discovery, and opportunities for students to prepare individual and group projects and present key concepts of the discipline.

2.3.4.7 Assessment

a. Grades 9 and 10

i. Students must successfully 'pass' Board examinations at the end of Grade 10. These examinations are conducted by the respective Boards of examinations with central evaluation. These examinations should assess the Competencies defined in the Learning Standards for each Curricular Area:

1) The Languages Curricular Area would have 3 examinations for R1, R2 and R3.

2) The Curricular Areas of Mathematics and Computational Thinking, Science, Social Science, and Interdisciplinary Areas would have one examination each adding to 4 examinations.

ii. Assessment schemes (question papers) for art, physical education and well-being, and vocational education can be prepared by the appropriate Board of examinations, and both the assessment and evaluation can be done locally at the school level with external examiners.

iii. Boards must offer these examinations multiple times (each being a cycle) in the same academic year and students' final certification must be on the basis of their best performance across these cycles, including taking the best performance from different Curricular Areas from different cycles within three academic years.

b. Grades 11 and 12

i. To complete Grade 12, students should pass the following Board examinations:

1) 2 examinations in languages, at least one of which is native to India. These languages may or may not be continuations of R1, R2 or R3. For example, they may be a specialised literature class in R1, R2, R3 or a new Indian Language (such as Sanskrit or classical Tamil) and/or a foreign language.

2) 4 examinations from at least 2 groups (plus an optional fifth exam):

- **Group 2:** Art Education, Physical Education and Well-being, Vocational Education
- **Group 3:** Social Science, Interdisciplinary Areas
- **Group 4:** Science, Mathematics and Computational Thinking

ii. The mode of conducting examinations should be liberalised in due course from the rigid annual examinations. Modular Examinations can be offered by boards as opposed to a single examination at the end of the year. These can be offered at different times of the year. In due course, Boards of examinations should develop capacities to offer 'on demand' examinations. The final certification will be based on the cumulative result of each of the examinations.

iii. Assessment schemes (question papers) for art education, physical education and well-being, and vocational education can be prepared by the appropriate board of examinations, and both the assessment and evaluation can be done locally at the school level with external examiners.

The matter of assessment and examinations are dealt with greater detail in Part A, Chapter 3, 3.4 which are equally relevant to the Secondary Stage.

2.3.4.8 Classroom Arrangement

The classroom arrangement should take into consideration that students are expected to be more independent learners. The physical arrangement should facilitate group discussions and explorations. Laboratory spaces can be utilised for science classrooms, with adequate safety precautions, instead of separating the sites of learning theory and practice. Dedicated classrooms for specific subjects are very effective at this stage, where the classrooms are equipped with the necessary TLMs.

2.3.4.9 Teachers

Teachers at this stage must be subject specialists with deep understanding and interest in the discipline. Art Education and Physical Education and Well-being would need specialists who are able to teach theory and practice both.

Chapter 3

Approach to Learning Standards, Content, Pedagogy and Assessment

Chapter 1 articulated the Aims of School Education for this NCF which in turn were derived from the vision and purposes of education outlined in NEP 2020. Chapter 2 detailed the four-stage design of schooling as recommended by NEP 2020.

This Chapter describes the approach taken by the NCF towards defining Learning Standards, selection of content, methods of teaching, and assessments to achieve these Aims in the context of the four-stage schooling structure.

Section 3.1
Approach to Learning Standards

Education can be seen both as a process and as an outcome. When we view education as an outcome, we think about a student's achievement of the desirable knowledge, capacities, values, and dispositions as derived from the Aims of School Education. To bring clarity to all stakeholders on what students must achieve in schools, this NCF has articulated these desired educational achievements as Learning Standards.

'Goal clarity' or 'clarity of objectives' is a critical element for success in any endeavour; Learning Standards are intended to provide such clarity in school education to all participants and stakeholders, teachers, students, educational functionaries, parents, and society as a whole.

While providing and having such clarity has many aspects. Three of the following things are critical:

a. Any such 'objective' must be at a level of detail and time-horizon that the person using it should be able to relate to it and to draw relevant actions. For example, a Preparatory Stage's language teacher would require goals that are to be achieved by the end of the stage in language and only having goals at the end of schooling will not be helpful to them; most parents would be able to relate with the goals that are for the particular age group of their child and would find it difficult to relate to the Aims of Education as goals in a useful manner.

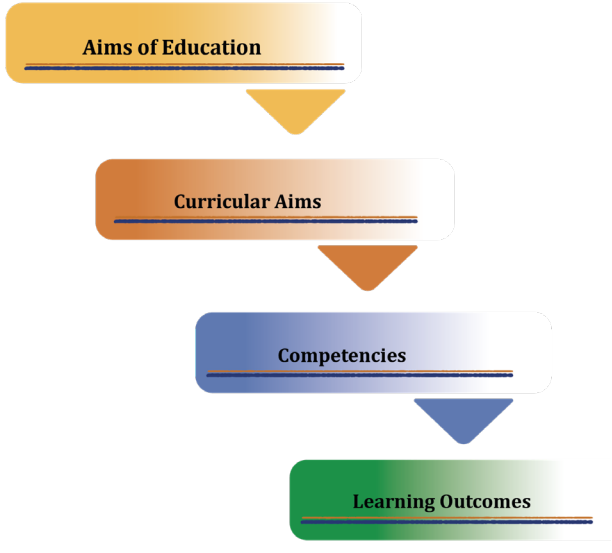
b. All such 'objectives' must be derived from the Aims of Education and together must achieve the aims, this is operationalised by the process of 'rigorous flow-down' as mentioned later in this chapter.

c. The entire set of 'objectives' must be cogent, consistent and connected, which would be essential to achieving the aims.

These objectives, starting from the Aims of School Education, are referred as Learning Standards in the NCF.

The first section below defines a few terms used in this NCF in the context of Learning Standards and then gives an approach to arriving at the Learning Standards.

Figure 3.1



3.1.1 Definitions

a. **Aims of School Education:** Aims are educational vision statements that give broad direction to all deliberate efforts of educational systems, curriculum development, institutional arrangements, funding and financing, people's capacities and so on. Aims of School Education are usually directed by Education Policy Documents. The NCF has derived the Aims of Education from NEP 2020 and these aims were articulated in Chapter 1. These Aims of Education are to be achieved through the gaining and development of knowledge, capacities, values and dispositions, which guide the aims within each subject area of the study.

b. **Curricular Goals:** Curricular Goals are statements that give directions to curriculum development and implementation. They are derived from Aims and are specific to a stage in education (e.g. the Foundational Stage). This NCF, which would guide the development of all curricula, lists and the states the Curricular Goals for each stage. For example, 'develops effective communication skills for day-to-day interactions in two languages' is such a Curricular Goal for the Foundational Stage.

c. **Competencies:** Competencies are learning achievements that are observable and can be assessed systematically. These competencies are derived from the Curricular Goals and are expected to be attained by the end of a stage. Competencies are articulated in Curriculum Frameworks including this NCF. However, curriculum developers can adapt and modify the competencies to address specific contexts for which the curriculum is being developed. The following are examples of some of the Competencies derived for the above Curricular Goal in this NCF, 'Converses fluently and can hold a meaningful conversation' and 'Understands oral instructions for a complex task and gives clear oral instructions for the same to others.'

d. **Learning Outcomes:** Competencies are attained over a period of time. Therefore, interim markers of learning achievements are needed so that teachers can observe and track learning and respond to the needs of learners continually. These interim markers are called Learning Outcomes. Thus, Learning Outcomes are granular milestones of learning and usually progress in a sequence leading to the attainment of a Competency. Learning Outcomes enable teachers to plan their content, pedagogy, and assessment towards achieving specific competencies. Curriculum developers and teachers should have the autonomy to define Learning Outcomes as appropriate to their classroom contexts, while maintaining clear connection to the competencies.

The following table is an example of Learning Outcomes derived for the competency 'Converses fluently and can hold a meaningful conversation' in the Foundational Stage:

Table 3.1i

Illustration

	A	B	C	D	E
	Competency: Converses fluently and can hold a meaningful conversation				
	Ages 3–8				
1	Listens attentively and speaks in short conversations with familiar people around.	Initiates conversations in daily life with peers and teachers in a variety of school settings.	Engages in conversations based on events, stories or their needs and asks questions.	Engages in conversations, waits for their turn to speak and allows others to speak.	Maintains the thread of the conversation across multiple exchanges.

Illustration 2					
	Expresses their needs and feelings through short meaningful sentences.	Narrates daily experiences in simple sentences and asks simple questions, using what, when, how or whom.	Narrates daily experiences to elaborate descriptions and asks 'why' questions.	Engages with non-fictional content read aloud or discuss in class, is able to link knowledge from their own experiences, and talks about it.	Engages in discussion about a topic and raises and responds to questions.

3.1.2 From Aims to Learning Outcomes

This NCF strongly emphasises the importance of the clear 'flow-down' that must connect Aims to Curricular Goals to Competencies to Learning Outcomes. Each set must emanate from the immediate level above while ensuring full coverage of the objectives at that higher level.

This is a process of 'breaking down and converting' relatively abstract and consolidated notions to more concrete components in order to make them useable in the practice of education. This process, including other considerations that must be accounted for in this 'flow-down,' are described in this Chapter. It is only such coherence, coverage and connection arising from a rigorous flow-down, from Aims to Learning Outcomes, which can align syllabus, content, pedagogical practices, institutional culture, and more to achieving what we desire from education.

This is simple because, in the everyday life of the teacher and institutions, efforts are (or should be) made towards achieving very specific, observable, and short-period learning objectives which are marked as Learning Outcomes. These Learning Outcomes arise from the process of flow-down described below. They guide the trajectory of educational efforts towards the attainment of competencies, which in turn accumulate to Curricular Goals. When the achievement of the Learning Outcomes, Competencies, and Curricular Goals are all taken together, they achieve the relevant Aims of Education.

NEP 2020 has articulated the vision and purpose of education. This NCF has drawn the Aims of School Education from this vision, which informs the knowledge, capacities, values, and dispositions that must be developed in students in order to achieve the aims of education. The aforementioned desirable knowledge, capacities, values, and dispositions are thereby reflected in the aims of each subject of study and also in the recommended school culture and practices.

The Curricular Goals are, in turn, derived from the Aims of Education, along with other relevant considerations. The competencies are then drawn from these Curricular Goals, and the Learning Outcomes from those competencies.

It must be noted that the competencies given in this NCF are illustrative and may be modified by curriculum developers to achieve the Curricular Goals more optimally, based on their context.

Thus, curriculum developers should carefully consider the set of competencies in the NCF and use these after making relevant changes where ever required. Given the relative stability and cross-cutting relevance of competencies across contexts (and time), there may be fewer requirements for changes in the competencies articulated in the NCF. However, decisions on this matter should be carefully considered by curriculum developers.

The Learning Outcomes can often be more contextual and will, therefore, require close attention and contextualisation for the curriculum or syllabus being developed.

Thus, the states and their relevant institutions, as well as other institutions responsible for curriculum and syllabus development, would need to conduct such a flow-down to arrive at a full set of Learning Standards for their use.

3.1.2.1 From Aims to Curricular Goals

The Aims of School Education, as envisaged in Chapter 1, give direction to the intended educational achievements for the four school stages, through the aims of each subject. As mentioned earlier, Curricular Goals to achieve these aims are stage specific.

In this NCF, Curricular Goals for the Foundational Stage are defined for the different domains of development. It is appropriate that, at the Foundational Stage, the curriculum is closely aligned with the domains of child development. From the Preparatory Stage onwards, the Curricular Goals are defined for specific Curricular Areas. These Curricular Areas have been enumerated in Chapter 1 along with their aims.

While the Aims of Education are the primary source for the Stage-specific Curricular Goals, there are two other kinds of considerations in arriving at their articulation. The Curricular Goals are arrived by considering:

a. The Aims of School Education, as articulated in the NCF *(Part A, Chapter 1)*
b. The nature of knowledge relevant to the Curricular Area.
c. Age appropriateness specific to the stage of schooling.

The Aims of School Education flow-down into the Curricular Goals. More specifically, the Curricular Goals are arrived from the desirable knowledge, capacities, values and dispositions within the Aims that are relevant to the Curricular Area, and which would contribute to achieving those aims.

3.1.2.2 From Curricular Goals to Competencies

The four main considerations for arriving at the list of competencies are:

a. Curricular Goals which flow-down into competencies.
b. Research appropriate for the stage and Curricular Area that informs the choice of content, pedagogy and assessment.
c. Experience of various educational efforts in the country.
d. Our context, which includes resource availability, time availability, and institutional and teachers' capacities.

Each stage has its own specific considerations regarding student's development and the increasing complexity of concepts and requirements of capacities *(Part A, Chapter 2).* These considerations, in turn, have an impact on the choices of competencies within each Curricular Goal.

All stakeholders in school education should have clarity on the competencies that are expected to be achieved. Keeping track of progress in the attainment of these competencies for every student would allow school systems to ensure that all students receive appropriate learning opportunities towards reaching the Curricular Goals of the NCF.

3.1.2.3 From Competencies to Learning Outcomes

Learning Outcomes are interim markers of learning achievement towards the attainment of competencies. They are defined based on the specifics of the socio-cultural contexts, the materials and resources available, and the contingencies of the classroom. A set of illustrative Learning Outcomes have been defined in this NCF, based on the broad understanding of the context of our education system.

These Learning Outcomes need to be seen as enabling guidelines for teachers and school leaders and not as constraining demands on them. They must have the autonomy to reimagine the Learning Outcomes based on their contexts.

3.1.3 Nested Learning Standards

In the Curricular Areas of Art Education and Physical Education and Well-being, this NCF has defined *Nested Learning Standards.* These Curricular Areas have been given due attention in terms of specifying clear Learning Standards that outline the expected learning achievements of students. To achieve these Learning Standards, particularly at the Middle and Secondary Stages, schools would need specialist teachers and resources, such as, playgrounds and equipment. Giving due consideration to the time schools might require to make such teachers and resources available, the Learning Standards for these two Curricular Areas have been defined as two sets.

The first set, called Learning Standards 1; details the full range of Curricular Goals and competencies to achieve the educational aims of the Curricular Area. These should be accomplished by all schools as soon as they add the required resources. Nested within this is a subset called Learning Standards 2; These should be accomplished by all schools from the very initiation of the implementation of this NCF.

Section 3.2
Approach to Curriculum Content

Content of the curriculum will be contained in and manifest directly in the various resources and materials used in the teaching-learning process, including:

a. **Books:** Textbooks, workbooks, playbooks, and any other kinds of books and their extracts.

b. **Other kinds of TLM:** Toys, puzzles, technology-based material including videos and experimental kits.

c. **Learning environment:** Classroom space, activities in the local environment, and engagement with the community. The learning environment of students must be safe, inclusive and stimulating.

Developing books, including textbooks, must follow a rigorous process based on an appropriate syllabus. Carefully selected TLMs play an essential role in all classrooms. The arrangement and organisation of the learning environment is also important across all stages and especially in the Foundational and Preparatory Stages.

3.2.1 Content Selection

This section describes the broad approach for selecting appropriate curricular content. More specific considerations for choosing content within particular curricular areas are elaborated upon in their respective chapters.

Curricular Goals, Competencies, and Learning Outcomes give clear direction as to what content is to be used for creating learning experiences for students.

Concepts formed in the Foundational and Preparatory Stages are largely perceptive (e.g., colour as visually discriminated) and practical (e.g., spoon used as a lever to open a tin cover, money to buy things in a shop), but not theoretical (e.g., colour as a spectrum of light, lever as a simple machine or money as a medium of exchange). Exploring the theories behind the perceptive and practical concepts is expected in the Middle and Secondary Stages of schooling. Choices of content for each stage must be based on these considerations.

Content in the Foundational and Preparatory Stages should be derived from children's life experiences. It should also reflect the cultural, geographical, and social context in which the child is developing and growing. As students move through the Middle and Secondary Stages, content can move away from the familiar and include ideas and theories not necessarily represented in the immediate environment.

Content should be tied to capacities and values that students need to develop through the stages of schooling. Special care should be taken to avoid the promotion of stereotypes.

These are general principles of content selection; subsequent chapters on Curricular Areas describe the specifics.

3.2.2 Textbooks

3.2.2.1 Role of Textbooks

Textbooks have been given great importance in Indian school education. In fact, it is a widely shared notion that, in practice, in too many of our schools and in the culture of our education system, textbooks stand in for all of the curriculum and syllabus, and the use and importance of most other materials and resources fades in comparison to textbooks. This is unhealthy and unhelpful for developing a robust system of school education.

This NCF has emphasised the achievement of Learning Standards as the central purpose of schooling. This emphasis signals a desirable shift in the role of textbooks. The current practice of 'covering' the textbook as the focus of classroom interaction should be avoided. Instead, the focus of classroom interactions should be the achievement of specific learning outcomes, and textbooks are one of the many resources available for teachers and students for achieving the Learning Outcomes. Some important considerations regarding textbooks include the following:

a. **Reduction in 'Textbook Ventricity':** As mentioned, our education is over-dependent on textbooks and this must change. Other kinds of TLMs, other kinds of books and the surrounding environment must be fully utilised.

b. **Expansive and inclusive notion of textbook:** The sharp distinction between textbooks, workbooks, playbooks, and other kinds of books is suboptimal from a student's perspective. The content and the form must be designed from a lens of 'what will get the student to learn better', and not from a textbook definition of 'textbooks'.

c. **Availability of multiple textbooks:** Even the best of textbooks have their limitations. So, from a perspective of improving learning, it will be more effective to have multiple textbooks made available for the same subject and class, which can be compared and selected by school systems (or schools), and some may even choose to use more than one textbook. (NEP 2020, 4.31)

d. **Quality of textbooks must be high:** Students deserve textbooks with high design and production values with respect to both content and form. The design, layout, and illustrations all matter for ensuring quality, as does the final printing and production.

e. **Cost of textbooks:** The public system does and should make available textbooks free to all students. However, the cost of textbooks matters and so must be optimised. (NEP 2020, 4.32) Since textbooks have the connotation of being mandatory, this should not be used for profiteering by some publishers.

3.2.2.2 Key Principles of Textbook Design

With these important basics in place, the principles and process of textbook development are mentioned below:

a. **Curriculum Principle:** The textbook should be designed specifically to achieve the competencies for the stage and the Learning Outcomes for the grade. Textbook developers and designers should not only be aware of the competencies of the particular domain or Curricular Area for which the textbook is being developed, but also the competencies for the whole stage. This would allow them to bring in horizontal connections across the domains and curricular areas of the stage.

b. **Values Principle:** The content chosen in the textbooks should also reflect the desirable values and dispositions articulated by the NCF. While values are often not explicitly taught, the school culture and environment should embody the desirable values. In addition, the content in textbooks play an important role in reflecting these values. For example, compassion in general and compassion for animals in particular can be reflected in using phrases, such as, 'We take milk from cows' rather than 'Cows give us milk' or 'Amundsen was the first to reach the South Pole', rather than 'Amundsen conquered the South Pole.'

c. **Discipline Principle:** Textbook developers should have sound knowledge of the discipline associated with the textbook being developed. The content and sequence included in the textbook should be carefully selected so as to not contradict some of the core principles of these disciplines.

d. **Pedagogy Principle:** Textbook developers need to have a clear understanding of the pedagogy that is appropriate for the competency and content. For example, in language, the balanced approach of including oral language, phonics and word-solving instruction, and meaning making needs to be incorporated all together for the Foundational Stage. They should also strive to keep textual matter to a careful minimum, avoiding the earlier common practice of overloading textbooks with details of questionable significance.

e. **Language Principle:** The language used in the content of the textbooks should be fully cognizant of the language competencies expected for that particular grade in the Learning Standards. Particularly in the early grades (Foundational and Preparatory Stages), students still learn to read and textbook developers of all subjects must take

this into consideration. Unfamiliar vocabulary and sentence structures should be appropriately scaffolded in the textbooks through glossaries and explanations. In higher grades (Middle Stage onwards), developing academic linguistic proficiency should not be seen as the responsibility of only language textbooks. Subject textbooks should highlight language use specific to that subject.

f. **Technology Principle:** Textbook developers should be aware of the current technology and audio-visual materials available for enhancing the learning experiences of students. Activities that involve digital technology and references to external material should be embedded appropriately in the textbook.

g. **Context Principle:** The local context and environment are important considerations for the choice of content in textbooks for the Foundational and Preparatory Stages. Moving from the familiar to the unfamiliar is an important aspect of learning. The textbook should also contain a balance of familiar contexts that is a comfort for the students and unfamiliar contexts that should generate curiosity and challenge their thoughts and preferences. For the Middle and Secondary Stages, this may not be a strong consideration in all Curricular Areas.

h. **Presentation Principle:** The textbooks should be so well designed that they grab the attention of students. For the Foundational and Preparatory Stages, the balance between visual material and text should be tilted towards visual materials. The colour schemes and design themes should be attractive and consistent. The fonts and size of text material should be visible and least confusing for young children to decode. For the Middle and Secondary Stages, attention should be given to the flow of concepts, clarity in articulation, and the design of illustrations, not only to clearly illustrate the concepts, but also to initiate discussions and invite students to ask questions.

i. **Diversity and Inclusion:** It is important to maintain the principles of diversity and inclusion in the choice of content for textbooks. Even within states, there are regional variations and these need to find adequate representation in textbooks.

3.2.2.3 Important Elements in Textbooks

Important elements that textbook developers need to keep in mind are:

a. **Design aesthetics and Consistency:** The look and feel of textbooks are nearly as important as the content presented in the textbooks. Design aesthetics and consistency across textbooks make it easier for the students to engage with textbooks.

b. **Learning Standards:** Chapters in all textbooks should be explicit and clear about the intended Learning Outcomes of the content presented in the chapter.

c. **Consistent Design Elements:** Each Curricular Area would have specific elements that consistently occur in each chapter of a textbook. These elements are particular to the Curricular Area and stage. For example, language textbooks in the Foundational Stage can have elements, such as, Oral Language, Read Alouds, Phonics and Word Solving, Comprehension, Writing and so on. A common design theme that clearly identifies and distinguishes these elements would make textbook design clear and the expectations explicit.

d. **Activities and Exercises:** Exercises need not be only at the ends of chapters. Appropriate activities and exercises can be embedded in the flow of content in the textbook. Exercises

should reflect a judicious mix of recall as well as exploratory and higher order thinking tasks. Recommended activities that have clear instructions and expectations allow for engagement outside the classroom. Where appropriate, recommendations for homework should also be included as a part of activities and exercises.

e. **Reference to Additional Materials:** It has to be emphasised that textbooks are not the only source of content. Along with this, it has to be acknowledged that, while the internet offers almost limitless access to content and knowledge, often the sheer choice is bewildering and confusing for a young learner. Textbook writers should also play the role of curators and provide references to additional materials available freely on the internet through QR-codes, provided that they have verified the genuineness and relevance of such materials. This should be a standard feature of every chapter in the textbook.

3.2.2.4 Process for Textbook Development

Applying the principles of textbook development, the process could be the following:

a. **Creation of a syllabus document:** It draws from the Curricular Goals, Competencies, and Learning Outcomes and the nature, pedagogy and assessment of a subject. The syllabus document could include the objectives of teaching the subject, approach to the content to be included (concept or theme), structure of the syllabus document (questions, key concepts, suggested strategies or activities), and choosing content that is cognitively and socio-culturally relevant. The syllabus document could also use literature from research studies, policy papers, teacher experiences, and subject matter expert opinions for deciding the extent and depth of the content.

b. **Panel of textbook writers, reviewers and designers or illustrators:** The people involved in textbook development could be:

   i. **Textbook writers and reviewers:** Teachers must be part of this group; others could include subject experts and university faculty and research scholars. Textbook authors should include people from diverse backgrounds to bring in diverse perspectives for content.

   ii. **Designers or Illustrators:** People or organisations that have design experience and understanding of the local context, preferably local experts, should be involved from the start of the process.

   iii. **Technical Experts.** A lot of content that complements the textbook can be made available through digital media. It is thus important for technical experts to be a part of the textbook development team from the start, therefore media content should not be an afterthought.

   The group should work together from the beginning to develop a shared vision of the textbook and create a common understanding of the process and be open to feedback, suggestions, and multiple iterations of the textbook.

c. **Choice of content, Pedagogy and Assessment:** The topics or themes chosen would need to include the context of the student, including previous experiences and language, and scope for further exploration. The content for each grade should be a precursor to the next. It is essential to ensure an alignment of the pedagogy and assessment with the content and the Learning Outcomes.

d. **Structure of the textbook:** Considering that the textbook is one important source of connection between the teacher and the student, the textbook should be useful for both. Content in textbooks is largely directed towards students. It has been a practice to include notes for teachers in the textbook. This approach is limiting. Therefore, this NCF recommends that each textbook released for students should be accompanied by a teacher's version of the same textbook. (*Box 3.1*)

e. **Presentation and Design:** The presentation of a textbook relies on the font size, images, sketches, the colours used, and their amalgamation, e.g., textual content in the early grades may be limited with a large number of images, font size should be large, and the illustrations used should be sensitive and inclusive. The language used should be grade appropriate and relevant to the subject.

f. **Writing, Review and Pilot Run:** The writing of a textbook needs sufficient time, regular peer reviews and panel reviews. It requires regular interactions with the illustrators to define and reiterate the requirement of the content being worked on. This adds to the rigour of textbook creation and assists in avoiding repetitions in the text, images, and ideas across subjects as the illustrators work with all the writers.

   The reviews provided should be constructive and encouraging. The feedback should include suggestions and alternative ideas. The writers should be open to multiple iterations and be cognizant of the principles of writing content. The review process must be done chapter-wise and then for the textbook as a whole. Meticulous proofreading of the textbook is essential and contributes to its quality.

   Selected schools must be identified pilot runs of the textbooks. During such a pilot run, the writers must visit schools and schedule classroom observations, conversations with teachers, student, and parents and receive their feedbacks about the textbook.

g. **Teacher Orientation to the Textbook:** There must be a provision for teacher orientation on the genesis of the textbook, its rationale, and the approach to pedagogy and assessment to ensure its appropriate use in the classroom. This orientation must be followed up through school visits, webinars, sharing of best practices, and regular interactions with the teachers to understand the challenges being faced in the use of the textbook.

h. **Multiple Textbooks:** Many agencies and teams must be encouraged to develop textbooks based on the same syllabus.

Box 3.1

Teacher's Handbook

It has been a practice to include notes to teachers in the textbook. This approach is limiting. If notes are kept to their briefest minimum, it is not really useful for the teacher. If they are elaborated and detailed, it unnecessarily increases the size of the textbook for the students and it perhaps would also be intimidating.

It is recommended that each textbook being published be accompanied by a Teacher's version (Textbook+) of the same textbook. The Textbook+ should be organised in the same sequence of chapters as the students' textbook, but can include additional materials:

- *Intended learning objectives of the chapter and how it is connected to the Learning Standards of the curriculum.*
- *Recommended pedagogical strategies relevant for that chapter.*

- *Alternative activities for students who are struggling to grasp the content.*
- *References (through QR-Codes) for resources, such as, digital materials, additional worksheets, formative assessments, and pedagogical content knowledge packages that provide additional teaching aids and also develops a more profound understanding in the teacher of the topic under consideration.*

Thus, the Textbook+ would be a valuable compendium for the teacher to go well beyond the textbook's content without burdening or intimidating the students.

3.2.3 Learning Environment and Teaching-Learning Materials

A safe, inclusive, and stimulating environment that supports every student's participation is critical for achieving the Learning Standards outlined in the NCF.

Classrooms (and schools overall) that are clean, well-ventilated, well-lit, and organised with appropriate access and safety provisions are important to facilitate learning. Safety provisions include physical, social and emotional safety.

Schools must be equipped with adequate resources and materials. Classrooms should allow for individual work and cooperative work. Classroom displays should be available for student work. Students with developmental delays or disabilities may need specific accommodations for physical space and TLMs to enable physical and curricular access.

For the Foundational and Preparatory Stages, classrooms may be organised into Learning Corners for specific domains of learning. The availability of a range of safe and stimulating material that encourages learning in different domains of development, literacy, and numeracy would be necessary for all students.

Well-resourced libraries and laboratories would be necessary for the Middle and Secondary Stages. Art Education, Physical Education and Well-being, and Vocational Education would require specific kinds of spaces and materials available and organised in particular ways.

The local context and the resources of the community may also be significantly helpful, when used and integrated thoughtfully. It is important that the full potential of the environment and various kinds of TLMs are utilised, all of which is intimately tied to the approach adopted in pedagogy (elaborated in the next section). Not only would this enable aspects of learning that are difficult to foster only through books, but it also makes the process more engaging. Thus, the curriculum content selected, including pedagogical aspects, must be carefully distributed and balanced between books, other TLMs and the use of the surrounding environment.

Section 3.3
Pedagogy

NEP 2020 states:

A good educational institution is one in which every student feels welcomed and cared for, where a safe and stimulating learning environment exists, where a wide range of learning experiences are offered, and where good physical infrastructure and appropriate resources conducive to learning are available to all students.

[NEP 2020, Principles]

Pedagogy is the method and practice of teaching used in classrooms by the teacher to help students learn. Effective pedagogy is based on a good understanding of how children grow and learn, and a clear focus on Curricular Goals, Competencies, and Learning Outcomes to be achieved for students.

3.3.1 How do Children Grow and Learn?

Healthy physical development requires basic needs of adequate nutrition and appropriate sensory and emotional stimulation. There are 'critical periods' in sensory development, e.g., normal visual experience is critical within the first few months of life. There are 'sensitive periods' in cognitive and emotional development as well, e.g., early childhood and adolescence. Physiological changes have ramifications on the psychological and social aspects of a child's life.

From an evolutionary point of view, human beings are born to learn, so we come with a drive to understand the world and explain things around us. We constantly make our own theories and refine them based on our perceptions and experiences.

Children are, therefore, natural learners. They are active, eager to learn, and respond with interest to new things. They have an innate sense of curiosity, they wonder, question, explore, try out, and discover to make sense of the world. By acting on their curiosity, they continue to discover and learn more.

Research from across the world has provided us with a set of ideas about how children learn that have practical implications for teaching. Some of these key aspects are the following:

a. **The brain plays an important role in learning:** The brain is a complex organ made up of neurons, glial cells, blood vessels, and many cells organised into specialised areas. The working of the brain is the ever-changing patterns of connections between millions of neurons. Learning is a physical process in which new knowledge is represented by new brain cell connections. The brain both shapes and is shaped by experience, including opportunities the child has for cognitive development and social interaction. The brain is designed to learn and remember new things through life, as long as it continues to be challenged and stimulated.

b. **Learning is based on the associations and connections that children make:** Children are far from blank slates on which we can simply write pages of information. They have knowledge and understandings based on their experience; they have intuitive theories about varied subjects. Nothing is ever recorded in a child's brain exactly as it is experienced. It is their interpretation of what they experience that becomes new knowledge. Interpretation is always in the light of whatever knowledge they already possess. Children are continuously fitting new experiences into existing knowledge and adjusting existing knowledge to allow new experiences.

c. **Emotions are deeply connected to learning:** Emotions are inextricably intertwined with attention, motivation and cognition. Positive emotions, such as, curiosity, wonder, joy, and excitement aid attention, cognition, memory, and therefore, learning. Positive emotions are often best nurtured through positive relationships with teachers and among students. When students feel they belong in a classroom

and they can trust their teacher and classmates, they feel free to try out, explore and learn better in the process. As trust grows, the classroom becomes emotionally safer, and students have fewer obstacles to building their confidence and their learning.

d. **The learning environment matters:** The word 'environment' refers to both the physical space and the atmosphere or psychological environment in the classroom. The physical environment provides a structure that allows safe exploration, cognitive growth and challenge. The atmosphere or psychological environment is made up of all the relationships and social interactions that happen in the classroom. A safe, secure, comfortable, and happy classroom environment can help children learn better and achieve more. For this, it is important that the necessary facilities, such as, learning materials, aids, equipment, and space for doing activities, working together, and playing so as to help each child learn better, are made available. The classroom must be an inclusive, enabling learning environment that provides every child with respect, openness, acceptance, meaningfulness, belonging and challenge.

e. **Learning occurs in particular social and cultural environments:** Learning in school becomes meaningful when it connects to students' lives and experiences. Most children grow up with stories, songs, games, food, rituals, and festivals special to their families and community along with local ways of dressing, working, travelling or living that are an integral part of their everyday lives. The diverse experiences of children must find a place in the classroom. As children grow up, while there may often be a difference between the culture of a student's home and the culture of the classroom, it is important to continue to listen to student's voices and honour their cultural traditions in the classroom.

3.3.2 Effective Pedagogy for Achieving Aims of School Education

As stated in Chapter 1, 1.3, the central purpose of schools as formal educational institutions is the achievement of valuable knowledge, capacities, values and dispositions by students. Based on how children learn, some key elements of pedagogy for achieving these aims are described below:

a. **Knowledge (knowing concepts, theories and principles):** Children form concepts and intuitive theories right from infancy. To learn a new theory or concept or principle, students fit this new experience into their existing knowledge and adjust their existing knowledge to allow new experiences in.

To help students do this well, teachers need to structure and sequence the teaching of concepts appropriately. They need to connect new concepts to students' existing experiences and understanding, pose questions that challenge their existing understanding, and make clear demonstrations that push their thinking beyond their existing understanding. All this should take place while ensuring their full participation in open discussions and hands-on activities. Teaching concepts, theories or principles in disconnected chunks or expecting students to reproduce them in the same way they were received makes true conceptual understanding impossible.

Box 3.2i

Importance of Memory

*The ancient Indian emphasis on **Smriti (memory)** is critical to learning and development. It has often been misunderstood as an emphasis on rote learning, which in principle and when practised with fidelity, it is not.*

*Current cognitive science research indicates that **Smriti (memory)** of both working memory and long-term memory, plays an important role in cognition and comprehension. Insufficient emphasis on memory often results in inadequate outcomes in the classroom. When we use memory inappropriately, we are ignoring its powers and capacities.*

Using memory for learning in the classroom encompasses a variety of activities, deliberate and regular practice, deep processing, generating cues, making connections and forming associations.

b. Capacities (knowing the abilities and skills): Abilities and skills are learnt best by doing and they improve with repeated exposure and practice. Good practice involves meaningful variety must be done in appropriate quantity and is supplemented with continuous discussions on why certain procedures work and others do not.

Box 3.2ii

Importance of Practice

Learning is a time-consuming process. Organised, regular, and steady practice yields steady and positive impact on learning. Practising helps to internalise information, access more complex information stored in long-term memory, and apply knowledge or skills automatically.

Across Curricular Areas, differences in students' performances are affected by how much they engage in deliberate practice. Deliberate practice is not the same as rote repetition. Rote repetition does not improve performance by itself. Deliberate practice involves attention, rehearsal, and repetition and leads to new knowledge or skills that can later be developed into more complex knowledge and skills.

When a skill becomes automatic, attention and mental resources can be freed up for higher-level of thinking and reasoning.

Most teachers are aware of two contradictory facts, drill can be boring, and yet practice is the only way for their students to master certain procedures. The problem with drill comes when we assume that it will substitute for understanding. Concepts and procedures are two different things, both of which students need to learn. Practice alone cannot lead to conceptual knowledge; understanding alone cannot lead to mastery of a procedure.

c. Values and Dispositions: Telling students about what values they should develop or uphold usually has little effect. It either becomes 'boring' or is perceived as 'preaching.' Therefore development of values and dispositions in school education happens primarily in the following ways:

i. Through school and classroom culture: Sensitivity and respect for others is encouraged when opportunities are provided for all students to participate in activities and select students do not end up participating in all activities. Students also learn from seeing exemplars.

ii. **Through school and classroom practices:** Seeing exemplars, listening or reading stories about particular values or participating in *Bal Sabha* and *Bal Panchayat* that help build notions of democracy, justice and equality.

iii. **As part of the learning through school subjects:** Laboratory experiments and trials help build scientific temper and thinking.

iv. As direct goals of some school subjects: Learning to win and lose with grace during sports and games helps build resilience.

Box 3.2iii

Importance of Questioning

There has existed a long and ancient tradition of questioning in India. Debate and discussion have always been held as a critical part of the Indian knowledge tradition.

The Upanishad was written in response to the questions of Shishya. The literal meaning of the word Upanishad is the sitting down (of the Shishya) near (the guru). The usual method of argument utilised reason and went from simple to complex, from concrete to abstract and from known to unknown.

In the Katha Upanishad, is the powerful story of Nachiketa, a young boy, who dared to ask Yama, the lord of death, a very simple but fundamental question, 'Is there life after death or is death the end?'

The Brihadaranyaka Upanishad narrates the debate of Yajnavalkya with Janaka and Gargi about the nature of the 'Self'. In the Chhandogya Upanishad, Uddalaka Aruni debates with his son Shvetaketu on the nature of the ultimate reality. The Mahabharata's Yakshaprashna has the famous dialogue between Yudhishthira and his own father, Dharma (Yama).

At different points in Indian history, there have been extraordinary scholars who were outstanding masters in their respective schools of thought. It was very common among learned people to debate the worth and limitations of these various systems of philosophy publically.

The legendary debates between Adi Shankara and Mandana Misra are a good example. Hordes of scholars often came from afar every day to watch and learn from them. These debates between two exceptional masters show how healthy competition existed so routinely among followers of different philosophies. Many such learned masters demonstrated open mindedness and the willingness to test their faith, beliefs, and philosophies, and if the reason arose, even changed their beliefs and the contours of the philosophies. Innumerable Indian scholars had to be accepting towards new concepts, experiments or questionings in this way.

Countless popular stories, such as, those of King Vikram and Betaal, Birbal and Akbar, Tenali Rama, also bear testimony to scholars debating and challenging each other through riddles, intellectual games or profound philosophical questions using simple everyday language.

Some values are developed better through particular processes; illustratively,

a. Regular dialogue and discussion with active listening as part of classroom culture and processes will help develop democratic values (e.g., pluralism, equality, justice, fraternity) and appreciation of others' viewpoints.

b. Curricular Areas, such as, Art Education and Physical Education and Well-being will help build individual virtues (e.g., honesty, courage, perseverance, teamwork, empathy and respect for others).

c. Curricular Areas, such as, Science and Mathematics will help build epistemic values (e.g., scientific temper, rigour in reasoning).

d. Marking important days through community service as part of school culture and practices will help build cultural values (e.g. *Nishkama Karma, Seva, Ahimsa, Shanti*) and respect for one's own and other's cultural traditions. Keeping the classroom and school premises clean and tidy reinforces the importance of *Swacchata*. Practicing reducing, recycling, and other green practices in schools encourage harmony with the environment and sustainable lifestyles.

e. Regular practices at the school assembly will help promote pride in India's cultural unity and diversity.

3.3.3 Key Elements that Enable Effective Pedagogy in the Classroom

a. **Ensuring respect and care:** Our schools are committed to providing an environment where children feel secure, and relationships are governed by care, equity and respect. Any form of discrimination based on religion, caste, gender, community, beliefs, disability or any other factor is unacceptable. Teachers must value and respect all students. Classrooms should be spaces that will offer all students equal access and opportunity to achieve learning outcomes. All students will participate in a variety of activities and school processes, not just those with the best chances of success. Our schools will create an environment that enhances the potential and interests of each student. Care is central to learning in schools. Care is an attitude of concern and responsibility for people and relationships. Empathy and respect are at the heart of caring.

b. **Building positive Teacher-Student relationships:** A safe and positive relationship between teacher and student is enriching for cognitive and socio-emotional development. Some important ways to build such a positive relationship are:

   i. **Getting to know each student individually:** This helps understand and plan individualised learning experiences for each student.

   ii. **Listening carefully to students:** This conveys care and respect, builds trust, and helps students gain confidence.

   iii. **Observing students:** This helps discover how each student thinks, reasons, and responds to different situations, which is critical to planning for teaching and learning.

   iv. **Encouraging student responses:** This helps meaningfully build on student's naturally creative and resourceful selves.

   v. **Encouraging questioning:** Questions to and from the teacher help students think through a particular subject in depth while responding.

   vi. **Recognising and responding to the emotions and moods of students:** This helps them settle and learn better, learn to regulate their own emotions, and understand and respond to the emotions of others.

   vii. **Responding gently:** If a student behaves inappropriately, the teacher should have a range of strategies to handle it, starting with gentle, compassionate one-to-one

interaction to understand what might cause such behaviour. Most students respond much better with these strategies than to scolding or punishment.

Box 3.2iv

Ways of the Guru

According to Sri Aurobindo, the three instruments of the Guru are teaching, example and influence.

Wise Teachers do not seek to impose themselves or their opinions on the passive acceptance of receptive minds. They seek to awaken much more than to instruct, and they aim for the growth of faculties and experiences by a natural process and free expansion. They prescribe a method as an aid, as a utilisable device, and not as an imperative formula or a fixed routine.

As the Taittiriya Upanishad tells us, the teacher is the first letter, the student is the last letter, knowledge is the meeting place and instruction is the link.

c. **Providing scaffolding:** Students can easily learn new knowledge when systematic support from other experienced students or adults is provided. Learning new knowledge should be a challenge, but the challenge should be within the reach of students; something that relates to their existing knowledge and can be done with the support of an experienced person.

Scaffolding refers to providing support, structure and guidance during instruction. Scaffolding differs depending on the task but occurs when the teacher carefully assigns students a learning task, and provides support along the way until gradually fading as the student reaches expertise.

One way of scaffolding is through a 'Gradual Release of Responsibility' (GRR), where first teachers model or explain ideas or skills, after which students and teachers work together on the same ideas and skills where the teacher provides guided support. Finally, students practise individually and independently.

d. **Using differentiated instruction:** Teachers will need to plan classes in a way that engages students with varying interests and capabilities meaningfully and encourages better learning.

One way to think about this is differentiated instruction, i.e., tailoring the teaching process according to the individual needs of students. Content, methods of learning, material, and assessment may be different for different students. It is often difficult to do this for individual students, especially in a large class. In that case, the teacher could identify small groups of students who have similar needs and address them differently as a group.

Before planning for this, it is important for the teacher to observe students carefully, analyse their work, and gather as much information as possible about them. For example, the teacher could plan to use worksheets of varying levels, starting with simple worksheets and progress to more complex ones according to what different groups of students in the class are able to do.

e. **Providing opportunities for independent and collaborative work:** Classroom processes should provide opportunities for students to work individually and to work

together. Teachers may ensure that students work in pairs, in small and large groups, as well as independently. Teachers must help students listen, understand, appreciate, and reflect on their own thought process and other's experiences with empathy and critical understanding.

Working with others often increases involvement in learning. Sharing one's own ideas and responding to others' reactions improves thinking, deepens understanding, and also leads to new insights and ideas. In carefully crafted collaborative learning situations, students require each other's contributions to successfully complete a learning task because of which they need to learn to take on varied roles, such as, observers, mediators, score managers, and note-takers based on the objectives of the task.

f. **Using varied resources:** Using the textbook meaningfully is important for learning. In addition, other resources and materials must be used to engage students beyond the textbook. Classroom processes should incorporate use of resources made by students, teachers, and the local community, as well as those available in the immediate environment. Digital resources must also be incorporated appropriately.

Classroom displays constitute an important part of the learning process which does not have to be limited to finished products alone, they could also include aspects of work in progress. Where possible, classroom displays should be dynamic, updated regularly, and aim to be aligned to the topics and questions students are engaging with. Permanent displays should be kept to a minimum.

g. **Helping students develop appropriate work habits and responsibility:** Developing appropriate work habits and taking responsibility are critical to learning. These include aspects, such as, students' organising space and materials before and after use, organising time, ensuring time on tasks, taking responsibility for tasks, persisting with and completing work, staying on a given task even without a teacher present, and allowing others to work without disturbance.

h. **Giving prompt and meaningful feedback:** Students need immediate and appropriate feedback to benefit from classroom processes and improve their learning. Integration of suitable technology can also be considered to support students with disabilities. Feedback helps students reflect on what they have learnt and what they still need to know.

Providing feedback means giving students an explanation of what they are doing correctly and incorrectly, with the focus of the feedback on what the student is doing right. Waiting too long to give feedback might make it difficult for the student to connect the feedback with the learning moment. It is vital that we take into consideration each individual when giving student feedback. Some students need to be nudged to achieve at a higher level and others need to be handled gently so as not to discourage their learning and damage self-esteem.

3.3.4 Planning for Teaching

Teaching is a deliberate act carried out with the intention of bringing about learning in students. This deliberate act needs to be well planned. Planning is central to good teaching. Planning includes construction and organisation of classroom tasks as per

Competencies and Learning Outcomes to be achieved, pedagogy to be followed, resources to be used, and assessment to be carried out. Planning also includes support activities for students, home assignments, and displays in the class relevant to what is being taught.

Good planning requires understanding of Aims of Education, Curricular Goals, Competencies, and Learning Outcomes to be achieved, along with prior learning of the students for whom the plan is being made and available TLMs and content to be used.

The major components of a teaching plan are the following:

a. Competencies, Learning Outcomes and intended lesson objectives.
b. Teacher-directed, Teacher-guided, and/or student-led activities to achieve objectives.
c. Prior understanding of the student on which choice of pedagogy is based.
d. Content and material to be used.
e. Duration and sequence of activities.
f. Classroom arrangements (e.g., seating, displays, arrangement of material).
g. Specific strategies for students who need extra help.
h. Methods of assessment.

Box 3.2v

Panchpadi: Five-Step Learning Process

The five-step learning process Panchpadi is a good guide to formulating the sequence that a teacher may adopt in planning for instruction of certain concepts and contexts:

- ***Aditi (Introduction):*** *As a first step, the teacher introduces a new concept or topic by establishing a connection with the child's prior knowledge. Children gather relevant information regarding the new topic with the help of the teacher by asking questions, exploring, and experimenting with ideas and material.*
- ***Bodh (Conceptual Understanding):*** *Children try to understand core concepts through play, inquiry, experiment, discussion or reading in the second step. The teacher observes the process and guides the children. The teaching plan has the list of concepts to be learnt by the children.*
- ***Abhyas (Practice):*** *The third step is about practice to strengthen understanding and skills through a range of interesting activities. Teachers can organise group work or small projects to reinforce conceptual understanding and attainment of competencies.*
- ***Prayog (Application):*** *The fourth step is about applying the acquired understanding in the child's everyday life. This can be accomplished through various activities and small projects.*
- ***Prasar (Expansion):*** *The fifth step is about spreading the acquired understanding (Pravachan) and using other resources to learn further (Swadhyay). Pravachan is largely mediated through peer learning, conversations with friends, telling each other new stories, singing new songs, reading new books together, and playing new games with each other. Swadhyay is mediated through engaging with materials and experiences related to learning. For each and every new topic learnt, a neural pathway is created in our brain. Sharing and enhancing knowledge strengthens our learning. A neural pathway is incomplete if we do not teach what we have learnt. Teaching makes learning clear and long-lasting.*

3.3.5 Managing Classrooms or Student Behaviour

Students behave inappropriately for many reasons. Behaviour is often the unspoken language through which young students act out feelings and thoughts. Sometimes they use behaviour to seek extra attention. Adolescents could be angry or helpless and do not know any other way to express these feelings. Sometimes this behaviour could be because of lack of sleep, poor nutrition, health issues, developmental delays, deficits or even family dysfunctionality or stress.

Norms, rules, and conventions must enable students' learning. Evolving clear classroom norms that can be implemented would help everyone own them rather than have a classroom function on the basis of fear.

Instances of indiscipline must be seen through the lens of development, with a balance of humour and compassion, and with careful intervention that is firm yet kind. These should be used as learning opportunities in helping students to solve problems. Discipline must be seen from the lens of self-regulation and self-discipline and as a necessary condition for development and the pursuit of learning. It is important for students to take responsibility for their behaviour and face appropriate consequences as they grow older.

Adults bear greater responsibility than students in creating an environment of respect and equality. Illustratively, school staff is expected to intervene if they see students using physical violence, bullying each other, being unkind, unfair to each other, and must put a stop to it immediately and firmly. They must encourage students to settle differences of opinion through dialogue and communication.

Box 3.2vi

Importance of Concentration

The Taittiriya Upanishad says that the secret of learning lies in the power of concentration in thought. The Science of Yoga is based on the process of concentration and the methods by which concentration can be achieved on the object of knowledge so that the contents, powers, and states of knowledge concerning that object can be realised by the seeker.

Sri Aurobindo also lays central importance on concentration and speaks of four principal methods by which concentration can be attained: meditation, contemplation, witnessing the passage of thoughts as they pass through the mind, and quieting and silencing the mind.

Concentration is a psychological process, it involves no rituals or ceremonies and is free from any doctrines. Hence, the cultivation of the powers of concentration is independent of any activity necessitating faith, belief or religious prescription.

3.3.6 Responding to Students with Disability or Other Individual Learning Needs

Classroom processes should respond to the diverse needs of students. Students learn best when they are challenged, but not so much that they feel threatened or overwhelmed by the level of challenge. Therefore, teachers would need to know and understand the learning needs of every student in their class and provide the appropriate level of challenge and support to each student.

During the normal course of teaching, based on routine observations and assessments, teachers could identify those students that may require additional support or

individualised attention. This in no way should lead to labelling of students as 'bright,' 'slow' or 'problem' students, nor does it imply 'lowering' of standards.

Some of the ways in which this additional support could be provided or students could be offered varying levels of challenge are listed below:

a. A 'bridge' course for a month or so at the beginning of the year, which will enable students to refresh their previously learnt concepts and prepare for the new class.

b. Specific work on designated days to supplement what has been done in class.

c. Differentiated assignments; the teacher could provide assignments or class tests of varying levels of difficulty using the same content.

d. Making specific resources available to students who need them, such as, extra worksheets for those who need additional practice and 'extra-challenging' worksheets for those who might enjoy or benefit from it.

e. Set up a 'buddy system' wherever appropriate, pair a student who needs help with another student who can provide it informally, e.g., to help with homework, offer explanations after class or carry out projects together.

f. Setting up a conference time once a month or so with every student in class so that the teacher has a chance to communicate one-on-one with every student and identify conceptual problems, learning difficulties or individual needs of all students.

g. Communicate regularly with all parents, but particularly those parents whose students may need special help and support so that parents are also able to provide support when required. The nature of this communication needs to be specific and clear to parents so that they know and understand what needs to be done to help their child.

h. In cases where the school is not equipped to help or support a student with an identified disability adequately, it may rely on external resources or resource persons. Integration of suitable technology can also be considered to support students with disabilities. Schools will understand and opt for all exemptions provided by Boards of Education in specific situations. All such decisions should be made in partnership with families.

3.3.7 Homework

Homework is an extension of the learning process. Work done at home is a consolidation of work done in school and helps make students capable of doing things on their own. It is based on the teaching provided to them in class. At the same time, homework should not be intended to merely repeat what has been learnt in class, but rather to apply it to different contexts. Homework tasks must therefore be meaningful for learning. It may include practice work (e.g., worksheets to be completed) as well as application of concepts through specific tasks (e.g., survey of local water resources).

Tasks and allocation of time spent on homework must be age appropriate. Teachers must also ensure that students can do these tasks on their own and they do not require parents or others to do anything on their behalf. Homework can be fun and provides a different kind of interesting challenge to students. It can also help to connect school with the student's home, especially in the Foundational and Preparatory Stages.

3.3.8 Pedagogy Across Stages

An effective approach to pedagogy in a particular School Stage is based on how children grow and learn (i.e., physical, cognitive, socio-emotional, language, and moral development) and the overall aims of education to be attained in this stage. This approach will help achieve Curricular Goals, Competencies and Learning Outcomes without compromising the holistic and expansive notion of individual development that NEP 2020 focusses on.

As stated earlier in this document, while the stages are distinct, students' growth and maturation are part of a gradual transition with overlaps and commonalities, especially across two adjacent stages (e.g., teaching for sensorial and perceptual ways of learning in the Foundational and Preparatory Stages, and teaching independent learning habits and discerning use of media gadgets in the Middle and Secondary Stages). It can also be seen that some changes occur in a continued fashion over the same facets within physical, emotional, social and ethical, and cognitive development over the stages (e.g., changes in physical strength and flexibility, in expressed need for emotional support, in the need for conformity and peer approval and in abstract thinking and independent reasoning abilities).

a. Pedagogical considerations related to physical development

i. **Foundational Stage:** Early years of school are formative and crucial in paving a positive experience of the learning environment. Any teaching strategy in this stage that speaks to vibrant energies, enables playful interactions, engages in enjoyable stories, uses curious toys, and allows for full-body engagement with learning would be ideal and effective. Children continuously engage through their senses and make most of the world around them this way. Pedagogy that encourages them to engage physically in aesthetic experiences of music, dance, art and crafts makes for an enjoyable school day. Teaching about health and hygiene practices ensures physical well-being in the long term.

ii. **Preparatory Stage:** Students continue to be physically active, highly perceptual, and engage with hands-on activities and make sense of concepts with the help of concrete physical learning aids. This requires teachers to demonstrate energetic and active participation in the things the students are required to do as part of their learning. The teacher needs to teach through modeling how to make sense of concepts more perceptually and practically with low levels of verbal complexity and theorising. The content that is chosen, the teaching plan, assessment, and classroom arrangement would need to be activity-based, playfully experimental, and lend themselves to a conversation and consolidation after 'doing.'

iii. **Middle Stage:** This is a stage of gradual and sudden changes in physical development. With adolescence and prepubescence on the cards, teachers will need to be prepared for handling growth pains and growth spurts with changes in strength and increased restlessness in their students. A good understanding of gender and sexuality would also help teachers understand their students better. Understanding families and local culture will help with understanding student behaviour in school. It is also a time when students must be encouraged to independently practise their learning despite the resistance that might come up.

iv. **Secondary Stage:** At this stage, students grapple with their changing bodies, may become self-conscious, and may be trying to make sense of their maturation. Pedagogy across subjects must accommodate for changes in students' perceptions of their bodies and abilities, provide adequately challenging physical tasks, and encourage greater participation in both group and individual activities, especially sports and games.

b. Pedagogical considerations related to emotional development

i. **Foundational Stage:** Children would require teachers to help them learn about understanding their own emotions and the emotions of others. The context of a school allows for a safe space for such conversation and learning. Learning to regulate feelings and behaviour, delaying the need for instant gratification, and practising positive learning habits will go a long way in the lives of children so these aspects must be facilitated and encouraged actively and regularly. Children will require close individualised attention and care.

ii. **Preparatory Stage:** Students at this stage are also rapidly learning to make sense of their thoughts and feelings and would need guidance with learning emotional regulation. Many of them would already display temperaments and preferences and teachers will need to engage and tease out emotional habits coming in the way of learning through their teaching interactions. They will also need to provide alternative possibilities to the emotional experiences of the students. Gradually, students must be supported and encouraged to become emotionally independent.

iii. **Middle Stage:** The classroom and the school as a site for emotional learning, growth, and expression are probably the most occupying for teachers at this stage. Students themselves go through unpredictable mood and energy fluctuations, often grappling with a sense of unexplainable wellness or not-so-wellness. Middle Stage pedagogy must allow for some amount of engagement with emotional experiences through quiet discussion and reflection. Curricular Areas can be used as contexts in which individual responses can be parsed. The teacher will have to find a balance in the approach to students' emotions, an approach that is neither intrusive nor indulgent, but reasonably firm, rationally clear, and emotionally caring towards students of this stage.

iv. **Secondary Stage:** It would be necessary for pedagogic strategies to guide individual reflection and group conversation on thoughts and feelings that emerge through engaging with curricular components. A philosophical understanding that feelings are transient and not set in stone, that individuals can act upon their emotions in healthy and unhealthy ways, and the social consequences of rational versus irrational decision-making based on emotional reactions are good discussions to have at this stage. The focus on emotional regulation must continue. Teachers will have to be discerning about when students require one-on-one attention and find ways to communicate with them effectively.

c. Pedagogical considerations related to social and ethical development

i. **Foundational Stage:** Teaching students social norms and strategies to adhere to teaching valuable social participation and contribution in accomplishing simple tasks, and teaching the meaning of cooperation and respect for others are all

immensely important in social and ethical development at the Foundational Stage. Social life is a long-lasting reality that children must learn to intelligently navigate early on. Ethical and moral instructions at this stage are aimed at teaching children simply the 'good' and appropriate from the 'bad' and inappropriate actions.

ii. **Preparatory Stage:** This stage is also a time for learning about social participation and contribution. The pedagogic strategies must enable pair work, small group work, and individual work in mixed proportions so that students are actively learning to work together with sensitivity, mutual respect and listening, cooperate with others, and also accept cultural differences and diversity of approaches in thinking and feeling. Teachers must engage students with basic ethical and moral questions about equality, fairness, sharing and cooperation.

iii. **Middle Stage:** Peers seem to become far more prominent in the lives of students at this point and this can be leveraged to the advantage of the learning atmosphere. Like the Preparatory Stage, the pedagogic strategies here too must plan for pair work, small group work, and individual work in good proportions. Mixed small group work would allow for listening and thinking together with different people. Many lessons must allow for learning to work together with others, for healthy ways of testing one's abilities through social facilitation, and for respectful and sportive competition. The pedagogy must explicitly aim (through content selection and interactional strategies) at fostering sensitivity and respect for diversity in gender, class, and cultural background. Students will need to learn to navigate their social world, including parents, teachers, and community, and will require clear expectations and rules set in these interactions. Teachers could discuss equity and respect for others as part of ethical reflection in class. It is also a time when they start learning about the world as much bigger than their immediate surroundings, so it is important to give them a sense of the cultural diversity that they are part of in our historically, geographically and culturally rich country.

iv. **Secondary Stage:** Students at this stage are young people with emerging opinions and loyal allegiances and with capacities for energetic participation and vehement dissent. Forming strong allegiances, explicit interest in varied ideologies that one can identify with, idealising individuals from politics or sport or the entertainment industry, and other similar impulses seem to show up in this age group based on the need for belongingness in students. Actual friendships, tightly knit small groups (ingroups and outgroups), and peer conformity would be features that can be used to the advantage of learning about oneself and the world around them. This is also the time to actively encourage individuation in thinking and reasoning while being able to respectfully listen and understand others. Challenges, such as, bullying, isolation, and confusion, with boundaries will need to be met in the context of the classroom and outside. Teaching strategies can include delegating responsibilities, allowing students to take charge of their own learning, and regulating each other's learning with a focus on helping others learn better. Teachers could actively talk with students about ethical and moral actions connected to social participation and change. It is also an important time in the lives of students to address ideas of identity and heritage about what it means to be Indian *(Bharatiyata)* and belong to our vast and culturally rich nation.

d. Pedagogical considerations related to cognitive development

i. **Foundational Stage:** Pedagogic strategies for this stage must ensure Foundational Literacy and Numeracy for all children as this forms the basis of all further learning. Exposure to rich learning experiences in Language and Mathematics, and rich aesthetic and cultural experiences through art, crafts, music, dance, stories, and theatre would enable sound overall cognitive development. Multimodal forms of TLMs, adequate outdoor experiences, one-on-one teacher attention, and physical wellness would also address the cognitive developmental needs of children at this stage.

ii. **Preparatory Stage:** Pedagogy at this stage will require a gradual move to more thinking and analysing after doing and observation, with plenty of material to engage with, repeat and practise. This repeated practise will form the basis for study habits, independent thinking, and independent learning that is to come in the Middle Stage. Multimodal TLMs and one-on-one attention are still necessary to a good extent at this stage, as these strategies will form a strong conceptual basis for students across Curricular Areas. Planning for field visits in the various subjects, apportioning sufficient time outdoors in a working week, encouraging students to demonstrate logic in their reasoning, encouraging thoughtful questioning, encouraging creative and artistic activity, learning skills to inquire through conversations with people, and reading; referring to books are important pedagogical strategies in this phase.

iii. **Middle Stage:** This stage often demonstrates the most accelerated learning possibilities, individual learning abilities and individual creativity begin to show sharply in distinction from others. This will require pedagogic attention, especially for those who struggle and for those who excel in their achievement levels given the context of group learning processes. Teaching students how to assimilate understanding and shifting from practical to theoretical concepts across curricular areas, demanding greater rigour in and capacity for working would be essential pedagogic considerations at this point.

With the introduction of newer Curricular Areas, it would be important to create adequate scaffolds for students to keep their interest and confidence in their intellectual capacities. Students' capacities for abstract thinking and formulating one's own innovative ideas improves markedly and teachers can present challenging material that requires abstract reasoning and application. Rules for technology and media usage become necessary in this stage. Teachers need to demonstrate in their teaching transactions (and explicitly teach) a discerning educational use of the internet and media gadgets in learning. This would require conversations about safe and healthy practices in using the internet, new media technology and gadgets in the context of the curriculum.

iv. **Secondary Stage:** There exist ample possibilities for maturation in thinking, learning, practising, and creative expression in this stage spread over four years of student life. Teaching students how to independently assimilate understanding and encouraging abstraction and theoretical concepts across curricular areas, demanding rigour, and encouraging creativity and innovation in working, and presenting their views would be very important pedagogical considerations for

Secondary Stage's students. Newer Curricular Areas and choices in specialisations begin at this stage, and it would be important to help students make their decisions (in subject choices) and create adequate opportunities to sustain practice in these. Given their age and independence, technology and media use rules will need strong follow-up and reminders. As less supervision is possible, and the 'discerning educational use of the internet and media gadgets in learning' principle taught in the previous stage is likely to wane, this will require repeated reminders. Caution against distractions while learning, cyberbullying, compulsive use, and many other unhealthy practices in using the internet will be required from teachers, especially as students will be engaging with online research for learning much more in this stage.

3.3.9 Overall Principles of Pedagogy

Given all of the above, the following principles of pedagogy must inform classroom planning and instruction across all stages:

- **Every child is capable of learning and children are natural learners:**
  a. Learning is an active process that involves both understanding and doing.
  b. Children learn best when they are respected, valued, and involved in the learning process.
  c. Children learn in a variety of ways, illustratively, through making something, participating in discussion, listening, speaking, reading, writing, questioning, exploring, discovering and experimenting.
  d. Learning happens best when classroom processes make connections with the life of students and their prior experiences, focus on conceptual clarity, and provide variety and challenge to students.
  e. Practice is a critical and integral part of the learning process.
- The following are non-negotiable:
  i. Punishment and fear are detrimental to learning and must not be used in the classroom.
  ii. Inequity in the classroom on the basis of caste, gender, religion, socio-economic conditions, student performance or any other factor is unacceptable.
  iii. Memorisation must not be the primary form of learning or of assessment.
  iv. Students must not be treated as passive receivers of information, this makes classroom processes lead to boredom and monotonous routines. Students must be seen as active agents in their own education.

Effective pedagogy, therefore, encourages conceptual understanding, active discovery, questioning and debating, and independent learning. It gives serious consideration to student experiences and student voices, acknowledges and accommodates student diversity, builds on students' previous knowledge, uses a range of teaching techniques and gives timely feedback on work done.

Section 3.4
Approach to Assessment

NEP 2020 states:

> *The aim of assessment in the culture of our schooling system will shift from one that is summative and primarily tests rote memorisation skills to one that is more regular and formative, is more competency-based, promotes learning and development for our students, and tests higher-order skills, such as, analysis, critical thinking and conceptual clarity. The primary purpose of assessment will indeed be for learning; it will help the teacher and student, and the entire schooling system, continuously revise teaching-learning processes to optimise learning and development for all students. This will be the underlying principle for assessment at all levels of education.*
>
> *[NEP 2020, 4.34]*

The policy further continues:

> *The progress card will be a holistic, 360-degree, multidimensional report that reflects in great detail the progress as well as the uniqueness of each learner in the cognitive, affective, and psychomotor domains. It will include self-assessment and peer assessment, and progress of the child in project based and inquiry-based learning, quizzes, role plays, group work, portfolios, etc., along with teacher assessment. The holistic progress card will form an important link between home and school and will be accompanied by Parent-Teacher Meetings in order to actively involve parents in their children's holistic education and development. The progress card would also provide teachers and parents with valuable information on how to support each student in and out of the classroom. AI-based software could be developed and used by students to help track their growth through their school years based on learning data and interactive questionnaires for parents, students and teachers, in order to provide students with valuable information on their strengths, areas of interest, and needed areas of focus, and to thereby help them make optimal career choices.*
>
> *[NEP 2020, 4.35]*

3.4.1 Purposes of Assessment

Assessment has two purposes; measuring achievement of student learning and gauging effectiveness of classroom processes and teaching materials used for teaching and learning. In the everyday of the classroom, assessment refers to any process of gathering information about student learning that can be interpreted, analysed, and used by the teacher (and others, where relevant) for guiding the teaching-learning process, aggregating student learning at relevant junctures and reporting student progress over time. Educational assessment thus plays a critical role in continually improving teaching and learning.

Assessment is also used for certifying student learning and education completion at key stages (e.g., Grade 10, Grade 12).

3.4.2 Assessment of Learning; Assessment for Learning; Assessment as Learning

Assessment of learning refers to the measurement of achievement of student learning. *Assessment for learning* refers to evidence of student learning gathered by the teacher

that provides inputs to guide teaching-learning processes. Assessment, when designed meaningfully, can be used as a powerful tool that contributes to and supports better student learning and teaching practices. Teachers who have a good sense of where students in class do well and where they struggle can take more informed decisions about their pedagogical practices.

Recent studies have shown that students can play an active role in taking charge of their own learning. When assessments are introduced as non-threatening tools for self-reflection and introspection, they become developmental and constructive in nature. This is referred as *assessment as learning.*

In school education, one needs to look at all three approaches to assessments mentioned above: *Assessment of Learning; Assessment for Learning; and Assessment as Learning.*

3.4.3 Current Challenges in Assessment

In our schools currently, assessment has mostly become mechanical and routinised. It is mostly focussed on measuring rote learning of content rather than on measuring achievement of Competencies and Learning Outcomes. Assessment is also generally experienced by students as an intimidating process that generates fear and leads to labelling and segregation based on 'marks' that they have scored in tests and examinations with significant social consequences.

The stress caused by Board Examinations at Grades 10 and 12 is even more, leading to deep anxiety among students and families almost universally in our country. The examinations place an enormous amount of pressure on students over what are perceived as life-altering days and milestones of their lives. Many other matters contribute to Board Examinations becoming severe stressors, e.g., examinations being available only on particular days, little real possibility of improvement if the student has had one 'bad day' during the examinations, and use of board examination results in college admissions.

The current structure of many (but not all) Board Examinations forces students to concentrate only on a few Curricular Areas at the expense of others, preventing truly holistic development. Rote memorisation and coaching for performing on these examinations become primary, while real learning through understanding, thinking, analysing and doing becomes secondary. Ideally, examinations should be seen as certification and also learning experiences, from which one can learn and improve in the future. The current Board Examination system does not lend itself to this. India has over 60 Boards of Examination, some of whom have taken definitive actions to address many of these issues.

3.4.4 Key Principles of Effective Assessment

Key principles that could guide our thinking on effective use of assessments to aid better teaching and learning are listed below:

a. **Assessment should measure achievement of Competencies and Learning Outcomes leading to attainment of Curricular Goals:** Assessments should explicitly track student progress on all aspects of learning as stated in the Competencies for

each stage and Learning Outcomes for each grade. Assessments should accurately reflect the intent of evaluating the achievement of a Competency or Learning Outcome. The connection between the Competency or Learning Outcome and the assessment should be clear and precise. Appropriate forms of assessments may be chosen in alignment with the Competencies and Learning Outcomes to be assessed.

b. **Assessments should be constructive, developmental and learning focussed:** Assessments need to be visualised as an ongoing process which teachers integrate within the teaching-learning process using formal and informal ways to elicit reliable evidence about student learning. Collecting such evidence helps teachers understand the effectiveness of their pedagogy in terms of what the students have understood, what needs to be worked on further, which methods of teaching work, what kinds of resources work and so on. For students, assessments need to be placed as an important tool that will help them understand and reflect on their own learning. Assessment should not become an intimidating process that involves the labelling and segregation of students.

c. **Assessments should be stage appropriate:** At the Foundational Stage, teachers would primarily drive all assessment activities, which are largely based on observation. At the Preparatory and Middle Stages, multiple tools and methods should be introduced. Students should also be given a more proactive role in assessing their own learning trajectories. Additionally, at the Secondary Stage, students should be prepared to take standardised tests including Board and other examinations.

d. **Assessments should accommodate student diversity:** It is important to move away from the 'one size fits all' approach while designing assessments. A variety of assessment methods, e.g., paper-pencil tests, oral assessments, project work and group assignments should be used. Assessment tools and processes must accommodate for students performing at different levels in a classroom. Well-designed, graded assessments can be used to understand individual student needs better so that their learning needs can be adequately catered to.

e. **Assessments should be supported by timely, credible and constructive feedback to students:** Students should be given useful feedback on their performance. Such feedback needs to be constructive with information on what has worked well and what areas might need improvement and how can this be achieved. Use of Holistic Progress Cards (HPCs) that detail out student performance in multiple aspects, including formative and summative assessments, should be explored.

f. **Assessments should support in meaningful aggregation or summation of student learning:** While the formative function of assessment is critical, the summative function of assessment is also important. Summative examinations, including certification examinations, continue to be relevant as they serve as a necessary test to understand students' achievement of Competencies and Learning Outcomes. While the significance of summative examinations is well established, what needs immediate attention is the approach to the same. Examinations should move away from testing rote memorisation and instead focus on conceptual understanding, application of concepts, problem solving abilities, critical thinking and other such capacities.

3.4.5 Types of Assessment

Assessments could be formative or summative, and both are important for improving teaching and learning.

a. **Formative assessments** are continuous and ongoing. They are used to track student learning to provide ongoing feedback that can be used by teachers to improve their teaching and by students to improve their learning. Formative assessments are generally low stake and do not have strong consequences. Some examples of formative assessments include observing student behaviour in class; asking students to draw a concept map in class to represent their understanding of a topic; and asking students to write a few sentences with a friend on a poem they have read.

b. **Summative assessments** evaluate student learning at the end of a lesson or a logical period of teaching. Summative assessments are normally higher stake in that they compare student performance to a benchmark or standard and have some consequence. Some examples of summative assessments include a term-end test or a Board exam. Results of summative assessment can also be used for formative purposes, i.e. for informing teaching and learning.

It is very important to note that the core difference between summative and formative assessment is the purpose for which the assessment is used. Formative assessment is used as a part of and as input to the teaching-learning process, whereas summative assessment is about evaluation of achievement of learning over a period of time. The same tool, instrument, method or form can be used for summative or formative assessment when suitably designed. For example, the often-used 'paper-pencil test' or written test can be used to assess what a student is struggling with and focus the next class on that matter, which is formative assessment. On the other hand, as we know well, paper-pencil tests or written tests are used as the standard for year-end examinations, which are summative assessments.

3.4.6 Forms of Assessment

There are several forms of assessment that can be used across both formative and summative assessments:

a. **Written Tests:** These require written responses to questions from students. They are the most common form of assessment used across various stages of school education. Forms of written tests include:

   i. **Objective Type Questions:** The most commonly used form of objective-type questions is 'Multiple Choice Questions' (MCQs) that require students to think through and select correct responses from a variety of options. Other forms include filling in blanks, matching, sorting lists based on select criteria, picking the odd one out, labelling a diagram, solving a crossword, unscrambling a word, solving riddles, and word grids that require a very short or one-word answer.

   ii. **Constructed Response Questions:** These are questions that require students to frame and write answers. They can be being close ended (requiring one correct and short answer) or open ended (requiring a short or long essay with multiple correct or alternate answers). It is important to have clear and detailed scoring guides or marking schemes for such questions to avoid subjectivity in assessment.

iii. **Graphic Organisers:** These are visual representation of ideas and concepts that allow students to sort information and make connections. They help students organise their learning and assimilate new knowledge. These organisers are particularly useful in diverse classrooms where writing skills may not be a strength for all students. These can be used across subjects.

b. **Oral Tests:** These require an oral response from students and can be used in many ways. The most common forms are reading aloud, responding to questions, recitation, and debates and discussions. Other forms including group discussions, presentations and extempore talks, which could also be used for assessment.

i. **Reading Aloud:** Reading assessments could include reading aloud a passage, a poem or any other form of writing. Word recognition, fluency, and voice modulation skills could be assessed along with comprehension through asking students to summarise or talk about what they have read.

ii. **Listening and Responding:** Students listen to a text and respond either orally or on a worksheet. This form of assessment can be used in language as well as other subjects, especially when teachers wish to remove any barriers that might hinder expression of what a student has learnt.

iii. **Recitation:** This is a commonly used assessment especially at the Foundational and Preparatory Stages. It helps the teacher assess spoken language with specific focus on pronunciation, intonation and comprehension through observation of the students' expressions and actions.

iv. **Debates and Discussions:** In the Middle and Secondary Stages, students' fluency of language as well as proficiency in making strong arguments using knowledge and reasoning to persuade and convince an audience can be assessed while also developing an ability to understand and respect others' viewpoints and opinions. Teachers can also include other parameters, such as, diction, deportment, ability to take criticism positively, and manage their emotions and body language during public speaking. Sharing parameters before setting the task helps students focus on developing these skills and serve as good learning opportunities as well. Debates in Science and Social Science can help seamlessly integrate ethical and environmental dimensions of the curriculum into subject-specific tasks.

c. **Practical Tests:** These require students to demonstrate specific skills and applications of their new learning. Some key illustrations are described below:

i. **Experiments:** Using experiments helps assess students' understanding of concepts of science and the scientific method. This is also a good way of finding out whether students can 'do' science and not just answer questions about science.

ii. **Artefacts:** An artefact refers to an object created by students. Artefacts provide a rich source of information about a student's strengths and abilities. These could include art and craft products, costumes for theatre, products in vocational education, and making models in particular subjects.

iii. **Demonstration:** In Curricular Areas, such as, Art Education, Physical Education and Well-being, and Vocational Education, assessment is based on demonstration of a student's skills and abilities. Illustratively, dribbling in basketball, use of *Mudra*

in dance, hitting the right notes while singing, keeping rhythm during a song, using a chisel and mallet in woodwork, and mixing manure in the right proportion in gardening.

iv. **Projects:** Projects are longer, structured activities completed by individual students or groups of students that result in a product. For example, a model, a substantial report, or a collection of artefacts. While doing projects, students investigate, explore, and respond to complex questions, real-world challenges, and problems. Projects help assess collaboration, communication, perseverance, creativity, and problem solving along with assessing subject-specific knowledge and skills.

v. **Portfolios:** A student portfolio is a purposeful collection of student work that tells a story about a student's efforts, progress, and achievement in one or more subjects over a period of time. It could be a collection of the student's day-to-day work or a selection of the student's best pieces of work. Portfolios may include writing samples, laboratory reports, journals, artwork, short surveys and research papers, projects, photos, worksheets, tests, map work, teacher's qualitative comments on the student's work, peer feedback, and the student's own reflections on his or her learnings. It becomes a cumulative record of performance from which emerges a clear picture of what student knows and can do and how they have progressed over the period. Portfolios are good sources of evidence of learning that can provide rich information to teachers about where students are and how they can be supported to improve.

d. **Open-Book Tests:** An open-book test is one where the students have access to resources and references (e.g., textbooks, class notes, library books) while answering questions. These tests assess the ability to process or use available information and apply the same in various contexts. These tests shift the focus from recall to application and synthesis.

3.4.7 Designing Good Questions

All assessment should measure achievement of Competencies at the stage and Learning Outcomes for the Grade, leading to attainment of Curricular Goals. This is the basis of designing good questions. Designing good questions is a skill that is built over time with practice. Some key thumb rules for designing good questions are as follows:

a. Questions should assess a relevant concept or capacity that is core to the subject or area being tested (e.g., assessment in language should test skills of language learning, not the content used to teach those skills).

b. Questions should be clear, and factually and conceptually correct.

c. Vocabulary used in the questions should be contextual, age appropriate, and sensitive to bias.

d. While developing MCQs, obviously incorrect or correct responses should be avoided. The incorrect options or distractors should indicate misconceptions that students commonly have.

e. All descriptive questions should be coupled with a clear and concise marking scheme. *(Part C, School Subjects, Assessment Sections for samples of the above.)*

3.4.8 Designing Marking Schemes

a. All questions that require descriptive answers and measure the achievement of more complex Learning Outcomes need to have a detailed marking scheme. This ensures clarity and helps to reduce subjectivity.

b. Marking schemes should lay out specific expectations of what is expected for a fully correct, partially correct and incorrect response.

c. For questions assessing conceptual understanding, application and reasoning, it is necessary to include specific samples of responses. There could be variations in student responses and marking schemes should account for that. This is particularly necessary in open-ended questions where student opinions could differ; or in solving mathematics or science problems where their approaches could vary.

d. Assessment of projects and portfolios also need explicit criteria for evaluation. *(Part C, School Subjects, Assessment Sections for samples of the above.)*

3.4.9 Assessment across Stages

3.4.9.1 Foundational Stage

a. Assessment tools and processes should be designed in a way that they are a natural extension of the learning experience for the child. Assessment should not contribute to any additional burden for the child. Explicit tests and examinations are completely inappropriate assessment tools for this stage.

b. Assessment should allow for diversity among children and in their learning. Children learn differently and express their learning differently too. There might be many ways to assess the achievement of a Learning Outcome or Competency. The teacher should have the ability to design different kinds of assessment for the same Learning Outcome and use each assessment appropriately.

c. Assessment should enable recording and documentation. Children's progress should be described and analysed through systematic collection of evidence.

d. Assessment should not overly burden the teacher. The teacher should have the autonomy to judiciously choose the appropriate tool for assessment and the periodicity in which assessment-related record keeping is maintained. While this autonomy is important, systematic record keeping of children's assessment should be seen as an important part of a teacher's professional responsibilities.

e. At the Foundational Stage, two primary methods of assessment are appropriate. Observations of the child and analysing artefacts that the child has created as part of their learning experience.

3.4.9.2 Preparatory Stage

a. With the start of more formal learning across Curricular Areas, a robust system of formative assessment is required to track progress of individual students. Assessment should act as an instructional tool and help in providing a comprehensive account of student learning.

b. Students from this stage onwards learn better when they are more aware of the Competencies to be attained. Teachers should help make them understand the desired Competency to be achieved through a lesson or a unit of study.

c. At the Preparatory Stage, in addition to observation of students and analysis of artefacts created by students, a variety of formative oral and written assessments should be introduced. These assessments should test conceptual understanding and Competencies, and should include questions that encourage creativity.

d. At the end of each year of the Preparatory Stage, there will be a comprehensive summative assessment of the student's readiness to enter the next grade with robust options for support during the break between grades to help ensure such readiness.

3.4.9.3 Middle Stage

a. With the introduction of more concepts in each subject at this stage, assessment will continue to be Competency based, covering all dimensions of learning.

b. At this stage, the focus of the curriculum moves to conceptual understanding and higher-order capacities. Therefore, various formative assessment techniques, such as, projects, debates, presentations, experiments, investigations, role plays, journals and portfolios should be used to assess learning.

c. Regular assessments comprising MCQs and constructed responses (e.g., short answer, long answer), with the aim to test conceptual understanding and higher-order capacities rather than merely rote learning, may be used to track student progress, give valuable feedback to students, and continuously revise teaching-learning plans and practices. Questions that require creativity are especially encouraged at this stage.

d. At the Middle Stage, in addition to a variety of oral and written tests, a variety of practical tests and projects should also be introduced. At the end of each year of the Middle Stage, there will be a comprehensive summative assessment of the student's readiness to enter the next grade, with robust options for support during the break between grades to help ensure such readiness.

3.4.9.4 Secondary Stage

a. Given the demand of greater subject depth, regular formative assessments should be effectively practised for facilitating meaningful learning and constructive feedback.

b. Classroom assessments, as in the Middle Stage, will continue to play an important role considering the nature and complexity of the Competencies at this stage. Self-assessment will also play a key role in the student's learning at this stage. Students should be facilitated to monitor what they are learning and use the feedback from this monitoring to adjust, adapt, and decide their own strategies for learning.

c. Assessments can be designed using case-based questions, simulations, and essay-type questions to enable the assessment of Competencies, in order to continually replan and revise the teaching-learning process. Questions that require creativity are again especially encouraged at this stage.

d. At the Secondary Stage, a variety of written tests, practical tests, projects, and openbook tests should be used. At the end of each year or term of the Secondary

Stage, there will be a comprehensive summative assessment of each subject, which in relevant cases would be the Board examinations.

3.4.10 Holistic Progress Cards (HPC)

a. Progress cards are a formal means of communication between the school and home, informing parents and families of a student's progress and providing an opportunity for self-evaluation to students, thereby motivating them to do better.

b. A Holistic Progress Card (HPCs) is an individualised and comprehensive reporting of a student's progress in all domains or areas of learning on the basis of Competencies and Learning Outcomes to be achieved.

c. This brings out each student's progress and interests and enables the development of a unique plan to support each student.

d. Unlike a single score or letter grade, an HPC provides disaggregated reporting, which does not represent performance in an entire subject area. It is based on evidence of student work beyond performances on tests (e.g., assessment of writing samples, projects, portfolios, artwork, participation in games).

e. The HPC will enable focus on the student's progress as opposed to comparison with others. The comparison will be with the student's earlier report card and not with the performance of other students in the class.

3.4.11 Progression across Grades

a. Students should not be detained from Grades 1 to 8.

b. It is the responsibility of the education system to ensure that all students achieve requisite competencies by Grade 8 so that they can successfully continue onwards from Grade 9.

c. There must be clear checkpoints and support systems in place to help all students acquire the requisite competencies by Grade 8.

d. NEP 2020 (4.40) requires all students to take examinations in Grades 3, 5 and 8, conducted by an appropriate authority that tests competencies.

   i. These examinations will be conducted by a body which is outside the school as mentioned in NEP 2020; it may be a state or district body or any other appropriate body.

   ii. These will be competency-based examinations and not be based on memorisation and procedural skills.

   iii. It is important that these examinations are based on the core key competencies. For Grades 3 and 5 the focus could be on FLN competencies. This would not cover the entire curriculum, but core competencies that are crucial for study in later grades.

   iv. These must be conducted by an independent body (e.g., a district board) which has the capacity to conduct valid and reliable tests with high integrity. This is the lynchpin of executing this particular NEP 2020 recommendation.

e. The assessment of achievement of competencies will be shared by the school with individual students and their parents or families or guardians with a developmental and improvement objective.

f. Those students who have achieved satisfactory levels of competencies will be helped by this very specific engagement and discussion on their progress.

g. For students who have not achieved levels of competencies satisfactory enough to begin the study of the next grade, clear and definite actions will have to be taken immediately by the school with support from the system to ensure that such students achieve requisite competency levels to be able to study in the next grade in the coming session.

One immediate action would be, where possible, providing a summer school (6–8 weeks) for these students with adequate number of teachers.

i. At the end of the summer school, the examination will be reconducted by the same appropriate authority and if the student has still not achieved requisite competencies, then the actions as per points below will be taken.

ii. Grade 3 students will move to Grade 4, and Grade 4 students to Grade 5. However, the school must ensure that the students acquire the requisite competencies in the first two months of the new session.

iii. Students in Grades 5 and 8 and their parents or families or guardians will be given the option for the students to continue for one more year in Grade 5 or 8, as the case may be.

iv. The decision to continue in the same Grade would entirely be that of the students and their parents or families or guardians.

h. In case students and their parents or families or guardians choose to continue in the same grade, and despite a second year in the same grade, the student's achievement is not at the level of adequate competencies, then:

i. An appropriate evaluation of the school will be done by a competent academic institution (e.g., DIET, BRC, another school); this evaluation would be of the entire school, and not only the teacher who is teaching that particular Grade, because the overall school and previous grade teaching has effects on this matter.

ii. Clear actions to improve the conditions that are causing this lack of achievement (including poor attendance if that is the case) will be planned and implemented. This will form a part of the School Development Plan and discussed with the School Management Committee (SMC).

iii. Also the student's competencies will be assessed through the common Grade 5 or 8 exam as the case may be and they will be progressed to the next grade and given the requisite extra support as described below. No student will be retained in the same grade for a second time, even if the students and their parents or families or guardians wish to do so.

For those students who are progressed from Grade 5 to 6 or Grade 8 to 9, without having achieved the requisite competencies, in either of the cases mentioned earlier; parents and student choose to progress (Point g., subpoint iv.) or it is after an additional year in the same grade (Point h., subpoint iii.). It will be

ensured that the student gains the competencies required to study in the next Grade and to enable that extra resources including teachers will be provided in the next Grade, as also other measures will be taken, such as:

i. 4–6 weeks of 'reinforcement' or 'catch-up' for these students at the beginning of the next Grade, including others who have not performed well on the examinations.

ii. A longer daily programme of 'catch-up' as part of the Language or Mathematics class with a well-defined structure and materials, such as, workbooks.

iii. Additional homework during the summer break can be considered with some follow-up by the teachers during the break.

iv. These students will not face any discriminatory action (e.g., be made to sit in another class), it will be an integrated classroom that will be treated like a multilevel classroom.

i. While the school and the system must take responsibility for students' learning (and inadequate learning), the matter of irregularity of attendance has to be accounted for.

i. If a student has not attended school regularly, say less than 60 percentage, then if the student does not achieve the requisite competencies, the school or teacher must include this matter in the discussion with the parents (as in point e., earlier, and in continuing discussions with parents). And at least for Grade 8, there should be an encouragement for continuing for one more year in the same grade.

ii. The discussions also must be used to understand if there were special family or health situations that caused irregular attendance. The pattern of attendance and scores of previous examinations could be reviewed to understand if the student has otherwise been attending and doing better in earlier grades and this examination or attendance is an aberration.

j. An annual report on this matter and progress on it, on the number of students achieving adequate competencies in Grades 5 and 8, and actions taken in this regard will be prepared by each school.

k. This report must ensure that students who have not achieved requisite competencies remain anonymous. A block and district-level aggregation of this report will also be carried out and made available to the public.

l. Data privacy will be a very important issue. This must be rigorously designed into the system with respect to both IT system and the process.

3.4.12 Approach to Board Examinations in Grades 10 and 12

3.4.12.1 Current Challenges

a. Board examinations currently cause severe stress in students and their families for a variety of reasons, including:

i. **Social factors:** A student's performance in Board examinations is often considered a marker of intrinsic worth. There is also a widespread feeling that Board examinations are milestones which have life-altering effects.

ii. **High stakes:** The results of Board examinations are often used for college admissions and other purposes. Given the relative paucity of good Higher Education Institutions, this becomes a very important issue.

iii. **No second chances:** The way the Board examinations are currently held, one day underperformance can severely affect Board examination results. Since these examinations are held only once in a year, there is no practical possibility of improvement for any student who has just had one bad day despite having learnt well.

iv. **Nature of examinations:** Since most of the examinations tend to test accumulation of facts, it is a significant stressor, because remembering and reproducing a vast range of facts across multiple subjects in a high-stakes situation is far more difficult than responding to something which is assessing genuine understanding.

v. **Other influencers:** There is an ecosystem with commercial interests that creates artificial competitive pressures around Board examinations, hoping to benefit by offering coaching and tutoring services.

b. Board examinations conducted at the end of Grades 10 and 12 are certification examinations to ascertain the extent to which students have achieved Competencies across curricular areas leading to the attainment of Curricular Goals. Most Board examinations struggle to do this well in a meaningful and consistent manner.

c. Board examinations tend to focus on the capacity of students to reproduce learnt facts and more. There is a misalignment between what these examinations should test and what they do test. Given that most examinations largely test rote memory, a very narrow range of competencies are assessed. This gives an incomplete (at best) or incorrect (at worst) picture of student learning. Most test instruments are not backed by clear and detailed marking schemes, which leads to subjectivity by evaluators and questions of consistency. Thus, there remain serious concerns over the validity and reliability of these tests at the current time.

d. The burden of the students from the existing content overload of the curriculum is exacerbated by this approach of the Board examinations.

3.4.12.2 Changes in Board Examinations

a. Board examinations should assess the achievement of competencies for the Secondary Stage as stated in the curriculum. These examinations should provide a valid and reliable picture of student performance as per the competencies in the curriculum.

b. The burden of Board examinations on students must be reduced through multiple actions:

i. Making them easier and lighter with significantly reduced content load.

ii. Focusing sharply on competencies rather than recounting facts.

iii. Offering the same examination at least twice a year, so that students have an option to take the exam a second time and improve. (Point d. given below)

iv. In the long term, all Boards should change to semester or term-based systems, where students can test in a subject as soon as they have completed the subject, which would further reduce the content load being tested in any one examination.

c. It is the responsibility of Boards of Examination to design and implement fair, reliable, and valid testing processes and instruments to assess achievement of the articulated Competencies and certify students on the basis of this achievement. Articulation of Competencies is the responsibility of the appropriate academic authority (e.g., NCERT or SCERT).

d. Board examinations should be offered at least twice a year to ensure that students have enough time and opportunity to perform well. Students can then appear for a Board examination in subjects they have completed and feel ready for. This process could be made possible through the creation of a comprehensive test paper bank, which can be used to create tests using suitable software. This will enable the move towards a system of on-demand examinations in the near future as described in NEP 2020.

e. Vocational Education, Art Education, and Physical Education and Well-being are an integral part of the curriculum in this NCF. However, in this case, much of the assessment will have to be demonstration-based and not written-exam based. It is recommended that 75 percentage of weightage in overall certification be given to the demonstration-based assessment, and only 25 percentage to any written examination. Boards will also need to design and implement high-quality systems which can locally (at the school) assess on the basis of demonstration. This will need to be independent from the school, yet operationally feasible.

f. Science and other subjects also need to have demonstration-based assessment, e.g., conducting experiments. This should have 20–25 percent of weightage in the overall certification of the subject. This kind of assessment currently happens but needs significant improvement for validity and objectivity (similar to point e. mentioned above).

g. Selection of test developers, reviewers, translators, and evaluators for Board Examinations should be based on a rigorous process based on detailed guidelines. Boards of Examination should ensure that all test developers, reviewers, and evaluators go through formal University-certified courses on test development before they begin this work. In addition, there should be ongoing capacity building of test developers, evaluators, and reviewers to support them in the design of high-quality test instruments.

h. Test development processes for written examinations should be significantly streamlined. Some illustrative steps are given below:

   i. Creating Assessment frameworks is the first step to start the process. Assessment frameworks ensure a well-articulated basis for deciding what to test. Such frameworks detail out the Competencies, Learning Outcomes, and content domains to be assessed.

   ii. Designing a blueprint based on the assessment framework is the next step. A blueprint is a planning document where all the relevant information for a test is listed. The blueprint is usually a working document which undergoes change during the process of test paper designing. The information in the blueprint includes Competencies, Learning Outcomes and content domains to be tested, format of test papers (e.g., MCQs, short written answers, etc.), length of the test and marking schemes.

iii. Designing good quality matter of the test papers and scoring guides is the third step. Broadly, test paper formats are of two kinds; Selected Response questions (e.g., MCQs, True or False) where students must select the correct response from the options provided and Constructed Response questions where the student must develop the correct response. Some important quality parameters to be kept in mind while designing test papers are language clarity, factual accuracy, quality of distractors, and choice of stimulus materials (e.g., graphics, illustrations, maps) used. The marking schemes are as important as the test papers themselves.

iv. Once test papers are developed, rigorous review procedures (e.g., test paper panelling with an expert group) should be ensured. Marking schemes should also be reviewed along with test papers.

i. Boards of examination should ensure periodic, rigorous reviews of the quality of test instruments designed.

3.4.12.3 Assessing Values and Dispositions in Board Examinations

Development of values and dispositions is best assessed through everyday school processes and based on observation and recording by the teacher. This is described in Part B, Chapter 2.

If values and dispositions must be assessed through Board examinations, they should be done with very careful thought and thorough preparation. While standardised psychometric tests and individual diagnostic tests are available, these are best avoided for this purpose. Two possible methods are given below in options 1 and 2. Boards of examination may devise their own methods based on similar underlying principles.

Option 1: Give students questions based on the subject being assessed that are written in story formats and involve a certain conflict in their premise. The idea is to understand how students expect the protagonist in the story to respond to the said conflict. These conflicts could range from matters of inequality to issues of collaboration to using problem solving abilities. What matters is to allow the student being assessed to be a third party providing an opinion or solution to a problem given in a story. Removing the onus of direct personal response to a given situation may help students choose a response that reflects the students' own thought and not that which the student perceives as 'acceptable.' Designing story-questions must be done with care. The rubrics for assessing responses to these story questions also need to be carefully crafted and consistently applied across student responses.

Option 2: Focus on the assessment of values and dispositions through examinations for Physical Education and Well-being, Vocational Education and Art Education, all of which have significant practice and demonstration components. All these three subjects have values and dispositions strongly built into their Curricular Goals and Competencies. Assessment of achievement of these competencies will also need carefully designed tasks and rubrics for assessment that are coherent, consistent and meaningful across student groups.

3.4.12.4 Challenges of Entry into Higher Education

As NEP 2020 explicitly recognises, India currently has a shortage of high-quality Higher Education Institutions. This has created a situation where the vast majority of students wanting to pursue Higher Education are 'competing' for the relatively small capacity available in the high-quality Higher Education Institutions. This situation is a significant cause of most serious problems being faced by Secondary Stage students in India, including:

a. High stress, and unfortunately too often, serious mental health issues. This is not limited to the students themselves but also affects their families.

b. A widespread culture of coaching and tutoring, feeding commercial interests, leveraging this 'high competition' situation.

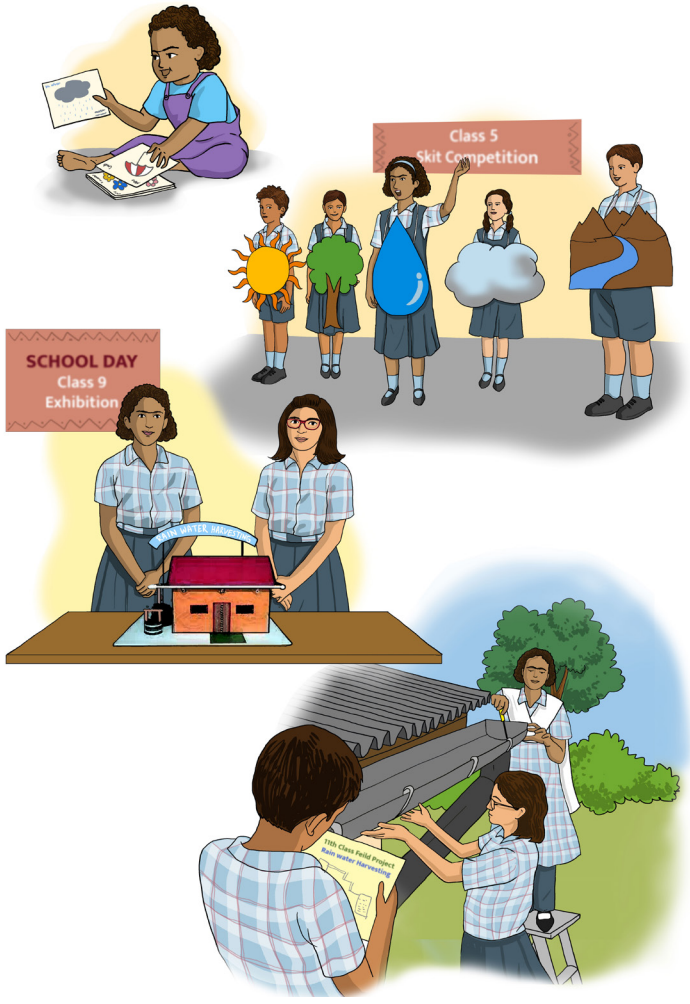
c. A tendency to ignore real learning and focus on 'cracking' the entrance test or the Board examinations, whichever are used for college admissions.

NEP 2020 has a comprehensive set of recommendations to address this very significant set of challenges, including some that have been implemented already, such as, the Common University Entrance Test, and some that are being planned and implemented, such as, substantial expansion of the number of high-quality Higher Education Institutions.

This NCF is taking clear steps to address the curricular matters in schools that contribute to the current undesirable situation, including the significant matters pertaining to Board examinations addressed in this chapter.

Chapter 4

Time Allocation



Time is an invaluable resource in every school. Thus, the allocation of time to different activities and areas of learning (often referred to as the 'timetable') must be carried out very carefully. It must consider practical aspects, such as, time available, but also must enable the operationalisation of the curriculum including its priorities and balance.

This section describes the principles and approach to time allocation in a school that would bring this NCF to life. The specific time allocations described in this section must be seen as illustrative, and the actual time allocations must be conducted by schools, in accordance with their contexts, using these principles and approach.

Section 4.1
Considerations for Reduction of Content Load

As mentioned in NEP 2020 and discussed earlier in chapter 3, 3.2, care has been taken to ensure a reduction in the content load across Curricular Areas while designing the Learning Standards of this NCF. This reduction in the content load across the stages has been chalked out with the following considerations:

a. Adequate time and space must be created for the development of genuine conceptual understanding, and of the development of capacities, rather than mere procedural or rote learning which often occurs due to content overload.

b. Requisite space and time are needed for the Curricular Areas that have renewed focus and emphasis, like Art Education, Physical Education and Vocational Education. Often, these areas have earlier been considered 'co-curricular' or 'not important,' without (inadequate) specific Learning Standards and expectations. In this NCF, they need explicit and significant time allocation.

c. The teaching time available in a working day, over an academic year for various Curricular Areas, and their distribution in a week's timetable is limited and poses a challenge to the achievement of 'content knowledge' focused learning.

These three factors imply that the content load in some Curricular Areas need to be rationalised and reduced. This will ensure both that these Curricular Areas are learnt meaningfully and that space is created for other Curricular Areas.

a. The curriculum has been designed with an explicit focus on a range of essential competencies and not coverage of content knowledge. Hence the content load (in terms of the amount of content to be learnt in a particular school stage) has been reduced. This also means that the competencies must be viewed as the core essentials, and the overall time available must enable their achievement.

b. The illustrative timetable given later in this section might show an increased amount of time in the working day and week when compared to the existing school time. This increases in the number of daily hours at school does not directly indicate a heavier content load in individual Curricular Areas. The actual decision on the exact number of working hours would be taken by schools or school systems, and the proportion and rhythm of the illustrative timetable in the NCF could still be held.

c. In the illustrative timetable given here, Curricular Areas, such as, Languages, Mathematics, Science and Social Science may show a lower number of annual hours apportioned to them compared to the number of hours they may have received earlier in school. This has been made possible by focusing on the core essentials in terms of competencies (as in the Learning Standards) in these areas.

Some of the points relevant to specific Curricular Areas, for the design choices made to reduce content are as follows:

a. In Science, the focus on essential capacities of scientific inquiry allows for rationalisation of content. The concepts are therefore chosen based on the opportunities they provide for developing these capacities, thus reducing content load.

b. In Mathematics, whatever is specialised prerequisite knowledge for certain types of higher education needs has been moved out from the compulsory curricular content to the choice-based curriculum in the Secondary Stage, while retaining all concepts or areas that are foundational to the subject.

c. In Social Science, the approach based on themes and levels ensures the learning of essential competencies while reducing content load.

d. In language education, there are three languages to be learnt in school education through Grade 10. A range of literary Curricular Goals are transferable from a known language to the learning of unfamiliar languages, and those that are specialised liguistic and literary goals have been moved to the choice-based Curricular Areas of the Secondary Stage, keeping only the core essential competencies until Grade 10.

Section 4.2
Foundational Stage

Young children enjoy using their free time to explore their immediate environment. However, as they grow older, they also need organised, structured and guided activities that are play-based.

The day needs to be carefully organised so that all developmental domains receive adequate time and attention. While activities of each domain are connected with other domains (e.g., a good story will help language development as well as socio-emotional and ethical development), the routine must ensure that children get ample opportunity for a range of experiences in every domain.

4.2.1 Considerations for the Daily Routine

The organisation of the day is based on the institutional setting, the number of working days, and the number of daily working hours for each day.

Each activity may be planned keeping in mind the attention span of the child. There may be a balance between child-initiated and teacher-guided activities, group (whole group or small group) and individual or pair activities, and alternating activities (e.g., quieter activity after physical activity, group activity after individual activity, indoor activity after outdoor activity).

Art and Craft, Outdoor Play and Free Play must have adequate time and focus in the day.

4.2.1.1 Illustrative Daily Routine for Ages 3–6

There are multiple ways to organise the daily routine for children of ages 3–6. Two illustrations are given below:

The first illustration is more appropriate in contexts where experiences, such as, Circle Time, Story Time, and Concept or Pre-numeracy Time are Teacher-guided, Free Play and Corners Time are independent activities for the children.

Table 4.1i

From	To	Duration	Activity
Morning Routine/Free Play/Corners Time			
09:30	10:15	45 minutes	Circle time/Conversation
10:15	10:30	15 minutes	Snack Break
10:30	10:45	15 minutes	Rhyme/Song/Music/Movement
10:45	11:45	1 hour	Concept Time/Pre-numeracy

11:45	12:15	30 minutes	Art/Craft/Free Play
12:15	13:00	45 minutes	Corners Time
13:00	13:45	45 minutes	Lunch Break (ages 3–4 go home)
13:45	14:30	45 minutes	Emergent Literacy/Story Time
14:30	15:00	30 minutes	Outdoor Play and Wind Up

The second illustration is more appropriate in contexts with fewer children and where there is a range of appropriate material available for them to use. Emphasis is on self-learning and children learn to use materials independently and with care.

'Work Time' is allotted for children to independently choose the activity they would like to engage with. Children select activities of their choice and work with materials on those activities independently. Teachers observe children's activities and extend support whenever required. Teachers also decide and present the next activity to an individual child, based on their observations during Work Time. Activities and the corresponding materials are arranged according to the domains of development (e.g., Physical, Cognitive, Language, Art) and children are made familiar with this arrangement.

Table 4.1ii

From	To	Duration	Activity
Morning Routine + Silent Game			
09:30	10:15	45 minutes	Circle Time (Conversation, Songs, Poems)
10:15	10:30	15 minutes	Snack Break
10:30	12:15	1 hour, 45 minutes	Work Time
12:15	13:00	45 minutes	Art/Crafts/Sports/Free Play
13:00	13:45	45 minutes	Lunch Break (ages 3–4 go home)
13:45	15:00	1 hour, 15 minutes	Language and Emergent Literacy (ages 4–6)

Note: *Both the illustrations have a five-and-a-half-hour school day with about four-and-a-half hours of active instructional time for children of ages 4–6.*

4.2.1.2 Illustrative Daily or Weekly Routine for Ages 6–8

The daily routine for ages 6–8 would be slightly longer and a little more structured. While all language classes for children 3–6 years can be handled together, for this age group dedicated time for each language is necessary. Specific blocks of time for literacy, numeracy and art can be incorporated. R1 would need 90 minutes every day and R2 would need 60 minutes. Mathematics and numeracy would require 60 minutes a day. These periods of time can be organised into four blocks.

Table 4.1iii

From	To	Duration	Activity
09:00	09:30	30 minutes	Circle Time: Song/Movement
09:30	10:00	30 minutes	R1: Oral Language

10:00	10:30	30 minutes	R1: Word Recognition
10:20	10:35	15 minutes	Snack Time
10:35	11:35	1 hour	Mathematics
11:35	12:05	30 minutes	Art and Crafts
12:05	12:45	30 minutes	R1: Reading/Writing
12:45	13:30	45 minutes	Lunch Break
13:30	14:30	1 hour	R2: Oral Language, Word Recognition
14:30	15:00	30 minutes	Play

A longer day would allow more time for activities, such as, art, sports and gardening. The illustrative weekly timetable below allows for such possibilities. As mentioned earlier, Mathematics and R1 would include activities in blocks of time.

Table 4.1iv

From	To	Monday	Tuesday	Wednesday	Thursday	Friday
9:00	10:00	Maths	Maths	R2	Math	R2
10:00	10:45	R1	R1	R1	R1	R1
10:45	11:00	Snack Time				
11:00	12:00	R1	R1	R1	R1	R1
12:00	13:00	R2	R2	Maths	R2	Art
13:00	13:45	Lunch Break				
13:45	14:45	Art	Maths	Art	Art	Maths
14:45	15:30	Library	Gardening	Sports	Gardening	Sports

Section 4.3
Considerations for Time Allocation Across Preparatory, Middle and Secondary Stages

a. The annual working year, for schools, has 220 instruction or school-going days after taking into consideration national holidays, term breaks and vacations.

b. Of these 220 days, around 20 days may be considered for assessments and other assessment-related activities across stages.

c. Another 20 days may be set aside for school events and other similar activities (as a buffer for less foreseeable events) in schools. The ten bagless days mandated by NEP 2020 can come from these 20 days spread across the year for the Middle and Secondary Stage students.

d. Therefore, a safe estimate can be of 180 days of instruction time across these three stages at school.

e. Given the wide range of contexts in which schools operate across the country, a working school week has been taken as five and a half days (with Saturdays as half working days).

f. Since not all Saturdays are likely to be working for all students, the model here has considered five and a half days of school every alternate week only.

g. Given the range of subjects in the different stages and the reasonable number of hours students can spend in school, a working school year would have around 34 working weeks of around 29 hours of instruction hours every week.

h. The exact timings and order of subjects may be chosen to be the same each day (e.g., Language and Mathematics in the morning after a nutritious breakfast) in order to establish a daily rhythm for students; or they may be varied on a weekly basis to give different subjects different priorities each day within the time schedule. What works best for each school would depend on the local context, on whether breakfast or snacks can be offered to all students each morning, on the daylight hours in the local region, etc.

Section 4.4
Stage-specific Considerations

4.4.1 Time Allocation for the Preparatory Stage

a. Weekdays begin with an assembly for 25 minutes with 05 minutes to reach the classroom.

b. Class time for all subjects is 40 minutes. Some subjects will require a block period of 80 minutes (1 hour 20 minutes).

c. The transition time for students to prepare for the next class is 05 minutes.

d. The two working Saturdays a month have a slightly different schedule compared to other working weekdays. No assembly on Saturdays.

e. A snack break of 15 minutes and a lunch break of 45 minutes has been built in (see the illustrative timetable) on weekdays. Lunch time is of 30 minutes on Saturdays.

f. R1 Language has Curricular Goals for the Library built into it in the design of Learning Standards. Therefore, the time is shared between these two subjects on the timetable.

g. Languages (R1 and R2 together) have been given adequate time for students to become independent readers and writers in these, as the basis of learning other Curricular Areas.

h. R2 has been given more time than R1 as gaining proficiency in the language by the end of this stage will require additional time. Also all other Curricular Areas are taught in the language of R1 and so add to the learning of R1.

i. The World Around Us (TWAU) has also been given adequate time as the Preparatory Stage is a developmentally critical time to learn essential multidisciplinary skills of inquiring about and learning from the world around the students.

j. Art Education and Physical Education (PE) have been given a fair share of their time considering the Learning Standards built into this Curriculum Framework.

Table 4.2i

Preparatory	Annual Hours	Annual Periods
R1+Library	180	270
R2	190	285
Mathematics (Maths)	185	277.5
The World Around Us (TWAU)	200	300
Art Education (Art)	100	150
Physical Education (PE)	100	150

Number of classes in each subject on the illustrative timetable (Table 4.2ii) matches these numbers approximately.

4.4.2 Time Allocation for the Middle Stage

a. The weekday begins with an assembly for 25 minutes with 05 minutes to reach the classroom.

b. Class time for all subjects is 40 minutes. Some subjects will require a block period of 80 minutes (1 hour and 20 minutes) for activities, lab work and other such pedagogic requirements.

c. The transition time for students to prepare for the next class is 05 minutes.

d. The two working Saturdays a month have a slightly different schedule compared to other working weekdays. No assembly on Saturdays.

e. A snack break of 15 minutes and a lunch break of 45 minutes has been built in (see the illustrative timetable) on weekdays. Lunch is 30 minutes on Saturdays.

f. R1 Language has Curricular Goals for the library built into it in the design of Learning Standards. Therefore, the time is shared between these two subjects on the timetable.

g. A third Language (R3) gets introduced in the Middle Stage and requires an adequate amount of time to develop basic interpersonal communication skills. R3 has been given more time than R2 and R1 as the learning of a third unfamiliar language in the Middle Stage requires adequate time and practice.

h. Science, Social Science, and Vocational Education as new Curricular Areas have been given a fair share of their time considering the Learning Standards built into this Curriculum Framework.

Table 4.2ii

Illustrative timetable for the Preparatory Stage (Two Working Saturdays)							
Time (hrs)	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Time**	**Saturday**
08:30–08:55	*Assembly*	*Assembly*	*Assembly*	*Assembly*	*Assembly*	08:30–09:10	TWAU
09:00–09:40	R1	R1	R1	R1	R2	09:15–09:55	TWAU
09:45–10:25	R1	Library	R1	Library	R2	09:55–10:15	Snack time
10:30–10:45	Snack time	Snack time	Snack time	Snack time	Snack time	10:20–11:00	R2
10:50–11:30	Maths	Maths	R2	Maths	Maths	11:05–11:45	Art
11:35–12:05	Maths	Maths	R2	Maths	Maths	11:50–12:30	PE
12:05–12:50	Lunch break	Lunch break	Lunch break	Lunch break	Lunch break	12:30–13:00	Lunch break
12:50–13:30	TWAU	R2	TWAU	R2	TWAU		
13:35–14:15	TWAU	R2	TWAU	R2	TWAU		
14:20–15:00	PE	Art	Art	TWAU	PE		
15:05–15:45	PE	Art	Art	TWAU	PE		

Table 4.2iii

Illustrative timetable for the Middle Stage (Two Working Saturdays)							
Time	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Time**	**Saturday**
08:30–08:55	*Assembly*	*Assembly*	*Assembly*	*Assembly*	*Assembly*	08:30–09:10	Library
09:00–09:40	R1	Maths	Maths	Maths	Maths	09:15–09:55	Library
09:45–10:25	R2	R2	R1	Maths	R1	09:55–10:15	Snack time
10:30–10:45	Snack time	Snack time	Snack time	Snack time	Snack time	10:20–11:00	VE
10:50–11:30	SS	SS	SS	SS	SS	11;05–11:45	Art
11:35–12:05	SS	Science	SS	Science	Science	11:50–12:30	PE
12:05–12:50	Lunch break	Lunch break	Lunch break	Lunch break	Lunch break	12:30–13:00	Lunch break
12:50–13:30	Science	Art	Science	Art	R2		
13:35–14:15	Science	Art	Science	Art	R3		
14:20–15:00	PE	VE	R3	PE	VE		
15:05–15:45	PE	VE	R3	PE	VE		

Table 4.2iv

Middle	Annual Hours	Annual Periods
R1+Library	65	97.5
R2	70	105
R3	75	112.5
Mathematics (Maths)	115	172.5
Science	160	240
Social Science (SS)	160	240
Art Education (Art)	100	150
Physical Education (PE)	100	150
Vocational Education (VE)	110	165

Number of classes in each subject on the illustrative timetable (Table 4.2iii) matches these numbers approximately.

4.4.3 Time Allocation for the Secondary Stage

a. The weekday begins with an assembly for 25 minutes with 05 minutes to reach the classroom.

b. Class time for all subjects is 50 minutes. Some subjects will require a block period of 100 minutes (1 hour 40 minutes) for hands-on work, activities, lab work, and other such pedagogic requirements.

c. The transition time for students to prepare for the next class is 05 minutes.

d. The two working Saturdays a month have a slightly different schedule compared to other working weekdays.

e. A lunch break of 55 minutes has been built in (see the illustrative timetable) on weekdays and 30 minutes on Saturdays.

f. There is an optional 'Additional Enrichment Period' (AEP) every evening and on the two working Saturdays after class. This is for students to use as additional time for enrichment in any subject of the curriculum. In Curricular Areas, such as, Art Education, Physical Education and Well-being, and Vocational Education, extended time for group/team practice, interschool competitions, subject clubs, etc. can be facilitated by the school in AEP if students choose to participate.

g. There is no separate Library time built into the timetable, students may use time from the AEP for this purpose.

h. All three Languages (R1, R2 and R3) will continue in this stage. By the end of Grade 10, schools will ensure the development of the capacity for basic communication for social purposes in R1, R2 and R3, and linguistic proficiency for academic use in the classrooms in R1 and R2, and to the extent possible, in R3.

i. Interdisciplinary Areas (IDA) is a new Curricular Area and has been given a reasonable share of time on the timetable.

Table 4.2v

Illustrative timetable for the Secondary Stage (Grades 9 and 10)							
Time	**Monday**	**Tuesday**	**Wednesday**	**Thursday**	**Friday**	**Time**	**Saturday**
08:00–08:25	*Assembly*	*Assembly*	*Assembly*	*Assembly*	*Assembly*	08:00–08:50	SS
08:30–09:20	R1	R2	Maths	R2	R1	08:55–09:45	IDA
09:25–10:15	Maths	Maths	Maths	Maths	R3	09:50–10:40	R2
10:20–11:10	Art	Science	Science	Science	Art	10:45–11:35	R3
11:15–12:05	Art	PE	Science	Science	Art	11:40–12:30	R1
12:05–13:00	Lunch break	Lunch break	Lunch break	Lunch break	Lunch break	12:30–13:00	Lunch break
13:00–13:50	SS	SS	SS	SS	SS	13:05–13:55	AEP*
13:55–14:45	IDA	VE	PE	VE	IDA		
14:50–15:40	IDA	VE	PE	VE	IDA		
15:45–16:35	AEP*	AEP*	AEP*	AEP*	AEP*		
*AEP: Additional Enrichment Period							

Box 4.1

Ten Bagless Days

Every student will take a fun course, during Grades 6–8, that gives a survey and hands-on experience of a sampling of important vocational crafts, such as carpentry, electric work, metal work, gardening, pottery making, etc., as decided by states and local communities and as mapped by local skilling needs. A practice-based curriculum for Grades 6–8 will be appropriately designed by NCERT while framing the NCF-SE 2020–21. All students will participate in a 10 day bagless period sometime during Grades 6–8 where they intern with local vocational experts, such as, carpenters, gardeners, potters, artists, etc. Similar internship opportunities to learn vocational subjects may be made available to students throughout Grades 6–12, including holiday periods. Vocational courses through online mode will also be made available. Bagless days will be encouraged throughout the year for various types of enrichment activities involving the arts, quizzes, sports and vocational crafts. Children will be given periodic exposure to activities outside school through visits to places or monuments of historical, cultural, and tourist importance, meeting local artists and craftsmen and visits higher educational institutions in their village or Tehsil or district or state. [NEP 2020, 4.26]

Learning in school is not limited to the experiences in the classroom. Recognising and legitimising this possibility, NEP 2020 has stated that provisions be made in the annual calendar of schools for ten bagless days in the Middle and Secondary Stages. In this students do not have to carry their books to school and use that time valuably in learning from local professionals through various walks of life and engage with different educational activities, such as, vocational crafts and field trips.

The illustrative timetable given here in this NCF has accounted for these ten bagless days in the twenty days kept aside for school events.

Table 4.2v

Secondary	Annual Hours	Annual Periods
R1	70	84
R2	70	84
R3	70	84
Mathematics (Maths)	135	162
Science	135	162
Social Science (SS)	125	150
Interdisciplinary Area (IDA)	125	150
Art Education (Art)	115	138
Physical Education (PE)	90	108
Vocational Education (VE)	110	132

Note: *Number of classes in each subject on the illustrative timetable (Table 4.2v) matches these numbers approximately.*

Part B
Cross-Cutting Themes

This part deals with a selection of critical areas of high priority that cut across all aspects of this NCF. The themes discussed here must be seen as extremely vital and highly pervasive across school education. They are considered here and given a special focus because they do not fall into any one curricular or administrative area simply and neatly. There are six themes chosen for discussion. Each chapter is dedicated to one prominent theme, and it lays out an approach to understanding and principles for execution.

Chapter 1 *on* ***Rootedness in India and Indian Knowledge Systems*** *discusses how character building occurs through the development of values that can be learned from the rich heritage of knowledge that emerged and developed in the country and its relevance to current aims of education. India's ancient wisdom, its unique Guru-Shishya tradition, the schools and practices of thought in various fields, and its modern thinking find a place in this NCF.* ***Chapter 2*** *on* ***Values and Dispositions*** *foregrounds the importance and the challenge of teaching values and dispositions in schools and shows how it has been pragmatically and creatively approached in the curriculum.* ***Chapter 3*** *on* ***Learning about and Caring for the Environment*** *discusses environmental literacy for students, sustainable practices, positive regard and respect for the natural environment, and other such capacities that will be taught in multiple ways in multiple areas of the curriculum.* ***Chapter 4*** *on* ***Inclusion in Schools*** *lays out the innumerable ways in which this NCF urges the schooling system to encompass the learning needs of students of varied abilities and from varied walks of life ensuring no child gets left behind.* ***Chapter 5*** *on* ***Guidance and Counselling in Schools*** *lays the foundational ideas for setting up support systems within schools that will deal with offering curricular and psycho-social advice, enabling all students to flourish and achieve their fullest potential.* ***Chapter 6*** *on* ***Educational Technology in Schools*** *lays out ways in which Information and Communication Technology (ICT) can enhance educational processes and learning in schools through digital literacy and empowerment.*

Chapter 1

Rootedness in India and Indian Knowledge Systems

India has a rich cultural and ancient civilisational heritage with varied traditions within and across local communities. Contemporary India is equally vibrant, taking its place in the modern world. This vibrant national heritage, and the environment in which we live, influences the way we think, speak, work, eat, wear clothes, interact with nature and with each other, schedule our time, read, write, and learn. Our country is also home to deep knowledge and extensive practice in a variety of disciplines and fields, from language to Mathematics, Philosophy to Art, Grammar to Astronomy, Ecology to Medicine, Architecture to Agriculture, Ethics to Governance, Crafts to Technologies, Psychology to Politics, Literature to Music, and Economics to Education.

It is therefore important that all curriculum and pedagogy, from the Foundational Stage onwards, is designed to be strongly rooted in the Indian and local context and ethos in terms of culture, traditions, heritage, customs, language, philosophy, geography, ancient and contemporary knowledge, societal and scientific needs, indigenous and traditional ways of learning, etc. In order to ensure that education is maximally relatable, relevant, interesting, and effective for our students. Stories, art, games, sports, examples, problems, and more, hence, must be chosen as much as possible to be rooted in the

Indian and local geographic context. Ideas, abstractions, and creativity will indeed best flourish amongst our students and teachers when learning is thus rooted.

Hence, this NCF aims to be strongly rooted in India's context and in Indian thought. This is manifested in the NCF in the following ways:

a. A holistic vision of education and its aims, from our ancient heritage to our modern thinkers, informs the overall approach of the NCF.

b. The vibrant epistemic approach of Indian schools of thought to knowledge, and how we know.

c. The core of the *Guru-Shishya* tradition as a base for the centrality of the Teacher-student relationship for effective learning; correspondingly, the tradition of dialogue and debate as the best way to acquire knowledge and wisdom.

d. The use of local resources for learning, including language, practices, experts, histories, environment, and more, as rich sources of illustrations or case studies.

e. The importance of the involvement of parents and communities in education.

f. Educational content, such as, stories, art, games, sports, examples, and problems, chosen as much as possible to be rooted in the Indian and local geographic context, in order to maximise creativity, comprehension, relatability, relevance, and the flourishing of ideas in the classroom.

g. The rich history of Indian contributions to various fields (also referred as Indian Knowledge Systems) incorporated throughout the curriculum, as this not only develops pride, and self-confidence, but also enriches learning in those areas. For example, Mathematics Education is enriched when students understand the multidisciplinary story of creativity in India in the discovery of the concept of zero, involving philosophy, linguistics, astronomy, and algebra; the approach to Environmental Education is deeply enriched by the range of nature conservation traditions across India; and the approach to Values and Ethics is enhanced by its rootedness in Indian concepts and practices, such as, respect and compassion for fellow humans and all creatures, embracing of diversity, and the spirit of service or *Seva*, cleanliness or *Swacchata*.

Section 1.1
NCF Anchored in the Indian Vision of Education

The Indian vision of education has been both broad and deep, including the idea that education must foster both inner and external development. Learning is not merely gathering information, but is about self-discovery and self-development, our relationships with others, being able to discriminate between different forms of knowledge, and being able to fruitfully apply what is learnt for the benefit of the individual and the society.

The rich heritage of ancient and eternal Indian knowledge, and thought, serves as a guiding light for this NCF. The pursuit of knowledge *(Jnana)*, wisdom *(Prajna)*, and truth *(Satya)* were always considered in Indian thought, and philosophy as the highest human goal. The aim of education in ancient India was not just the acquisition of knowledge as preparation for life in this world or life beyond schooling, but for the complete realisation,

and liberation of the self. The Indian education system produced great scholars, such as Charaka, Susruta, Aryabhata, Varahamihira, Bhaskaracharya, Brahmagupta, Chanakya, Chakrapani Datta, Madhava, Panini, Patanjali, Nagarjuna, Gautama, Pingala, Sankardev, Maitreyi, Gargi and Thiruvalluvar among numerous others, who made seminal contributions to world knowledge in diverse fields, such as, mathematics, astronomy, metallurgy, medical science and surgery, civil engineering, architecture, shipbuilding and navigation, yoga, fine arts, chess, and more. Indian culture and philosophy have had a strong influence on the world.

These rich legacies to world heritage must not only be nurtured and preserved for posterity, but also researched, enhanced, and put to new uses through our education system. Instiling knowledge of India and its varied social, cultural, and technological needs, its inimitable artistic, language, and knowledge traditions, and its strong ethics in India's young people is considered critical for purposes of national pride, self-confidence, self-knowledge, cooperation, and integration.

The traditional Indian system of education, one of the oldest in the world, founded on the teacher-student interrelationship, fostered holistic development, and transmission of knowledge. Debates and discussions were the primary modes of learning and assessment. Teachers were often assisted by their senior students. Older students, more advanced in their learning, often taught younger, newer students. Collaborative and peer learning was encouraged.

Education focussed on the moral, physical, spiritual, and intellectual aspects of life emphasising values, such as, humility, truthfulness, discipline (and self-discipline, in particular), self-reliance, and respect for all. There was a strong emphasis on appreciating the balance between human beings and nature; it was understood that the individual's well-being is dependent on the well-being of the world around them. Sources of learning were drawn from various disciplines, language and grammar, philosophy, logic, history, architecture, commerce, governance, agriculture, trade, archery. Creative arts developed a sense of aesthetics and sensitiveness to beauty in all aspects of life. Physical Education and Well-being was an important Curricular Area with learning of games, martial skills, and yoga, so as to include the body in a complete education.

Thus, education was seen as the integral growth of *Panchakosha* (the five levels or parts of our being), an ancient Indian concept which explains the body-mind complex in human experience and understanding. *(Part A, Chapter 2 for details)*. This is also an eminently pragmatic perspective, achievable and complementary to life, developing good physical health and socio-emotional skills along with developing the ability to think and make ethical and rational choices and decisions in life, must occur in a holistic manner.

During the 19th and 20th centuries, many great modern Indian thinkers and personalities, such as, Savitribai and Jyotiba Phule, Rabindranath Tagore, Swami Vivekananda, Mahatma Gandhi, Sri Aurobindo, and Jiddu Krishnamurti, emphasised the need for India to develop its own 'national system of education', with its roots in India's intellectual and artistic heritage, but also integrating the important aspects of contemporary developments, in science and technology in particular (see NCF-FS for more details). Their philosophy of education also underpins this NCF.

Box 1.1

Importance of Yoga

Yoga today is too often understood as a set of practices centred on Asanas (postures) and Pranayama (discipline or expansion of the breath). But in the ancient Indian conception, Yoga (literally, 'union') is vastly more: it refers to any of a number of systems of self-exploration, self-mastery, self-discovery, or indeed discovery of the Self (Atman), which is how 'Yoga' first appears in the Upanishads.

To reach its ultimate objective, Yoga (as in the celebrated Patanjali's Yoga-sutras, a few centuries BCE) first insists on the stilling and detachment of the mind, with Asanas and Pranayama merely as aids to this discipline. Soon, other major forms of Yoga are discussed (as in the Bhagavad-Gita), including Jnana Yoga or the Yoga of self-knowledge, in which meditation usually plays an important part; bhakti yoga or the Yoga of devotion and surrender to any form of the Divine; and Karma Yoga, where action and works are offered as a sacrifice, with no expectation of any fruit (Niskama Karma or desireless action). Many more paths of Yoga have flourished, all of them sharing the same goal. On the way, some of their by-products, as it were, include peace of mind, unshakable calmness, control of emotions and desires, and a sense of focus and fulfilment. Yoga in its many forms has thus transformed the lives of millions, in India and across the world; its profound influence is perceptible in literature, art, and social life. This knowledge system may be said to be one of India's most precious gifts to the world, and this informs the Indian approach to education and learning in very significant ways.

Section 1.2
Approach to Rootedness in India in the NCF

This NCF is anchored in our country's understanding and experience of education and research across disciplines over thousands of years. This includes the full gamut of the country's journey, from the knowledge, wisdom, and traditions of ancient India to the energy, vibrancy, and aspirations of contemporary India. This understanding and experience also includes local knowledge from all parts of the country, including local traditions and understandings from diverse and multiple communities.

The approach to rootedness in India in this NCF involves: (a) the Indian vision of the aims of education; (b) a vibrant epistemic approach; (c) a positive and nurturing Teacher-student relationship; (d) deep engagement of families and communities; (e) judicious use of local resources; (f) curriculum content carefully chosen according to the Indian and local context of the students; and (g) the incorporation of knowledge of India, including Indian Knowledge Systems in the curriculum wherever it is relevant, interesting, and beneficial.

1.2.1 Aims of Education

a. The NCF is rooted in the Indian vision of education, which emphasises the holistic development of every child. This includes physical development, socio-emotional development, intellectual development, spiritual growth, and development of values and dispositions.

i. All domains of development are seen as critical and equally important for human development, and flourishing.

ii. The design of this NCF reflects the above principle with a range of Curricular Areas being part of school education: mathematics, languages, science, social science, art education, vocational education, physical education and Well-being and Interdisciplinary Areas, such as, Environmental Education and Value Education.

iii. All Curricular Areas are seen as equally important for a child's learning and development, there is no hierarchy across Curricular Areas.

iv. This equal importance is demonstrated by a common rigour in expected learning outcomes across Curricular Areas, the choice of content, the pedagogical approaches, the assessment strategies, perhaps, and most importantly the time allocated to each of these areas in the school day.

b. One of the central aims of the Indian vision of education is character building. The NCF emphasises this through the development of values throughout the school years from early childhood onwards. Values and dispositions are developed through school and classroom culture and practices and through the learning of different subjects in the curriculum.

i. These include values that are an integral part of our tradition (e.g., *Seva, Ahimsa, Nishkam Karma*) and values that are part of our modern Constitution (e.g., commitment to equality, to justice, to the protection of the environment).

ii. Along with values, the NCF emphasises developing particular dispositions including a positive work ethic (e.g., being responsible, exerting oneself, pursuing quality, and honesty in one's work, having respect towards all manners of work).

This is further discussed in Part B, Chapter 2 on Values and Dispositions.

1.2.2 Vibrant Epistemic Approach

The theory of knowledge, or *Pramana-Sastra,* is one of the richest areas of classical Indian philosophy, spanning several centuries, and rife with the liveliest debates. Indeed, claims about how we come to know is often the principal criterion that separates different schools or *Darsanas* of Indian philosophy. Furthermore, questions about knowledge are almost inextricable from other fundamental questions about the nature of reality (metaphysics) and language.

These debates and approaches express themselves in the current scientific methods and the methods of the various disciplines; their nuances enrich our current thinking on 'how we know,' 'what is it we know,' 'what is true,' 'what is adequate knowledge', and more. Much of this nuance informs the Nature of Knowledge section of Curricular Areas (Part C, Chapters 2–9).

It is important to note that the above methods of India's intellectual tradition involved rigour and logic. To do justice to this tradition of questioning and debate, the NCF insists on the absolute authenticity of all educational material used in imparting rootedness in India,

steering clear of the exaggerations, and flights of imagination that have plagued numerous popular writings or websites, such as, those insisting that ancient Indian savants were masters of aeronautics and nuclear weapons or knew the laws of quantum physics or string theory. Such claims are not only untenable but also end up discrediting, and doing a disservice to the glorious and genuine intellectual heritage that Indian students are inheritors of.

1.2.3 Teacher-Student Relationship: Effective Learning

One of the most significant principles of the Indian vision of education is the importance given to the relationship between teacher and student. Based on this principle, this NCF emphasises a positive and nurturing relationship between teacher and student that is enriching both for cognitive and socio-emotional-ethical development.

a. This positive relationship is developed mainly through teachers getting to know each student individually, observing and listening to them carefully, encouraging their questions and responses, and recognising and responding to their thoughts and emotions.

b. Pedagogical approaches and classroom practices may alter as students grow and their ways of learning change, but irrespective of that, they are always based on this bedrock of a positive and nurturing relationship between teacher and student.

c. In particular, this relationship will be anchored in the value system which the teacher is expected to embody (Part B, Chapter 2); this system rests on empathy and patience and promotes self-discipline in the student, a self-discipline of which the teacher is expected to be an exemplar.

1.2.4 Engagement of Families and Communities

Another important aspect in the NCF is the role of families and communities in a student's overall development and learning. The NCF is clear that teachers and families should work together to understand each child better, and together create a more positive experience for students. When families ask questions of teachers and clarify doubts in their minds, they learn more about school processes. When teachers understand a child's home environment, they are able to plan better learning experiences for the student. By sharing and working together, teachers and families support the child's development across all domains. This kind of involvement helps families support the learning experiences that happen in school through good practices at home as well. Families could also contribute to assessing the child's progress and areas of need. They would also gain further confidence in their own parenting abilities through this process. These measures would help make the time at home and the time at school more synergetic, positive, and productive for the student.

1.2.5 Local Learning Resources

The use of locally rooted resources for learning is not only more cost effective, more eco-friendly, and more supportive of local communities, but it is also more pedagogically effective. It results in curricular Content and Pedagogy that is more relatable and interesting to the student, which in turn leads to better learning.

Teaching-Learning Materials (TLMs) are thus most effective when they are locally sourced. This includes both physical items, such as, toys, books, games, sports equipment, vocational education equipment, art, and craft materials, materials for science experiments, and local plants and flowers, as well as non-physical items, such as, stories, poems, songs and festivals. Trips to places such as local parks, monuments, shops, businesses, and education institutions also are considered effective local learning resources at appropriate junctures in the curriculum.

1.2.6 Content Selected from the Indian Context

Learning happens best when it is situated and rooted in the student's context. While contemporary ideas of Teaching and Learning are an important part of the Curriculum Framework, it is also extremely important that diverse experiences of children, their families, and their communities find a crucial place in the classroom. Ideas, abstractions, and creativity best flourish when learning is thus rooted.

a. The NCF foregrounds the child's context as critical to learning all through the school years, with particular emphasis in the early years of a child's life in school.

b. Local stories, songs, food, clothes, art, and music are an integral part of the learning experiences of students in school in order to ensure that education is maximally relatable, relevant, interesting, and effective for children.

c. Thus, educational content, such as, stories, art, games, sports, examples, and problems, will be chosen to the extent possible to be rooted in the Indian and local geographic context to ensure maximal creativity, comprehension, relatability, relevance, and flourishing of ideas in the classroom.

1.2.7 Integration of Knowledge of India

Building both pride and rootedness in India is a fundamental disposition that is to be developed throughout school education. This happens primarily through building deep familiarity with India's rich heritage, which includes India's contributions to knowledge across all disciplines and fields of study from time immemorial, include some of the significant contemporary achievements. Building pride and rootedness in India is a focus across all Curricular Areas but should be achieved as a natural by-product of exposing the child to this heritage and 'Knowledge of India.'

Knowledge of India will include knowledge, from ancient India and its contributions to modern India and its successes and challenges, and a clear sense of India's future aspirations with regard to education, health, environment, etc. These elements will be incorporated in an accurate and scientific manner throughout the school curriculum wherever relevant.

In particular, Indian Knowledge Systems, including tribal knowledge and indigenous and traditional ways of learning will be covered and included in mathematics, astronomy, philosophy, Yoga, architecture, medicine, agriculture, engineering, linguistics, literature, sports, games, as well as in governance, polity, and conservation, where it is relevant and enriches learning. Tribal ethno-medicinal practices, forest management, traditional (organic) crop cultivation, natural farming, etc. will also be incorporated wherever

possible and relevant. Thus, Indian Knowledge Systems here refer to all the systematised disciplines of knowledge that were developed to a high degree of sophistication in India, and also all of the traditions and practices, which various communities of India, including tribal communities have evolved, refined, and preserved over generations. An engaging course on Indian Knowledge Systems will also be available to students in secondary school as an elective.

School culture and processes also help to strengthen knowledge and connection to country, such as, through everyday practices and activities like the School Assembly and through special events and festivals like Independence Day and Republic Day that reinforce pride in the country and its art and heritage, understanding of our struggle for independence, and the importance of preserving and protecting our independence.

Section 1.3
Some Illustrations Across School Stages and Curricular Areas

Learning about India, and thereby developing a pride and rootedness in India, is an integral aspect of this NCF. This is reflected throughout this document, as part of Aims of Education, Knowledge, Capacities, Values, and Dispositions to be developed, Learning Standards at every stage (in Curricular Goals and Competencies across curricular areas), as part of pedagogical processes across stages, and as a fundamental principle of content selection through the stages and across Curricular Areas.

Some illustrations are described below:

a. For Children at the Foundational Stage

i. One of the Curricular Goals at this Stage is learning the importance of *seva*. This is where children are first introduced to one of the most important Indian values, and learn to help those in need, a value that will stay with them for life.

ii. Stories, music, art, games from the Indian and local context and from their families and communities are part of content used for teaching at this Stage. Children also have the opportunity to read and learn appropriate selections from India's great repositories of stories, including fun fables, folk stories, and inspiring tales from the Indian tradition. Stories from the lives of Indian heroes and heroines of history are also seen as an excellent way to inspire and introduce core values in children.

b. At the Preparatory, Middle, and Secondary Stages, each Curricular Area takes a specific approach to embed rootedness in India based on the nature of the subject:

i. Art Education draws from ancient Indian texts, such as, the *Natyashastra, Abhinaya Darpanam, Shilpashastra, Vastushastra, Chitrasutra,* and *Sangita-Ratnakara*, which have codified and structured the elements, methods, and aesthetic principles of the arts.

Through different stages, students will develop knowledge of these elements and principles and a vocabulary of the arts used to describe and discuss artwork and their processes, e.g., *Sruti, Naada, Raaga, Taala, Laya,*

Bhaava, Alankaar, Nritta, Natya, Pramaana, Saahitya, Gamak, Meend, Rasa. These concepts are to be introduced in such a manner that the student can experience them and experiment with them.

This will help students understand the unparalleled diversity and multicultural ethos of Indian artistic traditions through a consistent and meaningful engagement with local art, crafts, music, dance, theatre, puppetry, textile art, and so on. It also ensures that students are exposed to different genres of classical, folk, tribal, and contemporary artistic styles by providing adequate opportunities to view, and be inspired by various aesthetic sensibilities and apply their imagination and expression while making their own artwork.

The artistic processes of thinking, making, and appreciating will extend itself beyond the classroom to include the local community of artists, art administrators, and craftspeople, as well as a larger repository of art and culture through monuments, museums, archives, heritage sites, and other relevant cultural institutions and organisations.

At the Preparatory Stage, students are expected to observe their local art and culture, and practise basic art forms, such as, *rangoli*, and basic crafts, such as, clay work, pottery (without the wheel), puppetry, folk songs, folk dances, and so on. At the Middle Stage, students are expected to learn simple artistic processes that are associated with different art traditions and expand their knowledge of artists and art forms across their state and neighbouring states. They are also expected to draw comparisons regarding the stylistic features and social contexts of various art practices, and architectural features of the region.

At the Secondary Stage, students are expected to broaden their art exposure to art traditions from different parts of India and analyse the similarities and differences, and the possible causes due to geographical or social contexts. They will also help them to apply this knowledge into their own art practice as they refine their crafting techniques and ideation skills. Class discussions, projects, and activities could include comparisons between different regional styles of music or dance or temple construction, so as to bring out not only their common, pan Indian features rooted in the classical texts, but also their substantial regional variations. Such exercises will provide opportunities to introduce students to two fundamental principles of India's art traditions, which are (1) faithfulness to classical concepts of aesthetics together with freedom to innovate; (2) free borrowings from folk to classical and vice-versa, resulting in mutual enrichment, and endless diversity with an underlying unity.

ii. **Technologies:** As every other major ancient civilisation, India saw great advances in technologies, with some unique developments. Technology, however, cannot be defined here as the 'application of scientific knowledge,' since, more often than not, it precedes science; rather it should be understood as the ways in which the living environment is altered by human activities, and innovations. To drive this point home, it would be useful to first sensitise younger students (ideally through educational videos) to animal technologies,

e.g., nest-construction by birds, dam construction by beavers, use of stones or sticks by apes, etc., as an illustration of the richness and complexity of the natural world.

Some of the early technologies in India, roughly in chronological order of appearance, include stone-tool making, hunting-tool making, agriculture (including animal husbandry), pottery, gemmology and bead-making, metallurgy, textile manufacture (including spinning, weaving, and dyeing) and various other crafts, transport technology (from the bullock-cart to transport of heavy loads, sailing, and shipbuilding), water management, construction, town-planning, faience and glass technologies, warfare (including weapon making), writing, cosmetics and perfumes, and more.

Clearly it will not be possible or desirable to impart a detailed knowledge of these technologies to students. An overview with a few selected case studies will suffice. At the Preparatory and Middle Stages, a purely experiential approach to familiarise the child with a few technologies will work best. Examples could include playing with clay, replicating a water-management system on a small scale (perhaps in a part of the school campus), growing a few small patches of grains or pulses, extracting dye from some flowers and dyeing a white cloth, constructing a corbelled arch and comparing it with a true arch, playing with bricks of different proportions to show the efficacy of the modern (but also Harappan) proportions, constructing a miniature but fully functional bullock-cart, understanding the difference between a riverboat, and a sea-faring ship taking as starting points depictions of ships in Indian art, e.g., a painting in the Ajanta caves or a panel at the Sri Alakiyanampirayar temple at Tirukkurungudi, and so on.

At the Secondary Stage, more advanced technologies will be brought in, such as, metallurgy, with stress on unique achievements, such as, wootz steel and rust-resistant iron. Their study will be multidisciplinary, since the former will highlight the popularity of this steel all the way to the Mediterranean world, while the latter will lead to a study of the tribal communities that perfected iron-extracting techniques, and their importance in Indian society. Excerpts from relevant texts will be used, again with care to point to their often cross disciplinary nature; for instance, a chapter on preparation of perfumes in Vaharamihira's *Brihat Samhita*, mixing sets of basic ingredients in different proportions, provides a good example of combinatorics. Similarly, texts on shipbuilding connect with overseas trade and India's considerable exports to many regions of the world until the colonial period; a manuscript on the construction of the gigantic Konark temple describes stone-lifting mechanisms which not only can be interesting objects of study, but it also records minute details of the work force engaged in the construction.

In summary, the study of a few early Indian technologies will not be so much about accumulating facts and figures as about understanding Indian society better.

iii. **Science:** The Science Curriculum will include references to both the everyday use of science in our lives as well as Indian contributions to scientific knowledge, such as, those of astronomy mentioned below. While students

will learn about the contributions of ancient Indian scientists, they will also engage with the contribution of modern Indian scientists to contemporary scientific knowledge as well as to nation building. This can include inspiring biographical sketches and pioneering discoveries of scientists, such as, J.C. Bose, P.C. Ray, Ramanujan, S.N. Bose, Meghnad Saha, C.V. Raman, A.K. Raychaudhuri, Harish-Chandra, Obaid Siddiqi, Bibha Chowdhuri, G.N. Ramachandran, Asima Chatterjee, Salim Ali, and many more.

In the Middle Stage, students will be introduced to Indian scientific ideas which can be explored through observation in the local community, e.g., students will explore local tools for measuring physical properties of matter, traditional Indian dietary and culinary practices, and diversity of food in India. They will connect concepts, such as, nutrition, sources of food, and impact of climatic conditions related to diversity of diets in the country. Activities could include cultivating a small plot of medicinal plants, documenting them, and their medicinal properties.

At the Secondary Stage, students will be introduced to contributions made by ancient as well as contemporary India to scientific knowledge. They will examine the contributions of ancient India to science, indigenous practices related to health and medicinal systems, the basic principles and practices of a system, such as, *Ayurveda*, and contemporary Indian contributions to science and technology.

The case of astronomy requires a separate treatment:

iv. **Astronomy:** Although we often hear of developments in 'Mathematics and Astronomy,' Astronomy preceded Mathematics in most early civilisations, India's included. A few thousand years ago, Vedic texts knew about lunar and solar years, equinoxes and solstices, solar eclipses, divided the year into six *Ritus* or seasons of two months each, and gave the first list of 27 *Nakshatras* or lunar mansions. Because of the need to keep time for agriculture (the proper time to sow crops and harvest them), for festivals, and for the proper conduct of rituals, calendrical astronomy became very precise in India, with several systems of intercalary months (*Adhikamasa*) to compensate for the difference between the lunar and the solar years. Later, huge scales of time were conceived by Jain, and other scholars to account for the cycles and duration of the universe. The solar zodiac with its 12 *Rashis* was introduced, as well as the seven-day week, among other concepts. During the classical period, sophisticated techniques evolved to calculate the positions at any given time of the sun, the moon, or the five planets visible to the naked eye, and also the occurrences and parameters of solar and lunar eclipses.

Aryabhata gave a good approximation for the earth's circumference, gave the correct explanations for eclipses, and proposed, among other theories to explain the sun's apparent daily motion, that the earth was a sphere hanging in space, rotating upon itself. Later astronomers refined calculation methods, created highly accurate sine tables, and (as part of the Kerala School of Mathematics and Astronomy) had the planets revolve around the sun rather than around the earth.

The emphasis here will not be on the technicalities of such concepts, much less the calculations involved (except for a few simple ones), but on the ways in which ancient Indians viewed the cosmos and tried to make sense of it. The insistence on accurate and fast calculations rather than on theoretical models will also be shown to be a distinctly Indian approach to astronomy. A comparison of different regional calendrical systems can also be used to illustrate diversity with an underlying unity.

A more complete treatment of astronomy is found in Part C, Chapter 4 on science education.

v. **Mathematics:** India has a long history of contribution to Mathematics in various domains of the discipline, beginning with geometry (for intricate constructions of fire altars, which led to the first general statement, around 800 BCE, of the Baudhayana-Pythagoras theorem) and arithmetic (the basic operations and some early important equations and formulae). In their search for an efficient number system, Indian mathematicians used the zero not just as a placeholder (as the Mesopotamians also did), but eventually as a full-fledged number, which led to the development of the Indian numeral system, the most powerful numeration system in the world which is now used around the globe today, and forms the basis for all modern science and technology. Other major contributions included the discovery of the sine function by Aryabhata (of great application in astronomy, and now throughout science), discovery of the negative numbers by Brahmagupta (with the rules for their basic operations), increasingly precise calculations of the decimals of π, with the first exact formula for π given by Madhava as an infinite series, foundational formulae in combinatorics and their interactions with linguistics and poetry, solutions to equations of several types, such as, single-variable quadratic equations and the Brahmagupta-Pell equation, and (again by Madhava's school), the first expansions of trigonometric functions as infinite series, notions of their differentials, and other foundational elements of calculus.

Mathematics in this NCF makes a deliberate effort to introduce students to some of these major contributions by Indian mathematicians. At the Preparatory Stage, students will be introduced to the Indian origin of the Indian numerals and the decimal numeral system in use the world over. Students at the Middle Stage, and more so at the Secondary Stage, will be able to understand the development of important mathematical ideas over a period and locate the contributions of Indian mathematicians, such as, Baudhayana, Panini, Pingala, Aryabhata, Bhaskara I, Brahmagupta, Virahanka, Sridhara, Bhaskara II, Madhava, Narayana Pandita, and Ramanujan. At the Secondary Stage, students will learn about contributions of Indian mathematicians to advanced mathematical ideas including those in algebra, coordinate geometry, combinatorics, and calculus.

A more complete treatment of Mathematics is found in Part B, Chapter 3 on Mathematics Education.

vi. **Social Science:** One of the key Curricular Goals is for students to appreciate the importance of being an Indian *(Bharatiya)* by understanding India's past

and its rich geographical and cultural diversity. Indian contributions to democratic ideas which flourished in ancient, medieval, and the modern periods are also an important part of student learning.

At the Middle Stage, students will learn of the historical underpinnings which led to the formation of the modern Indian state and how ideas of peace, ahimsa, and coexistence have been part of Indian culture since ancient times; they will learn about codes of ethics set before rulers and elaborate democratic structures (e.g., assemblies, guilds, *panchayats,* and *sabhas*, such as, that described in the Uthiramerur inscription) giving the society some freedom to self-organise; they will develop a perception of India as a civilisation rather than as a nation in the current limited sense. At the Secondary Stage, students will go into details to understand India's past and appreciate its complexity, diversity, and unity brought about by cultural integration and the sharing of knowledge traditions across geographical and linguistic boundaries.

This is further developed in Part C, Chapter 5 on Social Science Education.

vii. **Languages:** Language education plays a crucial role in keeping students rooted to their country, as it allows individuals to connect with their culture, heritage, and society. Indeed, culture is largely embedded within languages. India is a country with a rich linguistic heritage, comprising scores of languages with a great literary heritage. Learning in the mother tongue or a familiar language at the Foundational Stage will keep students connected to their home and cultural heritage. R1, which is most often the regional language, will help students form a deeper understanding and connect. Exposure to two other languages (R2 and R3) will help students to become multilingual, appreciate unity in diversity, and thereby help form a national identity.

This language curriculum framework will help individual students connect with their cultural roots and heritage by providing them with a deeper understanding of the language, literature, and cultural practices of their locality and their country. It will help students appreciate the unity underlying diversity through observing shared concepts, motifs, perspectives, vocabularies, linguistic constructions, and cultural heritage in the country's languages and literatures.

See Part C, Chapter 2 for further elaborations.

viii. **Physical Education and Well-being:** Sports and physical activities are an inseparable part of our culture, they unite us emotionally. India has very rich heritage of games and physical activity that developed across centuries e.g., yoga, wrestling (*Mallayuddha, Kusti*), malkhamb, handling of weapons, such as, bows (archery), maces, swords, and sticks, water sports, chariot racing, polo, different forms of martial arts (e.g., *Kalarippayattu*), dance forms, hide and seek, and countless other games/physical activities.

Yoga has a special place in our knowledge systems and culture, and its benefits for all-round development are well established. Yoga leads to peace and tranquillity, harmony and health, love and happiness, precision, and efficiency; although its physical aspect *(Asanas, Pranayama)* is the one most-often taught,

its philosophical background, as a tool for self-realisation and self-fulfilment, should not be lost sight of.

The approach in Physical Education and Well-being is to make these Indian games, and physical/wellness activities an integral part of the curriculum across Stages.

ix. **Interdisciplinary Areas:** The Interdisciplinary Areas, by their nature, enable an understanding of the social and natural world. This understanding develops the capacity to identify core issues facing our society, and to act towards mitigating them to the extent possible.

An integral part of the Interdisciplinary Areas is Environmental Education. The focus of Environmental Education through school Stages is to develop capacities for understanding the need for and acting to maintain balance and harmony between human society *(Samaj)* and nature *(Prakriti)*. This harmony is rooted in the Indian tradition of viewing human beings and nature as unconditionally interconnected. This tradition also makes no distinction between 'animate' and 'inanimate,' as it sees all elements of nature and the universe as imbued with consciousness. The constant efforts of human beings to preserve the environment, and therefore be preserved by it, are seen as a direct consequence of this worldview. This connect is emphasised not only in historical inscriptions and numerous texts, but also in the Constitution of India, which includes protection and improvement of the natural environment including forests, lakes, rivers, and wildlife, and having compassion for living creatures among the Fundamental Duties.

In the Foundational and Preparatory Stages, students engage with their immediate social and natural environments and move towards the state, region, and country. Students are exposed to local stories, poems, narratives, folklore, histories, and games. They explore diverse socio-cultural practices, traditions, and festivals within their community, and connect these to the influence of the natural environment. Activities around plants, observing seasons or the weather can be supplemented by selecting videos of natural phenomena, wildlife, and more.

In the Middle and Secondary Stages, through an integrated approach with other disciplines as well as in the form of an essential area of study in Grade 10, students deepen their conceptual knowledge, and are able to use this to acquire an understanding of how Indian cultures and traditions evolved across the country. They also examine the relevance of traditional sustainable practices related to the conservation of resources and agriculture and engage with current efforts in the country towards mitigation of the effects of the triple planetary crisis of climate change, biodiversity loss, and pollution.

Along with Environmental Education (Part B, Chapter 3), Interdisciplinary Areas include a course of study on Individuals in Society in Grade 9, which aims to develop the capacity for ethical and moral reasoning among students. This capacity is enabled by the acquisition of traditional Indian, as well as, Constitutional values through the Foundational, Preparatory, and Middle Stages. Students engage with issues or events that are significant for the

country, and also with current affairs that have far-reaching impact within their community and the world. These issues or events cover the socio-cultural, political, economic, and environmental domains, and reflect both larger concerns that have persisted over a long period of time (e.g., equitable access to resources, preservation of local art and craft traditions), as well as, current concerns (e.g., local elections, schemes for employment generation, ongoing efforts towards mitigation of impact of climate change, encouraging growth of tradition crops such as millets).

This NCF, therefore, aims to be rooted in the immense knowledge, rich culture, and traditions of India. It also ensures that our students build equal familiarity with contemporary India, our immense strengths, our rich diversity and learn to respond sensitively and effectively to the challenges that we face as our country plays a greater role in the world.

Section 1.4
Course on Indian Knowledge Systems

While the contributions to knowledge are best integrated in the whole schooling as described above, a special, engaging elective on Indian Knowledge Systems should be offered spread across Grades 11 and 12. Creative treatment and coverage of the matter would spark student interest. It could draw from current such courses, for example, a course entitled *Knowledge Traditions and Practices of India* (KTPI), which has been running for over a decade, with the following scheme:

Table 1.4

Grade 11	Grade 12
Philosophical Systems	Agriculture
Literatures (2 parts)	Architecture (2 parts)
Mathematics	Dance (2 parts)
Astronomy	Education
Chemistry	Ethics
Metallurgy	Martial Arts
Ayurveda (3 parts)	Language
Environmental Conservation	Other Technologies
Music	Painting
Theatre and Drama	Society State and Polity
	Trade

Each module includes a survey of the field, proposed activities and further readings, and a choice of selections from primary texts.

However, for this to happen, some of the modules would now be revised to a slightly more advanced level, since their basics will already have been integrated in earlier classes. This is the case especially of mathematics, astronomy, chemistry, and possibly also *Ayurveda*, Environmental Conservation and Ethics, among others. The revision of the KTPI modules will be done taking careful note of the levels reached in those fields through the material integrated in the regular subjects, and will ensure that students adopting these modules will be taken to a suitably higher level in both concepts and practices, including acquaintance with some primary texts, and will be exposed to a slightly wider range of material in those fields.

It should be emphasised that this elective course would be offered only as a means to deepen the student's knowledge of the above disciplines. With this NCF, by the time students reach Grade 11, the regular curriculum will have ensured that they get exposed to some basic concepts and important practices; from Grade 11 onward, students not adopting this KTPI elective will get more such exposure through the regular curriculum, while those adopting this elective will have an opportunity to pursue those topics further.

Chapter 2

Values and Dispositions

Developing Values and Dispositions is integral to the Aims of Education of this NCF. This is directly informed by the explicit commitment of NEP-2020:

> *The purpose of the education system is to develop good human beings capable of rational thought and action, possessing compassion and empathy, courage and resilience, scientific temper and creative imagination, with sound ethical moorings and values. It aims at producing engaged, productive, and contributing citizens for building an equitable, inclusive, and plural society as envisaged by our Constitution.*
>
> *[NEP-2020, Principles of this Policy]*

> *Education must build character, enable learners to be ethical, rational, compassionate, and caring, while at the same time prepare them for gainful, fulfilling employment.*
>
> *[NEP-2020, Introduction, p. 4]*

The education system and its individual institutions must also develop in students ethics and human and Constitutional values like empathy, respect for others, cleanliness, courtesy, democratic spirit, spirit of service, respect for public property, scientific temper, liberty, responsibility, pluralism, equality, and justice

[NEP-2020, Principles of this Policy, p.5]

Students will be taught at a young age the importance of 'doing what's right' and will be given a logical framework for making ethical decisions. In later years, this would then be expanded along themes of cheating, violence, plagiarism, littering, tolerance, equality, empathy, etc., with a view to enabling children to embrace moral or ethical values in conducting one's life, formulate a position or argument about an ethical issue from multiple perspectives, and use ethical practices in all work. As consequences of such basic ethical reasoning, traditional Indian values and all basic human and Constitutional values (such as, seva, ahimsa, swachchhata, satya, nishkama karma, shanti, sacrifice, tolerance, diversity, pluralism, righteous conduct, gender sensitivity, respect for elders, respect for all people and their inherent capabilities regardless of background, respect for environment, helpfulness, courtesy, patience, forgiveness, empathy, compassion, patriotism, democratic outlook, integrity, responsibility, justice, liberty, equality, and fraternity) will be developed in all students.

[NEP-2020, 4.28]

Section 2.1
NCF Commitment to Values and Dispositions Aligned to NEP-2020

As stated in Part A, Chapter 1 on Aims and Curricular Areas of School Education of this NCF, developing Values and Dispositions is critical to attaining the Aims of Education.

The coherent set of Values and Dispositions to be developed through this NCF are derived from NEP-2020, which in turn are informed by India's Constitutional values and broader human values, including those that arise from India's deep cultural heritage, worldview, and elaborate ethical systems.

The process and the content of education across Stages will aim to develop in all students these Values and Dispositions, and the capacities for their practice.

This goal will inform the curriculum, school cultures and practices, as well as the overall culture of the school education system. Some of these values are democratic outlook and commitment to liberty and freedom; striving for equality, justice, and fairness; embracing diversity, plurality, and inclusion while remaining conscious of our underlying unity; humaneness, compassion, empathy, and fraternal spirit; responsibilities that come from freedom and rights; social responsibility and the spirit of *Seva* (service); ethics of integrity and honesty; self-discipline; equanimity in the face of success or failure *(Nishkama Karma)*; scientific temper and commitment to rational and public dialogue; patience and persistence; humility; peace; social action through Constitutional means; respect and care for the environment and nature; sense of aesthetics; respect for India's cultural heritage; unity and integrity of the nation; and a true rootedness and pride in India with a forward looking spirit to continuously improve as a nation.

See Part A, Chapter 1, and Part D, Chapter 1 for more details.

Section 2.2
Approach to Developing Values and Dispositions in the NCF

While there is an overall consensus that education must develop values, there is equal recognition that developing values has been one of the biggest challenges in formal educational settings.

The approach of this NCF is to aim to develop Values and Dispositions using both direct and indirect methods. In the direct method, there will be classroom activities, discussions, and readings specifically designed to address ethical and moral awareness and reasoning; in addition, a course on 'Moral and Ethical Reasoning' will be introduced for all students in Grade 9. In the indirect method, the contents of Languages, literature, history, and the social sciences will incorporate discussions particularly aimed at addressing ethical and moral principles and values, such as, patriotism, sacrifice, nonviolence, truth, honesty, peace, righteous conduct, forgiveness, tolerance, sympathy, helpfulness, courtesy, cleanliness, equality, and fraternity.

As consequences of basic ethical reasoning, traditional Indian values, such as, *Seva, Ahimsa, Swacchata, Satya, Nishkama Karma,* tolerance, honesty, hard work, respect for women, respect for elders, respect for all people and their inherent capabilities regardless of background, and respect for the environment will be fostered in students, as these qualities are extremely important for society's and India's progress. Using dustbins, using toilets and leaving toilets clean after use, standing in queues properly and patiently, helping the vulnerable and contributing to philanthropic and community work, being punctual, and always being courteous and helpful to those around you in general even when you do not know them are some of the basic values of social responsibility that will be developed in students early, and throughout their school years.

The approach in this NCF for the development of Values and Dispositions has the following key aspects:

a. **Integral part of learning standards:** In this NCF, the development of Values and Dispositions is an integral part of the Learning Standards and pedagogical processes across all Stages and Curricular Areas and must reflect in their content, pedagogy, and assessment (e.g., building resilience through learning to win and lose with grace in Physical Education, or building scientific thinking through laboratory experiments and trials in Science).

b. **Development through practice:** Values are best learnt and imbibed, and dispositions are best developed when experienced and seen by students in practice in real life. This NCF lays a lot of emphasis on building, sustaining, and enriching school culture and practices which immerse the students in desirable values. It is the responsibility of the school, from the management and leadership to the Teachers and other school workers, to provide an enabling environment and opportunities and encouragement for practising values and developing dispositions.

c. **School culture is central:** The most important way in which these values are practised and dispositions are developed in school is through the building of a caring,

collaborative, and inclusive school and classroom culture and practices. Illustratively, sensitivity and respect for others are encouraged when opportunities are provided for all students to participate in activities and select students do not participate in all activities; regular *Bal Sabhas* and *Bal Panchayats* help build notions of democracy, justice, equality, sharing, and fraternity.

d. **Differentiated development across stages:** The development of Values and Dispositions is influenced by school and classroom culture and processes in a differentiated manner as children grow, and therefore must be planned appropriately at different Stages. Illustratively, at the Foundational Stage, the learning of Values and Dispositions are embedded in the selection of content (e.g., choosing stories that emphasise a love of nature) and pedagogy (e.g., encouraging children to play together and learn to share). At the Preparatory Stage, there is a clearer emphasis on developing positive habits (e.g., emphasising on completion of given work and putting things back in their place as a part of classroom practice). In the Middle Stage, the emphasis on collaborative group work as part of classroom practice helps develop the ability to work in teams. In the Secondary Stage, the emphasis on giving critical feedback on work done would help develop the ability to handle criticism and praise, success, and failure with equanimity.

e. **Differentiated development effects:** It is also important to note that each of these processes helps develop different kinds of values. Some values are developed better through particular processes. Illustratively, regular dialogue and discussion with active listening as part of classroom culture and processes help develop democratic values, such as, commitment to equality and justice, as well as, rational thinking and sensitivity in dealing with fellow humans. Curricular Areas, such as, art education and physical education and Well-being help build individual virtues, such as, aesthetic sensitivity, patience, endurance, honesty, and courage. Curricular Areas such as Science and Mathematics help build epistemic values, such as, scientific temper and mathematical reasoning. Marking important days through community service as part of school culture and practices help build cultural values, such as, Seva, *Ahimsa,* and *Shanti*. Regular music and dance performances at the school assembly help promote pride in India's rich cultural heritage.

f. **In content:** The content, both implicit and explicit will support the development of desired values. All implicit content choices have deep implications for the learning process. For example, diversity in the choices of names of people (e.g., characters in stories or illustrations), vocations, and geographical areas of India used and depicted in textbooks and illustrations that also aim to break gender or other stereotypes, should be given attention throughout.

Equally, high-quality content explicitly fostering these values should be included. Inspiring lessons from the works of literature and the people of India must be incorporated throughout the curriculum as relevant. India has a long history and tradition of people and stories that beautifully teach or exemplify so many of the above-mentioned core values and socio-emotional capacities. Discussions on the Indian Constitution, the values of Equality, Liberty, and Fraternity that it espouses, and the Fundamental Duties that it enjoins on Indian citizens must be a part of classroom processes. Stories from the lives of great Indian heroes of history are also an excellent way to inspire and introduce core values to students.

g. **Separate subject:** In this NCF, the development of Values and Dispositions is fully integrated into Learning Standards, pedagogical processes, and school and classroom culture and processes. In addition, a course on 'Moral and Ethical Reasoning' will be introduced for all students in Grade 9. In addition to the curriculum for this course, developers or schools (in practice) could consider and rigorously address the following questions and issues:

   i. Examine whether there are specific values that need to be addressed in a focussed manner with students and, therefore, require specified time to be set aside. Illustratively, commitment to equality may require an understanding of the idea of equality, its practice, our individual and collective experiences, research from across the world, and its importance for democracy. If so, this could need both separate time and attention, warranting a separate class perhaps alongside social science.

   ii. Teachers may need support in developing the capability to handle such specific sessions on the development of Values and Dispositions in a rigorous manner that encourages respectful questioning and discussion.

   iii. Teachers and students may need appropriate rigorous, and interesting material on these matters that incorporates both research and experience.

h. **Values in conflict:** Another critical issue that schools often face is that the values recognised or encouraged at school may not be seen or practised outside of the school commonly, in fact, they may even be actively discouraged, and the school has very little or no control over what happens in students' lives outside of it. For example, gender equality is taught and encouraged in school but students may sometimes see the opposite within their families or communities.

   How does a school handle this conflict in the lives of students presented by the values being aimed at the school versus actual situations in which these values may be violated? This question does not have a simple answer.

   Processes of dialogue and empathetic behaviour which demonstrate that conflicts and values are an integral part of human societies and that they need to be resolved through discussion and sustained effort, will have to be built into classroom culture and practice.

   This process of reconciliation of values would need some focussed attention. Teachers would need to help students listen and observe carefully, not jump to conclusions, ask questions politely, study the issue, and learn about it in some depth before deciding on a response. It would be critical for Teachers to help students understand why there may be some differences in values at school and in their families or communities, and to support them to choose their responses in a way that allows students to place their views before their families or communities with respect and reason, and without giving up easily in the face of opposition.

   A particular kind of conflict or contradiction that must be addressed is an individual's own action that may fall short of the values commitment that they have. Students must learn that such things happen in the natural course of the development of a human being and that the important thing is to learn from such challenging situations and keep improving one's response to it.

i. **Assessing the development of values and dispositions through observation of behaviour:** Developing values and dispositions is a continuous process and is mostly contingent on the environment supporting and encouraging such development. Putting the onus of developing values and dispositions on the student could take away this responsibility from the school and its processes.

However, developing values and dispositions is a critical part of the education process and it is important to understand the development of these just as much as it is important to understand how much Mathematics or Language a student has learnt.

Careful and objective observation would be critical to the assessment of developing values and dispositions:

i. The focus of the assessment must be on the 'behaviour' that demonstrates the value or the disposition. Just like actually adding two numbers demonstrates that a student is able to 'do' addition, illustratively, 'Student A helps other students when there is a problem' is a better way of articulating the learning rather than saying that a Student has developed 'empathy' or 'sensitivity.'
ii. The rubrics for this need to be very carefully developed avoiding all biases, and ensuring that these can be practically implemented by Teachers.
iii. This should form a part of the periodic learning assessment report.
iv. The rubrics, the report, and everything else associated with this must be constructive and must ensure that it does not have any kind of negative effect on (or negative labelling of) the students or their families.

Some other possible ways of assessment could be through analysis of student reflective diaries or material developed by students, group discussions or presentations on a particular topic, and student participation in community work or school events.

It is important to reiterate that only 'understanding' values and disposition is not enough. Values and dispositions must be part of everyday behaviour to demonstrate that they have been learnt and developed.

j. **Values of the teachers, principals, and system:** In the process of developing values and dispositions in students, the perspectives and capacities of educational functionaries, school Principals and Teachers are equally critical. Their understanding of these values and building them into school culture and practices is what will make this happen. The culture of the education system must support the development of the same values and dispositions that are expected of students.

Section 2.3
Some Illustrations Across School Stages and Curricular Areas

Developing values and dispositions is an integral part of this NCF across all School Stages and Curricular Areas. This is reflected in different ways, as part of Learning Standards at every Stage (as reflected in Curricular Goals and Competencies), as part of pedagogical

processes across Stages, conceptually integrated into Curricular Areas, and as a separate Curricular Area in the Secondary Stage. It is a critical objective of school and classroom culture and practices.

Some Stage-wise illustrations are suggested below, among countless other possibilities. Teachers will have to judiciously select from the vast material that can be tapped to evoke and inspire values.

See section on Pedagogy for more detail in Part A, Chapter 3, and 3.1.2.

a. At the Preparatory Stage, values are best learnt through simple stories selected from India's vast repository of stories, such as, *Panchatantra, Hitopadesha*, and *Jataka* tales. Storytelling should be followed by discussions, such as, 'What is the meaning of friendship in this story?', 'How could the lion and the bull maintain their friendship?' Among many other possible activities, children can be made to draw scenes from a story, or create a puppet show for it. Apart from children's books with good graphics, well-selected short videos of the stories could also be used.

b. At the Middle Stage, more elaborate stories, such as, those drawn from Indian Epics and Indian Literature from across our languages can be used; popular literature for children, including comics, is a useful source. Many stories of Birbal and Akbar, for instance, illustrate values of justice, compassion, mindfulness, and the capacities of rational thinking, problem solving, scientific temper, and humour. Every story read (or film shown) should be followed by a discussion or class activities, such as, staging of the story, role plays, and students imagining multiple alternative scenarios. Life stories of inspiring Indian figures can be introduced, such as, Mahatma Gandhi, Babasaheb Ambedkar, Swami Vivekananda, Sri Aurobindo, Guru Nanak, Mahavira Acharya, Gautam Buddha, Dr. A.P.J. Abdul Kalam, Shri Rabindranath Tagore, Dr. M.S. Subbulakshmi, Ustad Bismillah Khan, Charaka, Susruta, Aryabhata, Varahamihira, Bhaskaracharya, Brahmagupta, Chanakya, Chakrapani Datta, Madhava, Panini, Patanjali, Nagarjuna, Gautama, Pingala, Srinivasa Ramanujan, Dr. C.V. Raman, Dr. Homi Bhabha, Sankardev, Maitreyi, Gargi, and Tiruvalluvar, among many other Indian greats from all fields and walks of life. Heroes from all over the world in various disciplines can also be discussed to further inspire students, such as, Albert Einstein, Martin Luther King, Jr., and Nelson Mandela.

c. In the Secondary Stage, the full range of Indian literature can be used for the development of values. Many well-selected *Subhasitas* can also be used in the same manner. For example, discuss 'One may own a hundred cows, but his need is only one cup of milk; one may own a hundred villages, but his need is only one morsel of food. One may own a palace with hundred rooms, but his need is just one cot. All the rest belongs to others.' Or 'Trees are like good people. While they themselves stand in the scorching sun, they provide shade and fruit for others. Texts, such as, Bhartrihari's *Satakatraya* or Tiruvalluvar's *Tirukkural* also offer many thoughtful maxims that can initiate stimulating discussions.

Regional freedom fighters or social reformers can also offer shining examples. Some of our industrialists, business person, scientists, and artists of modern times with an altruistic attitude and record, medical and agricultural pioneers, and other inspiring well-known and not-so-well-known people (particularly from local areas) can provide shining examples of values.

Students can be encouraged to find out information on some of these inspiring figures by themselves. For example, a school project could be putting together an anthology of ethical persons who have had an impact on the students' own lives, or a compilation of local freedom fighters, or of unsung heroes who came out to help at the time of calamities and disasters. All of this also lends itself to Stage-wise adaptations.

Besides such material drawn from the vast resources offered by India, students should be exposed, through brief biographical sketches, skits, and/or videos, to some other great figures worldwide, including Martin Luther King, Jr. and Nelson Mandela, etc., who embodied the values of leadership, dedication, selflessness, altruism, quest for truth, fight for justice, and freedom from oppression. Discussions on growing ethical issues and conflicts in the use of technology, for example, information technology, genetics, and issues of environmental pollution, also need to be introduced.

In all of the above, two critical approaches should be constantly kept in mind:

a. At every step, care should be taken to lead the student to connect specific values and situations to their immediate environment, or the nation or world at large. This may lead to complex and occasionally delicate discussions, especially in the higher Stages, and care should be taken to be non-judgmental and encourage nuanced reasoning in students.

b. Values, as explained above, impact every field of knowledge, from physical education to environmental education, from science to social science, and from vocational education to art education. Cross-cutting situations should therefore be abundantly used to drive home the point that values are about the whole of life and not a separate isolated subject. Some more discussion regarding this is in Section 3.1.2. This NCF provides many examples of such intersections in chapters on Environmental Education (Part B, Chapter 3), Inclusion (Part B, Chapter 4), social science (Part C, Chapter 5), and physical education (Part C, Chapter 8), among others. Chapter 7 in Part C on Interdisciplinary Areas also has a useful discussion on this.

2.3.1 School Culture and Practices

Various aspects of school culture and practices can be aimed at developing Values and Dispositions. For example, the daily assembly can allow students to take up different tasks at different times helping them learn responsibility, and accountability. Music during the assembly can include songs from the local area as well as from different regions and in different Indian languages. Real stories of courage and resilience and *seva* can be narrated, preferably by the students themselves. Students can perform skits on various social issues to sensitise others and assembly time also can be devoted to discussing current social and national issues.

Like the daily assembly, mealtime is another daily practice that allows schools to inculcate values of equality, sharing, care, and the importance of health and hygiene. All students sharing and enjoying a meal together will send a strong message to students about non-discrimination. For many students, this could be the one proper meal that they get during the day, so the school's effort in serving a good nutritious meal will demonstrate care and responsibility towards students, teaching them the same. Healthy eating habits and good hygiene standards can also be taught in this process.

Every school must encourage the formation of student committees and forums (*Bal Sabha, Bal Panchayat*, and other student forums) to involve students in school activities, and create a sense of ownership and responsibility among them. By participating in activities of different committees, students learn cooperation, teamwork, proactiveness, taking initiative, leadership, and conflict resolution. Some of these committees take care of school-level tasks, such as, ensuring cleanliness, managing Mid-day meals, or organising cultural events. Some schools also have committees that work at the community level. Health committees, sports committees, eco clubs, and music clubs can take up activities within the community with guidance from the teacher. Through these forums, students learn and develop respect for different kinds of work.

When the school reaches out to parents and the community welcomes them gives them regular updates consults them on relevant matters, and tries to use their knowledge and experience they feel respected. When schools respect parents and the community and invite students to participate in this process, they send a strong message to students that they must do so too. This would improve their relationship with their own parents and their participation in community life.

2.3.2 Pedagogy Across Stages

Many values are directly reflected in the way classes are conducted in schools. Student participation and learning must be the focus of classroom activities and events. Opportunities must be provided for all students to participate in activities, and not for some selected children to end up participating in all activities.

Classroom processes must encourage active learning with an emphasis on dialogue and building relationships based on mutual respect. Students can work individually, in pairs, and groups. They must be encouraged to listen, understand, appreciate, and reflect on their own thought process, and look at others' experiences with empathy and critical understanding. Teachers can participate in discussions as one among the group, and facilitate understanding of varied points of view and encourage students to take on varied roles in the group.

Students must be encouraged to develop appropriate work habits and responsibilities. They should organise the space and materials before and after use, persist and complete work, stay on a task even without a Teacher being present, convey doubts, solve problems, and also give space to others to work in silence as per individual needs.

Teachers must ensure that students feel safe enough to take intellectual risks, make mistakes, experiment, and freely express their opinions without the anxiety of being judged, ridiculed, reprimanded, or punished. Confidentiality of sensitive information (regarding a student's background and circumstances) should be maintained. Bullying, harassment, intimidation, and the use of derogatory or demeaning language are calmly but strongly discouraged.

a. **At the Foundational Stage**, the learning expectations of Values and Dispositions are embedded as part of classroom processes, in the selection of content, pedagogical approaches, and assessment tools. Some competencies lend themselves to values. For example, 'Shows kindness and helpfulness to others, including animals, plants, when they are in need' is a competency that embodies the value of compassion.

Given the developmental stage that children are in, it is well understood that children learn these ideas and their practices best when it is an integral part of the teaching-learning process.

b. **Art Education** across stages focusses on thinking, making, and appreciation. Students get exposure to artists from their own community as well as those from different parts of India. Knowledge and appreciation of art traditions and unique approaches and artwork help them appreciate the richness and beauty of thought and expression across cultures. This helps them realise that multiple perspectives and interpretations can coexist in their own classroom so the same would hold true for society too.

The 'making' process lends itself to the inculcation of values. For example, making string puppets and then playing with them to perform a variety of actions to narrate a story requires practice and hard work, while also being a joyful experience. As students work with a variety of art forms and techniques, they will develop an appreciation for hard work and an understanding of the time, effort, and practice required to achieve quality artwork.

With such experiences, students would develop respect for all kinds of vocations, professions, and work, as well as respect for all people. The value of liberty and freedom is best experienced when students create and express themselves openly through their artwork. A student who may experience shyness, stage fear, or any other kind of discomfort with their own body can express their experiences and challenges during the process of learning Dance and Movement. This develops greater understanding among students and respect for all people regardless of their capacities and background. Such processes also allow all students to feel included as equal contributors in the learning process.

c. **Science** across stages provides students with opportunities to explore their observations and experiences in the real world. Students must identify and appreciate scientific values, for example, creativity, objectivity, rational thinking, perseverance, cooperation, scepticism, through 'doing', as well as, engaging with specific examples. These examples will be related to the development of scientific laws and theories, and the lives and work of a few scientists in some detail. Students will examine how ideas have changed over time in light of new evidence, leading to an understanding of the tentative nature of science, and the role of empiricism in developing scientific knowledge.

Students must also develop a holistic understanding of Science through seeing its interconnectedness with the real world as well as with other Curricular Areas. While appreciating how science and technology have contributed to human lives, they will also examine their use from the lens of ethics, which may appropriately include discussions on the limits of science and technology when their applications are not governed by appropriate values.

d. **Interdisciplinary Areas** include building sensitivity and care towards the environment and developing the capacity for moral and ethical reasoning.

Students will be encouraged to explore, appreciate, and develop sensitivity towards their social and natural environment. They will appreciate the need for

balance and harmony between human society and nature. They will develop a sense of care not only for themselves, but also for other humans, plants, birds, and animals as well as the rest of the natural environment.

Students will also develop capacities for ethical and moral reasoning, and active participation as citizens in debate and action. They will develop an understanding of how to respond to issues and events, they will be able to examine them from multiple perspectives, identify ethical and moral questions and dilemmas, and evaluate them for violation of human and Constitutional values as enlisted in NEP 2020. They will be able to take a position and justify it with evidence and rationale. They will also be able to re-examine their positions based on additional information and/or evidence and be able to communicate in a democratic manner.

e. **Physical Education and Well-being** across stages will help students value physical activity, hygiene, nutrition, and diet for a healthy life. It will also encourage inclusion, cooperation, and responsible behaviour, quick decision making, respect for all players including opponents and fair play, gracious acceptance of both victory and defeat, and commitment, perseverance, and hard work to achieve excellence.

Sports provide opportunities to reflect on personal and team behaviour, and help build dispositions helpful for working in teams, such as, teaching patience, regulating emotions, handling difficult situations, and celebrating others' achievements. Students will also learn to modify a game or create new ones to include those who may have different needs and abilities.

f. **Mathematics** across stages will develop capacities for logical thinking and reasoning in a rigorous, accurate, objective, and rational manner. Through participation in the discovery of patterns and relationships and the derivation and proof of principles and theorems, they will learn the value of collaboration, creativity, and perseverance when engaging in problem solving. They will also learn the value of communicating their ideas clearly and precisely.

g. **Language** across stages will help students develop democratic and epistemic values, and dispositions of respect for culture and diversity in society ('cultural literacy'). Learning more than one language will broaden students' horizons and learning another Indian language will enable a deeper connection with the country and develop a sense of pride and belonging to the country.

Students will be encouraged to think independently, take an interest in books, and read to learn about the world at large. Young learners will develop an attitude of thirsting for knowledge about the world through books. They will also develop the ability to express themselves, fostering independent analysis, organising thinking, and creative expression.

Through Language education, students will develop deeper capacities for effective communication and will be taught the value of meaningful and effective social and democratic participation. Along with this, students develop the ability to enjoy reading and writing, and explore different literary devices and forms of literature in more than one language, thus inculcating respect for other cultures and viewpoints.

Students will learn an appreciation of aesthetics in different genres, use language to develop reasoning and argumentation and an appreciation for different regional languages to acknowledge, respect, and respond to ideas from across the country.

h. **Social Science** across stages will focusses on inculcating epistemic values of scientific rigour in the analysis of events, and the interpretation of sources related to different aspects of human life and society. Globally accepted scientific methods of enquiry, such as, the evidence-based, empirical, and verifiable approaches to social, historical, and political events ensure the development of this epistemic value.

Appreciation for Indianness (*Bharatiyata*) through an understanding of India's rich past, that includes its cultural diversity, heritage, traditions, literature, art, philosophy, and medicine, and learning about the geographical diversity of the Indian subcontinent is an important Curricular Goal. Similarly, understanding the functioning and impact of social and political institutions, and learning about various forms of inequality and discrimination will contribute to social and democratic values of equality, justice, fairness, and inclusion.

Students will learn the process of development of the Constitution of India, the emergence of the modern Indian state, and the importance of these in the promotion of democratic values, culture, and biodiversity. Understanding the basic contours of the economy and its rapid development is an essential aspect of the curriculum that contributes to an appreciation of modern India with a forward-looking attitude, and desire to continuously improve as a nation.

i. **Vocational Education** helps students learn and respect the value of *shrama* or physical work, respect for all and their capabilities regardless of background, and respect for the environment.

Vocational Education will prepare students for meaningful and productive participation in the world of work by learning hands-on abilities and skills (i.e., 'physically doing'), developing equal respect for head-hands-heart, valuing the dignity of labour, and understanding vocational choices for the future.

Students will develop a broad-based understanding of different forms of work. They will also develop respect for dignity of all labour through the acquisition of values related to work and the workplace. Students will develop persistence and focus, curiosity and creativity, empathy and sensitivity, and collaboration and teamwork. The disposition of working hard with persistence, focus, and attention to detail is an important component of work ethic.

Schools must design and establish cultures and processes to ensure that students develop Values and Dispositions that help them attain the Aims of Education.

2.3.3 Assessment of Values

Assessment of values is necessarily a delicate exercise, since testing values through MCQs, for instance would be a futile exercise. Values should be assessed in their practice, not as dry knowledge. This section must be read along with Section 2.2 (i) earlier.

Assessment of values must not be for judging the student but must be only a developmental exercise. Any use of such assessment for 'judging' is likely to do deep harm.

Assessment of values in Preparatory and Middle Stages is best carried out internally in the school, through careful and objective observation of each student's participation and behaviour in class discussions and activities. In the Secondary Stage, assessment could additionally include creative short essays in class (e.g., asking for comments on a text) or projects.

In all the above, an excellent practice consists in asking students to evaluate another student's presentation or project or exposition, which provides training in objectivity and impartiality. Self-assessment can also be tried whenever adequate, with guaranteed confidentiality.

At the level of Board examinations, the question needs proper thought and planning and is addressed in Part A, Chapter 3.

Since Values and Dispositions will not be acquired if the student fails to perceive the Teacher and the whole school as embodiments of those values, innovative exercises to get the Teacher and the school management assessed by the students could be undertaken, as in higher education, where students' feedback is sought on instructors and courses. This may be done through anonymous questionnaires that will not only ask specific questions and also invite constructive suggestions.

Chapter 3

Learning about and Caring for the Environment

Environmental Education (EE) is a balanced process of developing cognitive understanding, emotional connectedness, and behavioural change towards environmental issues that concern both humans and the natural system. The goal is to enable individuals to find equitable, just, and sustainable solutions that maintain a dynamic equilibrium between human and environmental well-being.

Environmental Education is by nature a cross-disciplinary Curricular Area, as it involves understanding the diverse set of factors, both natural and societal that can affect this increasingly delicate equilibrium between nature and humans. Environmental Education, therefore, requires a holistic mix of content from the science as well as the Social Science, including biology, chemistry, physics, mathematics, geology, ecology, history, economics, psychology, sociology, and anthropology. Additionally, our strong cultural traditions regarding our conception of, and relationship with, nature, and the wealth of practices of environmental conservation that have resulted from this conception, must also find their place in Environmental Education.

The National Education Policy (NEP) 2020 emphasises developing 'among the learners a deep-rooted pride in being Indian and dispositions that support responsible commitment to human rights, sustainable development and living, and global well-being, thereby reflecting a truly global citizen.' In particular, the policy makes the topical recommendation of including Environmental Education as a focus subject area, given the perilous state of environmental affairs not just in India, but around the world. The policy further emphasises that:

> *...certain subjects, skills, and capacities should be learned by all students to become good, successful, innovative, adaptable, and productive human beings in today's rapidly changing world, these skills include: environmental awareness including water and resource conservation, sanitation and hygiene.*
>
> *[NEP-2020, 4.23]*

Keeping in the mind this mandate of NEP-2020, the Curriculum Framework for Environmental Education strives to offer a well-researched set of guidelines that will provide strategic direction to the development of the curriculum, as well as tangible means by which these guidelines can be implemented on the ground.

Section 3.1
History of and Rationale for Environmental Education in India

Nature is an integral part of Indian life and traditions, the lives of communities and the environment around them are unconditionally interconnected. This intricate link between nature and society imposes upon us a moral and existential imperative to understand it, stand up for it, and protect it for its and our own survival.

Interventions at all levels are required, but perhaps the most foundational and enduring among them is harnessing the power of education to create awareness, and develop an empathetic disposition towards the natural system that sustains us all. In fact, the UN's Sustainable Development Goals identify Education for Sustainable Development (ESD) as a key enabler in building a sustainable society that protects life now and in the future. In the Indian context, an awareness of, and sensitivity to, India's local or traditional approaches towards respecting and conserving nature and the environment, and some of the major practices that resulted from these approaches, must be harnessed, and included in any holistic development of ESD.

3.1.1 India and Nature: Concepts and Practices

Extensive literature in India has, from ancient times emphasised the intimate connection between nature and humanity and the interconnectedness of all creatures. Thus, the *Rigveda*, India's most ancient text, addresses earth and heaven as 'twins' or a single being (*Dyavaprithivi*) and compares the universe to a thousand-branched tree (a fine symbol for endless diversity united by one trunk). Similarly, in the *Yajurveda,* another one of the four most ancient Indian texts, the hymns advocate for a peaceful coexistence with every component of nature and ask people to look at one another and all aspects of the natural system through the lens of 'friendship'. The hymns wish for no harm or injury to any of these 'relatives', and their well-being is tied to humans' well-being. Mountains, rivers, forests, trees, animals, and plants are seen as imbued with sacredness and become cosmic symbols of it; thus, the *ashwattha* (peepal) tree, the same tree under which the Buddha will attain enlightenment, is said to symbolise the whole universe. Rivers are mothers (and often goddesses) as they make it easy for us to grow food. The *Tirukkural* declares that 'Sparkling water, open space, hills, and forests constitute a fortress' (that is, our defence and protection), while *Subhasitas* (wise sayings) remind us that 'Trees are like good people. While they themselves stand in the scorching sun, they provide shade and fruit for others.' Countless texts paint pictures of the beauty and generosity of nature, our mother which feeds and nurtures us.

These lofty concepts inspired widespread practices. A whole branch of *Ayurveda*, *Vrikshayurveda*, was dedicated to the treatment of trees and other plants, including crops before and after the sowing of seeds. While some forests were cleared for agriculture, others were protected just as today's wildlife sanctuaries (as prescribed in the *Arthashastra*). Vegetarianism spread, largely promoted by the practice of *ahimsa* or 'non-

hurting'. Water management systems, from simple to highly sophisticated ones, took care of the people's needs in different regions with diverse climates. In texts and inscriptions, people were promised *Punya* (religious merit) if they dug ponds the simplest way to recharge the water table. Urban planning took care to include parks; reservoirs were added to temples and monuments across India, fulfilling cultural as well as environmental needs; sacred groves, where hunting and the collection of wood were prohibited, were created in the vicinity of villages in many parts of India. Indeed, many of these traditions survive to these days, though diminished and often endangered.

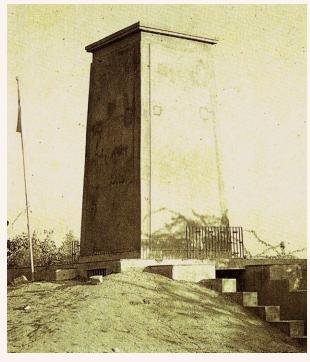
Owing to their lifestyle in proximity to the natural environment, numerous rural and tribal communities developed a huge corpus of traditional knowledge of medicinal plants, agriculture, water conservation, metallurgy, zoology, survival techniques, and resilience in the face of natural calamities. Indian systems of medicine, agriculture, metallurgy, water management, and more have amply borrowed from this corpus, codifying, and classifying it.

Box 3.1

The Bishnoi's Sacrifice

In 1730 at Khejadli (Rajasthan): 363 women, children and men laid down their lives to protest cutting of Khejadli trees. Led by Amrita Devi and her three young daughters, they died chanting one of their Guru's teachings: Sar Santey Rookh Rahe To Bhi Sasto Jaan, 'If a tree is saved even at the cost of one's head, it is worth it.'

The Maharaja of Jodhpur apologised and prohibited the cutting of trees and hunting of animals in all Bishnoi villages.



The Khejarli Massacre cenotaph to commemorate the sacrifice of the Bishnois (Wikipedia)

These ancient, tribal, and other local traditions to conserve and live in harmony with our environments have been practised, and advocated throughout India for centuries. In more recent times, many poets, novelists, environmental thinkers, and activists, such as, Mahatma Gandhi, Rabindranath Tagore, Premchand, Ghanashyam Raturi, and R. K. Narayan, to name just a few, have stressed this inextricable link between nature and human society.

The Constitution of India also emphasises this connect, one of its Fundamental Duties enjoins citizens to 'protect and improve the natural environment, including forests, lakes, rivers, and wildlife and to have compassion for living creatures.'

3.1.2 Today's Context

In more recent times, the pressures of modern life have fractured the bonds between the natural environment and human beings. What was once revered as a mutually sustaining relationship is now steadily falling into an intense competition between two conflicting entities. As India's future generations inherit the challenges of life in the modern era, it is important to pass on this ancient knowledge and reverence, the mandate from our

Constitution, and, most importantly, the modern knowledge and tools from the science and social sciences. Ideally, knowledge from ancient times to the modern should converge towards sustainable solutions to the growing environmental challenges.

Environmental Education constitutes an important step in this direction. By incorporating topics from various subject areas, students will learn to appreciate the nuances, and complexity of the human-nature equilibrium and the impact and trade-offs of different decisions taken at a societal, or even individual, level. They will develop important skills, such as, keen observation, critical thinking, pattern recognition, logical reasoning, and problem solving, all of which are important to finding remedies to the environmental issues we face today to avoid far more serious problems in the future. At the same time, such a cross-disciplinary approach that opens students' eyes to different realities and perspectives will help students be less rigid in their outlook and more compassionate in their attitude towards those around them.

At this time, the world is undoubtedly at a crisis point due to environmental concerns, which include but are not limited to scarcity of water, ground, air and water pollution, waste overload, loss of natural habitats through deforestation, accelerating loss of biodiversity, rising sea levels, and increasingly severe weather due to climate change. It is equally clear that encouraging students to develop sensitivity towards the environment, build an understanding of the environment, and find ways to demonstrate care through action about their environment is a critical responsibility of school education.

As committed to in NEP 2020, developing sensitivity to and care for the environment must thus be a central theme throughout school education in this NCF.

Section 3.2
Aims of Environmental Education

The aims of Environmental Education in the school curriculum are listed below:

a. Create a strong foundation of environmental literacy, which includes understanding the interlinkages between ecological, social, economic, and political factors.

b. Develop a more compassionate attitude towards the natural environment, drawing upon teachings from ancient Indian traditions and practices, the Indian Constitution, as well as scientific research on the effects of modern human activity on the environment.

c. Develop an action-oriented mindset and skillset to promote environmental causes, with a solid understanding of how individual, societal, national, and global actions can help us restore the balance between humans and nature, and thereby saving our planet and ourselves.

Section 3.3
Approach to Learning about and Caring for the Environment in the NCF

Environmental Education is best imparted through a combination of in-class and experiential learning.

Previous approaches of teaching facts without an opportunity to discuss and debate open-ended questions rendered Environmental Education a perfunctory subject that was only important as far as school assessments were concerned. On the other hand, introducing a more immersive, experiential learning component will ensure that students internalise conceptual knowledge gained in the classroom.

Below are some of the salient features of Environmental Education that will enable learning for children:

a. **Familiar**: Content should be customised to children's surroundings and environment so that it is accessible and familiar to them. Local or regional flavour to the content will also make it easier for educators to include experiential learning elements in the learning process, e.g., 'show and tell' of natural resources found locally, field visits to nearby sites of topical importance, and guest lectures by regional experts on local flora or fauna or environmental issues.

b. **Cumulative:** Learning must build on the foundations laid in previous classes. Related to this point, content must be appropriately curated for each pedagogical stage, neither too easy (which makes the subject uninteresting) nor too difficult (which makes it daunting). For instance, teaching a complex concept about ecological communities could be broken up into smaller parts that build up across Stages. In the Foundational Stage, the focus could be on plants and animals found in an area. Teachers could use a combination of in-class teaching, field visits, and museum tours to explain this concept to students. In the Preparatory and Middle Stages, the material can build on what was previously taught and include concepts, such as, the role of different plants and animals producers, consumers, scavengers, and decomposers, in the ecological community. As students grow older, their ability for logical and abstract thinking develops as well.

   In the Secondary Stage, the same ecological community concept can be expanded to include more complex components, such as, predator-prey relationships, food chains, food webs, and energy transfer. Such a cumulative approach to teaching holds true even for the socio-emotional and behavioural dimensions of learning.

   In the Foundational and Preparatory Stages, students can be taught to develop a curiosity, and interest towards the environment. By the time they reach the Secondary Stage, their attitudes and behaviours evolve beyond interest to respect and acceptance of different perspectives with a desire to understand the nuances of human-environmental relationships. Students in the Secondary Stage can independently deepen their environmental knowledge, analyse issues across various areas, make informed judgments on statements and debates in media and society, and use a wider range of techniques to investigate, analyse, synthesise, question, critique, and draw their own conclusions. At this Stage, it is best to offer them cases to study, and critique existing policies and practices.

c. **Participative:** Students should be encouraged to engage with the content at an intellectual level through active participation in the classroom (e.g., asking questions, engaging in debates) and also at an experiential level by undertaking hands-on community projects (e.g., participating in environmentally sustainable activities at school, composting, minimising waste and maximising recycling or upcycling, raising a small plot or bed of medicinal plants, fundraising for important causes, community

service in and around the school locality). Students' questions, related to the social and physical environment and of social processes around them (including schools and family), must be given space. In the classroom, students must be provided opportunities to explore the relationship between questions and responses, rather than limiting to 'yes/no' or fact-based answers. This helps them connect their thinking process with their exploration and findings. This process leads to the development of the ability for critical thinking. Use of different modes and methods that are interactive, observation and dialogues, and the communication of ideas, help students strengthen this ability. It also helps them relate present content to previous knowledge.

d. Continuous or integrated: Learning continues beyond the classroom when Teachers lead by example. Learning in Environmental Education in the early years is largely through interaction with adults and peers, in alignment with learning theories of social constructivism. Interaction with adults, peers, and experts forms an important part of learning in Environmental Education. The culture of the school with respect to its surroundings and the environment also has a deep impact on the lifelong attitudes of the members of the school including its students.

e. Diversified: Content that spans spatial and temporal breadth will open students' eyes to various perspectives on environmental issues. Also, by making the dissemination of the content more multi-modal in nature, students can engage with the topics or content in a manner that most appeals to them, e.g., documentaries, field trips, guest lectures, class, and group projects, essay writing. Depending on each student's bent of mind, different activities will resonate differently. For example, getting students to participate in task-oriented work, such as, the creation of simple models and toys may facilitate better conceptual understanding for some students who prefer learning by doing.

Other considerations that must be considered when developing TLMs and pedagogy in Environmental Education:

a. Students are naturally inclined to observe their natural and social environments. They participate in several interactions with nature, living and non-living things, and relationships within families and communities. They experience emotions related to these experiences. Further, personal, and cultural identities are often tied to the local environment. School education must build on this natural ability and interest.

b. Learning about the environment helps students discover its beauty and take pride in, ownership and responsibility for its care. This also helps in developing specific values, e.g., dignity of all beings, respect for all living beings, appreciation of diversity, respect for resources and their judicial use, and equitable distribution of available resources.

c. India has a long history and rich traditions of environmentally sustainable practices. It is important for our students to understand this, and learn about such practices from different regions of our country. They can also research why the modern context often causes these practices to be abandoned. Illustratively, they may research the accumulation of plastic waste in their village or street, and discuss, among themselves, as well as, with the concerned neighbourhoods, how this could be reduced or eliminated.

d. As students grow, school education must enable them to be environmentally literate. This includes the students developing environmental values, dispositions, and capacities to investigate the environment, and make intelligent informed decisions about individual and collective solutions to the current problems, and the prevention of new ones.

   An important aspect of environmental literacy is the ability to sift through information, news, views, and opinions to arrive at authentic conclusions. This must lead them to advocate for and participate in necessary action at the level of their local communities, since collective action is a key in mitigating environmental challenges.

e. Students must also develop awareness and concern for the interdependence between the natural and human-made environments and the economic, socio-cultural, political, historical, ethical, and aesthetic dimensions of human societies. They must appreciate the need for balance between the environment and human society.

f. The knowledge base for Environmental Education comes from both, research, and practice. Environmental Education draws from many different fields, such as, biology, ecology, philosophy, geography, chemistry, geology, physics, economics, sociology, natural resources, agriculture, management, law, and politics. Environmental problems must be seen in all their complexity. They involve issues of public health, social justice, behaviour towards nature, science, policy, rights, and ethics. They must, therefore, be examined through the lens of multiple disciplines and perspectives.

g. Pedagogy must use different modes and methods, including observation of nature, interaction and dialogue, completing small projects, reading, and writing. Students' questions and experiences must be given space. Older students should work on specific issues, and examine their impact using an interdisciplinary lens. All this will require sufficient time, which is provided for in this NCF.

h. While it is important that students acquire a conceptual understanding of environmental issues and challenges as well as an appreciation of the magnitude of the problem, it is equally important to ensure they do not get discouraged or despair for their future. Indeed, information on the environmental crisis tends to be overwhelming and distressing, at times resulting in depression (now called 'eco-anxiety'); students should be shown how to convert such trends into positive action, in effect turning despair into hope. To do this, the NCF focusses on presenting possibilities and positive examples of actions to contain or reverse environmental damage. At the same time, it is emphasised that the onus for mitigation is not only on individuals, but on communities and nations as well.

Section 3.4
Learning about and Caring for the Environment Across School Stages

Learning about and caring for the environment is an integral part of this NCF across all School Stages. This is reflected in different ways, as part of Learning Standards at every

stage (as reflected in Curricular Goals and Competencies), as part of pedagogical processes across Stages, conceptually integrated into Curricular Areas, and as a separate Curricular Area.

a. There are 13 Curricular Goals and 20 Competencies that directly address learning about and caring for the environment in this NCF across Curricular Areas and School Stages.

b. Having Curricular Goals and Competencies focussed on this area will ensure that all students attain environmental literacy, and sensitivity through school education.

c. Some illustrative Curricular Goals on the environment at the Foundational, Preparatory, and Middle Stages in this NCF are as follows:

   i. **Foundational Stage:** Children develop a positive regard for the natural environment around them (CG-6).

   ii. **Preparatory Stage:** Students develop sensitivity towards their social and natural environment (CG-4: The World Around Us).

   iii. **Middle Stage:** Understands the spatial distribution of resources (from local to global), their conservation, and the interdependence between natural phenomena and human life (CG-5: Social Science).

d. At the Secondary Stage, Environmental Education is a subject that all students must study. This has a set of Curricular Goals and Competencies focussed fully on learning about the environment.

   Some other key points for each of the stages follow:

3.4.1 Foundational Stage

a. In the Foundational Stage, Curricular Goals and Competencies are organised around domains of development, and not as Curricular Areas. Developing a positive regard for the environment, caring for all life forms, and finding joy in engaging with nature are part of the Learning Standards at this stage.

b. Spending time in nature is an integral part of pedagogy at this stage, encouraging children to observe and interact sensitively with plants, animals, insects, and birds.

c. Children listen to stories, poems, and songs that often have elements of the environment (e.g., birds, animals, plants, flowers, mountains, rivers) woven in. Sources of sound around them include the buzzing of bees, the cooing of the *koyal*, or rain on a window. Toys are made from local materials, and often take the shape of animals and birds.

3.4.2 Preparatory Stage

a. In the Preparatory Stage, learning about the environment is integrated into The World Around Us, one of the Curricular Areas at this stage. The focus is to begin with the immediate environment of students and gradually broaden it by the end of the stage. An interdisciplinary approach enables learning, and ensures that students do not receive a fragmented view of the world around them.

b. In this stage, there are Learning Standards related to observing, understanding, and engaging with nature. Pedagogical processes that emphasise caring for nature (e.g.,

growing plants, observing animals, using water carefully) are also the focus at this stage. For students to become environmentally literate, they must learn through 'doing by themselves.'

c. Students also begin to appreciate the interdependence of human society, and the natural environment at this stage. They make connections between cultural practices within the community and the environment, appreciate how natural systems support their lives and those of other living beings, and begin to understand how life changes as the environment changes. They carry out small investigations, surveys, field trips, and observations to understand these connections.

d. Content in this stage is selected to ensure maximum interaction with the environment, reflecting diversity in geographical features, flora, and fauna. Folklore, folk songs, oral histories, and small case studies connected to the environment continue to be used to develop among students a love for the environment.

3.4.3 Middle Stage

a. In the Middle Stage, concepts related to the environment are integrated into science and social science. This is to ensure that students engage with the basic 'knowledge of the environment' to enable a deeper understanding of ideas around the environment at the next stage.

b. Learning Standards in science and social science include those on understanding the environment (e.g., Explores the living world around us, and its interaction with the inanimate world in scientific terms; Understands the spatial distribution of resources, their conservation, and the interdependence between natural phenomena and human life).

c. Content and pedagogical processes continue to emphasise sensitivity and care for the environment. Students engage with the environment through as much direct engagement as possible in science, examining diversity of living beings, both those that are in their surroundings as well as those at a smaller scale, and how they interact with their environment. They examine the conditions necessary for sustaining life. In social science, students examine the spatial distribution of resources, and disparity in availability for people from different sections of society. They illustrate attempts at conservation, restoration, and regeneration and advocate the critical importance of these efforts.

3.4.4 Secondary Stage

a. In the Secondary Stage, Environmental Education is part of Interdisciplinary Areas, a separate Curricular Area at this stage, offered in Grade 10. Students will focus on developing a holistic understanding of key concerns and issues related to the environment, drawing upon their understanding across other Curricular Areas.

b. In this stage, students can independently deepen their environmental knowledge, assess issues, and analyse their causes, make informed judgments on statements and debates in the media and in society, and use a range of techniques developed in earlier grades to investigate, analyse, synthesise, question, critique, and draw their

own conclusions. They can use multiple perspectives to develop an integrated understanding, and advocate actions for certain environmental phenomena.

c. The capacities mentioned in the preceding point are developed through Individuals in society, offered in Grade 9. This course aims to develop capacity for ethical and moral capacities with a specific focus on the environment, among other domains. Students systematically examine issues or events related to the environment to identify key ethical and moral questions, and then present an informed position for specific actions.

d. Students will view Environmental Education from the perspective of a social-ecological perspectives, as opposed to a perspective informed primarily by either science or social science. The social-ecological perspective emphasises interdisciplinarity, integrating conceptual frameworks and methods from the natural and social science for a holistic understanding of interlinkages between society and the environment. Central to the idea of the social-ecological framework are ideas of equity, environmental justice, and human well-being, all fundamental to the development of sustainable societies.

e. In this Stage, Environmental Education will also encourage students to develop knowledge about traditional practices across communities for prevention of environmental degradation, issues related to the survival of animal species, and sustainable use of resources, such as, forests and rivers.

Across School Stages, students' continuous engagement with and care for their environment is emphasised. From a direct engagement with nature in earlier stages, students move towards deepening their environmental knowledge, assessing issues, showing initiative, creativity, perseverance, and problem-solving skills for environmental action.

Environmental values include, but are not limited to, aesthetic appreciation of beauty and sensitivity, they also include the ability and motivation to identify and raise questions related to the environment. Therefore, these values related to the environment have to be demonstrated by adults in the school so that students develop them as well.

This NCF progressively builds capacities, values, and dispositions for learning about and caring for the environment in students across the school stages.

Chapter 4

Inclusion in Schools

Inclusive and equitable education, while an essential goal in its own right is also critical to achieving an inclusive and equitable society in which every citizen has the opportunity to dream, learn, thrive, and contribute. NEP 2020 aims to create an education system where all of India's children get equal opportunity to learn and excel, regardless of circumstances of birth or background.

Existing inequalities create several roadblocks in the process of achieving inclusive and equitable education across all stages. Studies show that a large percentage of students who either drop out of school or discontinue their education after school belong to Socio-Economically Disadvantaged Groups (SEDGs). Many among these groups who manage to continue their education struggle to achieve appropriate learning outcomes due to a lack of adequate support, nutrition, access to learning resources, or various sorts of social and/or economic distress.

The commitment to inclusive education is an integral and important part of the design of this NCF. Schools must ensure that every student gets full opportunity and access to learn, and experience a sense of belonging. To ensure this, schools and the overall education system must take many actions. The curriculum must be truly equitable and inclusive in practice for all students.

> *Education is the single greatest tool for achieving social justice and equality. Inclusive and equitable education, while indeed an essential goal in its own right, is also critical to achieving an inclusive and equitable society in which every citizen has the opportunity to dream, thrive, and contribute to the nation. The education system must aim to benefit India's children so that no child loses any opportunity to learn and excel because of circumstances of birth or background. This policy reaffirms that bridging the social category gaps in access, participation, and learning outcomes in school education.*
>
> *[NEP 2020, 6.1]*

This chapter outlines the basic principles of inclusion and illustrates, some practices of inclusion that is appropriate in schools. This is followed by a section on practices appropriate for students with disabilities, and another section for students with special talents.

Section 4.1
Principles of Inclusion

The practices for inclusion in school education is driven by some fundamental principles. These are articulated below:

a. All education begins with the foundational principle that every child is capable of learning. Children learn best when they are respected, valued, and involved in the learning process.

b. Student success and failure are often determined by the nature of school culture and the learning environment.

c. Inclusion is an integral part of school culture that manifests in the relationships in school, organising of school processes, accessibility of resources, and fundamentals of classroom pedagogy and assessment. The School Principal is critical for setting the vision and culture, and ensuring its translation into practice.

d. There should be equitable and non-discriminatory access to both physical and curricular resources. Schools must make necessary infrastructure and learning resources available to help every student learn better, and this can happen with appropriate provisioning at the school level. For example, TLMs have to be reviewed for biases against any category of people or culture, and different aids for learning for students with visual, speech, or hearing impairment must be procured. Physical spaces too would require assessing with these disabilities in mind.

e. Schools should develop safe environments with credible mechanisms to ensure there is no discrimination, harassment, or bullying. Classrooms must be safe spaces for students to ask questions, make mistakes, and try out ideas.

f. Having adequate number of Teachers is necessary but not sufficient. Teachers need to be able to respond to the context such that principles of equity and inclusiveness are of the highest priority, this should be a fundamental ingredient of Teacher professional development.

g. All members of the school will need to be sensitised to the requirements of all students, the notions of inclusion and equity, and the respect and dignity of all persons. Aspects of the curriculum that emphasise equity and inclusion and the values that underlie this must be significantly strengthened.

h. Schools must engage with the local communities around them. An educational institution cannot meaningfully engage in its educational endeavour while being insulated from the communities around it.

i. This NCF is in consonance with the provisions of the Rights of Persons with Disabilities (RPWD) Act 2016, and endorses all its recommendations regarding school education. The Act clearly states that children with disabilities shall enjoy their rights equally with others.

j. These principles of inclusion are equally applicable for any and all students whose differences may require specific attention. While the sections below detail measures for students with disability and those with special talents, the principles must also be practised in schools and school systems for any other form of difference, for example, transgender students, temporary migrants, physical differences, amongst others.

Section 4.2
Illustrations of Inclusive Practices Across Stages

This section gives illustrations of appropriate practices based on the principles of inclusion stated in the previous section. Illustrations of inclusion are categorised in terms of physical infrastructure provision, language usage, safety measures adopted, use of Curricular Content, and Inclusive Pedagogy:

a. Physical access

i. There is barrier-free access into and inside the school for all.

ii. Toilets are well maintained, functional, safe, and suitable for all including people with disabilities, and there are separate toilets for boys and girls.

iii. Common spaces and common property on the school campus meant for students and teachers are equally accessible to all students and teachers without discrimination (e.g., furniture, stationery, plates used for meals, and glasses used for drinking water).

b. Language

i. There is extensive use of home language or familiar language in the classroom and in Curricular Material, especially at the Foundational and Preparatory Stages.

ii. All languages, including regional variations in accents and vocabulary, are given equal dignity and status.

iii. Indian Sign Language is used wherever necessary.

c. Safety

i. Students feel safe enough to take intellectual risks, make mistakes, experiment, and freely express their opinions without the anxiety of being ridiculed, reprimanded, or punished.

ii. Inequity on the basis of caste, gender, religion, socio-economic conditions, physical characteristics, or performance of students is not tolerated and actively discouraged.

iii. Bullying, harassing, intimidating, and use of derogatory or demeaning language with or by students is not tolerated.

iv. Threats or physical punishments are never used.

v. Confidentiality of sensitive information (regarding a student's background and circumstances) is maintained.

d. Curricular Material

i. All backgrounds, genders, and abilities are represented in a manner that upholds their dignity and empowers them.

ii. Special care is taken to avoid promotion of stereotypes.

iii. Experiences from the lives of all people and children from SEDGs are represented. NEP also recommends that curriculums should be free of all forms of bias and stereotypes and 'more material will be included that is relevant and relatable to all communities.'

iv. Images and illustrations also reiterate inclusion.

e. Pedagogy

i. Classroom processes are flexible and inclusive, and reflective of diverse needs.

ii. School timetable or calendar is adjusted to suit the needs of students, and the local community.

iii. There is heterogeneity in seating arrangement and fixed seating arrangements on the lines of background, gender, abilities, or performance are discouraged.

iv. Assessments use multiple modes to ensure that all students can meaningfully demonstrate their learning.

Section 4.3

Inclusive Practices for Students with Disabilities

To be truly inclusive, all schools must be prepared to give meaningful and effective educational opportunities for students with disabilities:

a. The RPWD Act 2016 defines inclusive education as a 'system of education wherein students with and without disabilities learn together and the system of Teaching and Learning is suitably adapted to meet the learning needs of different types of students with disabilities.'

b. Physical access for all students with disabilities is enabled through barrier-free structures as per the RPWD Act. Adequate attention must be paid to the safety and security of children with disabilities.

c. Early identification and early intervention for children with developmental delays, disabilities, and children at risk is a strong focus at the Foundational and Preparatory Stages.

d. Curricular and Pedagogical accommodations: The idea of accommodations is different from modifications. While modification is about altering or changing the difficulty levels of the content or the expectations of learning of the student, accommodation is about making changes to assist a student to work with the conditions of disability and be able to demonstrate their learning achievement on the same standards. With accommodations, neither what is being taught changes nor does the grading criteria for students with disabilities:

    i. **Illustrative content accommodations:** Use of bigger fonts of the printed material with adequate spacing, sharing printouts of summarised notes of the class, using assistive technologies (e.g., text-to-speech read aloud, speech-to-text software), repeated and reinforced ideas, and concepts in the TLM are important support mechanisms.

    ii. **Illustrative pedagogical accommodations:** Teaching strategies will require a Universal Design in their planning and structure for equitable access. This is an important accommodation that will help meet learning challenges that students face. Allowing students to use word processors with or without spellcheck (through the use of assistive devices to practise spelling, grammar, and computing), creating a system of peer support, and organising special educator support in the classroom whenever necessary would make for an inclusive pedagogy.

    iii. **Illustrative assessment accommodations:** This typically involves changing or reorganising the order of tasks or questions for assessment, making assessment question papers or worksheets with large font print for ease of reading, allowing extended time for completion, organising for a scribe or writer or reading assistant, allowing the use of word processing software on a computer, organising a distraction-free room, allowing for the use of a calculator or a tablet, permitting more frequent breaks in the course of the assessment, and providing alternative furniture.

    iv. **Assistive devices and appropriate technology-based tools,** as well as adequate and language-appropriate TLMs (e.g., textbooks in accessible formats, such as, in large print or Braille) are made available. This applies to all school activities, including art, sports, and vocational education. More details on aspects of using technology for students with disability is addressed in Part B, Chapter 6 on Educational Technology in Schools.

The core intention of accommodations is to ensure equity in learning opportunities in the classroom. This means enabling equal access for all students. It also means effectively assisting learning for students with specific learning needs because of disabilities of any kind that they may have.

Section 4.4
Inclusive Practices for Students with Special Talents

There are innate talents in every student, which must be discovered, nurtured, fostered, and developed. These talents may express themselves in the form of varying interests, dispositions, and capacities. Those students that show particularly strong interests and capacities in a given realm must be encouraged to pursue that realm beyond the general school curriculum. Teacher education will include methods for the recognition and fostering of such student talents and interests. The NCERT and NCTE will develop guidelines for the education of gifted children. B.Ed. programmes may also allow a specialisation in the education of gifted children.

[NEP 2020, 4.43]

The commitment to inclusion in schools also implies accounting for the educational needs of students with special talents. Identifying students with special talents is often easier when they excel in their academic performance in some subjects in the classroom than those who excel across the spectrum of Curricular Areas.

Special talents can independently exist in intellectual, creative, social, musical, and psychomotor domains. Care must be taken to identify special talents in students in all areas of the curriculum and to plan for enriching their learning in depth and breadth. This will ensure these students do not get frustrated and lost in the class, and that their enthusiasm and motivation to learn are maintained.

Some key considerations for the inclusion of students with special talents are as follows:

a. **Special attention and special support:** Contrary to popular belief, students with special talents may need special attention and support with their school learning experience, and cannot be left to their own devices. This may include using richer reading material, as well as assigning more challenging exercises.

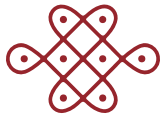
b. **Inclusion of students from across the socio-economic spectrum:** Students with special talents who come from economically-advantaged backgrounds tend to get better overall support than students from economically-disadvantaged backgrounds. Schools need to ensure equal opportunities for all students in this realm.

c. **Differences in behavioural traits:** These students are often reported to have certain social or emotional traits in common, including heightened sensitivity, emotional intensity and reactivity, perfectionism, and uneven development of intellectual and emotional capacities. Teachers and parents or families need adequate orientation to understand and deal with these needs.

d. **Rethinking pedagogy:** Teaching strategies or practices require review and redesign based on the degree and kind of special talents students display across the stages.

e. **Supportive and democratic school culture:** Peers and other adults in the school must also be oriented to support these students which requires the development of a school culture that values special talents while acknowledging other students' talents as well. Schools must guard against giving undue attention to students with special talents at the cost of others.

As stated in NEP 2020, a good educational institution is one where every student feels welcomed and cared for, a safe and stimulating learning environment exists, a wide range of learning experiences are offered, and good physical infrastructure and appropriate resources conducive to learning are available to all students. The fundamental principle that guides good education is that all children are capable of learning. Thus, equity and inclusion are the cornerstones of our education system.



Chapter 5

Guidance and Counselling in Schools

One of the key principles of good education also stated clearly in NEP 2020 is that care is central to learning. Care is demonstrated by detailed attention to the content, pedagogy, structure, and processes used in teaching and learning. It is visible in the way teachers and students interact with and amongst each other, the way tasks are constructed and organised, the physical accessibility of learning resources, the organisation of the timetable, the distribution of responsibilities, and the participation of students in a host of arrangements and actions that schools undertake for student learning.

In addition, individual students or cohorts of students may have particular needs which the school may meet through a system of Guidance and Counselling provided by the school.

Section 5.1
Defining Guidance and Counselling

Guidance can be broadly defined as the process of assisting individuals to enable themselves. It is a supportive engagement that enables a person to find direction for making their own decisions and take actions, all with the objective of moving towards personal well-being, and useful social participation. Often, it involves a trustful relationship where the person guiding is in some position of trustworthiness, seniority, or authority or is deemed insightful or knowledgeable.

Counselling as a process involves an individual consulting another for advice. Much like the process of guidance, it involves helping individuals understand and act upon their attitudes and decisions. Except that, here, this change-seeking aspect takes a more central feature, and often requires a skilful (and well-trained) individual to engage and challenge individual patterns of belief and behaviour.

In the school environment, Guidance and Counselling can be seen as paired activities and not separate ones. Here, it refers to the process of supporting the learning and maturation of students and not as a standalone or a separate part of the school curriculum. It must be seen as complementary to the overall curriculum. Another important point to note is that the school curriculum is almost wholly designed for student groups. The pointed focus of Guidance and Counselling is on an individual student's needs of learning, health, and well-being.

Having a system of Guidance and Counselling would also help teachers, parents, and administrators meet the academic and psycho-social well-being needs of different students, e.g., difficulties in learning, career and higher education choices, maturation-related issues (adolescence, autonomy, social cohesion), and mental health and well-being.

Section 5.2
Approach to Guidance and Counselling in Schools

In schools, Guidance and Counselling can be seen as supporting the attainment of educational aims. It contributes to creating an ethos of overall well-being, teaching individuals an ethic of care and mutual respect.

The scope of Guidance and Counselling support in schools may be seen as follows:

a. **Health and well-being for members of the school community:** Providing basic Guidance and Counselling to students, parents, and administrators in the context of the school community in the following areas:
    i. **Physical health and wellness:** This is one of the most crucial needs of growing up that requires careful addressing by schools. Designing programmes that contribute to good health and physical fitness for all students across the stages of their school life is a central goal.
    ii. **Psychological health and wellness:** With a primary focus on students, Guidance and Counselling work must teach strategies for emotional

regulation and positive motivation. While mild to moderate challenges with mental health can receive counselling support within the school, it would be necessary to direct students and families to more qualified professionals outside the school system for clinical diagnosis and support.

iii. **Social participation and cohesion:** This would involve teaching strategies for healthy adherence to social norms, expectations, and valuable social participation in the school. Schools would need to be equipped to meet the challenges of resistance, aggression, isolation, and bullying.

iv. **Cognitive health and growth:** Identifying students who are struggling to meet cognitive developmental milestones, advising their parents with supportive strategies, and planning for additional teaching support.

v. **Learning needs and diversity:** Identifying challenges of attention and learning, attending to challenges that arise from any disability in students, and creating Individualised Education Plans (IEPs).

b. **Academic and career counselling:** Helping students make choices across Stages of their school life whenever newer Curricular Areas are introduced, and also helping with making decisions about academic and career choices after the Secondary Stage.

c. **Providing support for administrative and systemic improvements:** Individuals involved in Guidance and Counselling support must also be consulted while making decisions about the school's functioning, policies, programmes, and activities. Enabling systemic improvements in schools such that these are cognizant of the diversity of learning needs and support required by all members of the school.

Section 5.3
Who Can Guide and Counsel in School

In formal and informal ways, School Teachers and School Principals have long been naturally vested with the responsibility of Guiding and Counselling students and families. These members of the school community are best placed to do this because of their continuous contact and connection with students.

Considering the ground realities of a vast majority of schools across the country, it is important and reasonable to acknowledge that school systems will have their limitations in addressing many challenges that come up concerning Guidance and Counselling. A successful plan for such support would require an understanding of what kinds of challenges Teachers and Principals can manage to address and the kinds of events or issues they cannot manage themselves but must direct to professionals outside the ambit of the school.

While Teachers and Principals will continue playing the role of Guides and Counsellors and should get basic capacity building in this regard so that they have the required skills and capacities, a professional or specialist at the cluster or school complex level must be appointed as soon as possible, as suggested by NEP-2020. Schools that have the resources, and access to professionals can simply take the lead and follow what NEP-2020 suggests.

Section 5.4
Expected Outcomes of Quality Guidance and Counselling

A good quality Guidance and Counselling support process in schools over time will ensure that the following outcomes are achieved:

a. Students are physically and mentally healthy as individuals and comfortably practise positive learning habits.

b. Students are retained in school and the number of school dropouts in all Stages of schooling is lowered significantly.

c. Students with diverse learning needs find equitable opportunities for support and growth.

d. Individual students are able to make good subject, vocational, and career choices based on the advice they receive during Guidance and Counselling.

e. Teachers and parents are able to meaningfully communicate and support student learning.

f. Administrative policies and practices keep students' achievement of knowledge, capacities, and values, and dispositions at the heart of all decision-making processes.

g. The school environment is experienced as safe, and all members of the school are protected.

h. The school environment is seen as a space that allows for creative expression.

i. The school year is well-planned, and designed with good-quality learning processes that demand rigour and discipline in students.

j. The school receives adequate support and respect from the local community.

Guidance and Counselling in school help students recognise and understand their own abilities, enhance their coping skills, promote better decision making, improve their relationships, and help them become self-directed in adapting to life and its challenges.

Chapter 6

Educational Technology in Schools

Technology is a broad term used for all types of tools, methods, and processes created by human beings to improve their lives. In this chapter, the reference is specific to Information and Communication Technology (ICT). Information and Communication Technology (ICT) is a wider term and encompasses in it 'Technology of Education' and 'Technology in Education'. Whereas the first term talks about human touch and human role, the second one talks about technology (machines, engineering, and industry) in the field of education which is popularly known as ICT. It includes a wide range of software and hardware tools and technologies, including devices, such as, computers and mobile phones, networks, such as, the Internet, and software applications. These technologies enable us to store, process, and access information in digital form. This information can be stored in both textual and audio-visual forms. These technologies have also enabled us to communicate information with each other effectively, efficiently, at scale, and at great distances. In the past few decades, ICT has transformed the way in which humanity engages with information.

> *While education will play a critical role in this transformation (India's transformation into a digitally empowered society and knowledge economy), technology itself will play an important role in the improvement of educational processes and outcomes; thus, the relationship between technology and education at all levels is bi-directional.*
>
> *[NEP 2020, 23.1]*

In this chapter, we will explore the potential of ICT in school education, the possibilities of its use, the precautions of use and abuse, and finally the principles of use of ICT in school contexts.

Section 6.1
Context of ICT in India

India is rapidly becoming a society where technology is part of everyday life. People use ICT for daily transactions such as payments, shopping, and communication. Farmers use technology to learn, and make decisions on farming practices. Various services, such as, finding work or finding a marriage partner are also offered through ICT.

Digital platforms are being used to learn new skills and hobbies, and even to clarify doubts. There is increasing use of technology in various shapes and forms by both children and adults alike. Technology tools evolve and will continue to do so, it grows integral to life, social interactions and transactions, communication, and livelihood. The adoption of technology is a bottom-up process, people adopt the tools that benefit them and will use technology if it serves their needs and matches their purpose.

The relationship between education and technology is 'bi-directional' in the sense that many innovations in the Information and Communications Technology (ICT) world have found effective application in education, and are making large differences. Similarly, education develops the capacities amongst our young that drives India's vibrant technology sector.

Technology evolves and changes every generation, as it has been witnessed with radio, television, computers, internet, mobile devices, and, more recently, Artificial Intelligence (AI) including generative AI. Introduction of technology by itself does not radically improve school education, unless it complements, supplements, and fundamentally supports the growth and learning of the teacher and students.

It is abundantly clear that no technology can fix fundamental problems of resource provision, teachers' capacities and motivation, and students' readiness for schooling. The centrality of the presence of a motivated and capable teacher in every classroom in achieving educational goals needs continued emphasis. However, with the availability and appropriate use of these technologies, the effectiveness of teachers and the experience of learners can be enhanced. Technology can be a significant enabler of improvement on multiple dimensions of the education system.

Box 6.1

Key Highlights of Recent Digital Education Initiatives

School closure due to the COVID-19 pandemic affected an estimated 286 million children (aged 3–18 years) in India. During closure of educational institutions, 'continuity of learning' was a key challenge, and now post-pandemic, the need to respond to 'learning loss' is the key challenge.

There were several ICT-based responses across the country. The key enablers that emerged for ubiquitous access across the country were Direct to Home (DTH) channels, such as, PMeVidya DTH TV channel, Swayam Prabha DTH channel, radio, community radio stations, podcasts, and tele-classes on local TV channels and podcasts. Almost every State or UT has shared experience of using these media during the pandemic.

Data-led decision making has been a key possibility at State level using data analytics through Control and Command Centre (CCC) for education for tracking and monitoring of learning and administrative tasks. The learnings are being tracked with a view to identify the gaps in Learning Outcomes (LOs) at the level of schools so that suitable remedial action can be taken. This initiative accrues benefits to all stakeholders from different perspectives, administrators, teachers, students, and parents.

For e-content, DIKSHA provides video lessons, worksheets, assignments and e-textbooks for school curriculum across Boards and in multiple languages. States or UTs took initiatives to make learning content accessible through YouTube Channels of SCERTs and toll-free call centres for students to clear their doubts in critical topics.

Several States distributed tablets or laptops or smartphones to teachers and students with preloaded content.

To enhance the teaching versatility and smooth visualisation of lesson content, a CRT TV is being converted into a smart class with lesson plans, teaching videos, assessments, and fun zones to make teaching easy and learning easier.

None of this takes away from the fact that inequitable access to technology is a real challenge, the digital divide is real. Not everyone can have access to the same technology. For instance, India has users of smartphones and feature phones, as well as, people who have no access to phones. When we are thinking of solutions and scale solutions in a digital world, this fact cannot be ignored.

Technology tools are 'good slaves,' but 'bad taskmasters', a balanced approach to the selection and use of tools needs to be taken, including respecting the digital rights of children. As we move towards becoming a more digitised society, data of individual actions, choices, and behaviours are generated and also perhaps more accessible. This data, when used to serve the user, is a convenience, but the same data can make the individual vulnerable. Technology tools need to be used with caution, especially around data in an increasingly digital society, and inappropriate usage in the Teaching-Learning processes.

6.1.1 Evolving and Emerging Technology

6.1.1.1 Artificial Intelligence, Machine Learning, Augmented Reality, Virtual Reality

The emergence of technologies such as Artificial Intelligence, Machine Learning, as well as big data analytics, and visualisation will definitely find innovative applications in the education domain. There are enormous possibilities to use emerging technologies, such as, Artificial Intelligence, Machine Learning and Data Science, as well as immersive (AR or VR or virtual labs), interactive, and gamified contents to improve the Teaching-Learning and Assessment processes, supporting teacher preparation and professional development, enhancing educational access, and streamlining educational planning, management, and administration. For this, an ecosystem of digital education needs to be created where teachers, students, parents, as well as administrators are well oriented about the appropriate use of technology while taking necessary safety and security measures.

These technologies being used and implemented without discerning their impact is a danger of adding to the digital divide. However, their potential to be used to enhance and support the capabilities of teachers and students should not be ignored. Teachers and students as users or contributors or beneficiaries of these technologies must be made aware of the inherent function of such technologies. At national, State, and school level, students must be made aware of these technologies, their role, and how to discern its use and impact on them. For example, Responsible AI for Youth (YUVAi) is a national programme for government schools to empower the young generation to become AI-ready. Established by the National e-Governance Division of MeitY, the platform aims to help students develop a new-age tech mindset and relevant skill sets.

6.1.1.2 Generative AI

The evolution of technology is not entirely predictable. However, in the foreseeable future, the growth of Artificial Intelligence, Machine Learning, and consequently generative and responsive AI appears inevitable. Irrespective of the nature of technology, the skill sets of Teachers and students to develop a basic understanding of how these technologies work, and therefore to channel these emerging and disruptive technologies in a manner that serves the need and helps the Teacher and student in the Indian context is critical.

Generative AI is a type of AI that creates original content by learning from existing data; it uses patterns and structure from existing data to produce new content. It can generate new text, images, or music without explicit programming. Some examples of generative and responsive AI are Chat GPT and Bard. However, these can be leveraged to create technology solutions, such as, TaraBot, on DIKSHA. They can be used to discover ideas, create innovative content, and enable exploration and problem solving across design, music, art, and storytelling.

In education, generative AI can be a valuable tool for teachers. It enables the creation of engaging educational materials, such as, interactive lessons, videos, and personalised exercises. It also aids in content generation in multiple languages promoting inclusivity.

However, caution must be exercised to ensure that the generated content aligns with the curriculum and avoids biases. By responsibly incorporating generative AI, teachers can enhance creativity and innovation in the classroom, offering unique learning experiences to students.

Generative AI has the potential to play a complementary role in learning by significantly reducing the time and effort involved in generating content: quizzes, lesson plans, learning materials, adaptive assessments, interactive simulations, and virtual environments for engaging learning.

However, it is important to note that generative AI is a rapidly evolving field, and there are ethical considerations and challenges associated with its use. Issues, such as, bias in generated content, data privacy, and validity and veracity of generated content are issues that have come up, and more are being discovered. Also, there may arise real challenges and disruptions in education by (mis)use of AI, including students and educators 'outsourcing' the most fundamental process of educational work of thinking to AI. This could be in the form of homework and assignments being done by AI, or lesson plans and content being developed entirely by AI. In the long term, such behaviour starts stunting the growth of the capacities outsourced, in this case, thinking, and this would be deeply damaging.

Only deeply thoughtful and well-researched integration of AI in the process of education will let us use its potential fully while not succumbing to its more serious risks. This must be one of the most important areas of research and attention for the entire education system, eliminating the risks of AI and using it to its fullest extent. At the time this NCF is being written, nothing more definitive can be said.

Section 6.2
Potential of ICT in School Education

Technology in education has the potential to play the role of a significant extension of human capabilities, and ways of making Teaching and Learning more effective. Here are a few scenarios to examine what technology can enable:

a. Can break down barriers and constraints. For example, the student is not limited only to classroom experiences. They can explore and access content beyond the constraints of the book, teacher, and the classroom.

b. Enables exploring worlds, ideas, and places beyond that which can be physically accessed. For example, a student or even the teacher may not have travelled to see a planetarium or a museum, but if a video or a link to an augmented reality experience can be provided, they would be able to explore any space in the world.

c. It does not discriminate by itself. For example, the user's ability or location does not matter to technology. Technology opens up access to people of different abilities. Video content with subtitles and supported by sign language is critical for the hearing impaired; similarly audio content is critical for the visually and print impaired. Text with audio would be a life changer for learners with learning disabilities.

d. It makes it possible to exercise choice, make connections, and find what they need and want to learn. For example, teachers undergo training programmes on predetermined topics; while this is useful, it can be supplemented by the Teacher accessing training on the web.

6.2.1 Access

This NCF has consistently mentioned learning should not be limited to what is presented in textbooks. ICT makes it possible for students and teachers to have access to a wide variety of content. With the spreading network access to the internet, and the ubiquity of digital devices that can connect to the internet, access to educationally valuable content has become more equitable and democratised, thereby enabling learning anytime and anywhere.

6.2.1.1 For Students

Direct access to digital content on the internet might not be appropriate for very young children. Access to digital content should be moderated and mediated, by adults in this case:

a. Students can be encouraged to access and engage with relevant digital material that complements and supplements the content in their curriculum, syllabus, textbooks, and other materials they are typically unable to access in their physical environment.

b. Students can use ICT to deepen understanding, learn at their own pace, engage with additional practice, and do self-assessments. More than anything else, ICT can be of immense value to discover and explore new areas and topics, and as is becoming common, to become creators and makers (for example, creating 'how to...' videos and demonstrations).

c. Students can utilise technologies, such as, peer forums and chatbots to clarify their doubts or just to ask a question through voice or text to clarify or develop understanding and satiate curiosity.

d. The agency to learn and find spaces for learning without fear or judgment can be enabled through ICT.

6.2.1.2 For Teachers

More than the students, it is for the teachers that the use of ICT becomes significantly enabling and empowering:

a. Teachers can use digital content available on the internet for complementing and supplementing the textbook material. Such content can enable different pedagogical approaches, as well as provide different forms of engagement through audio-visual material. Textbook chapters and Teachers' handbooks can embed appropriate QR codes, which guide them to relevant complementary and supplementary content.

b. Resources for suggested and illustrative lesson plans for specific content areas and textbook chapters aid the teachers in preparing for classroom instruction.

c. Well-designed Pedagogical Content Knowledge (PCK) packages for specific concepts can orient and prepare teachers conceptually for teaching.

d. Additional assessment tools and readily available worksheets can enable teachers to create formative assessments to understand the learning of the students.

e. More in-depth courses can allow teachers to deepen their perspectives of education as well as specific content areas. Teachers can enrol in these online courses and develop their capacities at their own pace and convenience.

f. Teachers can use tools that can simplify administrative tasks to unburden themselves.

6.2.2 Content Creation

ICT has not only eased access to content, but it has also enabled the creation of content. ICT has the potential to enable a wide variety of practitioners to create educationally valuable and relevant content:

a. Locally relevant content to be used in classrooms can be created with the assistance of ICT at the school cluster or complex level by Teachers and resource persons.

b. Teachers can create content dynamically, based on the specific needs of their classroom. They can access existing digital content and modify it to their specific needs.

c. ICT has made it possible for content to be created and presented in various forms. Videos, audio clippings, graphic simulations, and animated presentations, all these forms of content can now be easily created by a motivated and capable Teacher with the use of simple tools in ICT. These different forms allow for a variety in the content used in the Teaching-Learning process.

d. ICT also enables students to express themselves beyond a simple textual form. They can capture their educationally relevant understanding in various audio-visual forms for Teachers to assess.

e. With this NCF's emphasis on art, physical , and vocational education, it is not hard to imagine the central role played by digital content. Instructional videos would be far more effective than textbook chapters for these Curricular Areas.

f. Teachers can use generative AI technologies to create content that is localised to their contexts and specific to their immediate pedagogical needs.

6.2.3 Individual Attention

ICT can help teachers provide greater individual attention to students and to their specific needs:

a. ICT can enable the recording of the learning achievements of the students at a fine level of granularity. This information can assist the teacher in creating useful learning profiles for a subset of students in their care. These learning profiles can help teachers in creating individualised learning plans, which could also be developed with the aid of relevant technology solutions. The teacher is central to this process to assess if the plan is relevant and of use to their students.

b. Students can engage with personalised content through digital devices, moderated by the teacher in the classroom. ICT can assist in personalising this content by using the students' specific profiles, which includes their prior knowledge and preferences.

c. In higher grades, students can access digital content that explains the concepts in different languages and multimedia formats. Students can engage with these materials at their own pace. Thus, this facilitates the slow shifting of the responsibility of learning to the students and makes them independent learners.

d. Teachers too can receive individualised training plans to suit their needs and for improvements in areas of difficulty for them.

e. Technology can bridge gaps and enable independent learning to support the diverse needs of students with disabilities. Technological aids in the form of diverse tools for early detection and intervention will be needed. In addition, specially curated e-content to address the learning needs of students with disabilities should essentially follow Universal Design for Learning (UDL) principles and the end products should be available on audio, video, ISL, and other digital formats, such as, EPUB, flipbooks, interactive Digitally Accessible Information System (DAISY). Mobile applications can be used to cater to the specific needs of students with learning disabilities. Audio modes, such as, radio and audio books, and television for hearing impaired with subtitling and ISL can be leveraged for students with disabilities.

6.2.4 Interactive Content

The use of ICT allows for the possibility of dynami, and interactive content that a textbook cannot manage. Such use of ICT might be appropriate from the Middle Stage, where students engage with interactive content through digital devices.

a. In Curricular Areas, such as, Science and Mathematics, digital simulations can make engagement with concepts more hands-on and dynamic, thus improving conceptual understanding.

b. With advanced voice recognition and natural language processing techniques, ICT can assist in oral language development through interactive software.

c. Digital textbooks can have assessments embedded in them, and students can check their understanding immediately.

6.2.5 Teacher Empowerment: Emerging Innovative Pedagogical Practices and Skills

There are many pedagogic practices, strategies, and ideas that are being tried that have achieved various degrees of success. These include flipped classrooms, blended learning, personalised learning, game-based learning, edutainment, computer-assisted learning, and several others. All of these may be effective in some contexts and not so in other contexts. There is no method or use of technology that fits all.

Thus, preparation of teachers to engage with technology and make the best choices for their students and schools becomes a critical step in making effective use of ICT in classrooms. Capabilities of ICT can be used in such capacity building of teachers at scale. The PRAGYATA (Pragyata Guidelines, Government of India) guidelines for digital education articulates the kind of preparation necessary for teachers to be able to deliver digital education as being a twofold process.

a. The first is the requirement of teacher preparation for adopting digital technology for teaching their students more efficiently.

b. The second is to use digital medium to keep abreast of new development, in education for their own professional growth.

Teachers must be ready to harness the potential of digital technology to keep them professionally up to date. The teacher may:

c. Explore digital technologies, such as, LMS (Learning Management System), apps, web portals, digital labs, and repositories of Open Educational Resources (OERs) at national or State or global levels.

d. Attend webinars, online training programmes, online courses on ICT pedagogy and content integration.

e. Use appropriate technology for Teaching and Learning and conducting assessments.

f. Use digital resources embedded in Alternative Academic Calendars (AAC) developed by NCERT for different stages.

g. Be part of forums, interest groups, and online communities to interact with peers and know how the rest of the world is doing with digital education.

h. Get acquainted with copyrighted as well as Free and Open Source (FOSS) e-content and tools for learning. Teachers can be made aware to use open resources as everything on the Internet is not available for free download or sharing.

Section 6.3
Possible ICT Solutions for School Education

The above section broadly outlines the potential of ICT to have a positive impact on school education; this section explores various ideas and solutions that are in use, and may be envisaged. However, this is not by any means an exhaustive list of ideas or solutions, it is merely indicative. Technology will evolve and adapt as is its nature, the attempt is to provide a framework for Teachers, Educationists, and Administrators to think of and leverage these tools (and also what may come in the future) to suit the needs of learners. For instance, a policy framework for developing education technology is National Digital Education Architecture (NDEAR).

6.3.1 National Digital Education Architecture

To fully achieve the potential of ICT in enabling the vision of NEP 2020, NDEAR was launched in July 2021. 'The core idea of NDEAR is to facilitate achieving the goals laid out by NEP 2020, through a digital infrastructure for innovations by, through and in the education ecosystem.'

NDEAR is a blueprint for the future of education in India. It aims to create a unified national digital infrastructure that will enable the use of technology to improve educational outcomes for all students. NDEAR creates standards and principles for technology solutions in education. This will help teachers find and use solutions that help meet the learning needs of students. NDEAR will encourage an ecosystem of digital contributors who can develop and use technology in school education. It follows some

core principles for developing technology in a manner such that it enables open access, agency, and choice for users as well as diversity and inclusion. It endeavours to meet the special needs of students with disabilities.

The NDEAR addresses the following aspects of ICT in education:

a. **Core Interactions:** NDEAR identifies two core interactions in education, learning interactions and administrative interactions. Learning interactions are those that take place between students and teachers, while administrative interactions are those that take place between teachers and administrators.

b. **Scenarios:** NDEAR defines three scenarios for the use of technology in education, learn, help learn, and manage learn.
   i. *Learn* scenario refers to the use of technology to enable learning directly.
   ii. *Help learn* scenario refers to the use of technology to provide support to learners.
   iii. *Manage learn* scenario refers to the use of technology to help administrators manage the educational process.

c. **Key Personas:** NDEAR identifies five key person as: students (any learner), parents (any caregiver), teachers (anyone who is a teacher, formal or informal), administrators (anyone who can help manage), and community members (society in its widest term including market players).

   Digital resources for learning and for use by the five different person as have a very important role to play in leveraging technology in a manner that is contextual, and relevant to learners.

6.3.2 Digital Books and Libraries

Textbooks, stories, novels, articles, and non-fiction in various languages in digital form are very important resources for school education.

6.3.2.1 Relevance

Digital books would be relevant across all subjects including vocational training. One example is to address the issue of low literacy levels requiring more resources for the development of language. Digital resources can aid in more listening, reading, expansion of vocabulary, and meaning making. The class and home need to be print rich, but it is also essential to be print rich digitally and have access to diverse digital content in the form of stories, books for various levels of readers, audiobooks, read-along digital content, vocabulary builders, digital dictionaries, word games, video content and online courses in multiple languages, and have access to tools to get a sense of one's own learning level in language.

6.3.2.2 Benefits of Digital Books

a. **Overcomes physical barriers to access:** Many books can be accessed by the individual even if they do not have access to physical books in their local environment.

b. **Portable:** They can be accessed from anywhere, anytime, and across devices.

c. **Extendable:** Textbooks particularly can be extended, modified, and updated quickly when in digital form.

d. **Delays:** Delivery delays can be overcome.

e. **Inclusive:** Digital books lend themselves to accessibility, options to enlarge size of the font, change the page colour, use the read-aloud, and access the audiobook formats can be enabled.

6.3.2.3 Resources

There are several platforms, and resources available that enable access to digital books. NCERT has made all its textbooks available online across various platforms, such as, SWAYAM, DIKSHA, ePathshala. In addition, IIT Kharagpur has the national digital library platform. Several private publishers are enabling access to digital versions of their publications, be it fiction or non-fiction.

6.3.3 Videos, Animations, and Audio

Digital material in the form of videos, animations, and audio is useful to explain topics, and concepts, and demonstrate through 'how to…' for both students and teachers.

6.3.3.1 Relevance

Across all subjects and domains ranging from an explanation and demo video for teacher (and student) on 'How to teach or learn place value using sticks and stone' to watching a video on 'Force in action in a cricket game.' Videos and animations are excellent learning aids for both students and teachers. The creation of contextual content is as relevant as the consumption of content in the Teaching-Learning process. This form of digital content is particularly relevant for the Curricular Areas of art education, physical education and well-being, and vocational education.

6.3.3.2 Benefits

a. **Deepens understanding:** Helps understand the subject matter better by engaging multiple senses (seeing and hearing) of the learner and also enables visualisation of the topic or concept.

b. **Connection:** A video helps establish a human connection to the learning process unlike engaging only with text.

c. **Shareable:** The teacher can send a video to the parent via messaging, and students can share with each other.

d. **Independence:** Enables independent study by students, and this becomes relevant as the learner evolves across stages.

e. **Repeatability and pacing:** Videos also give teachers the opportunity to demonstrate an aspect or subject repeatedly. The student can go back to ideas and concepts they have not understood and watch and learn again: it helps a student 'personalise' their pace of learning.

f. **Builds on an existing habit:** Engagement with videos across various platforms is an integral part of evolving learning habits, be it watching a cooking video to learn how to make an unfamiliar dish or a Teacher watching a video on how to teach place value using sticks.

g. **Makes interdisciplinary learning easier:** A well-crafted video on the topic can connect domains of learning in shorter time periods and a more efficient way. For example, connecting topics of physics to playing cricket; cooking to chemistry; carpentry to math.

6.3.3.3 Resources

Creating and sharing these videos and animations are possible across several platforms. Television, OTT platforms, and radio (including community radio) can play a big role, imagine being able to watch a movie or listen to a play based on a story in the language textbook.

Platforms, such as, SWAYAM and DIKSHA are regarded as well-curated spaces for curriculum-linked content, in addition to several private platforms. Using the curation along with sourcing tools (such as VidyaDaan) available on these platforms, the quality of curriculum-linked content can be increased. The learning experiences from SWAYAM and DIKSHA can help evolve a body of knowledge of digital pedagogy which, in turn, can help craft a common set of guidelines that will enable the creation of better quality and relevant content.

6.3.4 Online Courses

These are micro-courses and courses with certification available online.

6.3.4.1 Relevance

This NCF will open up the need for training and capacity building of Teachers and Administrators across the country. A cascade approach or only an in-person method of training will not be sufficient. The NCF also focusses on new Curricular Areas, such as, Vocational Education and Interdisciplinary Areas. Neither students nor teachers should be limited by geographical barriers, language barriers, or any other constraints to develop skills or explore interests outside of the school framework. Digital courses with or without credentials can enable exploration and capacity development.

6.3.4.2 Benefits

a. Anytime, anywhere learning.

b. Choice of topics to learn and develop skills.

c. Digital credentials for both students and teachers enable them to build and showcase their abilities and body of knowledge.

d. Opportunities to revisit and relearn.

e. Micro-courses as a concept will provide just-in-time, bite-sized learning. For Teachers, 'How to teach mathematics connecting to day-to-day living?', 'How to conduct read-aloud with stories to make them engaging' and 'Tips on how to link sports and physics'. For students, 'How to make pots,' 'How to build a wooden table', 'How to build a biogas plant', 'How to compost organic waste', 'How to play a musical instrument', 'How to develop the skills to be a sportsperson', 'How to pursue a certain career, e.g., police official' are useful educational resources.

6.3.4.3 Resources

SWAYAM, DIKSHA, NISHTHA platforms, and several State training programmes will be available for skill development, capacity building, and issuance of verifiable credentials.

NCERT's and State SCERTs' experience in rolling out large-scale online training programmes are available to be leveraged to evolve digital pedagogy that will work for the context, scale, and constraints of India.

Sourcing content for specific demands from the wider ecosystem through NDEAR VidyaDaan would enable the ecosystem to contribute to the needs of these courses.

6.3.5 QR Codes and Other Technologies that Connect the Physical to Digital: Phygital

6.3.5.1 Relevance

Across all Curricular Areas, access to a wide range of digital resources is needed. These resources could be in the form of further explanation of content, demonstration videos, worksheets, teacher education courses and assessments. QR codes act as the access point to the wider array of resources starting from a familiar learning resource, either a textbook or any physical Teaching-Learning material.

6.3.5.2 Benefits

a. **Bridging:** Bridges the physical and digital Teaching-Learning environments. For example, in a multilingual classroom, children whose home language is not the MOI may need access to some basic translation of content in their home language. QR-coded textbooks that connect the student to the explanation of key terms of each chapter in different languages will help build vocabulary and better understanding.

b. **Extendibility:** QR codes on physical books make it possible to 'extend content' and supplement in a seamless way.

c. **Connection:** Due to the limitation of physical space on the materials, it is easier to make connections in the digital space the QR code can provide access to linked materials in the form of text, audio or video, or any other format.

d. **Inclusive:** Across all subjects and educational materials, QR codes or similar *phygital* technology can become the gateway to access diverse content relevant to different learners, making inclusive classrooms a reality. Audio added to books helps print-impaired learners similarly, ISL content can be made available through the same QR codes or similar *phygital* technology.

6.3.5.3 Resources

Digital infrastructure available in the form of NDEAR-compliant DIKSHA DIAL code (a registry of QR codes linked to topics), and content repository enables the generation of taxonomy-linked QR codes to be used on TLMs. In addition, content repositories, such as, DIKSHA or any other NDEAR-compliant content repositories can be leveraged to source content.

6.3.6 Virtual Labs and Simulations

ICT allows for democratising access to environments for experiential learning and makes scarce resources available for all through technology. Virtual Labs and simulations are examples of such access; however, these need to be used in conjunction with physical teaching methods. Access to some basic physical labs will enhance the ability of students to leverage Virtual Labs better.

6.3.6.1 Relevance

Practical application of concepts and the ability to conduct experiments in a virtual environment will deepen learning. While used more often in mathematics and the sciences, it can also be developed to teach languages, and other subjects.

6.3.6.2 Benefits

a. **Access anytime anywhere:** Students in remote locations get access to labs, and enable anytime anywhere learning for all.

b. **Quality:** Better quality of labs without being restricted to challenges of funding, procurement of materials, and equipment.

c. **Immersion:** Visual aids to teach complex theoretical topics, and concepts creates an immersive learning experience.

d. **Repeatability and flexibility:** Time and space to repeat experiments, and try new experiments without resource constraints.

e. **Feedback loops:** Faster feedback and learning loops where dependence on the Teacher may be reduced.

f. **Equitable:** As a shared common resource, Virtual Labs as a common infrastructure provide equitable access to a scarce resource and remove constraints that apply to setting up high-quality physical labs.

6.3.6.3 Resources

The Virtual Labs project of the Ministry of Education has participation from many institutes of repute from higher education. However, more labs need to be created with a focus on the requirements of school education. One example of such a programme is the Amrita Virtual Lab. There are many such virtual labs being developed and will evolve to meet the requirements of Teachers and Learners as technology evolves.

Leveraging open-source tools and adapting them to the Indian context, such as, the PhET Interactive Simulations project at the University of Colorado Boulder, creates free interactive math and science simulations. These are based on extensive education research and engage students through an intuitive, game-like environment where students learn through exploration, and discovery.

6.3.7 Content Creation Capabilities

ICT enables easy creation and sharing of educationally appropriate content for the local context, and ensures equity by enabling the creation of accessible content.

6.3.7.1 Relevance

a. Across Curricular Areas, there is a need for the creation and distribution of contextual local content. Teachers and administrators are routinely creating and curating TLMs. This capability is demonstrated through the digital habit of teachers creating video content and sharing their work through messenger services.

b. Ideas on how to create and generate local content should be made available to all DIETs and teachers across the country. The social science Curricular Area requires 20% of the content to be locally specific to that panchayat or district. Such content should be created and made available through NDEAR-compliant platforms such as DIKSHA.

c. Local content creation can be implemented as a decentralised process throughout the year and uploaded onto SWAYAM, DIKSHA, and other platforms, including local TV and radio, and made available to all teachers.

d. Micro-courses that guide content creation processes should be made available to teachers, and other content creators.

e. The NDEAR ecosystem should enable community members to create relevant content, particularly in the areas of Art and Vocational Education.

f. There is a need to ensure equitable access to accessible content that has been developed following Universal Design for Learning and made widely available.

6.3.7.2 Benefits

a. Enabling content creation and building local capabilities will ensure contextual content development.

b. Self-sufficiency in resource regeneration at various levels will result in a diversity of teaching and learning resources.

c. Nuances, such as, addressing learning gaps, and dealing with multilingual classrooms which are very specific, can be addressed.

d. Enabling personalisation and access to contextual, relevant content for diverse learners.

6.3.7.3 Resources

a. There are multiple digital content creation tools across a multitude of platforms for various purposes, and there are a wide variety content platforms. As formats of content have evolved, tools have been evolving, including AI tools.

b. For open and easy access, NDEAR guidelines should be followed by content creators.

c. DIKSHA provides the capability of multilingual content support and creation support at the local level.

d. NCERT guidelines for digital content creation and the creation of inclusive content are useful resources in this journey.

6.3.8 Assessments, Question Banks and Practice Materials

Easy access to a portfolio of assessment tools and question banks that address and test a range of skills (including conceptual understanding and provoke critical thinking and problem sets) enables teachers to use them appropriately in their classroom teaching.

6.3.8.1 Relevance

For achieving several competencies, repeated practice becomes a necessity. At the same time, this practice work should not be routined and mechanical. To create a set of worksheets that allows for in-depth practice and, at the same time, sustains the learners' interest is not an easy task. ICT can enable teachers to easily create appropriate practice tasks keeping in mind the learning levels of the students and their local contexts.

Teachers need question banks, and problem sets linked to the curriculum to be able to do formative assessments of their students. Students can take charge of their own learning if assessments are non-threatening quizzes.

Assessments and quizzes can be done in many ways, online at scale, online at a local level, and in an offline manner. Question banks and practice questions appropriate for different levels of learners will be required across subjects and languages. To accommodate student diversity, assessments in many forms are to be facilitated, e.g., paper-pencil tests, oral assessments, project work, and group assignments.

6.3.8.2 Benefits

a. Online assessments give teachers and administrators data instantly.

b. **Teacher aids:** Access to question banks to curate regular formative assessments will be a supportive teacher aid.

c. **Student aids:** Access to practice questions across levels and access to quizzes would be helpful to students to do independent practice.

d. Inclusion by levelling and enabling formats of assessments, curated levelling of questions in different languages and enabling various methods of assessment, oral, video, and project work would allow the assessments to be within the Zone of Proximal Development (ZPD) of the learners.

e. Digitisation of assessment responses can help determine gaps across regions, and necessary remedial action to be taken. This needs to be done at the class and school level but is also necessary for large-scale assessments and surveys.

6.3.8.3 Resources

Digital infrastructure may be leveraged to create question banks aligned to Competencies and Curricular Goals. Tools for assessments may be developed and, where appropriate, the quiz creation capability of DIKSHA can be leveraged or also sourced from various solution providers across the ecosystem via NDEAR. For example, NCERT has conducted several national-level quizzes on the DIKSHA platform for students. While this is not an assessment tool as such, the same infrastructure can be used by teachers at a school, district, or State level to generate short assessments and quizzes on a daily basis for their students.

Section 6.4
Precautions in the Use of ICT in School Education

a. **Safety:** Students in schools have not reached adult age. Safety is thus paramount in any decision related to technology use. While students can be physically protected within the boundaries of the school, allowing them to access the internet during school hours creates avoidable risks. It is the responsibility of the school to protect children from predatory and abusive behaviour often found on the internet.

   The effect of screen time and the use of digital devices on the well-being of young children is still not fully understood. This implies a cautious approach to the use of digital technology by students, at least till the end of the Preparatory Stage.

b. **Privacy:** It is the responsibility of the school to protect the privacy of students when they are expected to use ICT for educational purposes.

c. **Inappropriateness:** Controlling access to all content available on the internet is not an easy task. Even inadvertent access to inappropriate content can cause serious harm to young minds. Schools should be extremely mindful of this possibility, and access to the internet should be under adult supervision in schools. For students in the Secondary Stage, norms of behaviour in the digital world should be explicit as the norms of behaviour in the school.

d. **Distraction:** Several large-scale studies have shown that digital technology can be as much of a distraction as a useful tool for learning. Schools and Teachers should be very cognizant of this possibility. It should not be forgotten that the purpose of the use of ICT is for the achievement of Learning Standards and not for the general entertainment of students or teachers.

e. **Commercialisation:** In recent years, rampant commercialisation of educational content has resulted in very predatory practices of commercial interests. These profit-seeking enterprises have preyed upon the anxieties of parents and are promoting ICT-based educational solutions with doubtful efficacy.

f. **Deep Risks:** As mentioned in the section on AI, we are still discovering the risks of many technologies. For example, there is growing evidence of the mental health impact of social media on teenagers, and of its impact on attention spans on children, which then affects all aspects of education and life. Not using or experimenting with technology in education because of the apprehension of such deep risks would stop progress. At the same time, using technology at the core of how children develop and grow (education being one such key process) without addressing the deepest of such risks can profoundly alter human well-being. Rigorous research and very thoughtful use of technology is the only way forward.

Part C

School Subjects

The first chapter of this part is about the Foundational Stage (up to Grade 2) drawing the links of this NCF to the NCF-FS. The next eight chapters cover the subjects to be taught in schools from Grades 3 to 10, across all Curricular Areas, namely Languages, Mathematics and Computational Thinking, Science, Social Science, Art Education, Interdisciplinary Areas, Physical Education and Well-being, and Vocational Education.

Each subject chapter is organised with the details of its aims, nature, principles of the approach, and most crucially, the Learning Standards with Curricular Goals and Stage-wise Competencies to be achieved. Stage-wise pedagogical and assessment strategies have also been highlighted.

The last chapter of this part is about the second phase of the Secondary Stage, which outlines the design and curricular approach in Grades 11 and 12.

Chapter 1

Learning in the Foundational Stage

The Foundational Stage envisions an integrated approach to Early Childhood Care and Education for children between ages 3–8. This is the first Stage in the 5+3+3+4 curricular and pedagogical restructuring of school education as envisioned in NEP 2020. Children start schooling in this stage.

This chapter summarises the characteristics and importance of this Curricular Stage, along with the learning standards, suggested content, pedagogy, and assessment for this stage. The National Curriculum Framework for the Foundational Stage (NCF-FS) deals with all these in detail. For a better understanding of the curriculum for this stage, readers should refer to that.

Section 1.1
Introduction

1.1.1 Early Childhood

The first eight years of a child's life are truly critical and lay the foundation for lifelong well-being and overall growth and development across all dimensions: physical, cognitive, and socio-emotional.

The pace of brain development in the first eight years is more rapid than at any other stage of a person's life. Research in the field of neuroscience informs us that over 85 per cent of an individual's brain development occurs by the age of six, indicating the critical importance of appropriate care and stimulation in a child's early years to promote sustained and healthy brain development and growth.

The most current research also demonstrates that children under the age of eight tend not to follow linear, age-based educational trajectories. It is only around the age of eight that children begin to converge in their learning trajectories. Even after the age of eight, the non-linearity and varied pace continues to be their inherent characteristics of learning and development. However, up to the age of eight, the differences are so varied that it is effective to view the age of eight, on average, as a transition point from one stage of learning to another. In particular, it is only around the age of eight that children begin to adapt to more structured learning.

Early Childhood Care and Education (ECCE) is generally defined as the care and education of children during this period from birth to the age of eight years.

1.1.2 ECCE Primarily at Home: Ages 0–3

Up to three years of age, the environment in which most children grow up is their homes with families, though some children do go to creches. Up to the age of three years, the home environment is (and should remain) almost the sole provider of everything that constitutes and forms the basis for ECCE.

This includes not only children's health, safety, and nutrition, but also their cognitive and emotional care, and stimulation of the infant through talking, playing, moving, listening to music and sounds, and stimulating all the other senses, particularly sight and touch so that at the end of three years of the age, optimal developmental outcomes are attained in various development domains, including physical and motor, socio-emotional, cognitive, communication, and emergent literacy and numeracy. It must be noted that these domains are overlapping and indeed deeply interdependent.

The guidelines and/or suggested practices to enable high-quality ECCE at home for ages 0–3 will be developed and disseminated by the Ministry of Women and Child Development (MWCD).

1.1.3 ECCE in Institutional Settings: Ages 3–8

After the age of three, a large proportion of children spend significant time in institutional settings. Hence, during the ages of 3–8, appropriate and high-quality ECCE provided in institutional environments must be available to all children.

From ages 3–8, ECCE includes continued attention to health, safety, care, and nutrition, as well as, self-help skills, motor skills, hygiene, the handling of separation anxiety, physical development through movement and exercise, expressing and communicating thoughts and feelings to parents and others, being comfortable around one's peers, sitting for long periods of time in order to work on and complete a task, ethical development, and forming all-round good habits.

It is important during this age range to nurture and develop the child's innate abilities and capacities of curiosity, creativity, critical thinking, cooperation, teamwork, social interaction, empathy, compassion, inclusiveness, communication, cultural appreciation, playfulness, and awareness of the immediate environment, along with the ability to interact with teachers, fellow students, and others successfully and respectfully.

ECCE during these years also entails the development of early literacy and numeracy, including learning about the alphabet, languages, numbers, counting, colours, shapes, drawing or painting, indoor and outdoor play, puzzles and logical thinking, art, craft, music, and movement. This becomes particularly important during the ages 6–8, forming the basis for the achievement of Foundational Literacy and Numeracy (FLN). The importance of FLN to overall education is well-understood and has been emphasised in NEP 2020.

Section 1.2
Foundational Stage

1.2.1 Aims

Considering all the above, NEP 2020 has articulated the Foundational Stage as a single curricular and pedagogical phase which comprises five years of flexible, multilevel, play and activity-based learning for children between ages 3–8 years.

Due to the critical importance of the Foundational Stage for the development of an individual, and for the long-term benefit to the society as a whole, NEP 2020 articulates a clear goal that every child, in the age group of 3–8 years, must have access to free, safe, high quality, and developmentally-appropriate ECCE by the year 2025.

Regardless of the circumstances of birth or background, quality ECCE enables children to participate and flourish in the educational system throughout their lives. ECCE is thus perhaps one of the greatest and most powerful equalisers. High-quality ECCE in the Foundational Stage gives the best chance for all children to grow into good, ethical, thoughtful, creative, empathetic, and productive human beings.

NEP 2020 specifically calls for the attainment of optional outcomes by all children in the domains of physical and motor development, cognitive development, socio-emotional and ethical development, cultural or artistic development, development of communication and early language, and literacy and numeracy.

1.2.2 Current State: Challenges

In India, where ECCE is available in institutional settings for ages 3–8, it is typically carried out as follows:

3–6 years: Early childhood education programmes in *Anganwadi, Balvatika*, or preschools.
6–8 years: Early primary education programmes in school (Grades 1 and 2).

ECCE has evolved significantly over the past several decades. While early childhood has always had a special cultural and social place in India, it has gained greater focus in education systems and policies over the years. The Integrated Child Development Scheme (ICDS) launched in 1975, the National Education Policy (NEP) in 1986, the National Early Childhood Care and Education Policy (ECCE) in 2013, National Curriculum Framework (NCF) for Early Childhood Care and Education in 2014 have all been significant milestones. In 2019, the NCERT developed a Preschool Curriculum for three years of preschool education along with the Guidelines for Preschool Education.

Despite the progress and the great potential, challenges exist:

a. Many children directly enrol or enter Grade 1 with limited experience due to a lack of suitable preschool options, especially among disadvantaged groups.
b. Due to deficiencies in supplies, infrastructure, and trained teachers in ECCE, *Anganwadi* generally focus less on the educational aspects of ECCE.
c. Low enrolment and attendance remain significant challenges, even with the implementation of the ICDS scheme.
d. Out of the total number of sanctioned posts in *Anganwadi*, 5 per cent are vacant, and for the posts for *Anganwadi* helpers, 7 per cent are vacant.
e. The private preschool sector remains largely unregulated despite the National ECCE Policy (2013). In the private sector, some preschools have better infrastructure and learning resources, but often prioritise formal teaching and rote memorisation, with high Pupil-Teacher Ratios and limited play-based and activity-based learning.
f. The number of teacher education institutions offering programmes preparing teachers for preschool is extremely low, with the North-Eastern States having none.
g. While India has made progress in key nutritional indicators for children, significant challenges still persist, including high rates of chronic under nutrition, acute under nutrition, and underweight children under the age of five, which impact their holistic development in the short and long term.
h. Moreover, there has been inadequate focus on the achievement of educational outcomes in ECCE institutions, which tends to cumulate through later school years.
i. Most children lack readiness competencies when they join school. The challenges during ages 6–8, pedagogical, curricular, systemic, and more, are the key roots of India's educational challenges.

Section 1.3
Learning Standards

There has been a long tradition of inquiry both in India, and in other cultures into the various domains of development that have been observed in young children that are both natural and desirable. The *Panchakosha* concept in the *Taittiriya Upanishad* is one of the earliest articulations of the different domains of development of the human being.

These descriptions remain relevant along with the more modern understanding that has emerged through Developmental Biology, Psychology, and Cognitive Neurosciences.

Physical Development or *Annamaya Kosha* and *Pranamaya Kosha* understood together include bodily awareness and embodied learning through active engagement of all sensorial perceptions.

Emotional and spiritual development or the *Manomaya Kosha* involves becoming aware of and skilfully regulating our emotions. The domain of Socio-emotional and Ethical Development thus emerges as an important domain of development both from the Indian traditions and current research.

The development of the intellect or *Vijnanamaya Kosha* is emphasised to engage meaningfully with the cognitive and conscious aspects of human experience. The domain of Cognitive Development captures this aspect of development.

Anandamaya Kosha or experience of transcendence is best addressed for this age group through art and culture. Thus, including the domain of Aesthetic and Cultural Development makes the educational experience holistic and complete.

NEP 2020 has emphasised on Foundational Literacy and Numeracy as an 'urgent and necessary prerequisite to learning.' This emphasis has been realised by giving special attention to Foundational Literacy through the domain of Language and Literacy Development and Foundational Numeracy through the domain of Cognitive Development.

Finally, the Foundational Stage is also seen as setting the foundations for formal schooling. The development of Positive Learning Habits that are more appropriate for a formal school environment becomes another important Curricular Goal for this stage.
Thus, the Curricular Goals for the Foundational Stage have been derived by giving equal consideration to the vision and details of NEP 2020, and the domains of development.

Section 1.4
Curricular Goals and Competencies

The Curricular Goals for the Foundational Stage and the Competencies against each of the Curricular Goals have been outlined in this section. Curricular Goals have been numbered as CG-1, CG-2 and so on, while Competencies have been numbered as C-1.1, C-1.2 and so on.

Domain: Physical Development

Table 1.1i

CG-1 Develops habits that keep them healthy and safe	C-1.1	Shows a liking for and understanding of nutritious food and does not waste food
	C-1.2	Practises basic self-care and hygiene
	C-1.3	Keeps school/classroom hygienic and organised
	C-1.4	Practises safe use of material and simple tools
	C-1.5	Shows awareness of safety in movements (e.g., walking, running, cycling, etc.) and acts appropriately
	C-1.6	Understands unsafe situations and asks for help

CG-2 Develops sharpness in sensorial perceptions	C-2.1	Differentiates between shapes, colours, and their shades
	C-2.2	Develops visual memory for symbols and representations
	C-2.3	Differentiates sounds and sound patterns by their pitch, volume, and tempo
	C-2.4	Differentiates multiple smells and tastes
	C-2.5	Develops discrimination in the sense of touch
	C-2.6	Begins integrating sensorial perceptions to get a holistic awareness of their experiences
CG-3 Develops a fit and flexible body	C-3.1	Shows coordination between sensorial perceptions and body movements in various activities
	C-3.2	Shows balance, coordination, and flexibility in various physical activities
	C-3.3	Shows precision and control in working with hands and fingers
	C-3.4	Shows strength and endurance in carrying, walking, and running

Domain: Socio-Emotional and Ethical Development

Table 1.1ii

CG-4 Develops emotional intelligence, i.e., the ability to understand and manage their own emotions, and responds positively to social norms	C-4.1	Starts recognising 'self' as an individual belonging to a family and community
	C-4.2	Recognises different emotions and makes deliberate efforts to regulate them appropriately
	C-4.3	Interacts comfortably with other children and adults
	C-4.4	Shows cooperative behaviour with other children
	C-4.5	Understands and responds positively to social norms in the classroom and school
	C-4.6	Shows kindness and helpfulness to others (including animals, and plants) when they are in need
	C-4.7	Understands and responds positively to different thoughts, preferences, and emotional needs of other children
CG-5 Develops a positive attitude towards productive work and service or *'Seva'*	C-5.1	Engages in age-appropriate work at school and/or at home
CG-6 Develops a positive regard for the natural environment around them	C-6.1	Shows care for and joy in engaging with all life forms

Domain: Cognitive Development

Table 1.1iii

CG-7 Makes sense of the world around through observation and logical thinking	C-7.1	Observes and understands different categories of objects and the relationships between them
	C-7.2	Observes and understands cause and effect relationships in nature by forming simple hypotheses and uses observations to explain their hypotheses
	C-7.3	Uses appropriate tools and technology in daily life situations and for learning
CG-8 Develops mathematical understanding and abilities to recognise the world through quantities, shapes, and measures	C-8.1	Sorts objects into groups and sub-groups based on more than one property
	C-8.2	Identifies and implements simple patterns in their surroundings, shapes, and numbers
	C-8.3	Counts up to 99 both forwards and backwards, and in groups of 5s, 10s, and 20s
	C-8.4	Arranges numbers up to 99 in ascending and descending order
	C-8.5	Recognises and uses numerals to represent quantities up to 99 with the understanding of decimal place value system
	C-8.6	Performs addition and subtraction of 2-digit numbers fluently, using flexible strategies of composition and decomposition of both numerical and word problems
	C-8.7	Recognises multiplication as repeated addition and division as equal sharing
	C-8.8	Recognises, makes, and classifies basic geometric shapes, and their observable properties, and understands and explains the relative relation of objects in space
	C-8.9	Selects appropriate tools and units to perform simple measurements of length, weight, and volume of objects in their immediate environment
	C-8.10	Performs simple measurements of time in minutes, hours, days, weeks, and months
	C-8.11	Performs simple transactions using money up to INR 100
	C-8.12	Develops adequate and appropriate vocabulary for comprehending and expressing concepts and procedures related to quantities, shapes, space, and measurements
	C-8.13	Formulates and solves simple mathematical problems related to quantities, shapes, space, and measurements
	C-8.14	Feels confident and sees Mathematics as doable and worthwhile

Domain: Language and Literacy Development

Table 1.1iv

CG-9 Develops effective communication skills for day-to-day interactions in two languages[1]	C-9.1	Listens to and appreciates simple songs, rhymes, and poems
	C-9.2	Creates simple songs and poems on their own
	C-9.3	Converses fluently and can hold a meaningful conversation
	C-9.4	Understands oral instructions for a complex task and gives clear oral instructions for the same to others
	C-9.5	Comprehends narrated or read-out stories and identifies characters, storyline, and what the author wants to say
	C-9.6	Narrates short stories with clear plot and characters
	C-9.7	Knows and uses enough words to carry out day-to-day interactions effectively and can guess the meaning of new words by using existing vocabulary
CG-10 Develops fluency in reading and writing in Language 1	C-10.1	Develops phonological awareness and blends phonemes or syllables into words and segment words into phonemes or syllables
	C-10.2	Understands the basic structure or format of a book, idea of words in print and direction in which they are printed, and recognises basic punctuation marks
	C-10.3	Recognises all the letters of the alphabet (forms of *Akshar*) of the script, and uses this knowledge to read and write words
	C-10.4	Reads stories and passages with accuracy and fluency, with appropriate pauses and voice modulation
	C-10.5	Reads short stories and comprehends their meaning by identifying characters, storyline and what the author wants to say on their own
	C-10.6	Reads short poems and begins to appreciate a poem for its choice of words and imagination
	C-10.7	Reads and comprehends the meaning of short news items, instructions and recipes, and publicity material
	C-10.8	Writes a paragraph to express their understanding and experiences
	C-10.9	Shows interest in picking up and reading a variety of children's books
CG-11 Begins to read and write in Language 2	C-11.1	Develops phonological awareness and is able to blend phonemes or syllables into words and segment words into phonemes or syllables
	C-11.2	Recognises most frequently occurring letters of the alphabet (forms of *Akshar*) of the script and uses this knowledge to read and write simple words and sentences

[1] *This should be the goal for most classrooms given the need for multilingualism, but in circumstances where Language 2 is very unfamiliar to the children, many of the Competencies (from C-9.1 to C-9.7) can be in the emergent stage for Language 2 by the end of the Foundational Stage and consolidated in the early Preparatory Stage.*

Domain: Aesthetic and Cultural Development

Table 1.1v

CG-12 Develops abilities and sensibilities in Visual and performing Arts and expresses their emotions through art in meaningful and joyful ways	C-12.1	Explores and plays with a variety of materials and tools to create two-dimensional and three-dimensional artworks in varying sizes
	C-12.2	Explores and plays with their own voice, body, space, and a variety of objects to create music, role-play, dance, and movement
	C-12.3	Innovates and works imaginatively to express a range of ideas and emotions through the Arts
	C-12.4	Works collaboratively in the Arts
	C-12.5	Communicates and appreciates a variety of responses while creating and experiencing different forms of art, local culture, and heritage

Positive Learning Habits

Table 1.1vi

CG-13 Develops habits of learning that allows them to engage actively in formal learning environments such as a school classroom	C-13.1	Attention and intentional action: Acquire skills to plan, focus attention, and direct activities to achieve specific goals
	C-13.2	Memory and mental flexibility: Develop adequate working memory, mental flexibility (to sustain or shift attention appropriately), and self-control (to resist impulsive actions or responses) that would assist them in learning in structured environments
	C-13.3	Observation, wonder, curiosity, and exploration: Observes minute details of objects, wonders, and explores using various senses, tinkers with objects, asks questions
	C-13.4	Classroom norms: Adopts and follows norms with agency and understanding

Section 1.5
Pedagogy

Children are natural learners. They are active, eager to learn, and respond with interest to new things. They have an innate sense of curiosity, they wonder, question, explore, try out, and discover to make sense of the world. By acting on their curiosity, they continue to discover and learn more.

Children learn best through play, activity and experiencing. They like to run, jump, crawl, and balance, they enjoy repetition, respond spontaneously to rhythm, talk, ask, reason, and answer questions posed to them. They learn through first-hand experiences involving manipulation, exploration, and experimentation.

Engaging with materials, ideas, thoughts, and feelings during play helps in developing children's creativity, flexible thinking, and problem-solving abilities, and enhances their concentration, attention, and perseverance. Children also improve their thinking,

vocabulary, imagination, speaking, and listening skills through play, whether they are reconstructing real situations or creating imaginary worlds.

Learning at this stage is, therefore, an active and interactive process in which children learn through play, and interacting with other children and more experienced people. Children are actively engaged in their social and cultural experiences, they constantly adjust and use new information to make sense of their perceptions along with their experiences.

Children's playfulness can be nurtured and strengthened through experiences of active participation with others, and with natural, real-world materials that provoke and enhance learning, imagination, creativity, innovation, and problem-solving in diverse and unique ways.

It is vital that the learning of children at this stage be anchored by nurturing relationships with those around them. These relationships help children feel safe, and become more optimistic, curious, and communicative.

1.5.1 Building a Positive Relationship between Teachers and Children

When we walk into our classrooms, we see wide-eyed children who are bright, quick to observe, and are interested in everything around them. They constantly ask questions. Sometimes they can quietly observe something for a long time. At other times, they lose interest in a matter of minutes. Sometimes they need to jump and move around. At other times, they enjoy a quiet story. Sometimes they cry and clamour to go home. At the same time, they like to be comforted and cajoled, and are willing to be convinced to stay back. They can be curious, considerate, delightful, determined, affectionate, adventurous, funny, and fearless.

At this stage, for many children, it could also be their first experience of spending several hours away from their homes. Children require tenderness, nurturing and love. Working with them, being with them, and caring for them means enjoying all the different personalities that they have. Teachers need to be warm and genuine, patient and calm, understanding and empathetic. We need to give our children unhurried time and attention. Children must feel that they belong, that they can trust, and they are free to try out and explore and, therefore, learn better.

It is our job as teachers to ensure that children settle and enjoy their time at school. A safe and positive relationship between teacher and a child is enriching for emotional and cognitive development. To build such a relationship, teachers should get to know each child individually, listen to them, observe them, encourage their intuitional responses, recognise, and respond to their moods, and visit their homes regularly.

1.5.2 Learning through Play

Play is a child's work. Play, by its very nature, is something young children like to do and actively engage in. We can say that play and learning are two-way reciprocal processes. Play enables learning by allowing children to remain active, engaged, and involved in social interaction with other adults and children, thus meeting all the necessary conditions for learning to occur.

In this active playing process, children are learning to make sense of the world, solve problems, about themselves, and others, Language and Mathematics. Choice, wonder, and joy are key aspects of children's play, and our classrooms would do well to be organised around these three aspects. The play unfolds in the classroom when teachers use conversations, stories, toys, music, movement, art, craft, and games. All these can be free, guided or structured.

1.5.2.1 Conversations

Language is the medium through which children talk to themselves and to others, and it is with words that they begin to construct and get a grip on their reality. The ability to understand and use language clearly and cogently is essential for learning.

Conversations are very important for children's ability to connect with people and things around them. Continuous conversations with children in the classroom help build relationships based on trust.

Teachers can engage with children through free conversations, where children can sit with the teachers and discuss any interesting things that have occurred throughout the day, on their way to school or anything they wish to share. In structured conversations, the teachers can plan and organise a session in the morning hour where they talk and think through a topic together. Topics may be about children's daily life and happenings, and their feelings.

1.5.2.2 Storytelling

Stories are a particularly good medium for learning about social relationships, ethical choices, understanding and experiencing emotions, and becoming aware of life skills. While listening to stories, children learn new words, thus expanding their vocabulary, sentence structure, and problem-solving skills. Children with very short attention spans concentrate for a longer time when engrossed in a story. Through culturally contextual stories, we can acquaint children with their culture and social norms and create awareness about their surroundings.

Teachers can use picture books, story books with or without pictures, or story books in multiple languages. Flash cards that have story scenes drawn or printed on them can also be used to tell stories.

Besides listening to stories, children must also have the opportunity to tell stories. Stories told by children can be the same ones they have heard or something they have created. The teacher can begin to tell a story and ask the children to complete it.

1.5.2.3 Toy-based Learning

Young children learn from first-hand experiences and working with actual objects, and then they try out, explore, and learn. The classroom environment should cultivate this spirit of exploration through play with toys and manipulatives.

Many local toys are available in every child's surroundings. These should be used as important resources for teaching and learning. Whether a toy is simple or complex, it has a lesson for the child to learn. When a child holds a toy and manipulates it, he or she is practising motor skills and strengthening hand-eye coordination.

When a child builds a tower with blocks and eventually watches it fall to the ground, he or she learns concepts and thinks about a solution to stop the fall. A puzzle helps a

child explore patterns. When children use blocks, dolls, animal toys, balls, mini-cars or pretend toys, they start creating stories and living out scenarios in their minds. Board games teach children to follow simple rules and enhance their understanding of Language and Mathematics.

Toys can also be made from readily available items, such as, fabric, bottles, cardboard boxes, yarn, cooking pans, bangles, pipe cleaners and pinecones.

NCERT's Handbook on Toy-Based Pedagogy is an excellent guide for this.

1.5.2.4 Songs and Rhymes

Children love singing songs and rhymes, and dancing to music. Songs are also a wonderful means of learning language. Children understand different concepts through songs and their vocabulary also expands. Physical movements accompanying the songs enhance gross and fine motor movements, and body movements and gestures help children understand concepts. Songs promote interaction among children and lead to cooperation.

Local context-specific songs and rhymes are another good way to increase vocabulary, imagination and expression. Songs in different languages provide children with the ability to infer and make connections between common and different words in a language. Most of us in India are multilingual, and it is important that the songs and rhymes promote children's ability to remain multilingual.

The teacher could select a few rhymes or songs in two or three local languages, practise them and sing with children. Grandparents, parents, and community members can be wonderful resources for this.

1.5.2.5 Music and Movement

Music is joy. Music is also a strong stimulant for brain development and the formation of synaptic connections. So, following the rhythm, playing simple musical instruments, and singing should be encouraged. Body movements can accompany claps, or rhythm played on a tin box, or a *Khanjira* (tambourine) or *Manjira* (cymbals).

Music and movement activities can also be done in different ways. Children could quietly listen to instrumental music, dance freely to rhythm or make body movements accompanied by rhythm. A range of instruments, which are either local, homemade or purchased, should be made available to children for first-hand experiences in sound exploration and music-making.

Teachers could include a variety of music, dances, sound sources, rhymes, chants and songs with different moods, contexts, and languages for children to listen to and perform in the classroom. Dancing, singing, rhymes, folk songs, action songs, and finger movements provide opportunities for children to learn musical concepts.

1.5.2.6 Art and Craft

Children enjoy playing with colours and creating something that is of interest to them. Art and craft provide another medium for children to express their ideas, emotions, and feelings.

Teachers can encourage children to draw using paper, and crayons, sketch pens, coloured or black pencils or charcoal. Children can also draw on slates, blackboards or floors; every corner of the classroom can be utilised. Similarly, painting, pasting, and clay moulding are great ways to engage children. All these should be open-ended, with minimal direction from the teacher. Notions of 'right' and 'wrong', 'good' and 'bad' in

terms of artistic expression must be avoided. Instead, different viewpoints, experiences, expressions, and imaginations should be encouraged and celebrated. Children need to be encouraged to discover their own methods and techniques of using instruments and materials within each art discipline, in addition to conventionally accepted methods. Children not only need to observe their surroundings visually, but also become keen observers of their own thoughts, feelings, emotions, expressions, actions, and overall behaviour. The teacher should ensure that the art classroom is always an inclusive environment.

1.5.2.7 Indoor Games

Just as exercising the body is important to keep it fit and healthy, so too is exercising the mind. Games of strategy, logic and word puzzles, and recreational Mathematics are the best way to excite children about Mathematics and to develop the logical skills that are so critical throughout their school years and indeed throughout life.

Jigsaw puzzles, playing with blocks, and solving mazes help to develop a child's spatial reasoning. Different games of strategy (e.g., tic-tac-toe, and leading up to deeper games, such as, chess) develop strategic thinking and problem-solving skills.

Playing games (e.g., *Chaupad,* Snakes and Ladders*,* Ludo, etc.) is fun, it also teaches counting, strategy, collaboration, healthy competition, and bonding with peers. Word and logic puzzles are another fun way to teach deductive reasoning. Simple puzzles such as those in the box above help develop children's skills of logical and creative thinking in an enjoyable manner. The puzzles can get more challenging, and incorporate arithmetic and other elements as children get older. Arithmetic puzzles and games can help develop a comfort with numbers and develop quantitative reasoning.

Making learning enjoyable through fun exercises, games, and puzzles can be a key aspect in ensuring that children stay engaged and, at the same time, develop mental capacity and creativity.

1.5.2.8 Outdoor Games

Children in their early years cannot sit in one place for a long period of time, and they need to move around. Playing outside gives them a chance to explore the natural environment, test their physical limits, express themselves, and build self-confidence. Most importantly, it helps to build gross motor skills, physical fitness, and balance. Children enjoy the space, the freedom to run and jump, to climb, kick and fall. Playing outside also helps many children relax and calm down.

1.5.2.9 Spending Time in Nature

Children are naturally curious and need opportunities to explore, experiment, manipulate, create, and learn about the world around them. Children start exploring their environment through their senses by scanning their environment, touching, holding, and handling whatever they see, listening to and responding to sounds, music, and rhythm, and getting excited by unusual noises.

Children's thinking evolves as they construct an understanding of people, objects, and real-life situations through first-hand experiences. Children bring their own ideas, interests, and beliefs based on their own experiences and contexts as well as their own abilities.

Teachers and families must provide opportunities to children to explore the world around them, experiment and discover, compare, ask questions, make close observations,

think, and talk about their observations and predictions. Through this process, they are facilitated in satisfying their curiosities and make more discoveries. Sustaining children's natural curiosity to explore the world through first-hand experiences at home and in school lays the foundation for learning.

Spending time with plants and trees and birds and animals or just being quiet around nature can develop the basis for Lifestyle for Environment (LiFE).

1.5.2.10 Field Trips

Small, local field trips as part of the learning process reinforce the knowledge the children have gained in the classroom, push them to ask more questions, and build further connections with things that they already know. Children also learn to manage themselves and to be with others through these experiences.

The local vegetable market, doctor's clinic, bus depot, post office, and police station could all introduce children to an unfamiliar but interesting world, teaching them many new things.

1.5.3 Strategies for Literacy and Numeracy

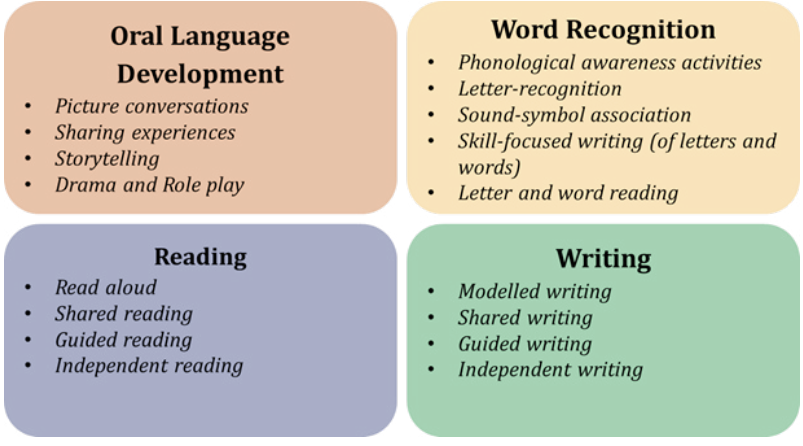
A significant component of structured learning should be added for literacy and numeracy, especially for Grades 1 and 2. It is important to ensure that the curriculum for children of ages 3–6 onwards must be planned in a way that builds on children's capacities of that particular age and leads to formal learning instead of a downward extension of the curriculum from Grade 1.

i. Classroom Strategies for Literacy

The teaching of language and literacy should provide children with ample opportunities to explore themselves as readers and writers, along with providing a balance of learning 'lower-order' skills (e.g., phonological awareness, decoding, writing letters and words correctly) and 'higher-order' skills (e.g., oral language development, engaging with books, drawing, and original writing) which are meaning-focussed.

There are four major components in language and literacy instruction: oral language, word recognition, reading, and writing. While activities for the four blocks may be implemented in an integrated manner, it is important that children spend time working on each of the blocks on a regular basis.

Figure 1.1i



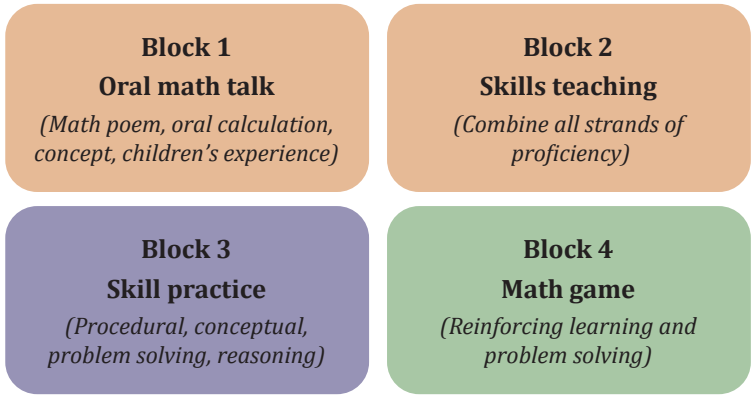
Part C

ii. Classroom Strategies for Numeracy

Learning goals for Mathematics can be categorised into higher goals such as mathematisation of a child's thought processes (e.g., ability to handle abstract thinking, problem-solving, visualisation, representation, reasoning, and making connections of Mathematics concepts with other domains) and content-specific goals (those related to different concepts in Mathematics (e.g., understanding numbers, shapes, patterns, etc.).

To become mathematically proficient, children need to build conceptual understanding, procedural understanding, strategies competence or application, communication and reasoning, and a positive attitude towards Mathematics. All these strands of mathematical proficiency can be designed in the following four blocks for the daily classroom process:

Figure 1.1ii



1.5.4 Creating a Positive Classroom Environment

As children enter school, their worlds expand, they make friends, begin connecting with adults beyond the family, and become more and more mobile and verbal. They want to explore and learn about everything. The role of a teacher is very important in guiding children in their behaviour and in forming strong positive relationships.

Teachers, therefore, must be thoughtful and responsive to the needs of children. Caring for children is complex and important work. It is complex because there are many parts involved in establishing relationships with children and their families.

1.5.4.1 Classroom Environment and Norms

A safe, secure, comfortable, and happy classroom environment can help children learn better. It is important that the necessary facilities, such as, learning materials, equipment, space for doing activities, working together, and playing, to help each child learn better, are provided. Care is central to the classroom environment at the Foundational Stage keeping an attitude of concern and responsibility for children and relationships. The classroom must be an inclusive, and enabling learning environment that provides every child with freedom, openness, acceptance, meaningfulness, belonging and challenge.

Introducing children, gently but clearly, to agreed norms of being in a classroom together should be done as early as possible. This gives them both clear direction and a way to settle well in class. It is best to have conversations with children and agree on

norms with them. This leads to an enhanced sense of ownership and responsibility, while nurturing and building a positive classroom culture. Norms should be short, clear, and easy to understand with positive phrasing.

1.5.4.2 Managing Difficult Behaviour

Teachers will also have to learn to manage difficult behaviours as behaviour is often the unspoken language through which children act out their feelings and thoughts. It is also often because they are unaware of behavioural norms or alternative ways of behaving.

Teachers should help children settle and guide their behaviour positively. Positive guidance is crucial because they promote children's self-control, teach children responsibility, and help children make thoughtful choices. Caring and respectful adults create a supportive atmosphere to help young children explore alternative behaviours, develop social skills, and learn to solve problems. This is called a positive approach to guidance. An effective guidance approach is interactive. Adults and children both learn to change as they interact with one another towards a common goal.

Understanding the development of a child will help us set appropriate standards of behaviour or expectations from children, think of appropriate alternatives, as well as age-appropriate explanations or ways to explain to the child.

Actions that insult or belittle are likely to cause children to view their teachers, parents, and other caregivers negatively, which can inhibit learning and can teach the child to be unkind to others. However, actions that acknowledge the child's efforts and progress, no matter how slow or small, are likely to encourage healthy development.

1.5.4.3 Discipline

Discipline is a part of the guidance strategies adults use to help children become responsible for their actions, learn self-control, and behave appropriately. Discipline does not mean punishing and preventing unwanted behaviours.

One of the major goals of a good guidance process is to help children achieve self-discipline. This happens only if adults lead in ways that support children's developing ability to control themselves. By gradually handing over to children, the opportunity to govern their actions, adults communicate trust.

1.5.4.4 Language used by Teacher

As teachers gain experience in handling problem behaviours, they learn to use the right kind of language. Teachers discover how potent the voice can be and what words will work best and when. They become aware of facial expressions, and what a touch or a look will convey to children.

How they use their body reflects a distinct attitude and approach to discipline. Through experience, new teachers learn to use these tools in ways that will work best for them and the children. Teachers should talk to children in the same way, they talk to other people by learning to control the volume of their voice and use good speech patterns for children to imitate. To be heard and get close enough to speak in a normal tone, get down to the child's physical level. Often, lowering volume and pitch is effective. Use simple and clear statements, spoken once will have more impact. This way, the child will be able to focus on the real issues. When working with small children, the teacher must be aware of body height and position, and get down to the level of the child. The

way teachers use their body invites or rejects close relationships and familiarity. A child finds teachers more approachable when they are seated down with arms unfolded, rather than standing with their arms folded. Non-verbal behaviours of a teacher, such as, gestures, posture, and eye contact must be such that a child can approach them without any hesitation.

The teachers have to examine the way that they were disciplined, and acknowledge their experiences and feelings about it, particularly assumptions that they may have on how children behave depending on their context and background.

The most effective methods of guidance are clear, consistent, and fair rules that are enforced in consistent and humane ways. Children should be aware of the consequences of breaking the rules. Good guidance practices emphasise the positive aspects of a child's behaviour, not just problem behaviours. Guidance has greater meaning to children, if they are encouraged to take responsibility for their actions and are part of the problem-solving process.

Section 1.6
Content for Teaching

Teaching at the Foundational Stage must be informed by the Curricular Goals, Competencies, and Learning Outcomes. The content to be used in the teaching-learning process includes the learning environment, Teaching-Learning Matrials (TLMs) and books.

The syllabus must contextualise the Learning Outcomes, guide teachers through handbooks on the sequence of learning planned in the syllabus and provide broad guidelines for assessments.

Content chosen should be sensorially engaging (activate the child's senses, have aesthetic appeal, etc.) and/or be practically relevant in the context of the child's experiences. It should be derived from children's life experiences, and reflect the cultural, geographical, and social context in which the child is developing and growing; it should also move from familiar to unfamiliar, simple to complex, and from self to others, and accommodate the diverse interests of children.

The texts for Language should be a good balance of stories and poems, along with content on the local natural and human environments. While stories and poems enhance the imaginative and linguistic capacities of young children, content on both flora and fauna as well as social and cultural aspects allow children to gain understanding of the world around them. Content could be in the form of textbooks, workbooks, children's literature, materials, such as, flashcards, games, and puzzles, and various audio-visual materials.

Similar to Language, content in Mathematics can reflect engagement with the local environment. Mathematical activities, whether understanding shapes or counting, can be integrated through engagement with the natural and human environments. The content in textbooks and workbooks should be complemented with appropriate manipulatives in the classroom. Art learning experiences are to be planned as activities focussed on specific Learning Outcomes and the content is drawn from the local context of the school.

1.6.1 Teaching-Learning Materials

Teaching-Learning Materials (TLMs) at this stage should engage children in multi-sensorial activities and encourage them to actively use their hands; this incudes simple toys, manipulatives for counting and numeracy, children's books, picture books, activity books, worksheets, and audio-visual materials to support learning.

The teachers should develop the capacity to prepare TLMs using locally available materials. Engaging children in the process of creating TLMs, such as, toys, puzzles, and boards using locally available products helps engage all aspects of their development. Some resources that are attractive, safe, and provide adequate opportunities for the children to explore and experiment with curiosity, and which are not locally available, can be purchased from the market.

The use of TLMs can enhance the learning of the children by providing them concrete experiences. For Mathematics, teachers can create simple TLMs, such as, counters, bundle-sticks, *Ganitmala*, arrow cards, flats-longs-units, shapes cut-outs, straw models, and polyominoes, using locally available materials, such as, seeds, sticks, pebbles, paper, cardboards, and beads.

The idea of a library not merely being a collection of books, but an attractive display of good books, which changes periodically, is essential for it to become an active place, and generate motivation and interest in reading. The teachers and other adults can model reading behaviour, read-aloud, and plan other engagements with texts in the library. The library or designated reading corners should provide children access to good children's literature, and the teachers should encourage them to 'borrow' books from the library and place them back in the classroom or the library.

As a part of pedagogic practice, teachers should model careful use of materials. A culture of care and responsibility in using and sharing material should be an essential Learning Outcome for this stage and should be carried through the later stages of schooling.

With a balanced approach between protection and participation, different types of technology, digital, and audio-visual material can also be used as TLMs. Children should have access to a diverse range of content and material that is contextual for the child, age-appropriate, and available in a range of languages and materials. They should contain diverse forms, spaces, and formats to ensure access and inclusion of children with disabilities. The key should be to create an enjoyable experience for the learner and feed the child's innate curiosity and agency, for which the capacity development of teachers, parents, and the community should be supported.

1.6.2 Books and Textbooks

Children at the Foundational Stage need to engage with texts in a variety of forms (e.g., picture books, storybooks, graded readers, and worksheets). A wide variety of books that are appropriate for all children including 3-year-olds should be made available to schools. Large picture books, colourful graded readers, and books with engaging stories and poems, all these would make reading books an exciting and engaging experience for children. Our country has a rich heritage of stories, folklores and legends that vary from region to region. These stories need to be translated into all languages; good children's literature should be produced from these sources, and made available to all. By making a variety of books available in schools, a sense and taste of *Sahitya* can be encouraged in young minds.

Textbooks should be designed specifically to achieve the competencies as articulated for the Foundational Stage. For the ages 3–6, learning environment, TLMs, and worksheets are sufficient to meet their Curricular Goals and pedagogical needs. They should not be burdened with the textbooks. For the ages 6–8, simple and attractive textbooks should be considered, which should also act as workbooks, but their curriculum should not be limited to the textbooks only.

Textbooks are often the only books children will engage with. Their understanding of the world beyond their immediate surroundings is built through the illustrations in the textbooks. Textbooks include the activities and assessments which introduce the children to the content of the textbook, as well as the language it uses. Therefore these textbooks play a huge role in motivating the children.

When developing and designing a textbook, one should be guided by the underlying principles of curriculum, discipline, pedagogy, technology, context, presentation, and diversity and inclusion. Applying these principles, the process of developing a textbook could include the creation of a syllabus, panels of textbook writers, reviewers, designers and illustrators, choice of content, pedagogy and assessment, structure of the textbook and language used, presentation and design, writing, review and pilot run, and textbook orientation of the teachers.

Textbook developers should have sound knowledge of applied linguistics and Mathematics, a clear understanding of the pedagogy that is appropriate for the competency and content, and also be aware of the current technology and audio-visual materials available for enhancing the learning experience of children. Local context and environment are also important considerations.

The textbook must provide teachers with concrete ways of integrating assessment with teaching and learning. If practicable, a teacher's manual can be developed as a companion to the textbook, aligned with both its approach and content. While the teacher manual is primarily intended for the teachers, its use will benefit children as well.

1.6.3 Learning Environment

An inclusive, welcoming, colourful and joyful learning environment that supports every child's participation is very critical for achieving the competencies outlined in the NCF.

a. The indoor environment needs to be well-lit and well-ventilated.
b. It should feel safe and inviting for the children.
c. It needs to be inclusive.
d. It should have a balance of both familiar and novel experiences for the child.
e. It should have a balance of materials that encourage different domains of development.
f. It should allow for both individual work and cooperative work.
g. It should include displays of children's work and also allow for children's work-in-progress to be preserved.

Considering the points mentioned above, the classroom environment can be optimised for engagement and learning by implementing some of the fundamental principles of ECCE. Some of the points are discussed in the next sections given below.

1.6.3.1 Indoor Environment

a. Running Blackboard: The running blackboard should be at children's reach as it allows them to express themselves artistically and engages them in activities.

b. **Circle Area:** Clean and organised circular area on the floor should be designated for circle time activities.

c. **Corner Set-up:** Corners can be planned inside the classroom to enable a variety of activities, including a dramatic play corner with masks and puppets, blocks or puzzles and Math corner, art or drawing corner, a tinkering corner, and books or Language corner. These corners encourage imaginative play, sensorial development, creativity, problem-solving, and language skills.

d. **Classroom Display:** To make a classroom dynamic and vibrant, an area should be allocated to display both children's and teacher's work. This can include a weather chart, a timetable, teacher-prepared charts, and norm charts.

e. **Portfolio Bag:** For easy access and visibility of children's work, and for keeping and storing children's work, the portfolio bags, neatly labelled with their names, can be hung on a wire or rope.

f. **Basic Elements:** Every classroom should have basic elements, such as, a mirror, a clock, space to keep footwear, and a dustbin.

The labelling of these locations, the text in the displays, and the reading corners should make the environment print rich, colourful and a happy place.

1.6.3.2 Outdoor Environment

a. **Sand Pit:** Sand pit is an excellent play area for children, which can also be used during free play. This can also be set up with the use of bricks and filled with sand or mud.

b. **Clay Box:** To develop gross and fine motor abilities, mixing, kneading, and making clay figures and toys is a very good exercise. This can be made using a small box built with bricks containing claying soil.

c. **Water:** A simple arrangement of buckets, mugs, and a tub for water activities should be kept alongside the sand and clay areas. Children find it calming, also these activities help in the coordination of multiple muscles and increase attention.

d. **Kitchen Garden:** A small kitchen garden gives children sensorial experiences, opportunities to work with their hands and concepts about the natural environment. Group work, physical labour, and other positive attitudes towards work can also be achieved by children working in a kitchen garden.

e. **Outdoor Play Equipment:** Slides, see-saws and swings are some essential outdoor play equipment. Ladders give opportunities for very young children to climb, which is an important developmental activity. In later years, simple rope ladders can be set up for a more demanding climbing experience.

Section 1.7
Assessment

Assessment should be well-designed and aligned to the Learning Outcomes and Competencies of the Foundational Stage. While analysing the evidence from an assessment, teacher should be unbiased and open-minded. The assessment should be formally and informally integrated through the course of the day in the classroom and

out-of-classroom activities. Teachers should have a proper mechanism to collect and document evidence. While analysing the assessment, teachers should focus on what children know, identifying the gaps, and utilising them in plans.

In the Foundational Stage, assessment is conducted through observation and analysing artefacts. Observation made across time provides the teachers with a comprehensive understanding of the child's learning. There can be several contexts where children exhibit their behaviour, attitudes, and learnings. Objects and Artefacts are created by a child during the teaching-learning process. These artefacts provide clues about the level of Learning Outcomes of the child, and are a source of information about the child's abilities and strengths.

The Holistic Progress Card would include this analysis, general information about the child's family, and the teacher's narrative summary of the child's progress.

Section 1.8
Addressing Developmental Delay and Disability

The Foundational Stage is critical to learning and development. We should aim to provide a safe, supportive, and responsive environment that upholds the dignity of every child learning with us. It is important for teachers and educational institutions to identify and address any risks pertaining to the children as early as possible, so that all children attain their learning goals and are safe and secure while they learn.

Recognising and addressing developmental delay and disability in the Foundational Stage is very important because these years are vital for the pathways on which future learning is based. The sooner we recognise and address any challenge to learning and development, the better will be the chances for redressal and success. Optimal nutrition and a caring and stimulating environment are crucial to learning and development at this stage. We need to support children in such a way that there are bridges, rather than gaps between early and later school learning. Developmental delay refers to very noticeable lags in achieving developmental milestones, beyond the individual differences that exist among children. The delay could be in any developmental domain. Developmental disabilities, e.g., autism spectrum disorder, cerebral palsy, intellectual disability, visual impairment, hearing impairment, etc., usually become apparent during infancy or childhood and is marked by delayed development and functional limitations in learning, language, communication, cognition, behaviour, socialisation, or mobility. Children often catch up or outgrow developmental delays with continuous support and stimulation. Developmental disabilities are long-lasting, though children can make a lot of progress in managing them with proper support.

Educational institutions and teachers are not authorised to make any diagnosis of developmental delay or disability. That is the job of authorised medical professionals. However, if a teacher notices a concern or persistent issue, she must observe the child across all developmental domains and keep a regular record to support proper diagnosis of the issue and appropriate action.

All our educational settings are committed to providing an environment that is not only stimulating and joyful but safe and secure as well. Schools and teachers must take care of physical and emotional safety and create a culture of zero tolerance of Child Sexual Abuse.

Chapter 2

Language Education

Language lies at the centre of human cognitive, social, and cultural experiences. Proficiency in languages gives individuals the capacity to comprehend, analyse, and relate to their locality, nation, and the world. It enables effective communication, which is integral to the formation and functioning of societies and cultures. Language additionally serves as an indispensable tool for the acquiring, accumulating, and advancing of knowledge. Thus, issues related to Language are some of the most fundamental in education. The effects and benefits of Language learning go far beyond proficiency in the languages themselves.

Language learning is, therefore, an important aspect of this NCF. Multiple studies show that individuals knowing many languages, not only gain the ability to communicate with a wider range of people, but also develop expanded cognitive abilities. In addition, they demonstrate improved capacities of cultural awareness and expression, which is among the major competencies considered important to develop in students. This provides them with a sense of their own identity and belonging, as well as an appreciation of other cultural identities.

Learning multiple languages enriches children intellectually and culturally, enabling them to think in more than one way by equipping them with the structures of expression, vocabulary, idioms and literature of more than one language. A multilingual India is thereby better educated and also better nationally integrated. Moreover, India's languages are some of the richest, most scientific, and most expressive in the world, with a huge body of ancient as well as modern literature that helps form India's cultural unity and national identity.

The science of child development and language acquisition clearly demonstrates that young children learn best through their mother tongue. Moreover, young children, who become literate in their mother tongue, gain a greater ability to learn multiple languages as students in their later years with its associated benefits.

This NCF thus gives central importance to learning in the mother tongue in the initial stages and to Language learning across all stages, with a commitment to multilingualism. This multilingualism promotes both socio-emotional and cognitive capacities at the individual level as well as cultural unity at the local and national levels.

Section 2.1
Aims

Learning languages enables students to access the understanding, knowledge and skills available in written or spoken forms in a society. It develops students' abilities to express ideas and feelings, be creative, think rationally, make well-informed choices, and act on those choices.

Proficiency in languages is essential for a democratic society, in which individuals participate and contribute to its political, economic, social and cultural life. Proficiency in multiple languages, including mother tongue and regional languages, promotes a society which respects and appreciates one's own as well as others' cultures. Such multilingualism also has direct benefits for the individual in terms of cognitive development and flexibility.

Language Education in schools must specifically aim to achieve:

a. **Oracy and Literacy:** Oracy and literacy are fundamental to school education. Achieving oracy means students develop fluency in expression and understanding of spoken language. Literacy means that all students demonstrate fluent, and critical reading, writing and comprehension capacities in the language. The capacity to use Language in spoken and textual forms are critical not just for language education, but also for foundational capacity for all other curricular areas.

b. **Effective Communication Skills:** Students should develop their language capacity to think critically, identify real-world problems, analyse them, make rational arguments, and work out solutions. The capacity to use language to think and communicate well in a variety of situations is critical for effective democratic, social, and cultural participation.

c. **Literary and Creative Capacities:** Language teaching in schools must aim at building capacity in students towards an appreciation of the literary aspects of language. It should also allow for an exploration of how to be creative and imaginative in their spoken and written expressions. Language serves as a vehicle for aesthetic and creative expression across cultures. Appreciation of the creative and aesthetic aspects

of language can be accomplished through creative prose, poetry, storytelling, word games, puzzles, jokes, riddles and more.

d. **Multilingual Capacity:** Language Education in schools should aim to make a student an independent speaker, reader, and writer in at least three languages, as laid out in NEP 2020. These three languages are denoted R1, R2, and R3 in this document. *(2.1, Box 2.2i for definitions of R1, R2, and R3)*

   It should aim to achieve this in R1 by age 8 (Grade 3), in R2 by age 11 (Grade 6), and in R3 by age 14 (Grade 9). Schools must ensure the development of the capacity for basic communication for social purposes and linguistic proficiency for academic use in the classrooms in R1 and R2, and to the extent possible in R3 as well by age 15 (Grade 10).

e. **Appreciation and Engagement in Culture:** Learning a language is learning a culture. Thus, language plays an important role in the immersion and participation in culture. Given the wide range of languages and the richness of their cultures in India, students must be given the opportunity to understand and appreciate the rich linguistic cultures of India. This can be achieved through introducing samples of various kinds of literature from languages across the country, including some of the great classical literature of India.

Section 2.2
Nature of Knowledge

In its most basic function, language is a system of the use of words and sentences when speaking, writing, or making gestures for communication among human beings.

a. **Language is a Rule-governed System:** The spoken and written components of language are governed by rules that are often a set of conventions or practices. Learning relevant sounds, shapes, words, sentence structures, and grammar rules, as well as understanding the functional and situational aspects of language use requires understanding and engagement with these rules.

b. **Language is an Integral Part of Culture:** Language does not operate in isolation, but is related to social interaction, context, and culture. Thus, language development among students is an act of cultural development; it invariably requires learning about an associated culture and society.

c. **Language Evolves Constantly:** Languages evolve over time, get inspired from other languages, and adapt to the varying contexts in which they are spoken. They constantly add to their vocabularies as new concepts arise. Learning any language thus involves being able to appreciate and engage with such evolution.

These specific characteristics of language guide the framing of the curriculum for language and its teaching. Other aspects, such as, the aims of Language Education (described earlier) and how children learn languages (section, 2.6, 2.6.1) guides the curriculum as well.

Section 2.3
Current Challenges

Language learning in schools across the country currently faces a few challenges which need urgent addressing.

a. **Low Levels of Literacy:** India is currently in a crisis of learning, where a large proportion of students currently in elementary school have not attained foundational skills in literacy, i.e., the ability to read, comprehend, and write basic text.

b. **Low-quality Learning Materials:** The learning materials used for Language teaching across the stages are currently of uneven quality, with a lot of them being of low quality. Good quality materials need a careful selection of relevant content (words, context, illustrations, and layout) that is age-appropriate and interesting for students to learn from. Relying only on the content in textbooks is very limiting for Language learning. The lack of availability of age-appropriate children's literature in Indian languages has posed a severe constraint in language classrooms across the nation.

c. **Inadequate Levels of Teacher Preparation:** Too often, an assumption is made that anyone can teach Language to students without adequate training in the subject and/or without adequate time for preparation. This contributes to underachievement in Language learning and classes becoming ineffective. There has been a severe scarcity of skilled Language teachers in India, despite various measures being taken. Teachers with appropriate preparation, flair, and practice in the subject are essential for a meaningful and enjoyable student experience in Language learning.

d. **Ineffective Pedagogic Strategies:** Many often-used teaching practices are not based on a sound understanding of how Language works and how students learn Language across various age groups. Teachers need to take stock of the strategies they have been using till now for their enjoyability, effectiveness, and ability to engage students meaningfully.

e. **Focus on Content-completion rather than Competency-based Teaching:** In Language Education, gaining competencies is far more important than mastering content. In practice, this is not too often, not considered by teachers or assessment developers. Effective Language teaching must be driven by the achievement of competencies and learning outcomes by students, rather than merely focussing on finishing the content given in the textbook.

f. **Memory-based Assessment:** Language Education intends to achieve Language proficiency, communication and functional ability, and appreciation of literature. Most assessments tend to focus on assessing recall of content given in a textbook rather than assessing Language abilities. While the recall of details of the content may be one way of demonstrating learning, it is not the core aim of teaching and learning Language.

Box 2.1

Use of Contemporary Language in the Indian Language Context

Many Indian languages have literary traditions spanning thousands of years. Often, vocabulary and sentence structures used in such literature are not in contemporary use anymore. In addition, there is a significant difference between the spoken and written forms in many Indian languages.

Content in Language textbooks, in terms of vocabulary and sentence structures, should aim to reflect the contemporary use of the language, particularly in the Foundational and Preparatory Stages, while also attempting to bridge it over time to the more literary form of the language so that literature can be read and appreciated. This would make Language and literature learning more interesting and relevant to students. Understanding and engaging with the literature of the Language is viewed as a separate Curricular Goal in the Middle and Secondary Stages. The language used to achieve this goal can have content drawn from such literature to make students familiar with the literary tradition of that Language (though the literature studied should also be chosen to be of a kind that is of contemporary interest to students). The language used in other chapters or the one used to teach other Curricular Areas, can continue to adopt contemporary language usage even in the higher Stages, in accordance with what works best for learning in that context in view of the overall Curricular Goals.

Vocabulary for new concepts or ideas should be introduced into Indian languages in such a way that is intuitive and relevant to the Indian context by the appropriate authorities (e.g., by the Language Academies proposed in NEP 2020), and such new words should be employed in a uniform manner across the country to ensure ease and effectiveness of communication.

Section 2.4
Learning Standards

As mentioned earlier, the approach to language teaching and learning in schools, including the Learning Standards to be achieved, is guided by the flexible, three-language formula as laid out in NEP 2020.

Box 2.2i

Learning Three Languages

The NCF aims to enable all our students to learn at least three languages, fully leveraging our socio-cultural context and resources. Our languages are one of our greatest heritages. This provides a remarkable opportunity for our students to learn multiple languages, when complemented by the education system.

Proficiency in several languages has a range of benefits, including in practical matters of communication, expanding cultural richness, and development of multiple cognitive capacities as suggested by research in the field of Brain Neurosciences and Developmental Psychology.

The three Languages that our students will learn in their school years are denoted R1, R2, and R3 in this document.

R1: This is the language in which literacy is first acquired in school. For this, it is of critical importance to be able to use the language that the student already knows, because that enables the full use of the linguistic and cultural knowledge (and resources) from one's home and community that the student already has, resulting in a deeper engagement and relevance, and a greater effectiveness and efficiency in the attainment of literacy. Thus, R1 should preferably be the Language most familiar to the students, which would be the mother tongue. If that is not possible because of practical considerations, then it should be the state Language, which would be the second most familiar Language. Also, since it is in R1 that literacy is first attained, it must be used as the medium of instruction (MoI) for other subjects, at least until literacy in another language is attained.

R2: Any Language other than R1.

R3: Any Language other than R1 and R2.

Furthermore, at least two of these three languages, R1, R2, and R3, must be native to India. The state or other relevant bodies would decide the choices of R1, R2, or R3 that would be given to students. An Indian language must be available for students as an option for the MoI through school education all the way up to Grade 12.

A few other related aspects on language learning:

- 'Practical considerations,' referred to earlier could be of various kinds, including the diversity of mother tongues in a class/school/community/region, and dearth of written resources in the language despite rich oral traditions. The complexity and difficulty of developing written resources for languages that are spoken by relatively small populations is a part of these considerations as well.
- There may be regions or areas in a state where the linguistic diversity is such that the most familiar language for students (after their mother tongues) is another widely spoken local language. These familiar languages may also be different from the state language. In such circumstances, if (because of practical considerations) the mother tongue cannot be R1, then the most familiar local language may be used as R1.
- In this NCF, we do not make any distinctions between 'languages' and 'dialects'; all variations of a language used for communication or literature in a given region are also referred to as languages.

The approach to literacy in R1 is taken up in detail in the chapter on the Approach to Language Education and Literacy in the Foundational stage, Chapter 3, 3.2 in NCF-FS. This includes the wide use of the mother tongue of students in the classroom and school, even when R1 is not the mother tongue, which will enable literacy in R1.

In the **Foundational Stage,** the focus is on building familiarity of students with two spoken Languages (R1 and R2). At the end of this stage, students are expected to read fluently in R1 and comprehend what they read, and begin writing sentences in R1 to express experiences, themes, and what they see in pictures. They gain some familiarity with reading and writing in R2.

In the **Preparatory Stage**, students develop proficiency in speaking, and competencies in reading and writing in both Languages (R1 and R2). While students achieve these faster in R1, they are expected to gain familiarity with R2, gradually progressing from basic communication skills to greater fluency and proficiency in speaking and writing.

By the end of the **Middle Stage,** teachers should aim to achieve similar levels of students' proficiency in both R1 and R2. Some transfer of skills from R1 to R2 enables quicker learning of R2. By the end of this stage, students can understand and appreciate the distinctive features of the language, engage in collaborative discussions, debates, and presentations, analyse and interpret what they read, and write independently with appropriate structure, grammar, vocabulary and creativity.

A new third Language, R3, is introduced in this stage. Students acquire familiarity with the spoken form of this language, along with the basics of reading and writing. They are expected to read various simple texts with comprehension in R3 by the end of the Middle Stage.

In the **Secondary Stage,** up to Grade 10, the Curricular Goals in R1 and R2 are almost the same. The same level of effective communication (both oral and written) in both languages must be achieved. Students should be able to use these languages for reasoning

and argumentation and make effective presentations. They should also be able to read and analyse a variety of texts (from early writing to contemporary literature), articles and documents. They further develop their critical reading and listening skills, their ability to evaluate arguments, and make connections between different texts. Students refine their writing skills through persuasive essays, literary analyses, researched writing and creative writing. Students develop linguistic proficiency for academic use in R1 and R2 by the end of this stage. In R3, students engage with different forms and types of literature and learn to apply the basics of linguistic rules in speech and writing. They also develop linguistic proficiency for academic use in the classroom to the extent possible. A higher level of familiarity, understanding and interpretation of literature is achieved for at least one of the languages, R1, R2, or R3, that is native to India.

In Grades 11 and 12, at least two languages will be studied, at least one of which is native to India, and would be chosen by students from the pool of language and literature courses that are offered. In addition to the possibility of continuing study in R1, R2 and/or R3, the choices for languages would include Sanskrit, and other modern or classical languages and literatures of India, including classical Tamil, Telugu, Kannada, Malayalam, Odia, Pali, Persian and Prakrit. This is to ensure that these languages and literatures stay alive and vibrant, especially in states where they may be best taught and nurtured. In addition to this, foreign languages, such as French, German, Japanese and Korean would also be offered.

As per NEP 2020, opportunities to study languages, such as, those mentioned in the previous paragraph, will also be given to students in the Middle Stage and in Grades 9 and 10 as optional additional courses, wherever it becomes feasible as school resources increase.

Box 2.2ii

Indian Sign Language

Sign Language is a mode of communication used predominantly by/for people with hearing impairment where there are no spoken words. The language involves using gestures or 'signs' (with both hands) for articulation to communicate meaningfully. There are many sign languages in the world. The one that is extensively used in India is called Indian Sign Language (ISL).

ISL has its own specialised hand gestures, grammar, and style. While there are regional variations in the way the Language is used for communication and the signs themselves may vary in their meaning (a particular object, idea, or meaning), ISL is useful, well-known and standardised in its lexicon and glossary.

In India, students with partial or full hearing impairment often find it difficult to get admission into regular schools as such schools are not yet equipped to be inclusive. These students often drop out of schools either due to inadequate teacher training in inclusive education or ISL to run classes in the higher grades. They also drop out as they do not receive adequate support for their learning needs.

Schools could consider offering ISL as part of their Language curriculum. The Learning Standards for ISL could follow those of R1 or R2 illustrated in this document. All students, even those without hearing impairment, should be given some basic familiarity with ISL and a few of its basic signs.

This section lays out Curricular Goals and Competencies for R1, R2 and R3 for the Preparatory, Middle and Secondary Stages; some variations and permutations may certainly occur across R1, R2 and R3, and stages, depending on practical considerations and on the choices offered for the three Languages. Specifically for the learning of languages, it is important to keep in mind that Curricular Goals and Competencies must be attained by students in an integrated manner and not separately, in particular, there should not be separate chapters or units in textbooks for individual Curricular Goals.

As throughout this NCF, Curricular Goals and Competencies have not been given for the Grades 11 and 12 courses and optional courses described above, due to the wide variety and levels of courses that would be on offer for students.

2.4.1 Language 1 (R1)

2.4.1.1 Preparatory Stage

CG-1 Develops oral language skills using complex sentence structures to understand and communicate ideas coherently	C-1.1	Converses fluently and meaningfully in different contexts
	C-1.2	Summarises core ideas from material read out in class
	C-1.3	Makes oral presentations (show and tell, short welcome notes, anchoring of small events, short speeches, and class debates)
CG-2 Develops the ability to read with comprehension by gaining a basic understanding of different forms of familiar and unfamiliar texts (such as prose and poetry)	C-2.1	Applies varied comprehension strategies (infernce, prediction, visualistion) to understand different texts
	C-2.2	Understands main ideas and draws essential conclusions from the material read
CG-3 Develops the ability to write simple and compound sentence structures to express their understanding and experiences	C-3.1	Uses writing strategies, such as sequencing, identifying headings/sub-headings, the beginning and ending, and forming paragraphs
	C-3.2	Writes clear and coherent paragraphs that convey their understanding of a given topic/concept or on reading of a text
	C-3.3	Creates posters, invites, simple poems, stories and dialogues, with appropriate information and purpose
	C-3.4	Uses appropriate grammar and structure in their writing

CG-4 Acquires a more comprehensive range of words in various contexts (of home and school experience) through different sources	C-4.1	Discusses meanings of words and develops vocabulary by listening to and reading a variety of texts
	C-4.2	Discusses meanings of words, and develops vocabulary by listening to and reading a variety of texts or other content areas
CG-5 Develops interest and preferences in reading	C-5.1	Borrows books from the library regularly to read at home
	C-5.2	Demonstrates interest in reading books from the library

2.4.1.2 Middle Stage

CG-1 Develops the capacity for effective communication using language skills for description, analysis and response	C-1.1	Identifies main points and summarises from careful listening or reading of the text (news articles, reports, and editorials)
	C-1.2	Listens to, plans and conducts different kinds of interviews (structured and unstructured)
	C-1.3	Raises probing questions about social experiences using appropriate language (open-ended/closed-ended, and formal/informal questions relevant to context with sensitivity)
	C-1.4	Writes different kinds of letters, essays, and reports using appropriate style and registers for different audiences and purposes
	C-1.5	Creates content for audio, visual or both, for different audiences and purposes
CG-2 Appreciates the language and literary and cultural heritage related to it by exploring the various forms of literary devices	C-2.1	Identifies and appreciates different forms of literature (prose, poetry, and drama), and styles of writing (narrative, descriptive, expository, and persuasive) from various cultures and time periods
	C-2.2	Identifies literary devices (simile, metaphor, personification (*Alankara*), hyperbole (*Athishayokthi*), alliteration (*Anuprasa*), idioms, proverbs, and riddles) by reading a variety of literature and uses them in writing
	C-2.3	Express their ideas and cirtiques through speech and writing on the various aspects of their social and cultural surroundings
CG-3 Develops the ability to recognise basic linguistic aspects (word and sentence structure), and use them in oral and written expression	C-3.1	Interprets, and understands basic linguistic aspects (rules), such as, sentence structure, punctuation, tense, gender and parts of speech, while reading different forms of literature, and applies them while writing
	C-3.2	Writes prose, poetry, and drama using appropriate style and language

CG-4 Develops the ability to write reviews and uses the library to find references	C-4.1	Reads, responds, and critically reviews books of varied genres (fiction and non-fiction)
	C-4.2	Uses books and other media resources effectively to find references to use in projects and other activities
CG-5 Develops appreciation for the distinctive features of the particular language, including its alphabet and script, sounds, rhymes, puns, and other wordplays, and games unique to the language	C-5.1	Understands the phonetics and script of the language, the number of vowels and consonants, and how they interact and are used
	C-5.2	Engages in the use of puns, rhymes, alliteration, and other wordplays in the language, to make speech and writing more interesting and enjoyable
	C-5.3	Becomes familiar with some of the major word games in the language (e.g., palindromes, spoonerisms, sentences without given letters or sounds, riddles, jokes, *Antakshari,* anagrams, crosswords, etc.)

2.4.1.3 Secondary Stage

CG-1 Uses language for effective communication through writing in various forms (essays, letters, articles, discussions, interviews, public speeches, etc.) including new media (email, audio, and visual material)	C-1.1	Uses language appropriate to social context, expresses agreement and disagreement with reasons, and arrives at conclusions through discussion and debate
	C-1.2	Writes in different styles (narrative, descriptive, expository, and persuasive) from their own, as well as others experiences
	C-1.3	Writes for real-life situations (invitations, speeches, condolence messages, notices, creative slogans, advertisements, etc.) and for school newsletter/ magazine/journal
	C-1.4	Scripts to inform and communicate ideas effectively with the use of technology
CG-2 Develops appreciation for the aesthetics in different genres (humour, suspense, tragedy, etc.) through analysis of style (narrative, descriptive, expository, persuasive, etc.) and employs these elements in their writing	C-2.1	Describes characteristics of works of literature from different time periods, such as, early, medieval, and contemporary
	C-2.2	Analyses a literary text by close reading, critiquing form and style, and interpreting possible meanings
	C-2.3	Composes literary texts by using appropriate literary devices
CG-3 Uses language to develop reasoning and argumentation skills by engaging with a variety of audio and written material	C-3.1	Analyses and evaluates the different audio and written material
	C-3.2	Argues with proper rationale by carefully evaluating premises

CG-4 Appreciates literary and cultural heritage related to the richness of Indian languages	C-4.1	Recognises the multilingual nature of Indian society and richness of its literary works through reading texts and watching content of different genres
	C-4.2	Appreciates the richness of culture and heritage in the different works of regional languages and with each other their connections
	C-4.3	Shows an understanding of the role of language in the formation of our identities and culture
	C-4.4	Demonstrates a basic knowledge of the commonalities among some of the major Indian languages, such as, their common phonetic and scientifically arranged alphabets and scripts, common grammatical structures, origins and sources of vocabularies from Sanskrit and other classical languages, as well as their rich inter-influences and differences
	C-4.5	Demonstrates a basic knowledge of languages spoken in different geographical areas, a sense of the nature and structure of tribal languages, and becomes familiar with a few useful words phrases, and works of literature from a few Indian languages from across the country

2.4.2 Language 2 (R2)

2.4.2.1 Preparatory Stage

CG-1 Sustains effective communication skills for day-to-day interactions, enhancing their oral ability to express ideas	C-1.1	Listens to poems, stories and conversations, and identifies important ideas in them
	C-1.2	Comprehends narrated/read out stories, and identifies characters, storyline, and key aspects
	C-1.3	Converses meaningfully and coherently
	C-1.4	Makes oral presentations and participates in group discussions
CG-2 Develops fluency in reading and the ability to read with comprehension	C-2.1	Develops further phonological awareness by blending phonemes or syllables into words and segmenting words into phonemes or syllables
	C-2.2	Examines the basic structure of the text and recognises words and sentences in print, and basic punctuation marks
	C-2.3	Reads stories and passages fluently and accurately with appropriate pauses
	C-2.4	Comprehends the meaning of stories, poems, and story posters
	C-2.5	Demonstrates interest in picking up and reading a variety of children's books

CG-3 Develops the ability to express understanding, experiences, feelings and ideas in writing	C-3.1	Writes a paragraph to express understanding and experiences
	C-3.2	Creates simple posters, invites, and instructions, with appropriate information and purpose
	C-3.3	Writes stories, poems, and conversations based on imagination and experiences
CG-4 Develops a wide range of vocabulary in various contexts and through different sources	C-4.1	Discusses meanings of words and develops vocabulary by listening to and reading a variety of texts in other content areas

2.4.2.2 Middle Stage

CG-1 Develops independent reading comprehension and summarising skills by engaging with a variety of texts (stories, poems, extracts of plays, essays, articles, and news reports) and shows interest in reading books	C-1.1	Applies varied comprehension strategies (inference, prediction, etc.) to understand different texts
	C-1.2	Identifies main points, summarises after a careful reading of the text, and responds coherently
	C-1.3	Identifies and appreciates the main idea in the various texts
	C-1.4	Shows interest in choosing and reading a variety of books
CG-2 Attains the ability to write about thoughts, feelings, and experiences of social events (e.g., village fairs, festivals, occasions, etc.)	C-2.1	Uses writing strategies, such as sequencing ideas, identifying headings/sub-headings, and forming paragraphs with clear beginning, and ending
	C-2.2	Expresses experiences, emotions, and critiques on various aspects of their surroundings in writing
CG-3 Develops the capacity for effective communication using language skills for questioning, describing, analysing and responding	C-3.1	Writes different kinds of letters and essays, using appropriate style and registers for different audiences and purposes
CG-4 Explores different literary devices and forms of literature	C-4.1	Identifies and appreciates different forms of literature (samples of prose, poetry and drama)
	C-4.2	Identifies literary devices, such as simile, metaphor, personification (*Alankara*), hyperbole (*Athishayokthi*), and alliteration (*Anuprasa*), by reading a variety of literature, and uses them in writing
CG-5 Develops the ability to recognise basic linguistic aspects (word and sentence structure), and uses them in oral and written expression	C-5.1	Uses appropriate grammar and structure in their writing

CG-6 Develops appreciation the distinctive features of the language, including its alphabet and script, sounds, rhymes, puns, and other wordplays and games unique to the language	C-6.1	Understands the phonetics and script of the language, the number of vowels and consonants, and how they interact and are used
	C-6.2	Engages in the use of puns, rhymes, alliteration, and other wordplays in the language to make speech and writing more interesting and enjoyable
	C-6.3	Becomes familiar with some of the major word games in the language (e.g., palindromes, spoonerisms, sentences without given letters or sounds, riddles, jokes, *Antakshari,* anagrams, crosswords, etc.)

2.4.2.3 Secondary Stage

CG-1 Uses language for effective communication through various oral activities (discussions, interviews, public speeches, etc.) and writing activities (essays, letters, articles, etc.), including new media (email, audio, and and visual material)	C-1.1	Uses language appropriate to social context, expresses agreement and disagreement with reasons, and arrives at conclusions through discussion and debate
	C-1.2	Writes in different styles (narrative, descriptive, expository, and persuasive) from their own as well as others experiences
	C-1.3	Writes for real-life situations (invitations, speeches, condolence messages, notices, creative slogans, advertisements, etc.) and for school newsletter/ magazine/journal.
	C-1.4	Scripts to inform and communicate ideas effectively with the use of technology
CG-2 Uses language to develop reasoning and argumentation skills by engaging with a variety of audio and written material	C-2.1	Analyses and evaluates different audio and written material
	C-2.2	Argues with proper rationale by carefully evaluating premises
CG-3 Develops an appreciation of the aesthetics in different genres (humour, suspense, tragedy, etc.) through an analysis of style (narrative, descriptive, expository, and persuasive) and employs these elements in their writing	C-3.1	Describes characteristics of works of literature from different time periods, such as, early, medieval, and contemporary)
	C-3.2	Analyses a literary text by close reading, critiquing form and style, and interpreting possible meanings
	C-3.3	Composes literary texts using appropriate literary devices

2.4.3 Language 3 (R3)

2.4.3.1 Middle Stage

CG-1 Develops effective communication skills for day-to-day interactions, enhancing their oral ability to express ideas by describing and narrating events and situations	C-1.1	Makes conversations relevant to the context
	C-1.2	Listens to varied texts (stories, poems and conversations) and summarises core ideas of the material
	C-1.3	Makes oral presentations (class debates, short welcome notes, anchoring of small events, short speeches, etc.)
CG-2 Develops fluency and the ability to comprehend what they read	C-2.1	Reads stories and passages with accuracy and fluency with appropriate pauses and intonation
	C-2.2	Comprehends the meaning of stories, poems, conversations, posters and instructions, and the main idea in the text
CG-3 Develops the ability to express their understanding, experiences, feelings and ideas in writing instructions, invitations and letters	C-3.1	Writes a paragraph to express their understanding and experiences

2.4.3.2 Secondary Stage

CG-1 Develops reading comprehension and summarising skills by engaging with a variety of texts (stories, poems, extracts of plays, essays, articles and news reports), and uses various strategies to write for different audiences	C-1.1	Identifies main points, summarises after a careful reading of the text, and responds coherently
	C-1.2	Uses strategies to organise ideas and information to write for an intended purpose and audience
CG-2 Develops the capacity for effective oral and written communication in different situations (formal and informal)	C-2.1	Listens critically and reads different news articles, reports and editorials to express opinions
	C-2.2	Asks a variety of questions on social experiences using appropriate language (open-ended/closed-ended, and formal/informal, questions relevant to context, with sensitivity)
	C-2.3	Shares ideas and critiques on the various aspects of their social and cultural surroundings in oral and written form
	C-2.4	Writes different kinds of letters and essays in an appropriate language for different audiences

CG-3 Explores different forms of literature (samples from early to contemporary period)	C-3.1	Identifies and appreciates different forms of literature, such as, samples of prose, poetry and drama (early to contemporary)
CG-4 Develops the ability to recognise basic linguistic aspects (word and sentence structure), and use them in oral and written expression	C-4.1	Interprets, understands, and applies basic linguistic aspects (rules), such as, sentence structure, punctuation, tense, gender, and parts of speech
CG-5 Develops an appreciation of the distinctive features of the particular language, including its alphabet and script, sounds, rhymes, puns, and other wordplays, and games unique to the language	C-5.1	Understands the phonetics and script of the language, the number of vowels and consonants, and how they interact and are used
	C-5.2	Engages in the use of puns, rhymes, alliteration and other wordplays in the language to make speech and writing more interesting and enjoyable
	C-5.3	Becomes familiar with some of the major word games in the language (e.g., palindromes, spoonerisms, sentences without given letters or sounds, riddles, jokes, *antakshari,* anagrams, crosswords, etc.)

Section 2.5
Content

The approach, principles, and methods of selecting content have commonalities across subjects, these have been discussed in Part A, Chapter 3, section 3.2 of this document. This section focusses only on what is most critical to Language Education in schools. Hence, it will be useful to read this section, along with the above mentioned section.

2.5.1 Principles of Content Selection

It is important to choose content that is appropriate and relevant to the developmental stages of language learning in students. Inadequate, age inappropriate, and low-quality materials are taking away the value of and joy in language classrooms. Teachers must ensure the use of good quality TLMs, carefully chosen and curated for students across all age groups. This will ensure enthusiasm for learning and foster a connection with the languages being learnt.

2.5.1.1 R1 and R2 in the Preparatory Stage

a. **For Developing Oracy:** Learning materials that lend themselves to students practising conversation with each other should be chosen. Playful language activities remove the fear of language and induce the fun element into learning. Content should have a variety of activities, such as, read-aloud rhymes, sing-aloud songs, role-plays, dramas, and interviews that allow students to practise these with interest in the classroom.

b. **For Developing Reading Skills:** Reading material should have variety, including stories, poems, plays, essays, diaries, comics, cartoons, letter, and travelogues. It should have a balance of familiar and unfamiliar text and context. Large font sizes, coloured pictures, and catchy titles of the chapters would arouse interest in the students. The text should be thought-provoking and generate imagination and interest among students. Content should lend itself to helping students progress from guided reading to independent reading.

c. **For Developing Writing Skills:** Chosen content must enable students to learn writing skills systematically and joyfully. The material must be designed to make students practise simple sentences on their own. Activities, such as, the completion of stories, finding suitable titles for pictures, catchy headlines for incidents, poster making, and banners should be part of textbooks.

d. **For Developing Values and Dispositions:** The content chosen should align with the broad purposes of education, and the values and dispositions that are embedded in NEP 2020 and the Constitution. This means choosing content that promotes these values, emphasises the unity in diversity of our country, and includes authors from all walks of life, and literature that represent local, regional and linguistic diversity in languages, with the explicit teaching of appreciation for the rich cultural heritage of the country.

2.5.1.2 R1 and R2 in the Middle and Secondary Stages

a. **For Developing Functional Language Skills:** Any learning material that is chosen must allow learners to grow in the functional use of language. Suggested content in this regard includes:

   i. Choosing themes and topics that are familiar to students and impact their daily lives, allowing them to participate in group activities, including discussions, debates, and role-plays on topics, such as, traffic jams in cities, effective town planning, floods, drought and pollution.

   ii. Letter writing, whether on paper or by email, is an important skill. Content must have samples of various kinds of letters, especially formal letters, including samples of letters for real-life situations such as applying for a new course in a college, a scholarship, a loan in the bank or completing/submitting any application in a government office.

   iii. A variety of content including notes, presentations, statements of purpose, articles, features, news items, and reports, and advertisements, posters, banners, headlines, videos and scripts for social media should be used in language classrooms.

b. **For Developing Literary Skills:** Students must be introduced to and given adequate exposure to different genres of literature. In the Middle Stage, introducing non-fiction and fiction would help students broaden their critical reading and writing abilities. In the Secondary Stage, students must be taught to enjoy the beauty of literature in greater depth and breadth. The selection of literature should be from regional, national and global writers. These can be relevant extracts so that students can engage with close and critical reading. The content should also have writers from all walks of

life with diversity of experiences. For example, contemporary *Janapada Geete* and *Janapada Kathe* from Kannada literature, and stories, such as, *Konni Juj* from Assamese literature.

c. **For Developing Linguistic Skills:** The content should help with improving fluency and accuracy in the language. Linguistic aspects, such as, punctuation marks, use of gender, sentence structures, and tenses must be prominently identifiable in the material to enhance language proficiency in reading, speaking and writing. Similarly, the selected content should allow students to practise advanced creative writing with greater sophistication using various literary devices and contexts.

d. **For Developing an Appreciation of Linguistic Heritage and Diversity:** Content should consider the multilingual aspect of the country, making a place for local and regional language variations in the materials selected. There should be a provision for neighbouring states' literature to be read by students of each state in the Middle and Secondary Stages.

e. **For Art and Sports Integration in the Learning of Languages:** Compositions in Art and Language can share some common aspects in aesthetics of form, style and content. Using art to access ideas, represent feelings and events, along with descriptive writing would only enhance the connection to the learning and the expression of the students. Making posters, signs and symbols, and illustrating for narrative and descriptive writing can lead to an interesting interdisciplinarity of approach in the understanding of language and expression (e.g., *Utsara* in Assamese textbooks talks about various festivals in the state of Assam, and various dance and art forms linked to the festivals). Similarly, using games and activities in language classes as springboards to conversation, (and as energisers) can improve the experience of language learning significantly.

f. **For Developing Values and Dispositions:** The content chosen should align with the broad purposes of education, and the values and dispositions that are embedded in NEP 2020 and the Constitution. This means choosing content that promotes these values, emphasises the unity in diversity of our country, and includes authors from all walks of life, and of literature that represent local, regional and linguistic diversity in languages, and explicit teaching of appreciation for the rich cultural heritage of the country. It also means choosing content that lends itself to the development of social, emotional, ethical, and aesthetic sensibilities in students through effective Language Education.

2.5.1.3 R3 in the Middle Stage

For learning R3, the chosen content should have materials, such as, alphabet charts and sentence cards that introduce the basic script.

a. For reading and writing development in R3, the book should contain small stories and poems in that language.

b. Reading and writing materials of R3 should be organised based on simple and complex levels of learning; they should have some basic introduction to start with.

c. The chosen content must lend itself to oral presentations and conversations, such as continuing a story or completing a conversation.

d. Content should enable the learning of functional skills in the Language R3, such as, basic letter writing, day-to-day conversations, poster making, and invitations.

2.5.1.4 R3 in the Secondary Stage

The choice of content for the teaching and learning of R3 can follow the same principles given in the section 2.5.1.2 for content selection in R1 and R2. However, the level of sophistication of content chosen can include both simple and complex learning material in R3 and move rapidly from one to the other (given the amount of time available and the quicker transferability of skills from R1 and R2), thus allowing for the development of linguistic proficiency for academic use in R3.

Box 2.2iii

Teaching Print and Digital Reading Skills: Future 'biliteracy'

One important thing to consider, given the nature of the current social milieu and what is to likely come, is the daily presence of digital media and screen-based devices in the lives of students. Reading and writing on smartphones and computers are rising norms among people. Given this, it is the need of the hour to teach students to be 'biliterate' in their reading skills. This will not only save them from the 'shallow reading' that digital media seems to foster, but also maximise benefits in their learning. Contemporary research suggests the value of 'deep reading' in the lives of human beings, and while well-meaning adults still struggle to switch between printed text and screens, students could be taught to read each medium and switch easily between the two (much like switching between two languages) without compromising on focussed attention, the pace of reading, and good meaning-making. This would mean a planned and deliberate teaching for students on how to read digital media, instead of treating the two mediums as the same.

Students need to develop a deep reading circuit in the first place, before being flooded with the distractions that are common to digital media. So, students spending their early years immersed in print material and then being introduced to digital reading with teacher guidance may be a way forward in this realm.

Section 2.6
Pedagogy and Assessment

The approach, principles and methods of pedagogy, and assessment have commonalities across subjects; the ones discussed in Part A, Chapter 3 section 3.3 and 3.4 of this document. This section focusses only on what is most critical to Language Education in schools. Hence, it will be useful to read this section along with the above-mentioned section.

2.6.1 Pedagogy for Languages

While all children have an innate and natural capacity to learn languages, it is necessary to know how Language is learned best by students in the educational context of a school. The following ideas on how students learn a language will inform effective pedagogic strategies in each stage.

a. **Students Learn a Language Well Through Deliberative Processes in Schools:** Language must be formally and purposively taught through direct instructions and essential rules. This kind of Language learning is a conscious process unlike 'language acquisition' in early life when a language is absorbed subconsciously. Reading and writing hence involve an active teaching-learning process as they are not natural or intuitive skills.

b. **Students Learn Better from a Balanced Approach to Literacy:** Students gradually become independent readers, when exposed to a balanced approach of introducing in meaning making, and decoding and spelling. Proficiency in literacy can be achieved by focussing on both word recognition and accuracy along with language comprehension and expression.

c. **Students Need Regular Practice Once Early Oracy and Literacy is Achieved:** Early oracy and literacy set the base for students to learn speaking, reading, and writing well. But this is not enough. Expanding vocabulary through sustained engagement, and systematic repetition of listening, speaking, reading, and writing skills through the school years are necessary for mastery of any Language.

d. **Students Grow in their Overall Language Abilities from Sustained Exposure to a Variety of Literature:** Exposure to a variety of literature and forms appropriate to a student's grade level would create an interest in reading. This enables students to graduate from 'learning to read' to the 'reading to learn' stage. By the Middle Stage, students are developmentally ready with the capacity to analyse, synthesise, describe, narrate and apply their language skills. In the Secondary Stage, students can recognise, think about, and express independent responses to social events and interactions.

2.6.1.1 Strategies for Teaching R1 and R2

2.6.1.1.1 Preparatory Stage

a. Teaching for Oracy

Listening to a variety of texts and literature enhances students' vocabulary, contributing to proficiency in speaking a language. Students will develop in their oral Language skills and capacities when they regularly speak about their experiences, describe the texts that they listen to or read, listen to teachers talking about books, and read texts from diverse genres themselves. Similarly, listening or watching the news (radio/TV), movies, serials, educational channels with subtitles and audio-video materials gives students an active sense of how to speak and listen. They must be taught to respond, describe, narrate, summarise, discuss, and role-play from what they listen to. Both free and guided conversations enable development of oral Language skills.

b. Developing Reading Comprehension

There are several steps in this process, starting from meaning making of individual words all the way to grasping the whole meaning of a text by connecting imagination and experiences. All these steps must be systematically taught for reading comprehension. Teachers must facilitate reading activities for developing the ability to understand different texts. Through this, students will acquire the habit of reading and continue to explore different genres of reading encouraged by the teacher.

Dedicated library hours will ensure that students continue to engage with a variety of books on a wide range of topics.

Some classroom strategies to develop reading comprehension are students reading aloud, discussing what was read, repeated reading for fluency, doing shared readings, guided readings, independent readings, and relating readings to prior knowledge, and summarising. *(Box 2.2iv)*

c. Developing Writing Skills

Writing activities require persistent, deliberate, and methodical practice in the classroom for any significant growth or improvement. Writing activities that are limited to copying a given text, copying answers to questions, and reproducing what is memorised do not help with the actual development of writing skills.

Writing can be taught effectively through purposive speaking first. Teachers should then expose students to different samples of writing forms and styles. They should teach students planning, drafting, and finally writing a piece based on audience and purpose. Teachers should also model good writing for them. Teachers' feedback on draft plans is formative in developing a good piece of writing. They should help students progress from writing with guidance to writing independently.

d. Developing Vocabulary

Learning new words and their uses must be integrated with other language skills, and should be part of daily instruction. Some useful strategies for developing vocabulary are helping students predict the contextual meaning of words, engaging them in word games and word-building activities, teaching them to use a dictionary extensively, and encouraging them to use new words they acquire in speech and writing. Students can also develop their range of vocabulary by engaging with books from the library. *(Box 2.2iv)*

Teacher's Voice 2.1i

Developing Interest and Preference in Reading

As a Teacher of Grade 4, I believe that it is necessary to give my students regular access to books, and also give them a chance to connect and engage with them. I do this often.

During such class, I decided to read a book named '*Kali Aur Dhamin Saamp*' by Zai Whitaker, to my students. The story of the book is about Kali, who stays isolated in his school and has no friends, according to the story this is because he comes from a marginalised section of a society. He is very good and clever at catching rat snakes, which other children can not do.

Before reading from the book, I showed my students the cover of the book and asked them to read the title aloud. Some of them did so. Then, I briefly introduced the author to them.

Next, I asked my class, "Who is Kali?"

The students said, "Kali is the name of the boy who is in the picture…" and "Dhamin is the name of the snake…" Students further added, "It looks as if the snake and the boy are friends."

Then, I told the class that, Dhamin, the snake is long, lives in the agriculture fields, and eats rats.

I continued, "Look at this picture, what do you think the story is about?"

Sahiba spoke, "There will be a snake near the river. The boy will go there, and then they become friends."

Muskan surmised, "The boy will go and ask the snake to be his friend."

Lucky guessed, "Kali looks very poor. He will earn money by showing the snake to people."

A few other children also shared their guesses.

I started reading the story, periodically showing pictures, and asked them to share what they saw, what Kali was doing, and what would happen next. My students answered my questions enthusiastically. I would periodically also ask what they thought about the development.

Soon, the children could identify the emotions depicted in the pictures. When asked 'why' questions, many students gave answers that were connected to their own lives, like Kali was sad because his mother or grandmother forced him to go to school. They were able to make rather accurate predictions about what would happen next. From this, I was also getting to know that they were able to understand important concepts and themes in the book with the help of experiences from their own social interactions.

My students also liked the pictures in the book very much. The class was happy to see the last picture where many children agreed to be friends with Kali.

I planned four to five activities designed to help my students engage more with the story. The first activity was a simple one, where my students sat in groups to draw a picture of Kali and his new friends playing, and then they shared and spoke about their drawings with each other. Some of these pictures are still put up in my classroom.

Subsequent activities included extending the story, enacting Kali's story, picture sequencing, writing a line to describe the picture, and story retelling by my students. On finishing all the activities, I showed the class a few other story books from the school library, with diverse contexts and talked about how interesting those stories are. I allowed them to choose books and told them to take them home to read. A few wanted to explore other books in the library too.

I have been seeing many small positive changes in my students. They became more inclined to take the books to their homes. They were also sharing more intuitive points about the books and pictures in post-reading activities. I felt that this whole process was very helpful in motivating my students to choose books they were interested in.

2.6.1.1.2 Middle Stage

a. Teaching Critical Listening and Oral Presentation Skills:

As the functional and literary aspects of Language take on a central focus, students in the Middle Stage learn to use Language more formally than in the Preparatory Stage. They progress to learning critical listening skills, listening to a variety of texts, contexts and varied kinds of literature that would enhance their vocabulary, leading to proficiency in speaking, reading, and writing. Listening and speaking activities must occur together in the classroom. Some specific classroom activities can include panel discussions, debates, interviews, anchoring, public speaking, and reviews of movies, plays or short films.

Box 2.2iv

Individual Differences in Classroom Participation

It is common to find some students in the Middle Stage communicating more freely in the classroom than others. In many cultures, boys are encouraged to interact more freely and assertively than girls, and some students from economically privileged backgrounds

express themselves more confidently than others who come from less privileged backgrounds. Students who tend to speak with hesitation for various reasons, such as, personal and socio-cultural beliefs, must be encouraged to participate freely in Language class activities. Language classes can be a space for empowering students and giving them encouragement and equal opportunities to express themselves through reading, speaking and writing. These classes can be a place for understanding and addressing the root causes of such hesitation, thus instilling the spirit of free speech and democratic participation.

b. Developing Reading Skills:

This is the stage where 'reading-to-learn' would happen to a greater extent.

i. **Functional Reading Skills:** These can be taught through samples of applications, letters, reports, invitations, emails, essays, posters and circulars. They learn to recognise and understand the purpose of each of these with the teacher's help through questions on the format and target audience.

ii. **Literary Reading Skills:** For developing literary reading skills in this stage teachers can conduct a variety of literature-related activities (e.g., choosing a genre for the week or a theme for the week). In these activities, students must be taught to describe the effect elicited on reading the words used, identify basic literary devices and share their overall experience of reading the text.

iii. **Critical Reading Skills:** For developing critical reading skills, the teacher encourages independent student reading of a fiction or non-fiction text and gives space to discuss the intent of the author, understand the context, identify core content, and interpret possible meanings, thus enabling critical reading.

iv. **Interest in Reading:** It is necessary to build interest in reading among students through exciting activities at school. These activities must be a part of the regular language classroom. For example, activities, such as, 'book of the day' (where extracts from a chosen book are read in the class, and students discuss the plotline, characters, and themes in the book), 'author of the day' (where students read many works of the same author, and discuss their style and broader concerns, making a trip to the local library (to learn about book cataloguing, book search, and Library maintenance), organising a literature festival (filled with book talks, exhibitions, creative writing competitions, and exhibits about authors from all walks of life), and a book exhibition (students display their current readings) would enhance student interest in books and reading. (*Box 2.2iv*)

c. Activities for Developing Writing Skills:

i. **Functional Language Writing Skills:** Teachers should provide students with opportunities to write using a variety of forms including essays, reports, emails, blogs, and social media comments and posts. Pedagogy should include teachers providing samples, explaining attributes and strategies for each form, encouraging students to ideate and write independently, as well as to proofread and revise their own writing.

ii. **Literary Language Writing Skills:** This should include experiential writing i.e., where students are encouraged to write based on their own experiences and they should also be writing appreciation or critique of literary works. The pedagogy

here also should include teachers providing samples, explaining attributes and strategies, encouraging students to write independently, as well as to proofread and revise their work. Critique of literature also needs students to read the texts carefully and often repeatedly, sometimes with the teacher's help.

Teacher's Voice 2.1ii

Learning to Interview

I am a teacher working with Grade 6 students. Developing interviewing skills is one of the prescribed Learning Outcomes. I designed a series of activities to help my students develop this skill, one of them is described here.

To provide students with a preliminary experience of conducting interviews, I gave them the task of talking to the clerk, Head Teacher or other staff working in the school, and asked them to learn more about their work and areas of interest/hobbies. I made four teams. I told students to go and interview whomever they wished to during the break. While observing the interviews, I identified some key points to discuss in the next stage.

I asked my students to share their experiences. Then I asked, "What do you think are the things that you should keep in mind while interviewing someone?" I allowed students to share their thoughts, I wrote their points on the blackboard while appreciating their efforts.

Drawing the attention of the students to the specific points on the blackboard, including mutual introduction, statement of purpose, preparation of interview questions, and documentation, I planned to provide opportunities to strengthen their skills in these areas.

To start with, I asked my class "Imagine that you are interviewing a farmer. How would you introduce yourself? Let us act out this situation." I allowed six students to act out this scenario. While the children were engaging in the role-play, I made sure that they clearly mentioned the purpose of the interview and that the other students took notice.

To further provide students with the experience of framing interview questions, I asked the students to think of interview questions for a different situation. I reminded them that the questions should be clear, simple and relevant to the topic. I also informed them that the questions should be respectful to the person and their profession. Following this, I paired my students, and asked them to interview each other with the questions that they have prepared. (The interviewee would assume the role mentioned in the situation given.)

In my next class, I asked students again about their experiences of conducting interviews and being interviewed. I slowly led my students to realise that while some of their questions were appropriate, others were not. I gave them some time to review their interview questions once more and asked them to conduct their interviews again.

In my next class, I told the students about the way to record interviews. I introduced two models to record interviews: Recording the Conversation (verbatim), and Summarising with Key Points, depending on the purpose of the interview. I engaged my students in a small discussion about how to prepare these reports as well. I then played a video of an interview and helped my students prepare a report on the same.

I decided that it was now time to provide my students practical exposure in conducting interviews. I told the class, "Now, we have understood the method of conducting an interview. Can you conduct an interview with any one person of your choice outside the school?"

I regularly followed up in my subsequent classes about the progress of the class in selecting a person to interview, preparing and reviewing their questions, conducting the interview, and preparing the report. After a period of two weeks, my whole class had completed their interviews and were preparing their reports.

The final activity involved narrating and editing the interview they had conducted, and their experience throughout the process.

2.6.1.1.3 Secondary Stage

a. Oral Presentations

Students must be given opportunities for sharing their ideas freely and listening to others' points of view. They must also ask questions, argue for their own views, and accept others' views with proper justification. Students must be taught focussed dialogue and conversation, which require organising their thoughts for better clarity, the art of raising relevant questions, brainstorming and thinking aloud, active participation, and skills of literary appreciation.

Teachers must use methods, such as, role-play, group discussion, debate, open dialogue, and interviews to allow students to ask questions and learn to respond impromptu. Club-based activities, assembly gatherings and celebrations in the school should be used as platforms to practise these methods, and should not be seen as a separate exercise. Teachers must also find ways to teach students how to work on their listening skills (paying attention to details, summarising, etc.) and use the same in day-to-day life.

b. Developing Reading Skills

i. **Literary Language Skills:** In the Secondary Stage, students should be encouraged to participate in group activities in critically analysing a literary text in the class (by engaging with questions related to form vocabulary ideas, and feelings provoked), and participate in the activities of the school literature club, poetry house and fiction-reading groups.

ii. **Critical Reading Skills:** The teacher should focus on enabling students to make meaning of a variety of texts, move from initial impressions to a closer reading of the text by asking questions related to the effect of words and ideas expressed, and how the effect of the language used in a text is working for specific purposes.

iii. **Exposure to Reading Multicultural Texts:** Teachers must bring a variety of texts from different regions and languages, and should encourage students to read and then share views on them. Activities such as the comparison of literary works of two different writers can be done effectively by inquiring into the author's voice, cultural background and context of the work, and talking about other similar works in the genre. Projects, plays, folk music performances, and posters are important ways in which students in this stage can be introduced to texts from a different era. Multicultural texts should be available in the library for students to read in their free time. *(Box 2.2iv)*

c. Developing Writing Skills

i. **Functional Language Writing Skills:** Students should be given enough opportunity to practise writing reports, essays, notes, applications, letters to editors, advertisements and notices. Students should also be encouraged to write in magazines, newsletters, newspapers and blogs.

Teachers must encourage students to make well-planned and scripted videos, plan for educational YouTube channels and podcasts, and should guide students to pick the right kind of content for these mediums. Here, the focus should be on writing the script for the content (core idea related ideas, order of ideas to be communicated, and elements of evocative communication).

ii. **Literary Language Writing Skills:** Students must be guided towards independent and creative writing in this stage. They must be taught capacities for analysing literature, and connecting it to its historical and socio-economical aspects rather than reading it in isolation, enabling the writing of a critical review. Teachers must ensure students practise writing poems, stories or plays using literary devices (e.g., similes, metaphors, hyperbole, irony, puns and oxymorons). Teaching them to identify voice and style of a writer, and taking cues from the material they read will help them find their own voice. The teacher should give constant feedback to help students improve their writing which comprises inputs on students' level of literary skills, proficiency in grammar and appropriateness of style in writing.

Box 2.2v

Teaching an Unfamiliar Language

The teaching of an unfamiliar or less familiar language would require a base of connections with an already-known language.

The rules of grammar in speech and writing in one language are often the basis for learning other languages in the life of a student at school. A certain degree of knowledge skills, and dispositions required for literacy is transferable to other new languages to be learned.

After initial exposure to listening to the language being used in simple communication, developing a basic understanding of what combination of sounds/phonemes are typical (and permissible) in a language, the patterns of stress and intonation in speaking it, the shapes of the letters and words (and sounds associated with them) becomes easier; these are all important milestones in learning the unfamiliar language. Once this is achieved, teachers may introduce new vocabulary, idioms, and samples of different forms of writing and literature.

The essential principles of how the meaning-making of written texts work, including literary appreciation (stylistic analysis, the effect of the language used and so on) are often common across many languages. The time taken for learning these the first time around in a particular language is often greater than the time taken to learn the same aspects in a newer language.

This means R2 and R3 in Language Education would require adequate practice time, but not necessarily an equal amount of initial learning time as R1. A speech-rich and text-rich class environment will allow for immersive learning of these newer languages.

2.6.1.2 Strategies for Teaching R3

2.6.1.2.1 Middle Stage

Since the students would have been already become proficient in their basic skills in R1 and R2, they will acquire these competencies much faster, given the transfer of Language skills.

a. Listening and Oral Development

To develop oral proficiency in R3, students must get a chance to listen and converse in that language first. This can be done through listening and talking about movies, plays and short films. As part of these listening activities, a pre-viewing and post-viewing talk about the movie/play and its significance can be discussed. Students can also do a detailed review of movies/plays/short films that can be presented orally in the classroom.

Similarly, students must engage in basic conversations to develop day-to-day speaking skills in the language. The teacher can provide relevant imaginary contexts for conversation between/among students (e.g., interactions between a shopkeeper and a customer, between a teacher and a student, between a doctor and a patient, and so on). After acquiring basic conversation skills, students may use real-world issues to discuss and debate in the classroom using R3. This will help the students sustain the conversation in the targeted language.

b. Development of Reading Skills

Reading skills in R3 can be taught in a systematic manner similar to the teaching of R1 and R2 Languages at an earlier stage. This would entail the teaching of script decoding and encoding through practice, and comprehension of new words (with support) by reading short stories and poems. Students also need to be taught to read in the language purposively for events, such as, 'book for the day' and 'author for the day,' expand their vocabulary with word-building exercises and the use of a dictionary, as well as read functional material, such as, recipe books, formal and informal letters, and invitations. A wide range of books and resources in R3 must also be available in the library that students can use to develop their reading skills, and interest in reading.

c. Development of Writing Skills

Here, students learn to apply already learned writing strategies (from R1 and R2 languages) to write in R3. The teacher can introduce the R3 script contextually, with the help of sign boards, nameplates and invitations (this can help in guessing the letters). Immediately after, the teacher may make students practice writing with the *Akshar* and *Maatra* in the language. After learning the script, the teacher can give students basic tasks, such as, writing signboards, nameplates and invitations. Gradually, they can be given the task of writing small sentences for conversations, helping the students use the language coherently. Writing for functional use is a necessary skill in R3. This can be achieved through simple activities such as diary writing, letter writing, and short story writing.

2.6.1.2.2 Secondary Stage

The pedagogic strategies for R3 in the Secondary Stage will resemble the techniques employed in the teaching of R1 and R2 for oral, reading and writing proficiency in the same stage. The degree of complexity of literary texts used may not equal those of the texts used in R1 and R2, but the essential linguistic and literary skills developed could be aimed at matching those of R1 and R2 as much as possible.

2.6.1.3 Some Additional Considerations

2.6.1.3.1 Specific Learning Disabilities

The box below (*Box 2.3i*) is a brief note on the idea of Specific Learning Disabilities (SLDs) in the classroom. Students with these disabilities struggle in the Language classroom and face significant difficulty in completing the tasks assigned to the class without any additional support. Classroom activities for students with specific learning Disabilities require more careful planning and support from the teacher.

Box 2.3i

Specific Learning Disabilities in the Language Classroom

Specific Learning Disabilities (SLDs) are a group of conditions that obstruct a person's ability to listen, think, speak, write, spell, or perform mathematical calculations. One or more of these abilities may affect a student at a time. Specific Learning Disability interferes with the developmentally predictable learning process of a student. The term does not include learning problems that are primarily the result of visual impairment, hearing impairment, motor disabilities, mental retardation, emotional disturbance, or based on cultural, environmental, or economic disadvantage.

As Language classrooms are one of the biggest sites for observation of such learning disabilities, teachers must be alert to the presence of any such learning challenges a student may be experiencing.

The Rights of Persons with Disability (RPWD) Act 2016 defines Specific Learning Disabilities as a dissimilar group of conditions, wherein there is a deficit in processing language, spoken or written, that may show itself as a difficulty to comprehend, speak, read, write, spell or to do mathematical calculations.

Teachers will need to find a professional diagnosis of such disabilities in Grade 3 (or at eight years of age, whichever is earlier). The school principal, teachers, parents, and the clinical psychologist or doctor will have to collaborate to develop learning strategies for a student with a learning disability, based on the kind and extent of their learning challenges. This means framing special considerations in the kind of content selected, the methods of pedagogy used, and the assessment tools used for the learning of such a student.

2.6.1.3.2 School Library for Language Development

Well-resourced libraries are necessary for students across all the stages. A wide range of books must cater to the interests and needs of all the students in the school to promote interest in reading, as well as address academic demands.

There is a need for students to engage more with books and develop a habit of reading. Therefore, specific Curricular Goals are referred to developing an interest in reading and the regular use of the library. These Goals, particularly in the Secondary Stage, would also require the library to have literary works in many Indian languages, as well as translated works of well-known authors.

Box 2.3ii

Library and Language Development

The school library is of paramount importance in developing language abilities among students across the stages. A well-equipped library provides access to diverse reading materials, promotes a love for reading, nurtures storytelling skills, fosters critical thinking

and creativity, enhances information literacy skills, and offers a safe and inclusive learning space. By engaging with the resources and activities provided by the library, students can develop invaluable language abilities that serve as a foundation for their academic success and lifelong learning.

Role of the Library in Language Development:

1. ***Access to a Wide Range of Resources:*** *A school library could provide students with access to a wide range of resources, including books, magazines, newspapers and other reading materials. If books are sorted according to grade levels, categorised, and labelled according to themes and subjects, it would provoke students' interest and allow easy access.*
2. ***Development of Language Abilities:*** *Exposure to reading diverse texts helps improve language skills, such as vocabulary, comprehension of different forms of text and language structure, different viewpoints, and overall language proficiency.*
3. ***Opportunities for Independent Reading:*** *A library can provide space for students to choose books that interest them and read at their own pace. Encouraging students to take books home and conducting activities in assemblies around books promotes reading among all students.*
4. ***Support for Classroom Learning:*** *The school library needs a mapping of books collection to Learning Standards, so that the library would not stand in isolation outside the classroom. Instead, it would be part of classroom resources and processes.*
5. ***Encouragement of a Love of Reading:*** *By providing a wide range of engaging and age-appropriate books, students can develop a lifelong love of reading, which can have a positive impact on their language and overall development.*
6. ***Promotion of Literacy Skills:*** *The school library can help promote literacy through activities such as book clubs, writing workshops and storytelling sessions, which can help students develop their language skills, and become more confident readers and writers.*
7. ***Supporting Research and Inquiry:*** The library offers resources such as encyclopaedias, dictionaries, and reference materials that support students' research and inquiry-based learning. By engaging in projects, students improve their reading, writing and information literacy skills, enabling them to express themselves effectively and communicate their findings.

Illustrative Library Activities for Language Development

1. ***Drawing Time:*** *Students can be invited to the library to select and read a book of their choice. Following this, they can be provided with stationery to draw a picture based on their understanding of the text.*
2. ***Book Reviews:*** *Students must be encouraged to process their reading of books through discussions and presentations. The task of presenting a book review to others helps with structuring one's own understanding and response to reading for the sake of clear communication with others.*
3. ***Storytime:*** *Storytime in the library would invite students to the space. These sessions can be interactive and engaging by incorporating elements, such as, songs and finger puppets.*
4. ***Reading Buddies:*** *Pairing younger students with older ones can be a fun and effective way to promote reading and writing skills. The older students can help the younger ones in reading and together they can learn the language more effectively.*
5. ***Book Clubs:*** *Setting up a book club for young students can encourage them to read more and discuss the books they are reading. They could encourage students to express their ideas in writing. It can be carried out for Middle Stage students in the library.*
6. ***Writing Workshops:*** *Writing workshops can focus on specific types of writing, such as, poetry or creative writing, and can be tailored to the age and skill level of students.*

7. ***Book Displays:*** *Visually appealing displays can be created, and themed around specific topics or events. These can also include activities, such as, writing prompts or book reviews.*
8. ***Enrichment Programmes:*** *Events, such as author visits, Author of the day, Genre of the week and so on would enhance students' listening and speaking skills as they engage in discussions, share their thoughts and interact with others.*
9. ***Book Repairs and Book Canvassing:*** *These activities teach students the value of good books and ideas.*

2.6.2 Assessment in Languages

Few key principles for assessment in Language are:

Students must be assessed for their fluency and proficiency in the language(s) taught, their ability to effectively communicate in those languages, and their skill of reading and writing in various forms, such as, picture descriptions, simple stories, complex essays, literary descriptions and research papers.

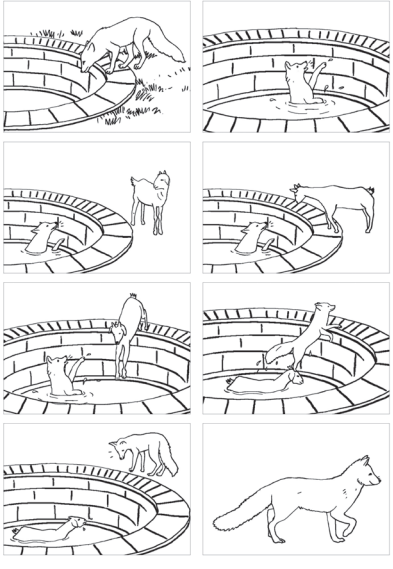
Students must be assessed for not only their fluency and proficiency in reading and comprehending a wide variety of texts, but also answering questions based on familiar/seen, as well as unseen passages/unfamiliar text, producing a variety of written materials, such as, essays, letters, posters, and other creative writing pieces, oral communication in class discussions, debates, role-plays and other forms of presentations.

A few Teacher Voices given below illustrate assessment in Language.

Teacher's Voice 2.1iii

Using Story Sequences to facilitate Independent Writing

I wanted to assess my Grade 5 students' ability to express in writing their own thoughts and feelings. I did not want them to only memorise a few sentences on any matter and reproduce it in writing.



I tried something different this time. I decided to give them a picture series of '*The Fox and the Goat*' to motivate them to write about it in their own words. Since all students in my class were not very confident, I also gave them some clues to start thinking about what to write.

I distributed copies of the pictures to my class and said, "Now, listen, everyone. Let us try a fun task today. First, does anyone in this class write stories? Have any of you ever tried?" I waited for my class to respond, and I was not disappointed. Rama, one of the quieter students, slowly raised his hand. He shared that he had written a story about a naughty boy and his dog. He had also drawn a picture to go along with his story.

I drew my students' attention to the picture series I had given them. "Now, look at these pictures. Which animals can you see?" A chorus of voices rang across the classroom, 'Fox!' and 'Goat…'

"Good! Now, Rama, what can you see in the first picture?"

"Fox is jumping!" he said.

I gave other students a chance to respond as well, and 2 to 3 more students offered responses along the same lines.

"Very nice!" I complimented my students. "Then, let us write the same story in 6–8 sentences with the help of the given clues. Remember, the clues are not in order, and you will have to expand on them for your story. When you read all the lines together, it should be a short story…"

I also wrote some clues on the blackboard to help them organise their thoughts.

Clues: not very deep; could not get out again; thirsty goat; water was good; jump in; began to drink; jumped on the goat's back; out of the well; begged the fox. To help my students, I asked them to try and frame sentences independently. I walked around, offered my support (in the form of words and spellings) to students who were facing difficulty. Some of them needed support in elaborating the connection between pictures.

By the end of the class, most of my students wrote short stories in their copybooks. This is the criteria I used for grading my students:

Criteria	Grade D	Grade C	Grade B	Grade A
Length and coherence in the story	Writes 1–2 sentences with limited coherence	Writes 3–4 sentences with a partially clear and coherent narrative	Writes 5–6 sentences with an almost clear and coherent narrative	Writes 6–8 sentences with a clear and coherent narrative
Clues Used	Develops the story using few to none of the clues	Develops the story using 2–3 clues	Develops the story using 4–7 clues	Develops the story using 8–10 clues
Writing Skills	Demonstrates no variation in sentence structures, vocabulary and sequencing	Demonstrates limited variation in sentence structures, vocabulary and sequencing	Demonstrates some variation in sentence structures, vocabulary and sequencing	Demonstrates a variety of sentence structures, vocabulary and appropriate sequencing
Grammar and Punctuation	Makes more than 10 grammar and punctuation errors that impede understanding	Makes 7–10 grammar and punctuation errors that impede understanding	Makes 3–6 grammar and punctuation errors that impede understanding	Grammar and punctuation are accurate with less than 3 errors

Teacher's Voice 2.1iv

Poem: Understanding Verses

I teach Language to Grade 7. I wanted to assess my students' ability to understand poems. Students tend to learn the lines of the poem by heart without understanding it. They also memorise the answers to the questions provided at the end of the poem.

So, I did something different.

I selected a poem that my students would be able to read and understand from an external source. I wanted to see if my students could read the poem independently and respond to questions based on it.

This was the poem that I selected:

Pirate Story

Three of us afloat in the meadow by the swing,
Three of us abroad in the basket on the lea.
Winds are in the air, they are blowing in the spring,
And waves are on the meadow like the waves there are at sea.

Where shall we adventure, to-day that we're afloat,
Wary of the weather and steering by a star?
Shall it be to Africa, a-steering of the boat,
To Providence, or Babylon or off to Malabar?

Hi! but here's a squadron a-rowing on the sea-
Cattle on the meadow a-charging with a roar!
Quick, and we'll escape them, they're as mad as they can be,
The wicket is the harbour and the garden is the shore.

Robert Louis Stevenson

Further I divided my students into groups of three. I asked them to read the poem, discuss it and then answer a few questions. The questions I gave my class were as follows:

1. What do you think is the theme of the poem?
   i. nature ii. **voyage** iii. love iv. friendship
2. The questions in the following stanza convey a sense of:
   Where shall we adventure, to-day that we're afloat,
   Wary of the weather and steering by a star?
   Shall it be to Africa, a-steering of the boat,
   To Providence, or Babylon or off to Malabar?
   i. melancholy ii. resolve iii. woe iv. uncertainty
3. List all the new words that you learnt in this poem. Now pick any 2 words and frame a new sentence with it.
   New words:
   Sentence 1:
   Sentence 2:
4. Describe any of the stanzas in the poem in your own words. (In 7–8 lines)
   _____
   _____
   _____
   _____
   _____
   _____
   _____
   _____

Part C

The third question was difficult for my students. So, I allowed them to use the dictionary to find out the meaning of the new words and then frame sentences using it.

After the class answered all 4 questions, this is how I graded them:

Criteria	Grade A	Grade B	Grade C
No. of questions answered	Answers all 4 questions correctly	Partially answers all 4 questions	Answers only 1–2 questions
Identifying new words and framing sentences	Identifies new words and frames grammatically correct sentences	Identifies new words and frames sentences with grammatical errors	Identifies new words, but is unable to frame meaningful sentences
Description of the stanzas	Describes accurately the meaning of the stanza in their own words	Describes the meaning of the stanza, but shows gaps in accuracy	Describes the stanza primarily using words from the poem
Use of vocabulary and expressions	Uses appropriate vocabulary and other forms of expression to enhance their writing	Uses very limited vocabulary and expressions in their writing	Unable to express themselves meaningfully, makes errors in writing

Teacher's Voice 2.2

Class Debates: Supporting Each Other to Speak

I teach Grade 9. Students are often uncomfortable when they are expected to speak. They are often unable to put across their points in the class, and contribute to discussions and debates. So, I wanted to create a space for my students to talk. I divided the class into groups and gave them the topic: 'Online teaching is the best way for students to learn.'

I taught them how to research topics using books from the library and the internet. I also explained to them some ways in which they could frame their arguments and present it to the group, such as:

"Excuse me, may I please have your attention for a few seconds?"

"In my opinion…"

"I am not convinced about…"

"I agree with the views expressed by…"

Each of my students made their own points for or against the topic. I gave them time to share their ideas with the group, discuss their points and then decide whether they agree/disagree with the topic. By the end of the class, I had taken note of the stance of each group and the members in each group. That evening, I prepared two sets of chits, one with names of students in groups who were for the topic, and the other with names of students in groups who were against the topic.

In my next class, I walked in carrying the two sets of chits and asked my students to sit in their groups. Then, I asked all the groups who supported the topic to sit on the right, and those who were against the topic to occupy the left side of the classroom.

I picked up two chits, one from each pile and asked them to share the points (one point each, in turns) they had discussed with the rest of the class. If they got stuck at any point of

the debate, I gave them two chances to ask for support from their group members. I felt that my students were more willing to speak in front of the class when they knew that they had an option to take support from their group members; this probably made them feel less put on the spot.

These are the areas in which I assessed my students and gave them qualitative feedback:

Areas of assessment	High	Moderate	Feedback to student
Relevance of the argument			
Connection and logic between ideas			
Grammatically correct sentences			
Confidence in speaking			

The whole activity took approximately 2–3 classes, but all my students made a genuine attempt to speak in the class. I was very happy with the results of this activity and decided to try more of such activities in the future.

Chapter 3

Mathematics Education

Mathematics is the art and science of discovering patterns and explaining them. These patterns are all around us, in nature, in technology, and in the motion of the earth, sun, moon, and stars. There is Mathematics in everything that we do and see, from shopping and cooking, to throwing a ball and playing games, to solar eclipses and climate patterns. Mathematics thus gives us the foundational concepts and capacities required to think about the world around us and the world beyond us. But most of all, when taught well, Mathematics is truly enjoyable and can become a lifelong passion. The goal of Mathematics Education is to bring to life these aspects of Mathematics.

Mathematics, including Computational Thinking, has never been more important globally, for students and for society, with the growing challenges with respect to artificial intelligence, machine learning, data science, climate modelling, infrastructure development, and the numerous other related scientific issues faced by India and all nations today. Quality education in mathematics and mathematical thinking will thus be indispensable for India's future, and indeed for ensuring India's leadership role in these critically important and emerging fields.

Mathematics Education aims to develop capacities of logical thinking, finding patterns, explaining patterns, making, refuting, and proving conjectures, problem solving, computing fluently, and communicating clearly and precisely, through content areas such as arithmetic, algebra, geometry, probability, statistics, trigonometry, and calculus.

Section 3.1
Aims

Mathematics helps students develop not only basic arithmetic skills, but also the crucial capacities of logical reasoning, creative problem solving, and clear and precise communication (both oral and written). Mathematical knowledge also plays a crucial role in understanding concepts in other school subjects, such as Science and Social Science, and even Art, Physical Education, and Vocational Education. Learning Mathematics can also contribute to the development of capacities for making informed choices and decisions. Understanding numbers and quantitative arguments is necessary for effective and meaningful democratic and economic participation.

Mathematics thus has an important role to play in achieving the overall aims of School Education. The specific aims of Mathematics Education in this NCF are as follows:

a. **Basic Numeracy:** Numbers and quantities along with words (language) are the two ways in which human beings understand and interpret the world. Numbers and quantities also play a very important role in day-to-day interactions within a complex society. Fluency in quantifying and performing calculating is essential for basic daily interactions, such as shopping and banking. Mathematics Education in schools should ensure that all students are fluent in basic numeracy. This would include not just fluency in numbers and number operations using Indian numerals, but also the capacities to handle situations that involve space and measurement.

b. **Mathematical Thinking:** Mathematical thinking involves systematic and logical ways to think about and interpret the world. The capacities for identifying patterns, explaining patterns, quantifying and measuring, using deductive reasoning, working with abstractions, and communicating clearly and precisely are some illustrations of mathematical thinking. Mathematics Education in schools should aim for developing such mathematical thinking in all students.

c. **Problem Solving:** The capacity to formulate well-defined problems that can be solved through mathematical thinking is an important aspect of learning Mathematics. Clear and precise formulation of problems and puzzles, knowing the appropriate mathematical concepts and techniques that can model the problems, and possessing the techniques and the creativity to solve the problems are core aspects of problem solving. Mathematics Education in schools should aim for developing such problem-solving capacities in all students. Problem solving also develops the capacities of perseverance, curiosity, confidence, and rigour.

d. **Mathematical Intuition:** Developing an intuition for what should or should not be true in Mathematics is often just as important as the more formal 'paper-pencil' doing of Mathematics. Focusing on the common themes and patterns of reasoning across mathematical areas, guessing correct answers (in terms of, e.g., 'order of magnitude') before working out precise answers, and engaging in informal argumentation before carrying out rigorous proofs are all effective ways of developing such mathematical intuition in students. Developing such mathematical intuition in all students should be one of the aims of Mathematics Education in schools.

e. **Joy, Curiosity and Wonder:** Discovering, understanding, and appreciating patterns and other mathematical concepts, ideas, and models can require great creativity and

often generates great wonder and joy. To see Mathematics as merely calculations and mechanical procedures is very limiting. Mathematics Education in schools should nurture this sense of joy, curiosity, aesthetics, creativity, and wonder in all students.

Section 3.2
Nature of Knowledge

Unlike any other subject, the notion of truth in Mathematics is timeless and absolute. In other words, once assumptions (sometimes called axioms) are agreed upon, and a mathematical truth is established based on those assumptions through logical and rigorous reasoning (sometimes called proof), then that truth cannot be refuted or debated and is true for all time. On occasion, mathematicians may find completely new logical arguments or proofs to establish the same truth, and this too is considered a breakthrough; this is because Mathematics is not just a collection of truths, but is also a framework of methods, tools, and arguments used to arrive at these truths.

Over thousands of years, the mathematical truths that are known to humans have grown in number and scope. Quite often, new mathematical truths that are discovered and established build on previously known truths. For that reason, mathematical education, like mathematics knowledge, is cumulative, new concepts that are learned often build on those learned previously.

Mathematical knowledge is built through finding patterns, making conjectures (i.e., proposed truths), and then verifying or refuting those conjectures through logical and rigorous reasoning (i.e., through explanations or proofs or counterexamples). The process of finding patterns, making conjectures, and finding proofs or counterexamples often involves a tremendous amount of creativity, sense of aesthetics, and elegance. Often, there are many different ways to arrive at the same mathematical truth and many different ways of solving the same problem. It is for that reason that mathematicians often refer to their own subject as more of an art than a science.

Mathematics often uses a formal, stylised, and symbolic language for communication, in order to be abstract and provide rigorous explanations of claims. In reality, mathematical discovery is characterised by informal arguments based on the development of reliable intuition. It is for this reason that developing intuition is described as an important aspect of learning and doing Mathematics.

Section 3.3
Current Challenges

Our current education system has faced multiple challenges with respect to Mathematics learning:

a. Currently, a large proportion of students in the early grades are not achieving Foundational Literacy and Numeracy. This makes it difficult for students to achieve any further higher learning in Mathematics and excludes them from effective economic and democratic participation in later years as described in earlier sections. Attaining Foundational Literacy and Numeracy for all students must therefore become an immediate national mission and a central goal of the Foundational Stage curriculum.

b. Mathematics learning has traditionally been more 'robotic' and 'procedural' rather than creative and aesthetic. This is a misrepresentation of the nature of Mathematics and must be addressed in the school curriculum.

c. Very often, the content presented in textbooks to illustrate mathematical concepts is far removed from the contextual realities of the learners. Young students find some mathematical concepts easier to absorb when they are directly connected to their experiences. Textbooks, classroom activities, and examples should aim to be motivated by and related to students' lives whenever possible.

d. There has also been a mistaken and exclusive emphasis on symbolic language and formalism in Mathematics teaching and learning, rather than on the informal argumentation and development of mathematical intuition that is so important for mathematical discovery.

e. Methods of assessment, too, have encouraged rote learning and meaningless drills and exercises, which in turn have promoted the perception of Mathematics as highly mechanical and computational. Assessment must move towards encouraging genuine understanding of core mathematical capacities, competencies, and creativity rather than mechanical procedures and rote learning.

f. Ultimately, many students in the current system have unfortunately developed a real fear of Mathematics. Tackling this will require some changes in how society perceives and talks about Mathematics but can also be addressed through the use of teaching-learning methods that encourage students to find meaning and joy in Mathematics and assessment methods that do not kill this joy. Interactive teaching-learning methods involving play, exploration, discovery, discussion, games, and puzzles may also help counter this fear.

Box 3.1i

Fear of Mathematics

There are two major aspects that cause fear of Mathematics: (1) the nature of the subject and how it is taught and assessed; and (2) how it is perceived in society.

1. The Nature of Mathematics and How it is Taught

a. Concepts in Mathematics are often cumulative in nature. If students struggle with place value, then certainly they will struggle with all four basic operations and decimal numbers, and hence in word problems. In early grades, the Teacher must provide differentiated learning experiences to ensure that each student has mastered the foundational concepts in Mathematics.

b. When symbols, part of the 'language' of Mathematics, are manipulated without understanding, after a point, boredom and bewilderment dominate many students, and dissociation develops. Hence, it is important for the Teacher to start teaching the concept by making connections to real life using the local language (especially up to Preparatory Stage), providing exposure to explore using concrete objects or examples, and gradually shift to more algebraic language.

c. Most of the assessment techniques and questions focus on facts, procedures, and memorisation of formulas. However, assessment should focus on understanding, reasoning, and when and how a mathematical technique is to be used in different contexts.

2. ***Societal Perceptions and Expectations***
    a. *A large number of parents expect their children to choose a career in the Science stream, regardless of their children's individual passions and interests, this inhibits them from the enjoying the process of mathematical discovery.*
    b. *Similarly, mathematical ability is seen as central to 'cracking' competitive entrance exams for professional courses, such as those in engineering. Due to immense competition in these exams, parents sometimes end up burdening their children with immense pressure to go to coaching classes and get a high score in Mathematics, instead of allowing them to proceed at their own pace and appreciate its joy and wonder.*

Hence, we must rethink the approach of teaching to one where students see Mathematics as a part of their life, and enjoy it with a greater focus on reasoning and creative problem solving. As with Language learning, students should not be allowed to fall behind in Mathematics and should be immediately supported to catch up if they do fall behind. NEP 2020 already has suggested delinking competitive entrance exams and the 'coaching culture' from the scheme of studies in schools. These measures should help redress this situation.

Section 3.4
Learning Standards

In the **Foundational Stage,** attaining foundational numeracy represents the key focus of Mathematics. Foundational numeracy includes understanding Indian numerals, adding and subtracting with Indian numerals, developing a sense of basic shapes and measurement using non-standard tools, and early mathematical thinking through play.

In the **Preparatory Stage,** while the focus is on to work on building conceptual understanding of numbers, operations (all four basic operations), shapes and spatial sense, measurement (standard tools and units) and data handling, the objective is to develop capacities in procedural fluency, and mathematical and computational thinking to solve problems from daily life.

In the **Middle Stage,** the emphasis moves towards abstracting some of the concepts learned in the Preparatory Stage to make them more widely applicable. Algebra, in particular, is introduced at this stage via which students are able to, for example, form rules to understand, extend, and generalise patterns. More abstract geometric ideas are also introduced at this Stage and relations with algebra are explored to solve problems and puzzles.

Finally, the **Secondary Stage** focusses on further developing the ability to justify claims and arguments through logical reasoning. Students become comfortable in working with abstractions and other core techniques of Mathematics and Computational Thinking, such as the mathematical modelling of phenomena and the development of algorithms to solve problems.

Across the Stages, students develop mathematical skills such as problem solving, visualisation, optimisation, representation, and communication, and thereby developing the capacities of Mathematics and Computational Thinking. Through creating and solving puzzles, pictorials, word problems, and optimisation problems, various values and dispositions, such as, perseverance, curiosity, confidence, rigour, and honesty would be developed across grades.

Finally, Mathematics has an extremely rich history in India spanning thousands of years. India is where the place value number system (including zero), that we all use today to write numbers, was first developed and used and is where many of the key foundations of algebra, geometry, trigonometry, and calculus were laid. By learning about the development of Mathematics in India as well as throughout the world, the rootedness in India can be enhanced, along with a more general appreciation of the history of Mathematics, and of the remarkable evolution and development of mathematical concepts through time (and India's critical roles in these developments).

3.4.1 Curricular Goals and Competencies

3.4.1.1 Preparatory Stage

CG-1 Understands numbers (counting numbers and fractions), represents whole numbers using the Indian place value system, understands and carries out the four basic operations with whole numbers, and discovers and recognises patterns in number sequences	C-1.1	Represents numbers using the place value structure of the Indian number system, compares whole numbers, and knows and can read the names of very large numbers
	C-1.2	Represents and compares commonly used fractions in daily life (such as ½, ¼) as parts of unit wholes, as locations on number lines and as divisions of whole numbers
	C-1.3	Understands and visualises arithmetic operations and the relationships among them, knows addition and multiplication tables at least up to 10 × 10 (*Pahade*) and applies the four basic operations on whole numbers to solve daily life problems
	C-1.4	Recognises, describes, and extends simple number patterns such as odd numbers, even numbers, square numbers, cubes, powers of 2, powers of 10, and Virahanka–Fibonacci numbers.
CG-2 Analyses the characteristics and properties of two - and three-dimensional geometric shapes, specifies locations and describes spatial relationships, and recognises and creates shapes that have symmetry	C-2.1	Identifies, compares, and analyses attributes of two- and three-dimensional shapes and develops vocabulary to describe their attributes or properties
	C-2.2	Describes location and movement using both common language and mathematical vocabulary; understands the notion of map (*Najri Naksha*)
	C-2.3	Recognises and creates symmetry (reflection, rotation) in familiar 2D and 3D shapes
	C-2.4	Discovers, recognises, describes, and extends patterns in 2D and 3D shapes

CG-3 Understands measurable attributes of objects and the units, systems, and processes of such measurement, including those related to distance, length, weight, area, volume, and time using non-standard and standard units	C-3.1	Measures in non-standard and standard units and evaluates the need for standard units
	C-3.2	Uses an appropriate unit and tool for the attribute (like length, perimeter, time, weight, volume) being measured
	C-3.3	Carries out simple unit conversions, such as from centimetres to metres, within a system of measurement
	C-3.4	Understands the definition and formula for the area of a square or rectangle as length times breadth
	C-3.5	Devises strategies for estimating the distance, length, time, perimeter (for regular and irregular shapes), area (for regular and irregular shapes), weight, and volume and verifies the same using standard units
	C-3.6	Deduces that shapes having equal areas can have different perimetres and shapes having equal perimetres can have different areas
	C-3.7	Evaluates the conservation of attributes like length and volume, and solves daily-life problems related to them
CG-4 Develops problem-solving skills with procedural fluency to solve mathematical puzzles as well as daily-life problems, and as a step towards developing computational thinking	C-4.1	Solves puzzles and daily-life problems involving one or more operations on whole numbers (including word puzzles and puzzles from 'recreational' areas, such as the construction of magic squares)
	C-4.2	Learns to systematically count and list all possible permutations or combination given a constraint, in simple situations (e.g., how to make a committee of two people from a group of five people)
	C-4.3	Selects appropriate methods and tools for computing with whole numbers, such as mental computation, estimation, or paper-pencil calculation, in accordance with the context
CG-5 Knows and appreciates the development in India of the decimal place value system that is used around the world today	C-5.1	Understands the development of zero in India and the Indian place value system for writing numerals, the history of its transmission to the world, and its modern impact on our lives and in all technology

3.4.1.2 Middle Stage

CG-1 Understands numbers and sets of numbers (whole numbers, fractions, integers, rational numbers, and real numbers), looks for patterns, and appreciates relationships between numbers	C-1.1	Develops a sense for and an ability to manipulate (e.g., read, write, form, compare, estimate, and apply operations) and name (in words) large whole numbers of up to 20 digits, and expresses them in scientific notation using exponents and powers
	C-1.2	Discovers, identifies, and explores patterns in numbers and describes rules for their formation (e.g., multiples of 7, powers of 3, prime numbers), and explains relations between different patterns
	C-1.3	Learns about the inclusion of zero and negative quantities as numbers, and the arithmetic operations on them, as given by Brahmagupta
	C-1.4	Explores and understands sets of numbers, such as whole numbers, fractions, integers, rational numbers, and real numbers, and their properties, and visualises them on the number line
	C-1.5	Explores the idea of percentage and applies it to solve problems
	C-1.6	Explores and applies fractions (both as ratios and in decimal form) in daily-life situations
CG-2 Understands the concepts of variable, constant, coefficient, expression, and (one-variable) equation, and uses these concepts to solve meaningful daily-life problems with procedural fluency	C-2.1	Understands equality between numerical expressions and learns to check arithmetical equations
	C-2.2	Extends the representation of a number in the form of a variable or an algebraic expression using a variable
	C-2.3	Forms algebraic expressions using variables, coefficients, and constants and manipulates them through basic operations
	C-2.4	Poses and solves linear equations to find the value of an unknown, including to solve puzzles and word problems
	C-2.5	Develops own methods to solve puzzles and problems using algebraic thinking
CG-3 Understands, formulates, and applies properties and theorems regarding simple geometric shapes (2D and 3D)	C-3.1	Describes, classifies, and understands relationships among different types of two- and three-dimensional shapes using their defining properties/attributes
	C-3.2	Outlines the properties of lines, angles, triangles, quadrilaterals, and polygons and applies them to solve related problems
	C-3.3	Identifies attributes of three-dimensional shapes (cubes, parallelepipeds, cylinders, cones), works hands-on with material to construct these shapes, and also uses two-dimensional representations of three-dimensional objects to visualise and solve problems
	C-3.4	Draws and constructs geometric shapes, such as lines, parallel lines, perpendicular lines, angles, and simple triangles, with specified properties using a compass and straightedge
	C-3.5	Understands congruence and similarity as it applies to geometric shapes and identifies similar and congruent triangles

CG-4 Develops understanding of perimeter and area for 2D shapes and uses them to solve day-to-day life problems	C-4.1	Discovers, understands, and uses formulae to determine the area of a square, triangle, parallelogram, and trapezium and develops strategies to find the areas of composite 2D shapes
	C-4.2	Learns the Baudhayana-Pythagoras theorem on the lengths of the sides of a right-angled triangle, and discovers a geometric proof using areas of squares erected on the sides of the triangle, and other related geometric constructions from the *Sulba-Sutras*
	C-4.3	Constructs various designs (using tiling) on a plane surface using different 2D shapes and appreciates their appearances in art in India and around the world
	C-4.4	Develops familiarity with the notion of fractal and identifies and appreciates the appearances of fractals in nature and art in India and around the world
CG-5 Collects, organises, represents (graphically and in tables), and interprets data/ information from daily-life experiences	C-5.1	Collects, organises, and interprets the data using measures of central tendencies such as average/mean, mode, and median
	C-5.2	Selects, creates, and uses appropriate graphical representations (e.g., pictographs, bar graphs, histograms, line graphs, and pie charts) of data to make interpretations
CG-6 Develops mathematical thinking and the ability to communicate mathematical ideas logically and precisely	C-6.1	Applies both inductive and deductive logic to formulate definitions and conjectures, evaluate and produce convincing arguments or proofs to turn these definitions and conjectures into theorems or correct statements, particularly in the areas of algebra, elementary number theory, and geometry
CG-7 Engages with puzzles and mathematical problems and develops own creative methods and strategies to solve them	C-7.1	Demonstrates creativity in discovering one's own solutions to puzzles and other problems, and appreciates the work of others in finding their own, possibly different, solutions
	C-7.2	Engages in and appreciates the artistry and aesthetics of puzzle-making and puzzle-solving
CG-8 Develops basic skills and capacities of computational thinking, namely, decomposition, pattern recognition, data representation, generalisation, abstraction, and algorithms in order to solve problems where such techniques of computational thinking are effective	C-8.1	Approaches problems using programmatic thinking techniques such as iteration, symbolic representation, and logical operations and reformulates problems into series of ordered steps (i.e., algorithmic thinking)
	C-8.2	Learns systematic counting and listing, systematic reasoning about counts and iterative patterns, and multiple data representations; learns to devise and follow algorithms, with an eye towards understanding correctness, effectiveness, and efficiency of algorithms

CG-9 Knows and appreciates the development of mathematical ideas over a period of time and the contributions of past and modern mathematicians from India and across the world	C-9.1	Recognises how concepts (like counting numbers, whole numbers, negative numbers, rational numbers, zero, concepts of algebra, geometry) evolved over a period of time in different civilisations.
	C-9.2	Knows and appreciates the contributions of specific Indian mathematicians, such as, Baudhayana, Pingala, Aryabhata, Brahmagupta, Virahanka, Bhaskara, and Ramanujan.
CG-10 Knows about and appreciates the interaction of Mathematics with each of their other school subjects	C-10.1	Recognises interaction of Mathematics with multiple subjects across Science, Social Science, Visual Arts, Music, Vocational Education, and Sports

3.4.1.3 Secondary Stage

CG-1 Understands numbers (natural, whole, integer, rational, irrational, and real), ways of representing numbers, relationships amongst numbers, and number sets	C-1.1	Develops understanding of numbers, including the set of real numbers and its properties
CG-2 Builds deductive and inductive logic to prove theorems related to numbers and their relationships (such as '$\sqrt{2}$ is an irrational number', recursion relation for *Virahanka* numbers, formula for the sum of the first n square numbers)	C-2.1	Extends the understanding of powers (radical powers) and exponents
CG-3 Discovers and proves algebraic identities and models real-life situations in the form of equations to solve them	C-3.1	States and motivates/proves remainder theorem, factor theorem, and division algorithm
	C-3.2	Models and solves contextualised problems using equations (e.g., simultaneous linear equations in two variables or single polynomial equations) and draws conclusions about a situation being modelled
	C-3.3	Learns Brahmagupta's quadratic formula (in both symbolic and poetic form) and its derivation, and uses it to solve some of the poetic puzzles of Bhaskara as well as modern-day problems

CG-4 Analyses characteristics and properties of two-dimensional geometric shapes and develops mathematical arguments to explain geometric relationships	C-4.1	Describes relationships including congruence of two-dimensional geometric shapes (such as lines, angles, triangles) to make and test conjectures and solve problems
	C-4.2	Proves theorems using Euclid's axioms and postulates for triangles and quadrilaterals, and applies them to solve geometric problems
	C-4.3	Proves theorems about the geometry of a circle, including its chords, subtended angles, inscribed polygons, and area in terms of π
	C-4.4	Understands the irrationality of π, the best approximations to π discovered over human history, and the first exact formula (infinite series) for π given by Madhava
	C-4.5	Specifies locations and describes spatial relationships using coordinate geometry, e.g., plotting a pair of linear equations and graphically finding the solution, or finding the area of triangle with given coordinates as vertices
	C-4.6	Understands the definitions of the basic trigonometric functions, their history and motivation (including the introduction of the *sin* and *cos* functions by Aryabhata using chords), and their utility across the sciences
CG-5 Derives and uses formulae to calculate areas of plane figures, and surface areas and volumes of solid objects	C-5.1	Visualises, represents, and calculates the area of a triangle using Heron's formula and its generalisation to cyclic quadrilaterals given by Brahmagupta's formula
	C-5.2	Visualises and uses mathematical thinking to discover formulae to calculate surface areas and volumes of solid objects (cubes, cuboids, spheres, hemispheres, right circular cylinders or cones, and their combinations)
CG-6 Analyses and interprets data using statistical concepts (such as measures of central tendency, standard deviations) and probability	C-6.1	Applies measures of central tendencies such as mean, median, and mode
	C-6.2	Applies concepts from probability to solve problems on the likelihood of everyday events

CG-7 Begins to perceive and appreciate the axiomatic and deductive structure of Mathematics	C-7.1	Proves mathematical statements and carries out geometric constructions using stated assumptions, axioms, postulates, definitions, and mathematics vocabulary
	C-7.2	Visualises and appreciates geometric proofs for algebraic identities and other 'proofs without words'
	C-7.3	Proves theorems using Euclid's axioms and postulates – for angles, triangles, quadrilaterals, circles, area-related theorems for triangles and parallelograms
	C-7.4	Constructs different geometrical shapes like bisectors of line segments, angles and their bisectors, triangles, and other polygons, satisfying given constraints
CG-8 Builds skills such as visualisation, optimisation, representation, and mathematical modelling along with their application in daily life	C-8.1	Models daily-life phenomena and uses representations such as graphs, tables, and equations to draw conclusions
	C-8.2	Uses two-dimensional representations of three-dimensional objects to visualise and solve problems such as those involving surface area and volume
	C-8.3	Employs optimisation strategies to maximise desired quantities (such as area, volume, or other output) under given constraints
CG-9 Develops computational thinking, i.e., deals with complex problems and is able to break them down into a series of simple problems that can then be solved by suitable procedures/ algorithms	C-9.1	Decomposes a problem into sub problems
	C-9.2	Describes and analyses a sequence of instructions being followed
	C-9.3	Analyses similarities and differences among problems to make one solution or procedure work for multiple problems
	C-9.4	Engages in algorithmic problem solving to design such solutions
CG-10 Knows and appreciates important contributions of mathematicians from India and around the world	C-10.1	Recognises the important contributions made by mathematicians (Indian and others) in the field of Mathematics (such as the evolution of numbers, geometry, algebra)
	C-10.2	Recognises modern contributions to Mathematics made in both India and abroad, and understands the next frontiers and next major open questions in the field of Mathematics
CG-11 Explores connections of Mathematics with other subjects	C-11.1	Applies mathematical knowledge and tools to analyse problems or situations in multiple subjects across Science, Social Science, Visual Arts, Music, Vocational Education, and Sports

3.4.2 Rationale for Selection of Concepts

The Learning Standards, the Curricular Goals and Competencies defined here make choices for the concepts that will be taught and learnt in each of the stages. The key principles that underlie these choices are described here:

a. **Principle of Essentiality:** This principle involves three key questions: What Mathematics is essential to learn so that one can solve one's day-to-day problems, live a normal life, and ably participate in the democratic processes of the country? What Mathematics is essential to be able to adequately understand other essential school subjects, such as Science and Social Science? And, finally, what mathematical ideas are essential for developing interest in students to further pursue the discipline if one desires to do so?

b. **Principle of Coherence:** Concepts that are selected for each stage must be in coherence with each other and with the overall Stage-specific Curricular Goals, Competencies, and Learning Outcomes. The goal must not be to bombard the student with all mathematical concepts at the expense of coherence.

c. **Principle of Practicality and Balance:** Due to a rush for completing the syllabus, the focus on building conceptual understanding often gets compromised and rote memorisation of formulae and direct use of algorithms becomes a central part of the teaching process. NEP 2020 strongly recommends reducing content to give time for discussion, analytical thinking, and fully appreciating concepts.

At each Stage, while choosing the concepts for Mathematics, emphasis has been given to the idea of balancing content load with discussion, analytical thinking, and true conceptual understanding. The selection of concepts in each Stage must aim to increase the space for balancing conceptual and procedural understanding of the concepts. This will create space for Teachers to focus more on building conceptual understanding and meaningful practice.

With this rationale, Learning Standards have been configured to give emphasis to understanding Mathematics as a discipline by the end of Grade 10, so that students can appreciate its intrinsic beauty and value, thereby, also pursue higher education in Mathematics if they so wish. Areas and concepts that are considered useful for all students to interact with the world over their lives, or study other subjects, are covered by Grade 10, so that if they decide to drop Mathematics after Grade 10, they are still equipped with essential skills, concepts, and Competencies in Mathematics. At each Stage, all concepts are included that may be needed as prerequisites for concepts in later Stages.

Section 3.5
Content

The approach, principles, and methods of selecting content has commonalities across subjects, those have been discussed in Part A, Chapter 3, 3.2 of this document. This section focusses only on what is most critical to Mathematics Education in schools. Hence, it will be useful to read this section along with above-mentioned section.

3.5.1 Principles for Content Selection

The following principles will be followed while choosing topics of study for Mathematics classrooms. Stage-wise principles are laid down; for each stage, principles for the previous Stage have also been considered, wherever applicable.

3.5.1.1 Preparatory Stage

a. Plenty of space should be given to students' local context and surroundings for developing concepts in Mathematics. Case studies, stories, situations from daily life, and vocabulary and phrasing in the home language should be brought in to help introduce and unfold a concept and its sub-concepts.

b. The development of a culture of learning outside the classroom should be encouraged. More play-way methods (activities) should be included wherever possible.

c. Avenues for mathematical reasoning should be created in all activities, projects, assignments, and exercises. The content should encourage students to articulate the reasons behind their observations and guesses or conjectures and ask why a pattern extends in a certain way and what the rule behind it is.

d. The language of the content should be simple so that students can also express their thoughts using similar language; this should gradually enlarge their vocabulary and enable them to become more skilled over time in using precise mathematical vocabulary, symbols, and notation.

e. Content should encourage learning processes (meaningful practice leading to building memory and procedural fluency) and cognitive skills (reasoning, comparing, contrasting, and classifying), as well as the acquisition of specific mathematical capacities.

f. There should be consistency and coherence across the content, and the progression of the concepts should be spiral rather than linear.

g. For content selection, the focus should be on activities that are engaging and built around the daily-life experiences of students. It should cater to more than one Learning Objective or Competency simultaneously and take into account one or more learning areas at the same time.

h. More formal definitions should naturally evolve at the end of a more informal discussion, as students gradually develop a clear understanding of a concept.

3.5.1.2 Middle Stage

a. Content should allow students to explore several strategies for solving a problem or puzzle.

b. Content should involve situations and problems that offer multiple correct answers. For this, open-ended questions should be given more space in the exercises.

c. Content should provide opportunities for students to 'talk' Mathematics. Semi-formal language used by students in discussions should be accepted and encouraged.

d. Problem posing is an important part of doing Mathematics. Exercises that require students to formulate and create a variety of problems and puzzles for their peers and others should be encouraged.

e. Content should allow students to explore, create, appreciate, and understand instead of just memorising concepts and algorithms without understanding the rationale behind how they work.

f. Content should offer meaningful practice through worksheets, games, puzzles, that leads to working memory (*Smriti*) and ultimately builds procedural or computational fluency.

g. Mathematics should emerge as a subject of exploration, discovery, and creativity rather than a set of mechanical procedures.

h. Content should give opportunities to naturally motivate the usefulness of abstraction.

Teacher's Voice 3.1

Finding π

Ever wondered if we can find Pi (π) on our own without any computer, calculator, or any textbook? The answer is yes! And that too, just by using a thread, paper-pencil, and a geometry box. In my class, I do this exercise when we learn the properties of circles. The activity is quite simple. We take a piece of paper and draw multiple circles using a compass of varying diametres. Then we put the thread on the outline of the circle and measure the length of that thread. This length will be the circumference of the circle. Repeat this for all the circles and note down in table like below:

#	Circumference or length of the thread (C)	Diametre (D)	Ratio of Circumference to Diametre
1.			
2.			
3.			
4.			
5.			

At the end of the exercise, I ask students to notice the ratio value. It is usually around 3. This is the famous constant, popularly known as the Pi, denoted by a Greek symbol 'π'.

Once we do this, we solve many more related questions, like 'If I know the radius of the circle, can we guess its circumference?' and more. Using teaching aids with such activities keeps my students more alert and interested throughout the class.

3.5.1.3 Secondary Stage

a. Content should be chosen and designed in a way that enables students to understand notions of abstraction, the axiomatic system, and deductive logic.

b. More project-based work should be designed and given space in the content so that students have opportunities to weave together several concepts simultaneously. This will help students appreciate the unity and inter-relatedness of mathematical concepts.

c. Interdisciplinary approaches should be kept in consideration while designing the content. Project-based work could be designed based on themes to ensure the integration of other subjects, e.g., linear variation and equation solving in the Science and Social Science.

d. Content at this stage should allow students to develop and consolidate the mathematical knowledge and skills acquired during the Middle Stage.

e. Students should develop necessary skills to work with tools, modern technological devices, and mathematical software useful in mathematical discovery and learning.

f. Content should highlight the history of Mathematics and how mathematical concepts have developed over time, and in particular, the contributions of Indian and other mathematicians.

Box 3.2

Incorporation of Indian Contributions to Mathematics

Mathematics has an extremely rich history in India spanning thousands of years from the ancient and Vedic times to the modern era. Some selected landmarks of mathematical discoveries in India include:

Before 2nd Millennium BCE	Names of powers of 10 up to 10^{12} in the *Yajurveda*
c.800 BCE	The first general statement of the Baudhayana-Pythagoras theorem, in Baudhayana's *Sulba-Sutra*
c.500 BCE	The concept of generative grammar is introduced, and is used to model an entire language, in Panini's *Astadhyayi*
c.300 BCE	First algorithm to represent numbers in binary, in Pingala's *Chhandashastra*
c.300	Development of the Indian system of writing numerals using the digits 0–9, as used around the world today. First known usage in the *Bakhshali* manuscript
499	Introduction of the ***sin*** (*Jya*) and ***cos*** (*Kotijya*) functions, thus laying foundations for trigonometry, in Aryabhata's *Aryabhatiya*
	First use of Indian numerals to perform complex computations, carried out in the context of astronomy in Aryabhata's *Aryabhatiya*
	Introduction of zero as a number, and of negative numbers as numbers, and of the rules for arithmetical operations on them, by Brahmagupta in *Brahmasphutasiddhanta*
628	First use of variables for numbers, thus laying the foundations for algebra, by Brahmagupta in *Brahmasphutasiddhanta*
	First general solution to the one-variable quadratic equation, by Brahmagupta in *Brahmasphutasiddhanta*
c.700	Introduction of the Virahanka--Fibonacci numbers 1,2,3,5,8,13,21,34, ..., in the context of poetry by Virahanka in the *Vrttajatisamucaya*
	First explicit description of Pingal's Meruprastar / Pascal's Triangle, in the context of poetry by Virahanka in *Vrttajatisamucaya*
c.1000	First known 4 × 4 magic square, inscribed at the Parshvanatha Temple in Khajuraho
1150	First complete method to solve the Brahmagupta-Pell equation $x^2 - ny^2 = 1$ (n a fixed integer) in integer pairs (x,y), given by Bhaskara in *Bijaganita*
1360	First exact formula for **π**, given as an infinite series by Madhava
1360 to 1650	Development of the foundations of calculus, including power series and differentials, by members of Madhava's school of mathematics, in particular, by Jyesthadeva in *Yuktibhasha*
1910's	Ramanujan discovers rapidly converging series for **π**, asymptotic formulas for the number of partitions of a number, the circle method, and mock theta functions among numerous other foundational discoveries
2002	First provably polynomial-time algorithm to determine whether a whole number is prime, in an article titled "PRIMES is in P" by Agarwal, Kayal, and Saxena at IIT Kanpur

These and other foundational mathematical discoveries in India, and the fascinating stories behind them, will be incorporated and integrated at appropriate points in the curriculum.

Part C

3.5.2 Materials and Resources

Materials and resources form a critical part of content. Principles for selecting content for teaching and learning Mathematics include:

a. **Concrete Materials:** TLMs can be useful resources that make learning experiences more interesting and enjoyable. Such material can be used in understanding concepts, as well as in practice and assessment. These resources enable students to comprehend concepts more effectively, as they connect verbal instruction with real experience, concretise abstract concepts, and develop curiosity and interest in learning. Schools can establish Mathematics laboratories or corners with equipment for experimentation, exploration, demonstration, and verification of mathematical ideas. Some examples include electronic calculators, graph machines, mathematical games, puzzles, ganit malas, bundle sticks, geoboards, algebra tiles, Dienes Blocks, or flat long cards, dominoes, pentominoes, Mathematics-related videos, and inclinometers.

b. **Textbooks:** Textbooks should provide factually correct information in an accessible manner. There should be broad narratives and motivations (including those specific to a State or region) that hold the content together, so it does not read like just a collection of techniques. The development of ideas should be coherent and sequential or spiral, with concrete examples leading to abstract concepts, and new concepts growing from old ones. The language should be simple and comprehensible and should give space for students to build their own definitions, and only gradually start using more formal mathematical terms. The content chosen should be in alignment with the pedagogical instructional practices specific to Mathematics (Section 3.6). Content should include first concrete representations and visual representations, and only then abstract representations. There should be a balance between content and exercises or puzzles to ensure learning by discovering or doing.

c. **Workbooks:** Workbooks are a useful tool in the teaching and learning of Mathematics. Workbooks can be designed to fulfil three purposes: (i) introducing new concepts; (ii) practice for consolidating the understanding of concepts, and attaining procedural and computational fluency; and (iii) self-assessment tools for students to track their own understanding, and to provide the same information to teachers also. Teacher handbooks accompanying student workbooks can also be very useful.

d. **Technology:** Information and communication technologies provide additional opportunities for students to see and interact with mathematical concepts, making the teaching of mathematics more interactive and engaging. Making use of graphing calculators or software, computer algebra systems, and other digital tools allow students to experiment with and visualise mathematical objects and operations, and to explore and make discoveries through games and simulations.

Section 3.6
Pedagogy and Assessment

The approach, principles, and methods of pedagogy and assessment has commonalities across subjects, those have been discussed in Part A, Chapter 3, 3.3 and 3.4 of this document. This section focusses only on what is most critical to Mathematics in schools. Hence, it will be useful to read this section along with the above-mentioned section.

3.6.1 Pedagogy for Mathematics

Traditional approaches to teaching mathematics directly jump into abstract symbolic manipulation. This is not very effective in making mathematics accessible to learners. There are several steps before the learner is ready for symbolic manipulations. The first step is to have concrete experiences that embody the mathematical concept involved. Once the learners have immersed themselves in this experience, discussing this experience using language is the next level of abstraction. This language use can then be represented as pictures or diagrams. Finally, these pictures can be converted into the symbols that are used in Mathematics to represent that particular concept or idea. Effective Mathematics pedagogy should take into consideration this sequence for developing a conceptual understanding of mathematics.

For students, problem-solving and problem-posing are critical steps in learning Mathematics. Practice and independent problem solving help students process and remember difficult concepts, and this should be encouraged in the classroom as frequently as possible. Students should also be encouraged to solve problems and puzzles in groups, so that they can see different approaches towards solving a problem and have conversations about mathematical concepts, thereby making them more graspable. They should also be encouraged to pose questions and come up with new problems.

Many students from the Preparatory Stage onwards enjoy learning via scientific experiments performed in laboratories. Students get to experience the following stages of scientific discovery: observing a phenomenon in nature, setting up an experiment in a lab, performing the experiment and noting down observations, trying to find a pattern, and then finally trying to explain the phenomenon. Unfortunately, current practices in Mathematics teaching does not expose students to such a journey. Mathematics is too often presented as a finished product which is purely demonstrative and formal. Guessing using increasingly developed intuition, a skill needed to discover new theorems and their proofs, is discouraged in Mathematics classes.

It is possible to show this 'experimental' nature of Mathematics using an inductive method of teaching at the Preparatory, Middle, and Secondary Stages. The idea is to develop teaching material consisting of appropriate Mathematics experiments. Students can work in groups and guessing can be encouraged. For example, an experiment could lead students to write down the first few even numbers as sums of two smaller numbers and lead them to observe that they can always be written as sum of 2 primes. Guidance from the Teacher should lead them to conjecture that 'any even number greater than 2 is a sum of 2 primes'. They should collect as much evidence as possible. Though this particular problem is unsolved, towards the end, each student could be given an opportunity to talk about their experiment (instead of proving or disproving the statement). Many such experiments in number theory, geometry, and combinatorics could be prepared. Such activities have the potential to greatly enhance intuition and problem-solving ability.

Mathematics also naturally provides many opportunities for critical thinking, in the form of interrogating definitions, formulating, or choosing alternative proofs, conjectures, explanations, representations, or generalisations. Curriculum and pedagogy need to provide room and educational opportunity for such thinking. For example, working on match-stick geometry helps interrogate geometric assertions. Students should be encouraged to define their own geometric objects and classes of numbers with specific properties to encourage experimentation, creativity, discovery, and critical thinking.

3.6.1.1 Instructional Practices

a. Students should be exposed to multiple ways of seeing the same mathematical concept. This could be through pictures, symbols, different motivations or applications, and different descriptions in spoken language. Each of these provides a distinct perspective, and they together help the student form their own understanding of the mathematical concept.

b. The Teacher should encourage students to express their understanding in their own words using mathematical vocabulary and terms, including in their own home language when different from the medium of instruction. Opportunities should be created for mathematical conversations between students.

c. The Teacher should provide opportunities for students to engage in meaningful discussions involving questions that require explanations, such as, 'How could you explain your thinking to someone just beginning to learn this?' or 'How do you know?'). Habits of verification should be inculcated from an early age. When a student has distributed 24 toffees among 8 students, it is important to not only ask 'Has everyone gotten an equal number of toffees?', but also to follow up with 'How do you know?'

d. The Teacher can incorporate problem-solving tasks in the classroom that serve multiple purposes. Problems can be chosen to review concepts previously studied by students and link them to new concepts. The task can be designed so that students have to reason through questions, and then justify their thinking orally or in writing.

e. Teachers can use physical models, diagrams, graphing calculators, simulations, computer algebra systems, games, and other tools to help students model situations, visualise concepts, think through a problem, and devise strategies for solutions.

f. Small-group work can be an effective way of learning Mathematics. Discussions and problem solving in groups give students the opportunity to talk about Mathematics, ask questions they may be hesitant to ask the teacher, and work on harder problems by pooling together their understanding. However, it should be of short duration to manage the groups effectively.

g. Meaningful practice, through worksheets, puzzles, games, mental and oral Mathematics, group work, and homework involving paper and pencil, should be an integral part of the Mathematics classroom. Practice problems should be designed so that students revisit concepts and techniques and see different situations where a certain technique can be used. When choosing problems and guiding students to solve them, teachers should ensure that students are actively learning and not just memorising techniques.

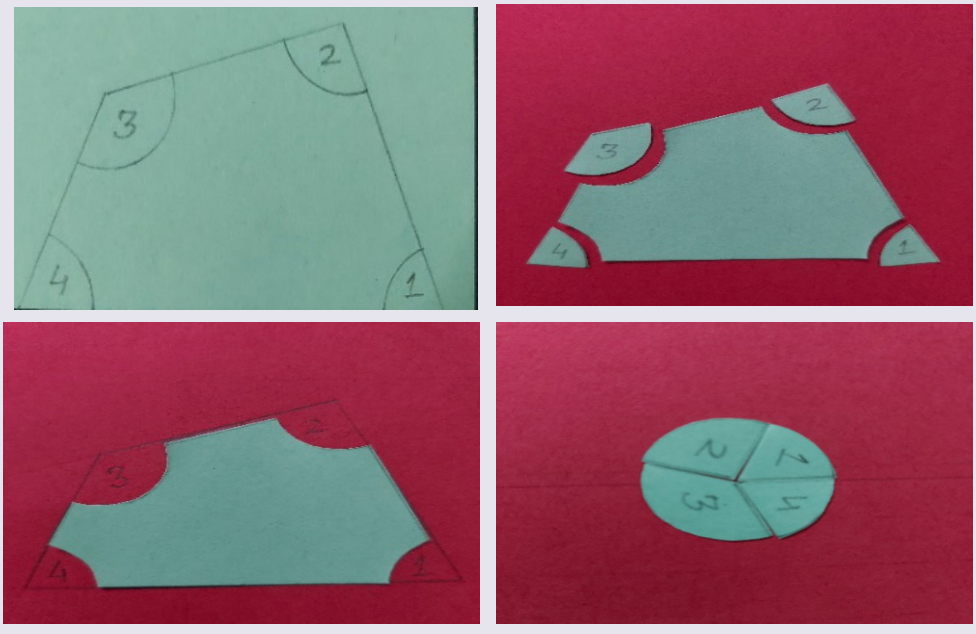
h. During the Middle and Secondary stages, opportunities should be provided for reading simple mathematical text and writing mathematical content. Mathematical communication should be explicitly signalled as an item of teaching and learning. Books and online resource material should be provided by schools for this purpose.

Teacher's Voice 3.1i

Discovering the Magic of Mathematics!

In geometry, there is a lot of learning through axioms, corollaries, and theorems which often leave students wondering 'Where did this come from? Does it happen every time?'

So, what I do is I usually introduce such things through activities. For example, to learn that 'sum of all internal angles in a quadrilateral is equal to 360°,' we do a simple activity. I ask students to draw any random quadrilateral and then label their internal angles as ∠1, ∠2, ∠3 and ∠4 as shown in the picture below. Next, I ask the students to measure the 4 angles to discover the sum is around 360°. Alternatively, when one cuts these angles and join them to meet their all four vertices at a point without leaving any gap (as seen below) to form a complete angle, one discovers that the sum is 360°.



Here, my emphasis is always on designing activities that help my students learn mathematical concepts instead of just memorising them as facts and formulae. This is an example of inductive method of teaching theorems, one could also use deductive methods to teach these theorems.

3.6.1.2 Some Suggested Methods of Teaching

a. **Play-way (Activity-based) Method:** In play-way or activity-based learning, students use toys, games, and puzzles to explore mathematics. This may involve physical games, or games or activities involving aids such as dice, puzzles, dominoes, and building blocks. Incorporating play can help make some mathematical notions seem more natural and relevant to students, and also enables them to be creative, pose questions, collaborate with others, and use multiple senses to learn. For students who feel alienated by Mathematics, this may help them enjoy the subject and feel more confident in their ability to understand it.

b. Inquiry-based Method: This method allows students to explore mathematical content by posing, investigating, and answering questions and sharing their findings with their peers for them to critique. Through this method, the student learns to reason and collaborate with their peers to discover mathematical patterns and truths.

c. Problem-solving Method: Word and logic puzzles, including puzzles that use elimination grids to solve logic problems, are a fun way to teach deductive reasoning. Simple puzzles can help develop students' logical and creative thinking skills in an enjoyable manner.

d. Inductive Method: Inductive method is based on the principle of induction. Induction is the process to establish a generalised truth by showing that if it is true for a reasonably adequate number of cases, then it is true for all such cases. Thus, the inductive method of teaching leads us from known to unknown, from a particular case to a general rule and from concrete to abstract. When a number of concrete cases have been understood, the student is able to attempt a generalisation. Students are presented with a series of individual concrete cases, and they are expected to come up with a generalised and abstract mathematical representation of these cases. This method can help students discover patterns in numbers or geometry, which they may later encounter as theorems or formulae. Such discoveries reveal the beauty that drives many people to study mathematics.

e. Deductive Method: Deduction is the process by which a particular fact is derived from some generally known truths. Thus, in the deductive method of teaching, the student proceeds from general to particular, from abstract to concrete, or from formula to examples. Here, a pre-established rule or formula is given to the student, and they are asked to solve the related problems by using that formula or to prove theorems using definitions, axioms, and postulates.

Each of the methods above has its own advantages and limitations. It is also true that one method does not work for all students, and so the Teacher must draw on their understanding of their class and choose a combination of methods to ensure the learning of every student. The matrix below suggests methods in rows and Stages in three columns.

Table 3.1

Suggestive Methods	Stages		
	Preparatory	Middle	Secondary
Play-way	✓✓✓	✓✓	✓
Discovery/Inquiry	✓✓	✓✓✓	✓✓
Problem solving	✓✓	✓✓✓	✓✓✓
Inductive	✓✓✓	✓✓	✓
Deductive	✓	✓✓	✓✓✓
Recommendation on Use: ✓✓✓ — *More Often,* ✓✓ — *Often, and* ✓ — *Less Often*			

3.6.1.3 Integrating Mathematics with Other Curricular Areas

An interdisciplinary approach enables students to expand their horizons by allowing them to consider and tackle problems that do not fit exactly into one subject. It also changes how students learn by enabling them to synthesise multiple perspectives, instead of driving their thoughts unidirectionally based on the understanding of one discipline. It allows students to explore and involve multiple perspectives and dimensions from different curricular areas to deal with daily life problems. Hence, integrating Mathematics with other Curricular Areas can help students develop interest in the subject and build a holistic view of different disciplines.

Mathematics learning can thus be made more meaningful and interesting by integrating it with other curricular areas. Some possibilities for doing this are described below:

a. **Integrating Mathematics and Art:** Art and Mathematics are closely linked with both disciplines playing an important role in understanding patterns, as well as enhancing spatial abilities and visualisation. Many activities that are a part of students' lives, such as music, dance, needlework, and *rangoli* naturally lead them to see patterns, which can be described and further understood using mathematical language. Integrating the Arts with Mathematics can include art and craft activities that engage students in creating visual patterns, tessellations, and geometric objects, and can include exposure to examples of artworks that contain interesting patterns. Some ideas for integrating Art in the Mathematics classroom are:

   i. Creating and analysing different *Rangoli or Kolam* patterns.

   ii. Creating *origami*, and using it to understand angles, symmetries, and how a 2D object can be transformed into a 3D one.

   iii. Recognising geometries and symmetries in art and architecture.

   iv. Symmetry can also be explored through dance and movement by assigning mirroring exercises for students. This concept can also be explored through visual games, self-designed board games, simple print-making activities based on traditional art forms like Rogan printing, and by viewing examples of architecture, painting, and sculpture.

   v. Pattern activities could also include art forms, like weaving, embroidery, and bead work, where patterning is heavily reliant on mathematical precision, grids, and matrices.

   vi. Ratio and proportion are fundamental to the arts. The technique of drawing the human body requires an understanding of proportion (e.g., the length of an arm is about thrice the length of the head). The study of ratios and proportions can also be related to different cultures and their canons of beauty being defined by specific ratios and proportions.

   vii. Music is filled with patterns. The joy of making music lies in creating innumerable permutations and combinations of patterns by grouping notes, sounds, and beats. Tempo determines how notes can be combined and fitted into specific rhythm cycles in multiple variations. Music is an extremely useful way to understand fractions since it uses full notes, half notes, quarter notes, and one-eighth notes which also relate to tempo in terms of *'ek gun, dugun, trigun, chaugun'*.

Improvisation in the classical forms of music require an immense alertness and ability to do mental math. For example, creating note patterns in multiples of 3, 5 or 7 in a 4-beat rhythm can be, both challenging and aesthetically pleasing.

The way frequencies are chosen in music also involves understanding simple fractions, due to what sounds good and most resonant to the ear. For example, the ratio of frequencies of the top and bottom *Sa* in a *saptak* is 2:1, and the ratio of frequencies of *Pa* and *Sa* is 3:2. There are reasons from Physics (namely, the notion of resonance) as to why particular combinations of notes sound good to the ear, and the notes *(Shrutis)* that are used in Indian classical music (and also in music around the world), as explained in *Bharata's Natyashastra,* is based on simple whole number ratios of frequencies.

b. **Integrating Mathematics and Sports:** Integrating Mathematics and Sports can benefit students who enjoy sports and see the relevance of measurement, unit conversion, probability and statistics, scoring systems, and trajectories of thrown objects in the context of sports. Student projects can explore mathematical connections such as in the Fosbury Flop in high jump or the Duckworth Lewis Scoring System in cricket.

c. **Integrating Mathematics and Science:** The appearance of the Virahanka numbers and the golden angle in nature (e.g., in pinecones, sunflowers, daisies, *kaner* and *tulsi* plants) make for an excellent interdisciplinary journey of discovery.

Similarly, other Curricular Areas can also be integrated with Mathematics to understand and see more meaning of Mathematics in daily life.

3.6.2 Assessment in Mathematics

Few key principles for assessment in Mathematics are:

a. Students must be assessed for understanding of concepts and mathematical skills and capacities, such as procedural fluency, computational thinking, problem solving, visualisation, optimisation, representation, and communication.

b. Students must be assessed through a variety of ways, e.g., solving a variety of problems testing procedural knowledge and conceptual understanding in key mathematical concepts, geometric reasoning, algebraic thinking, word problems, and working in groups to solve mathematical problems.

c. Open book assessments can go a long way towards reducing anxiety in students. Examinations could provide 'fact sheets' consisting of information, such as formulae, and definitions, so that students need not memorise them but use them in actual problem solving.

A few Teacher Voices illustrate assessment in Mathematics below:

Teacher's Voice 3.1ii

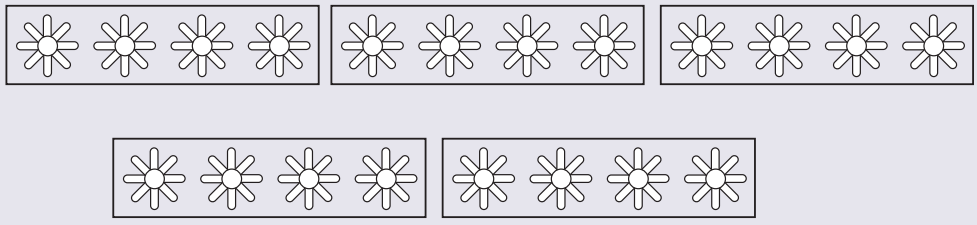
Multiplication as Repeated Addition

I teach Grade 4. I wanted to assess my students' understanding of multiplication as repeated addition and its application in daily life.

The question below is directly related to their conceptual understanding of multiplication as repeated addition and the ability to apply that understanding in a new

situation. I preferred this to just asking them to solve questions from the textbook using vertical and horizontal multiplication.

Given below are groups of flowers. Which of the following shows the fastest way to find out the **total number of flowers** in the given picture?



A. 4 + 5

B. 4 + 4 + 4+ 4 + 4

C. 3 + 2

D. **5 × 4**

E. 4 × 5

I used the following marking scheme:

Marking Scheme	
Option A	*0 point*
Option B	*1 point*
Option C	*0 point*
Option D	*2 points*
Option E	*0.5 point*

Teacher's Voice 3.1iii

Percentages

I teach Grade 7. I wanted to assess my students' ability to use the understanding of percentages in solving real-life contextual word problems. Students can solve routine problems from their textbooks, but tend to stumble when they need to comprehend a word problem by themselves and use the appropriate procedure to solve it. This is what I tried.

Q: A cricket team played 20 matches in a tournament. If they lost 25 per cent of the matches and won all the remaining matches, how many matches did the team lose?

a. 2 matches

b. 4 matches

c. 5 matches

d. 10 matches

Once the class solved this problem, I also asked my students to frame a problem on percentages where the answer would be 10 matches. Each student came up with a different word problem. This was a real test of their mathematical capacities.

Teacher's Voice 3.1iv

Multiple Methods

I teach Grade 9. I find that my students usually solve mathematical problems using only one method. They rarely use a combination of methods to arrive at a solution. This is an important capacity in Mathematics as it helps in discerning when to use which method.

So, I gave my students a problem and asked them to use at least 3 different ways of solving it. This was the problem:

There are 48 students in Grade 8 in a school. If the number of girls is three times the number of boys, then how many girls and boys are there in that class? Solve this question using at least 3 different methods: Algebraic method, Ratio method, Section method, using patterns, or any other method.

Since students may attempt this in very many ways, I also gave them these solved answers to self-assess their work after they worked out their methods.

Correct Answer 1: Algebraic Method (1) Step 1: Number of boys = x Step 2: Number of girls = 3x Step 3: 3x + x = 48 Step 4: 4x = 48 Step 5: x = 12 Step 6: Number of boys = 12 Step 7: Number of girls = 36
Correct Answer 2: Algebraic Method (2) Step 1: Number of girls = x Step 2: Number of boys = x/3 Step 3: x + (x/3) = 48 Step 4: (4x/3) = 48 Step 5: x = 36 Step 6: y = 12 Step 7: Number of girls = 36 Step 8: Number of boys = 12
Correct Answer 3: Using Ratios Step 1: The ratio of the number of girls to the number of boys is 3:1. Step 2: 3x + x = 48 Step 3: 4x = 48 Step 4: x = 12 Step 5: Number of boys = 12 Step 6: Number of girls = 36
Correct Answer 4: Using Section Method Step 1: Girl's section = 3/4 Step 2: Number of girls = 3/4 (48) Step 3: (3 × 48)/4 Step 4: 3 × 12 = 36 Step 5: Number of boys = 1/4 (48) = 12 or number of boys 48 – 36= 12 Step 6: Number of girls = 36

Correct Answer 5: Solving Using the Pattern

Boys	**Girls**
1	3
2	6
4	12
8	24
12	36

Number of girls = 36

Number of boys = 12

And any pattern from which the correct answer can be drawn.

Turn around and solve questions like:

36 + 12 = 48 And write 36 = 3 × 12

So, the number of girls = 36 and the number of boys = 12.

Correct Answer 6: Using Equations

Step 1: Number of girls = x

Step 2: Number of boys = y

Step 3: x + y = 48

Step 4: x = 3y

Step 5: 3y + y = 48

Step 6: 4y = 48

Step 7: y = 12

Step 8: x= 36

Step 9: Number of boys = 12

Step 10: Number of girls = 36

Chapter 4

Science Education

Science is the study of the natural and physical world around us through a systematic process of observing, questioning, forming hypotheses, testing hypotheses through experiment, analysing evidence, and thereby continuously revising our knowledge.

The process of Science is not something that only scientists do in laboratories alone. It also develops an important set of capacities (and dispositions) essential for leading a rational and fulfilling lives. These capacities (and dispositions) help us make informed and good decisions that benefit us and our communities.

Learning Science enables us to gain valid knowledge about the world as well as acquire scientific values, capacities, and dispositions, such as curiosity, creativity, evidence-based thinking, and sound decision-making.

As a subject in schools, Science draws significantly from the disciplines of Biology, Chemistry, Physics, Earth Science, as well as from Mathematics, Computational Sciences, and, where relevant, from Social Science and Vocational Education, in order to provide an interdisciplinary understanding and appreciation of the role of Science in everyday life.

Good education in Science, including the development of a mindset of inquiry and research in students, is critical in addressing the challenges that India and the world face today, such as, climate change, improving healthcare, technological advancement and use for sustainable development, creation of just and equitable livelihoods, and living in harmony with nature. Therefore, ensuring high quality education in Science, and its relationship with other subjects, such as, Social Science and Vocational Education forms a key focus of this NCF. This would help students to gain an understanding of how science and scientific research can address the central challenges faced by our society.

Children must start learning the process of science and the basics of the scientific method starting in the Foundational Stage itself. In the Preparatory Stage, they gain further experience in the process of Science and the scientific method through observing patterns and relationships in their natural environment and conducting simple hands-on experiments.

Science is introduced as a separate Curricular Area only in the Middle Stage. In this Stage, the approach integrates the disciplines of Biology, Chemistry, and Physics. This integrated approach continues in the first two years of the Secondary Stage (Grades 9 and 10). In the final two years of the Secondary Stage (Grades 11 and 12), a disciplinary approach is taken, with Physics, Chemistry, Biology, and Earth Science being offered separately. Students thereby get the opportunity to choose and understand the nature of one or more of these disciplines more deeply and develop competencies specific to each. As in the case of other Curricular Areas, Grades 11 and 12 are not dealt with in this chapter, but in Part B, Chapter 10.

Section 4.1
Aims

Science aims to develop an understanding of the natural and physical world through systematic inquiry. Learning Science also builds important capacities, such as, observation, analysis, and inference. This in turn enables the meaningful participation of individuals in society and the world of work with scientific temper, critical and evidence-based thinking, asking relevant questions, analysing practices and norms, and acting for necessary change. Science Education aims to achieve:

a. **Scientific Understanding of the Natural and Physical World:** Scientific understanding develops through specific observations, questions, experiments, theories, laws, principles, and concepts. An adequate knowledge of these is essential to build a systematic and verifiable understanding of the way the natural and physical world functions. In Science Education, students must thus learn the fundamental methods, concepts, and theories on which Science rests.

b. **Capacities for Scientific Inquiry:** The abilities to put forth hypotheses, arguments, predictions, and analyses, and to test hypotheses, evaluate situations, and draw logical conclusions, are fundamental to the learning of Science. Science Education must thus build these skills in students systematically over the Stages in school.

c. **Understanding the Evolution of Scientific Knowledge:** There are crucial historical moments in the development of Science and scientific knowledge that could not have occurred without the efforts of various individuals and organisations over thousands

of years. Understanding these key moments and discoveries will develop students' understanding of how scientific knowledge and the methods of science evolved and still evolve over time.

d. **Interdisciplinary Understanding between Science and Other Curricular Areas:** Learning in Science involves understanding interlinkages across disciplines. Concepts, principles, laws, and theories cannot be viewed as isolated, but instead they together contribute to a holistic understanding of the world. Students would learn to inquire and learn about the world through such an interdisciplinary approach.

e. **Understanding of the Relationship between Science, Technology and Society:** The contribution of Science to Society and how different societal needs led to the generation of scientific knowledge is also an important part of learning Science. Engaging with issues related to connections between Science, Technology, and Society, including the ethical aspects and implications, and appreciating the role Science plays in addressing the challenges and the world is undergoing, will add to the breadth of students' learning.

f. **Scientific Temper:** Developing the capacities for critical and evidence-based thinking and freedom from fear and prejudice is central to the learning of Science. Students will imbibe scientific values and dispositions, such as, honesty, integrity, scepticism, objectivity, tenacity, perseverance, collaboration and cooperation, concern for life, and preservation of the environment.

g. **Creativity:** Asking good questions, observing patterns in the world around us, formulating plausible hypotheses given those patterns, and designing good experiments to test those hypotheses often requires artistry and creativity. Developing such creativity and a sense of aesthetics in the pursuit of scientific understanding and exploration is another very important but often ignored aim of Science Education.

Section 4.2
Nature of Knowledge

Science is an organised system of knowledge, that evolves as a result of curiosity followed by inquiry, logical reasoning, experimentation, and the examination of empirical evidence. It enables an understanding of the physical and natural environments and phenomena, the identification of meaningful patterns and relations including causes and effects, and supports the development of models, theories, laws, and principles:

a. **Science is Fundamentally a Creative Endeavour:** Science involves imagining new ideas and concepts to understand the world. Creative imagination is required to engage with the concepts of Science, e.g., natural selection to explain diversity (theory of evolution), planetary models to represent the motion of planets, and atomic theory to envision the microscopic world beyond our capacity for observation. Asking questions, formulating hypotheses, designing experiments and making models all require creativity.

b. **Science Provides the Methods and Tools Necessary to Explore and Understand the World:** These methods and tools lead to explanations supported by empirical evidence that can be tested in a variety of diverse real-life situations against rigorous criteria (observation, rational argument, inference, replicability).

c. **Scientific Knowledge keeps Evolving and This is Reflected in its History:** Scientific knowledge is very reliable but also subject to change when presented with new evidence or with a re-conceptualisation of prior evidence and knowledge. Science, therefore, develops an appreciation for change as well as for the rigorous process through which scientific knowledge evolves.

Section 4.3
Current Challenges

A major challenge related to Science in the school curriculum is the focus on facts and definitions, often with a neglect for the development of conceptual understanding and the capacities for scientific inquiry:

a. Science teaching-learning has traditionally been based mostly on the textbook, with a focus on facts and definitions. One reason for this is the curricular load, which reduces the time available for exploration and discussion. The development of conceptual understanding and capacities requires time which is currently missing due to the high content load. This challenge only increases as students move to higher grades, the demand on them increases as the curricular load becomes even greater. The need for abstract thinking also increases. It is critical that the students develop the capacities to be able to make the progression. However, the current focus on facts does not build these capacities adequately.

b. The content to be included in the curriculum is often determined by the content and demands of entrance examinations for higher education. This is not sound logic. Science content in school should be determined by the Aims of School Education and what all students should aim to learn in Science. Meanwhile, higher education entrance examinations (or other methods) must change to being competency-based rather than rote-based and 'fact recounting'.

   Content of Science syllabus must not assume that all students will pursue Science in Higher Education, as some syllabi seem to, today.

c. Another challenge is the disconnect between the school curriculum and what students observe and experience outside school. Students come to school with their own theories about the world. These theories develop as they observe the world around them and seek explanations for what they see. Often, these theories may conflict with what is being discussed in the classroom; common intuition and scientific theories at times may not match. Illustratively, through mere perception, it is very hard to think that the Earth is not flat.

d. While a lack of infrastructure is common across Curricular Areas, learning Science especially requires access to apparatus, equipment, and laboratories. Unfortunately, this remains a neglected need. Low-cost, easily available materials are also not used, since Teachers often lack the capacity to develop such local, low-cost teaching-learning materials. At the Secondary Stage, access to a laboratory is non-negotiable, students must be able to assemble and manipulate apparatus, use materials, and design simple experiments to truly develop important competencies related to Science.

Section 4.4
Learning Standards

4.4.1 Curricular Goals and Competencies

This section lays out the Learning Standards (Curricular Goals and Competencies) for Science as an integrated Curricular Area.

In the Middle Stage and Grades 9 and 10 of the Secondary Stage, Science is taught using integrated approach. This integrated approach develops fundamental capacities related to the disciplines of Biology, Chemistry, Physics, and Earth Science while the use of connections across them helps students appreciate the interrelations between these subjects and make sense of their observations and experiences.

At all Stages, along with conceptual understanding, the capacities of scientific inquiry are developed as age appropriate. These concepts and capacities are chosen both from a disciplinary perspective and in terms of what is useful and necessary in their everyday lives. Students thereby understand the world around them with increasing depth, explore scientific questions at different levels through discussion and experimentation, and learn to communicate this understanding in different ways.

It is important to note that the Curricular Goals are interdependent, and not separate curricular pieces of study. For example, the Curricular Goals CG-1 (explore matter) and CG-6 (how to do Science) given in the Middle Stage would need to happen together, say through a project, for a student to attain both Goals.

4.4.1.1 Middle Stage

CG-1 Explores the world of matter and its constituents, properties, and behaviour	C-1.1	Classifies matter based on observable physical (solid, liquid, gas, shape, volume, density, transparent, opaque, translucent, magnetic, non-magnetic, conducting, non-conducting) and chemical (pure, impure; acid, base; metal, non-metal; element, compound) characteristics
	C-1.2	Describes changes in matter (physical and chemical) and uses particulate nature to represent the properties of matter and the changes
	C-1.3	Explains the importance of measurement and measures physical properties of matter (such as, volume, weight, temperature, density) in indigenous, non-standard and standard units using simple instruments
	C-1.4	Observes and explains the phenomena caused due to differences in pressure, temperature, and density (e.g., breathing, sinking-floating, water pumps in homes, cooling of things, formation of winds)

CG-2 Explores the physical world in scientific and mathematical terms	C-2.1	Describes one-dimensional motion (uniform, non-uniform, horizontal, vertical) using physical measurements (position, speed, and changes in speed) through mathematical and diagrammatic representations
	C-2.2	Describes how electricity works through manipulating different elements in simple circuits and demonstrates the heating and magnetic effects of electricity
	C-2.3	Describes the properties of a magnet (natural and artificial; Earth as a magnet)
	C-2.4	Demonstrates rectilinear propagation of light from different sources (natural, artificial, reflecting surfaces), verifies the laws of reflection through manipulation of light sources and objects and the use of apparatus and artefacts (such as, plane and curved mirrors, pinhole camera, kaleidoscope, periscope)
	C-2.5	Observes and identifies celestial objects (stars, planets, natural and artificial satellites, constellations, comets) in the night sky using a simple telescope and images or photographs, and explains their role in navigation, calendars, and other phenomena (phases of the moon, eclipse, life on earth)
CG-3 Explores the living world in scientific terms	C-3.1	Describes the diversity of living things observed in the natural surroundings (insects, earthworms, snails, birds, mammals, reptiles, spiders, diverse plants, and fungi), including at a smaller scale (microscopic organisms)
	C-3.2	Distinguishes the characteristics of living organisms (need for nutrition, growth and development, need for respiration, response to stimuli, reproduction, excretion, cellular organisation) from non-living things
	C-3.3	Analyses patterns of relationships between living organisms and their environments in terms of dependence on and response to each other
	C-3.4	Explains the conditions suitable for sustaining life on Earth and other planets (atmosphere; suitable temperature-pressure, light; properties of water)
CG-4 Understands the components of health, hygiene, and well-being	C-4.1	Undertakes a nutrition-based analysis of food components with special reference to Indian culinary practices and modern understanding of nutrition, and explains the effect of nutrition on health
	C-4.2	Examines different dimensions of diversity of food, sources, nutrients, climatic conditions, diets
	C-4.3	Describes biological changes (growth, hormonal) during adolescence, and measures to ensure overall well-being
	C-4.4	Recognises and discusses substance abuse, viewing school as a safe space to raise these concerns

CG-5 Understands the interface of Science, Technology, and Society	C-5.1	Illustrates how Science and Technology can help to improve the quality of human life (health care, communication, transportation, food security, mitigation of climate change, judicious consumption of resources, applications of artificial satellites), as well as, some of the harmful uses of science in history
	C-5.2	Shares views on news and articles related to the impact that Science or Technology and society have on each other
CG-6 Explores the nature and processes of Science through engaging with the evolution of scientific knowledge and conducting scientific inquiry	C-6.1	Illustrates how scientific knowledge and ideas have changed over time (description of motion of objects and planets, spontaneous generation of life, number of planets) and identifies the scientific values that are inherent and common across the evolution of scientific knowledge (scientific temper, Science as a collective endeavour, conserving biodiversity and ecosystems)
	C-6.2	Formulates questions using scientific terminology (to identify possible causes for an event, patterns, or behaviour of objects) and collects data as evidence (through observation of the natural environment, design of simple experiments, or use of simple scientific instruments)
CG-7 Communicates questions, observations, and conclusions related to Science	C-7.1	Uses scientific vocabulary to communicate Science accurately in oral and written form, and through visual representation
	C-7.2	Designs and builds simple models to demonstrate scientific concepts
	C-7.3	Represents real world events and relationships through diagrams and simple mathematical representations
CG-8 Understands and appreciates the contribution of India through history and the present times to the overall field of Science, including the disciplines that constitute it	C-8.1	Knows and explains the significant contributions of India to all matters (concepts, explanations, methods) that are studied within the curriculum in an integrated manner
CG-9 Develops awareness of the most current discoveries, ideas, and frontiers in all areas of scientific knowledge in order to appreciate that Science is ever evolving and that there are still many unanswered questions	C-9.1	States concepts that represent the most current understanding of the matter being studied, ranging from mere familiarity to conceptual understanding of the matter as appropriate to the developmental stage of the students
	C-9.2	States questions related to matters in the curriculum for which current scientific understanding is well-recognised to be inadequate

4.4.1.2 Secondary Stage

CG-1 Explores the world of matter, its interactions, and properties at the atomic level	C-1.1	Describes classification of elements in the Periodic Table, and explains how compounds (including carbon compounds) are formed based on atomic structure (Bohr's model) and properties (valency)
	C-1.2	Investigates the nature and properties of chemical substances (distillation, crystallisation, chromatography, centrifugation, types and properties of mixtures, solutions, colloids, and suspensions)
	C-1.3	Describes and represents chemical interactions and changes using symbols and chemical equations (acid and base, metal, and non-metal, reversible, and irreversible)
CG-2 Explores the physical world around them, and understands scientific principles and laws based on observations and analysis	C-2.1	Applies Newton's laws to explain the effect of forces (change in state of motion: displacement and direction, velocity and acceleration, uniform circular motion, acceleration due to gravity) and analyses graphical and mathematical representations of motion in one dimension
	C-2.2	Explains the relationship between mass and weight using universal law of gravitation and connect it to laws of motion
	C-2.3	Manipulates the position of object and properties of lenses (focus, centre of curvature) to observe image characteristics and correspondence with a ray diagram, and extends this understanding to a combination of lenses (telescope, microscope)
	C-2.4	Manipulates and analyses different characteristics of the circuit (current, voltage, resistance) and mathematises their relationship (Ohm's law), and applies it to everyday usage (electricity bill, short circuit, safety measures)
	C-2.5	Defines work in scientific terms, and represents the relationship between potential and kinetic energy (conservation of energy) in mathematical expressions
	C-2.6	Demonstrates the principle of mechanical advantage by constructing simple machines (system of levers and pulleys)
	C-2.7	Describes the origin and properties of sound (wavelength, frequency, amplitude) and differences in what we hear as it propagates through different instruments

CG-3 Explores the structure and function of the living world at the cellular level	C-3.1	Explains the role of cellular components (nucleus, mitochondria, endoplasmic reticulum, vacuoles, chloroplast, cell wall), including the semi-permeability of cell membrane in making cell the structural basis of living organisms and functional basis of life processes
	C-3.2	Analyses similarities and differences in the life processes involved in nutrition (photosynthesis in plants; absorption of nutrients in fungi; digestion in animals), transport (transport of water in plants; circulation in animals), exchange of materials (respiration and excretion), and reproduction
	C-3.3	Describes mechanisms of heredity (in terms of DNA, genes, chromosomes) and variation (as changes in the sequence of DNA)
CG-4 Explores interconnectedness between organisms and their environment	C-4.1	Applies the knowledge of cellular diversity in organisms along with the ecological role organisms play (autotrophic or heterotrophic nutrition) to classify them into five-kingdoms
	C-4.2	Illustrates different levels of organisations of living organisms (from molecules to organisms)
	C-4.3	Analyses different levels of biological organisation from organisms to ecosystems and biomes along with interactions that take place at each level
	C-4.4	Analyses patterns of inheritance of traits in terms of Mendel's laws and its consequences at a population level (using models and/or simulations)
	C-4.5	Analyses evidences of biological evolution demonstrating the consequences of the process of natural selection in terms of changes: in allele frequency in population, structure, and function of organisms
CG-5 Draws linkages between scientific knowledge and knowledge across other curricular areas	C-5.1	Explores how literature and the arts have influenced Science
	C-5.2	Examines a case study related to the use of Science in human life from the perspective of Social Sciences and ethics (e.g., Marie Curie, Jenner, treatment of patients with mental illness, the story of the atomic bomb, green revolution and GMOs, conservation of biodiversity)
	C-5.3	Applies scientific principles to explain phenomena in other subjects (sound pitch, octave, and amplitude in music; use of muscles in dance form and sports)
CG-6 Understands and appreciates the contribution of India through history and the present times to the overall field of Science, including the disciplines that constitute it	C-6.1	Knows and explains the significant contributions of India to all matters (concepts, explanations, methods) that are studied within the curriculum in an integrated manner

CG-7 Develops awareness of the most current discoveries, ideas, and frontiers in all areas of scientific knowledge in order to appreciate that Science is ever evolving, and that there are still many unanswered questions	C-7.1	States concepts that represent the most current understanding of the matter being studied, ranging from mere familiarity to conceptual understanding of the matter as appropriate to the developmental stage of the students
	C-7.2	States questions related to matters in the curriculum for which current scientific understanding is well-recognised to be inadequate
CG-8 Explores the nature of Science by doing Science	C-8.1	Develops accurate and appropriate models (including geometric, mathematical, graphical) to represent real-life events and phenomena using scientific principles and use these models to manipulate variables and predict results
	C-8.2	Designs and implements a plan for scientific inquiry (formulates hypotheses, makes predictions, identifies variables, accurately uses scientific instruments, represents data, primary and secondary, in multiple modes, draws inferences based on data and understanding of scientific concepts, theories, laws, and principles, communicates findings using scientific terminology)

4.4.2 Essential Concepts

There is a general agreement that the processes of Science are equally important to learn as the concepts. But usually, this does not seem to get translated into our classrooms. There is a tendency to treat Science as merely a 'bunch of facts'. This approach assumes that there are certain concepts, theories, facts, and information that students must know, and once acquired, they have knowledge of Science. However, the knowledge base of Science known today is vast and continues to grow at an unprecedented rate. This implies that no matter how many 'facts of Science' we learn, it will never be enough.

The question that this throws up is, what are the essential concepts that students must learn in Science at the school level?

Even though it would be clear that this is not complete 'knowledge of Science', this 'essential set' could be decided based on the following criteria:

a. It provides adequate knowledge of the world for that age group.

b. It provides the base and platform for further learning of scientific ideas.

c. It provides adequate 'material' for developing the capacities and values related to Science Education.

d. It provides sufficient scope for inquiry and development of capacities for scientific inquiry.

In addition, whatever concepts are chosen, they should be interesting, challenging, and intelligible for young minds.

At the same time, students must develop capacities for scientific inquiry and the ability to communicate scientific questions and ideas aligned with each Stage. These are addressed in the Curricular Goals and Competencies for both the Middle and Secondary

Stages. The Learning Standards must make a judicious choice of content on the basis of these principles to reduce the 'content load' on the students.

4.4.2.1 Middle Stage

Curricular Goals at the Middle Stage are based on the concrete experiences of students. They are based on how the Science curriculum can respond to the following questions:

a. What do students see around them?

b. What are the common observations they make?

c. What are the aspects of Science and Technology that are part of their daily lives?

d. What are their immediate concerns related to their own selves?

e. How can they start making sense of multiple aspects of their environment? How can they start learning to abstract 'Science' as the explanation of their observations and experiences?

f. How do students learn best? What capacities enable them to learn at this Stage?

g. What are the scientific values and dispositions that must be developed at this Stage?

Essential concepts selected on the basis of these questions include those that can build on students' observations of their immediate environment and help them find scientific explanations (e.g., characteristics of matter, changes in matter, diversity of living things, magnets, path of light and how it changes as it reflects from different surfaces). They are intended to enable the students to see differences and relationships between different parts of their environment (e.g., characteristics of living and non-living things, relationship between living organisms and their environment). They are related to aspects of their daily life that are of immediate interest and concern (e.g., nutrition-based analysis of food, substance abuse, the role of Science and Technology in improving their lives).

These concepts will provide a base for interested students to explore other scientific concepts and take up hobbies related to Science. Further, the concepts selected help students engage with the nature and processes of Science and develop scientific values and dispositions (including through examining the lives and works of scientists, and the development of scientific knowledge) that will enable them to take decisions in their daily lives as well as participate in larger society.

4.4.2.2 Secondary Stage

Curricular Goals at the Secondary Stage move from the concrete nature of the Middle Stage towards abstraction from perceptual and practical concepts to theoretical concepts. This abstraction could be in the nature of exploring what cannot be seen or in terms of more abstract representations (e.g., using a circuit diagram instead of drawing the components of a circuit). They help students extend their understanding with increasing complexity and abstraction. The effort is to continue with the concepts discussed in the Middle Stage; a few new concepts are also introduced. The questions the curriculum must respond to at this Stage are:

a. Is there something happening around us that we cannot directly observe?

b. Why do events and phenomena repeat themselves? What are the general principles that govern the world?

c. What are the reasons for the diversity around us?

d. What is the role of Science and Technology in Society?

e. What is the contribution of India to scientific knowledge?

f. How can Science be applied in other areas?

g. What are the connections between other areas and Science?

h. How should Science be practised?

i. What are the scientific values and dispositions that must be developed at this Stage?

At this Stage, essential concepts selected on the basis of these questions include those that help students develop foundations of key ideas in Science that have wider application (e.g., origin, properties and propagation of sound introduce students to the idea of waves) and help students explain processes and materials around them in scientific terms (e.g., nature and properties of chemical substances used in daily life, work and energy). At this Stage, students must begin to engage with what they cannot 'see' to provide explanations for what they can observe (e.g., atomic structure and valency, cellular processes) and be able to represent the world in scientific terms, draw inferences, and make predictions (e.g., representation of simple chemical interactions and changes). They must be able to see scientific patterns and relationships (e.g., Periodic Table, classification of living organisms) and formalise their observations and understanding in the form of generalisation and mathematisation (e.g., Newton's laws, Mendel's laws of inheritance, natural selection and evolution). They must be able to identify and manipulate variables to develop causal relationships (e.g., manipulation of object and lenses and image characteristics).

Students must develop an interdisciplinary understanding of Science, and its linkages with other curricular areas, as well as the connection between Science, Technology and Society (e.g., how literature and art have influenced Science). Students must also understand the contribution of India to the world's scientific knowledge (e.g., indigenous practices related to health and medicine).

Students must also be enabled to conduct scientific inquiry independently and connect their findings to their understanding of scientific concepts, laws, and principles, as well as, communicate their findings in different modes with accuracy and creativity.

Section 4.5
Content

The approach, principles, and methods of selecting content have commonalities across subjects those have been discussed in Part A, Chapter 3, 3.2 of this document. This section focusses only on what is most essential to education of Science in schools. Hence, it will be useful to read this section along with the above mentioned section.

Concepts by themselves are abstract. They need to be presented to students through content that helps them connect the concept with their previous knowledge, as well as, with their observations and experiences in the real world. For example, simply stating the rectilinear propagation of light is insufficient. This concept must be demonstrated to students, or they should be able to conclude that light travels in a straight line through observation or manipulation. Without suitable content, we reduce Science to mere facts.

To extend the example of rectilinear propagation of light, students can observe this through the formation of shadows, or the simple manipulation of cardboard sheets with small holes in front of a candle, or using a pinhole camera or periscope made in the classroom. Thus, content is extremely important and must be selected carefully.

With the above in mind, the principles for content selection are:

a. **Content should be connected to the students' lives and surroundings to the maximum possible extent:** A student in Andaman and Nicobar Islands and a student in Jharkhand will observe different kinds of plants and animals around them. But they should also understand the role of environmental factors. This generalisation will require them to understand environments they may not have experienced, as well as, some abstract ideas (e.g., temperature, precipitation).

   Light and its use is also all around us, we use mirrors, we see rainbows, we see the sun, and other sources of light. Light reflects off different surfaces in different ways. When we see objects in water, they get distorted. The content must encourage students to question and inquire about these phenomena, which will lead them to explore scientific ideas related to light. Thus, they will engage with a critical area that shows the progression of concepts (from the representation of the behaviour of light through a simple ray diagram in the Middle Stage to the representation of the behaviour of plane waves in the Secondary Stage) as well as the advances in Science and Technology (from the use of lenses and mirrors, to optic fibres in telescopes).

b. **Content should enable scientific inquiry for the progression of concepts across Stages:** For example, in the earlier Stages, students explore ideas of floating and sinking by making simple observations of different objects and making inferences about common properties. In the Middle Stage, students identify and measure the physical properties and determine the mathematical relationship between physical properties (e.g., relationship between mass, volume, and density and how this relates to floatation). They understand the concepts and represent diagrammatically the states of float and sink. They measure displacement of liquid and relate it to density. They may design simple experimental designs (e.g., clay boats of different shapes, weight) using instruments for measurement (measuring jar and overflow jar). Given data about the density of liquids, they make predictions about the state of float and sink of objects in them (relative density). They communicate their inferences in different modes (oral, mathematical, diagrammatic, in words). Thus, from verifying similar properties at earlier Stages, they progress to making quantitative predictions and measurements to arrive at theories about floatation. At the Secondary Stage, they can arrive at the conclusion that the density of water is 1 and they engage with the idea of buoyancy through quantitative measurements.

   In this approach, students are active participants in the learning process as opposed to passive receivers of information.

c. **Content should allow a comprehensive assessment of capacities of scientific inquiry at each Stage:** Content must be chosen to allow students to use the range of capacities in an observable manner so that Teachers can assess these capacities explicitly. This is aligned with the approach of defining competencies related to

capacities of scientific inquiry under separate goals. Student achievement related to these capacities should be recorded explicitly.

This means making a choice between the presentation of a concept versus ensuring students 'do' something to attain the understanding of the concept. On the other hand, content can offer tasks (e.g., activity, experiment, writing task) that are observable and provide scope for interpretation and understanding by students. For example, the effect on the time period of the pendulum on changing the length of the thread and mass of a simple pendulum can be discussed through a description and presentation on the blackboard or textbook. On the other hand, students can make simple pendulums using different, easily available materials and record their observations. Their conclusion may not be entirely perfect compared to a well-designed pendulum, but they can draw inferences, which lead to constructing theory (e.g., the relationship between mass and length of thread and time period). The content selected changes from 'time period of a simple pendulum' to 'investigating factors affecting the time period of a simple pendulum'.

Content of this nature enables self-reflection. If the experiment is not proceeding well (e.g., the bob swings wildly), the student must examine what needs to be done. This is relevant for each stage and ensures the progression of the attainment of the capacities of scientific inquiry across stages. This also enables students to take up collaborative as well as independent study.

d. **Content should enable an adequate sense of achievement at each stage. While concepts become complex across stages, milestones can be defined for subsidiary concepts that are complete and whole:** For example, we introduce students to plane mirrors, then spherical mirrors, and then lenses and system of lenses. They build a progressive understanding of reflection and image characteristics at each stage in a complete manner.

Similarly, in the Preparatory and early Middle Stage, observing the diversity of living organisms and classifying them based on the observable characteristics allows students to make sense of the living world around them. In the later part of the Middle Stage and the Secondary Stage, when microscopes are introduced, they make observations of living organisms and their cellular organisation which allows the students to re-classify or comprehend other ways of classifying the organisms based on the nature of their cellular organisation, such as, the five-kingdom system. At each Stage, different scales of complexities of living organisms are observed and understood. Thus, at each Stage, the criteria for classification are valid while providing scope for expanding these criteria with newer concepts.

e. **Content should provide opportunities for students to engage in extended durations of inquiry:** Content should lead to extended, long-term inquiry beyond the classroom engagement. This can be in the form of long-term projects, such as, documenting the cycle of food production over a season. It can also be a recording of simple observations over a period of a month or so to understand a concept better, such as drawing the phases of the moon on a classroom calendar. Or it can be a short

observation, such as, fermentation by yeast to make a bread. Students could monitor the life cycle of mosquitoes, butterflies, or moths; they could also grow fruit flies to observe organisms around them. This encourages students to go into the depth and breadth of a concept. It also connects concepts to real life situations.

f. **Content should cater to the diverse needs of students:** The content should cover a range of concepts that are interesting for all students. They must have opportunities to engage with the concept in different ways. For example, if a student is struggling to represent a concept in mathematical terms, they can start with representation through a simple working model, diagram, or verbal description and progress from there.

Students with disabilities should be included in the process of learning as far as possible. In this context, a range of materials and technology (simulation, audio-video resources) is necessary. For example, a force diagram can be made using tactile materials and detailed descriptions of the force diagram can be made available.

g. **Content must develop the ability to use the language of Science:** Communicating scientific ideas is critical, for this, both representation of the world, as well as, the development of a scientific vocabulary are critical. While the development of the scientific vocabulary progresses as engagement with scientific ideas increases, content must enable representation of natural phenomenon, from simple diagrammatic representations (evaporation, solar system, structure of plants) to more complex representations (atomic structure, structure of the cell) and abstractions that make understanding easy (forces acting on a body) to mathematical representations (laws of motion, vectors).

h. **Content should prepare students to engage with life as responsible members of the community:** Science Education at the school level should enable the students to use available scientific evidence to make decisions and choices of their everyday lives, such as, decisions to vaccinate oneself, make healthier eating choices, examine media claims critically, or contribute to an inclusive society by critically examining one's beliefs, and so on.

i. **Content should enable students to examine and practise scientific values and other human values:** Content must also demonstrate scientific values (integrity, honesty, transparency, pluralism, objectivity, acceptance of uncertainty) and enable processes of rational thinking that will help the individual take a position on societal issues.

For example, examining how the geocentric conceptualisation of the universe shifted to the heliocentric conceptualisation (established beliefs) and observations of the orbit of Pluto eventually led to it being classified as a dwarf planet (Middle Stage and Grades 9 and 10). The journey of these scientific ideas reflects the changing nature of scientific theories and the tenacity of scientists.

Also, studying heredity, evolution, and biological diversity can lend itself to an examination of how long-held beliefs were challenged by Science based on evidence, e.g., the superiority of humans (anthropocentricism) or assumptions regarding the notion of 'races' and their 'superiority', leading to an understanding of how every life matters for the symbiotic existence of every other life and of the similarity of the origins and beginning of life despite later diversity of physical characteristics.

j. **Content must enable integration across and within curricular areas:** Learning about Science can be enhanced through integration with other curricular areas. For example, playing with different musical instruments allows students to understand frequency and amplitude. Games allow students to develop concepts related to motion; examining play on the moon helps them engage with concepts of gravity and force. The use of muscles while playing, stretching, is related to both science physical education, e.g., in understanding which muscles are used for different purposes and what each muscle's use is in the body.

Section 4.6
Pedagogy and Assessment

The approach, principles, and methods of pedagogy and assessment have commonalities across subjects, those have been discussed in Part A, Chapter 3, 3.3 and 3.4 of this document. This section focusses only on what is essential for Science Education in schools. Hence, it will be useful to read this section along with the above mentioned section.

4.6.1 Pedagogy for Science

Learning Science involves not just learning theories and facts of Science, but also making connections between conceptual learning and real life, acquiring the capacities of scientific inquiry, and most importantly, applying these to understanding the world.

Students like to explore the world around them and understand why and how things happen. In this process of exploration, they use trial-and-error methods to test their hypotheses and reach possible conclusions. This exploration need not take place individually, students learn Science best through engaging with peers and adults.

Students have theories about why things happen, patterns they see around them, and about cause-and-effect relationships. As they learn about Science in a more formal set-up, these ideas get tested. Some concepts fit into the students' current understanding, while others require a shift in thinking. If there is an alignment between current ideas and what is discussed in classrooms, ideas get strengthened.

At the same time, some concepts do not fit into the students' current thinking. If not addressed, they can turn into alternative conceptions. For example, heavy objects fall faster, plants are non-living because they don't move, or heavy or big objects always sink in water. If these ideas are not challenged and suitably modified through investigation, they can turn into alternative conceptions which may persist as students move through school.

Apart from these theories, students also bring with them the ability to reason, understand, and explain relationships between cause and effect. These capacities serve as the basis for developing scientific reasoning. Opportunities, therefore, to inquire are important, as opposed to being 'told'.

Scientific values, such as, honesty and integrity, also develop through 'doing Science'. For example, while demonstrating an experiment on the boiling point of water, we should write the reading on the thermometer accurately, even if the water is not boiling at 100 degrees.

The role of the Teacher in aligning pedagogy and assessment with how students learn Science is critical. Teachers must build an environment that promotes natural curiosity, encourages questions, gives maximum possible opportunities for hands-on activities, and gives ample space to discuss ideas. Opportunities for students to express their understanding through different modes and formative assessments to track growing understanding are also key to learning Science.

4.6.1.1 Pedagogic Principles

Science pedagogy across stages must be informed by the following principles:

a. Learning Science requires an active engagement of students with the world around them to understand it. Science pedagogy achieves this through:
    i. Simulating the processes of Science, such as, asking questions, hypothesising, observing, testing, finding evidence, collecting data, analysing, modifying conclusions, communicating, and re-questioning.
    ii. Exposing students to a variety of aspects of learning Science in varied settings: the laboratory, classroom, and field, through approaches, such as, inquiry, discovery, didactic, hands-on Science.
    iii. Encouraging and sustaining curiosity by providing varied experiences that may challenge students' existing notions and ideas.

b. Learning Science requires communication and sharing of ideas and observations. Science pedagogy achieves this through:
    i. Using scientific vocabulary during instruction and creating a variety of contexts and situations for students to communicate their understanding, ideas, and observations.
    ii. Peer and collaborative learning.

c. Learning Science requires a gradual increase in the capacity to engage with complex and abstract ideas, aligned with the cognitive and procedural capacities of students. Science pedagogy achieves this by building on students' existing knowledge and using multiple representations (mathematical, graphical, diagrammatic, and models).

d. Learning Science requires making linkages between knowledge for the holistic and multidisciplinary learning emphasised in NEP 2020. Science pedagogy achieves this through:
    i. Connecting scientific knowledge inside and outside the classroom.
    ii. Horizontal connections with other curricular areas.

e. Learning Science enables the development of certain values, such as, collaboration, sensitivity, empathy, equality of opportunities, respect for diversity, and other values mentioned in NEP 2020. Science pedagogy must facilitate this process.

4.6.1.2 Recommended Pedagogical Approaches and Settings

The same pedagogical approach can be used across the three settings most suitable for learning Science: the classroom, the field, and the laboratory. This section recommends pedagogical approaches across a variety of settings in detail. The following is a list of

considerations based on which the Teachers can choose pedagogical approaches and settings:

a. The nature of a concept should guide the decision regarding the approach and setting. For example, speed can be discussed in the playing field, but the structure of a cell requires a microscope.

b. The approach and setting chosen should enable the attainment of learning outcomes and competencies.

c. Each of the recommended approaches and settings must be selected at least once in an academic year, if not more. This will ensure exposure to varied approaches and settings.

d. Even when Teachers choose a didactic approach, areas that students could have potentially inquired about or discovered should be highlighted.

a. Hands-on Science

The most important part of learning Science is actually 'doing Science' through hands-on experiential learning. 'Doing Science' can range from trial and error, using materials around them, or using basic scientific instruments (measuring instruments), and laboratory apparatus. In this process, students gain conceptual understanding and develop capacities through manipulating, designing, and building experiments and demonstrations.

b. Discovery Approach

Students explore the natural world following their own interests and discover patterns of how the world works during their explorations. Teachers may also create opportunities or draw attention to natural phenomena that students can explore further. Often, this discovery is followed by other, more structured approaches to ensure learning. For example, the Teacher draws the attention of the students to changes in the length of the shadows as the day progresses or to the venation patterns of the leaves of different plants. Students' observations on shadows are then connected to scientific concepts, such as, the path of light, and the venation pattern is connected to the shapes of the leaves.

c. Inquiry Approach

The inquiry approach allows students to navigate through unknown questions and explore solutions on their own. It allows students to work in the same way as scientists. The inquiry approach engages students with systematic observation, visualising, experimenting, inferring, communicating, and discovering relations. This approach allows Teachers to choose the appropriate type of inquiry with respect to the concept and to scaffold (support as per need) students' learning. For example, students could explore questions, such as: How do the image characteristics vary with the relative position between lens and object? How does the surface area of the reactants affect the rate of reaction? How does the intensity of light affect the rate of photosynthesis?

d. Project-centred Approach

This approach allows learning within the classroom to continue outside the classroom and extend over a period of time. For example, observing the changes in the moon over a month to understand the phases of the moon. In this process, connections to

daily life are also made. The project-centred approach allows students to develop artefacts or products (charts, presentations, speeches) that reflect and communicate their emerging understanding. It also allows the integration of concepts across different curricular areas. For example, visits to the sites of local professional communities and interactions with the people engaged there, such as, potters, weavers, craftspersons, farmers, blacksmiths, carpenters, and electricians would enable integrating concepts from vocational education and art with Science.

e. Didactic Approach

Often, teaching Science involves communicating certain important information in the form of scientific terms, phenomena, and the historical development of concepts and ideas. In this approach, the Teacher largely regulates the direction and flow of the lesson. For example, after students have discovered changes in the length of the shadows throughout the day, the Teacher can explain the effect of the position of the sun on the length of the shadow and how students can use it to keep track of the time as well.

f. Demonstration

The Teacher demonstrates the working of certain instruments or outcomes of experimental set-ups to draw the attention of the students to relevant concepts. These demonstrations enrich students' learning experiences of the concepts.

These approaches can be implemented in a variety of settings. A combination of the recommended pedagogical approaches and settings is also often needed to be used for teaching a concept.

The box below illustrates a Science class that uses some of these pedagogical approaches within a laboratory setting in the voice of a Teacher.

Teacher's Voice 4.1i

Demonstrating Osmosis in Living Cells

For my Grade 9 students, I planned a demonstration of osmosis in living cells. They already are familiar with the concept in form of daily life examples, such as, what causes pruning of our fingers if kept in water for long, but in this session, we go a level deeper to observe the process in living cells under the microscope.

We will have a total of 90 minutes to perform this. Hence, I prepare the material, such as, common salt (NaCl) solution and cut onion pieces and equipment, such as, glass slides, forceps, and microscopes. Students work in multiple groups. Hence, I prepare as many instruction or observation recording sheets.

On that day, I begin by demonstrating the experiment, I prepare three slides A, B and C, add drops of solution in varying quantity, place coverslip, and then observe under the microscope what is happening to the cells in the onion peel on the slide.

Then all groups repeat this same set of actions and record their observation by drawing on the sheet provided. Post this, we discuss whatever we observed. After the students discuss possible inferences, I introduce the term 'osmosis' to the class, using the concept to explain their observations and share more daily life examples where we see this phenomena, for example, in the process of pickling.

4.6.1.3 Horizontal Connections

a. Horizontal connections with other curricular areas are necessary for the holistic and multidisciplinary learning emphasised in NEP 2020. Some curricular goals and competencies in both the Middle and Secondary Stage are designed to ensure horizontal connections between Science and other curricular areas. At the same time, pedagogy must be designed so that these connections are made in the classroom.

b. Pedagogic approaches and methods, such as, inquiry and projects, by their nature, provide scope to utilise concepts and capacities that cut across the disciplines of Science, for example, a project on investigating the sound produced by different musical instruments, and how this sound can be varied. Qualities and properties of sound produced both in terms of aesthetics, physics concepts involved, mathematical patterns, and human perception lead to a holistic appreciation and integration of competencies across curricular areas.

c. Pedagogic methods, such as, surveys and field-based methods enable students to see concepts through socio-cultural, economic, emotional, and scientific lenses, for example, a survey of traditional medicinal and cooking practices and their connection with the seasons.

4.6.1.4 Resources in Science Teaching

Science laboratories are essential for a good Science Education class. However, there are no separate rooms for Science laboratories in the majority of Middle schools currently, although Science kits are provided. In this situation, Teachers can use their classrooms or any open space for conducting experiments. The following must inform the use of resources:

a. The materials and equipment should be simple and easy to use. This makes it more likely that they will be used in classrooms by Teachers. At the Middle Stage, Science kits available at most schools provide a good start.

b. However, teaching should not be restricted to the Science kits. The more materials students use, the more opportunities they get to do Science and hence learn Science. Improvised apparatus can be made using inexpensive materials to extend the use of materials beyond the Science kit. For example, a measuring jar can be made out of discarded transparent glass bottles, using measuring cups (that usually come with syrup bottles) and syringes for calibration.

c. At this Stage, if the school can provide dedicated lab space, with adequate space for simple materials and resources, it must be done.

d. At the same time, doing Science must not be restricted to Science laboratories or Science kits. Classrooms, especially in the Middle Stage, must allow the doing of Science. At the same time, all safety considerations must be kept in mind.

e. Tinkering laboratories, informal spaces where students can 'play' with simple scientific materials and equipment independently, can be set up in any room within the school. This will help students strengthen design thinking, creating, and experimental capacities. Initially, students would have to be supported by the Teacher.

f. Students at the Secondary Stage would require standard scientific equipment and apparatus and basic infrastructure in which they can perform experiments with convenience and safety. Therefore, Secondary schools should have well-equipped, resourceful, and spacious Science laboratories to conduct Science experiments and investigations.

g. If a school has a laboratory but the number of students is large, the Teacher can either allow students to do the experiments in groups or ask students to perform the experiments on alternate days.

h. Budgets for Science in the Middle and Secondary Stages are limited, so Science equipment and materials should be inexpensive. However, if the equipment is of inferior quality (e.g., weak magnet, cheap microscope with plastic lens), it may not be worth using.

i. Alternatives can be used. For example, in case of unavailability of litmus paper, a Teacher can use turmeric solution or turmeric paper strips for identifying the acidic and basic characteristics of the substances. For this, the Teacher can take turmeric (powder or solid) and add it on a paper or in a glass cup containing water. This solution can be used for the identification of acids and bases. The Teacher can also make wet paper strips dipped in turmeric solution. Students can be asked to do the following: dry these paper strips, prepare solutions of each substance in water, dip the strip in the solution, and check the colour change of the turmeric paper strips. Could you make a list of changes in the colours of these substances?

4.6.1.5 Classroom Management

Classroom environment plays a vital role in student's learning. An ideal classroom of Science is one which has sufficient space and flexible seating to enable both small group work and whole class seating. The flexibility of the classroom is key in terms of allowing enough space to accommodate a wide range of activities.

The displays, charts, and other TLMs in the classroom should change and get renewed in sync with the concepts being dealt with in the classroom. Some storage space in the room makes it easier for the Teacher to have materials handy.

Classroom arrangement should complement instructional strategies, one way to ensure this is to have the same classroom for Science lessons, with students coming to the room. Having a dedicated Science classroom for Middle and Secondary Stages will also help in managing the resources efficiently and reduce the operational load for the Teacher. Bringing materials together and ensuring they are replaced, arranging the classroom to enable students to work in groups, access to simple equipment that students may want to use (e.g., magnifying glass in a lesson on magnets in case students want to examine the surface of the magnets), and so on will be taken care of with ease in case of a dedicated classroom.

4.6.2 Assessment in Science

The following principles must inform assessment in Science across Stages:

a. Students must be assessed for understanding of concepts and for the ability to use the scientific method, i.e., observe, ask questions, hypothesise, predict, experiment, collect data, infer, predict, analyse, decide, and evaluate.

b. Students must be assessed through a variety of ways, e.g., answering good questions, designing, and conducting experiments, developing models, and participating in debates and discussions.

A few Teacher Voices illustrate assessment in Science below:

Teacher's Voice 4.1ii

Conditions Suitable for Life

I teach Grade 8. I wanted to assess my students' understanding of the connection between conditions suitable for life (in this case, bacteria) and the processes of food preservation.

I didn't want to ask them to simply state the conditions for sustaining life and why they are needed, or the steps for food preservation. These questions can be answered using rote memory.

I tried something different. I asked the question below, which is directly related to their everyday lives and requires an application of chemistry and biology to processes they see all the time.

Question:

Mohan is about to pickle lemons. He plans to take the following steps to do this:

1. Make a mixture of salt, red-chilli, and carrom seeds.
2. Cut the lemons and rub the spice mixture into them.
3. Put the lemons in a clean glass jar and close the lid tightly.
4. Place the jar directly under the sun for a few hours.
5. Open the jar, add a lot of salt and some lemon juice to the jar.
6. Cover the mouth of the jar with a clean cloth and close it tightly with the lid.
7. Shake the jar vigorously and place it under the sun for a few days.

Why do you think Mohan follows all these steps? Please select the most appropriate option amongst the ones given below.

a. Reason 1: Adding salt draws out water from the lemons so that harmful bacteria cannot grow.

b. Reason 2: The combination of salt, red-chilli and carrom seeds prevents the growth of mould.

c. Reason 3: The sunlight prevents growth of mould and yeast that would spoil the pickle.

d. Reasons 1 and **3** are correct.

e. Reasons 2 and **3** are correct.

I used the following marking scheme: 2 marks for choice d, 1 mark for choice a or c, and no marks for choice b or e.

Teacher's Voice 4.1iii

Circuits

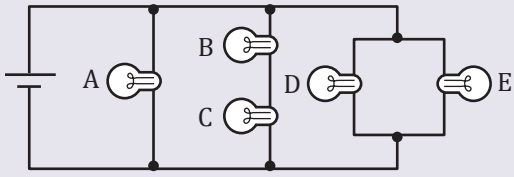
I teach Grade 9. I wanted to assess my students' ability to apply their understanding of current, voltage, resistance, energy, circuits in an unfamiliar situation. Students tend to

associate circuits with a very specific representation which is usually seen in textbooks. This question presents a different arrangement.

Question:

Arrange the bulbs in the following circuit diagram in decreasing order of their brightness, by choosing the most appropriate among the options given below:

1. A=D=E>B=C
2. B=C>A>D=E
3. A>B=C>D=E
4. A=B>C>D=E



Only students who chose option 1, were able to apply their understanding of these concepts and got marks for this question.

Teacher's Voice 4.1iv

Experiment: Hot Container

I teach Grade 7. I find experiments very useful for a comprehensive assessment of both conceptual understanding, its application, and the ability to use the scientific method.

The following experiment enables assessment of students' understanding of measurement, and the properties of matter, especially the specific property that is causing the phenomenon observed in the experiment and their ability to extend it to real life situations. It also enables assessment of skills, such as, safe and accurate use of equipment, data collection and interpretation, verification of scientific ideas, and communication of observations and conclusions along with use of scientific vocabulary.

Hot Container Activity

You have been provided with three containers: a paper cup, a metal can, and a ceramic mug, three thermometers, and a stopwatch.

Your challenge is to determine which of the three containers will keep a hot drink warm for the greatest length of time. Your experiment will last ten minutes, and you are expected to keep a record of your observations.

Gently place a thermometer in each container and ask your Teacher to pour hot water into each of them. Measure the temperature of the water in the container. Decide how you will gather your data and record it in the table. Please add rows as necessary.

S. No	Time	Cup A	Cup B	Cup C

After collecting data for 10 minutes, please answer the following questions:

a. According to your data, which container has kept the water warmer compared to the others over the period of 10 minutes? What do you think are the reasons for this?

b. Which container do you think will be the best for keeping ice cream cold? Give reasons for your answer.

I used the following criteria to grade my students' performance:

Criteria for assessment	Grade C	Grade B	Grade A
Handling equipment	Needs assistance with using the thermometer	Needs assistance with reading the thermometer	Uses thermometer properly and safely without any help
Recording data	Records data at the beginning and end of 10 minutes	Records data accurately over 10 minutes at arbitrary intervals	Records data accurately at preset intervals over 10 minutes
Interpreting data	Unable to make a clear choice based on data	Explanations focus on data related to only the chosen container	Explanations contrast chosen container with the other two based on data
Application of conceptual understanding	Does not connect explanation to container's properties in response to questions	States the properties of the containers without extending the explanation to both hotness and coldness	Compares properties of all containers and extends the argument to both hotness and coldness in response to questions
Communication	Responds to questions based on observations and does not provide explanations	Provides written explanations using accurate scientific vocabulary	Uses a visual representation to show relationship between time and temperature for different containers to provide explanations using accurate scientific vocabulary

Chapter 5

Social Science Education

Social Science is the systematic and scientific study of human societies that explores the relationship between the individual and society, social institutions, and organisations. In this NCF, the term Social Science is also used to include those branches of the Humanities that involve the more qualitative study of human society, culture, thoughts, creations, development, and actions in the past and present.

The purpose of Social Science Education is to help students learn about the society in which they live, how members of their society live, interact, behave, eat, speak (and in what languages), express themselves through art, the traditions they follow, the clothes they wear, and their aspirations. It also helps students in understanding their origins, their ancestors, their culture, their neighbours, and consequently, themselves. Social Science Education introduces students to people whom they have never met, places that they have never been, stories that they have never heard, and new ideas that they have never conceived, thereby expanding their horizons and opening their minds to new possibilities. Finally, Social Science Education helps students develop pride in their culture and their country, with a forward-looking spirit to continuously improve as individuals, as a society, and as a nation.

As a subject at school, Social Science draws significantly from the disciplines of History, Geography, Civics, Political Science, and Economics, and, also where relevant, from Psychology, Anthropology, Philosophy, Law, and others, thereby aiming to provide an interdisciplinary understanding.

The approach to the study of Social Science in this NCF is to develop an interdisciplinary perspective rooted in disciplinary knowledge that enhances the student's understanding of social processes in a holistic manner.

Social Science is first studied as a separate subject in the Middle Stage. In this Stage, the study of Social Science will be largely thematic. Each of the themes would be studied through an integrated view of History, Geography, Political Science, Economics, and other disciplines where relevant, such as, Psychology, Philosophy, Anthropology, and Sociology. Also, each such theme with this integrated multidisciplinary perspective will be studied at the local, regional, national, and global levels.

In Grades 9 and 10 of the Secondary Stage, the study of Social Science is organised within the disciplines of History, Geography, Political Science, and Economics. Thus, the concepts and content are chosen to develop an in-depth understanding in that discipline, including its methods. However, at the level of detail of these particular concepts or topics, a complete picture is attempted by ensuring that the same concept is also considered through the lenses of other disciplines in an integrated manner. This approach builds disciplinary depth while ensuring a holistic interdisciplinary perspective.

In Grades 11 and 12, students have the option to go deeper into disciplines that they choose from the range of disciplines that constitute the Social Sciences, such as, History, Geography, Political Science, Philosophy, Economics, Psychology, Sociology, and Anthropology. Grades 11 and 12 are dealt with in Part C, Chapter 10.

Box 5.1

While the entire NCF needs to be used and implemented in an integrated manner, it is important that this chapter be read along with Part A of the NCF document. The Curricular Aims and the Learning Standards in this chapter are in continuity with Part A, Chapter 3. Similarly, the sections on pedagogy, content, assessment, and TLMs in this chapter must be read with the corresponding chapters and sections in Part A, because what is common across curricular areas on these matters has been pulled together in the relevant sections of Part A to avoid repetition across multiple chapters. Thus, reading this chapter in isolation will convey an incomplete picture.

Section 5.1
Aims

Social Science plays an important role in developing an integrated understanding of the human world and its functioning, including its deep interrelationships with nature and the environment in the quest to continuously improve as a society. In the study of this subject, students learn methods of observing and interpreting the human world, which helps them lead their own lives and also contribute as members of a society. Social Science also helps in developing some of the Values and Dispositions that are essential for democratic participation, building and sustaining cooperation among communities that strive for peace, harmony, equity, and justice for all.

Social Science Education in schools must aim to achieve:

a. **Understanding How Society Functions:** Learning Social Science leads to the understanding of how societies function through the interplay of historical, geographical, social, cultural, economic, political, environmental, and other factors. Students will develop an awareness and understanding of:

   i. Continuity and change in human civilisation and their causes and effects

   ii. The interaction between nature, natural resources, and human beings, including the spatial and temporal patterns arising out of this interaction, its effect on human life, and the impact of human activity on nature

   iii. The commonness and diversity among people and their practices in different societies, regions, and cultures within societies

   iv. Various social, political, and economic institutions, their origins, functioning, and transformations over time till today

b. **Capacities for Inquiry in Social Science:** Students will develop capacities for carrying out and applying the methods of inquiry available in Social Science, including:

   i. Sourcing, verifying, and cross-validating evidence through multiple sources, interpreting this evidence, and constructing coherent narratives

   ii. Recognising features of the physical world, spatial and temporal patterns, map reading, analysis, and interpretation of various interconnected concepts and processes

   iii. Creative and critical thinking, forming informed opinions, demonstrating logical decision making, and having a problem-solving disposition

   iv. Collecting, organising, analysing, and representing data and information on various issues, historical, geographical, cultural, economic, environmental, and socio-political

   v. Proposing meaningful responses to contemporary concerns of society based on these methods of inquiry

c. **Responsible Human Beings and Contributing Citizens:** NEP 2020 states:

The purpose of the education system is to develop good human beings capable of rational thought and action, possessing compassion and empathy, courage and resilience, scientific temper, and creative imagination, with sound ethical moorings and values. It aims at producing engaged, productive, and contributing citizens for building an equitable, inclusive, and plural society as envisaged by our Constitution.

[NEP 2020, pages 4–5]

Social Science can play a unique role within the school curriculum to enable the Knowledge, Capacities, and Values and Dispositions that underpin this purpose of education as committed to in NEP.

Section 5.2
Nature of Knowledge

The nature of knowledge of Social Sciences may be understood as follows:

a. **Evidence-based, Empirical, and Verifiable:** Valid knowledge in and of Social Science relies on accepted norms of inquiry and verifiability of evidence, not on speculation. Verifiability is based on the corroboration of multiple sources of evidence, which are available in many forms, including oral narratives and traditions, performing and visual arts, literature, other texts, archaeological and other artefacts, physical and biological features, scientific investigations and experiments (both natural and conducted, such as, astronomy, related, climatic, and seismic phenomena, or carbon dating), and numerical and qualitative data on the lives of people. Multiple sources are ideally used to cross-validate evidence to establish something as true and valid; corroborating evidence from multiple sources leads to better explanations and conclusions.

b. **Social Science is often Interpretive:** While based on verifiable evidence, Social Science is nevertheless interpretive. Given the dynamism and complexity of human nature and cultures, and the real constraints in securing comprehensive, complete evidence for all aspects and for every level of any phenomenon, the same set of evidence often lends itself to different interpretations. The strength of growing evidence may eventually support a particular interpretation. However, this interpretive nature does not make Social Science unreliable or arbitrary in its claims, but rather a dynamic subject that constantly evolves and responds to the latest challenges and evidence.

c. **Social Science is Value-laden:** Since Social Science is interpretive, it also reflects the values and the worldview of the interpreter. This manifests not only in different interpretations and explanations that can be drawn from the same set of verified evidence, but sometimes also in methodological issues, such as, the weight to be given to various kinds of sources of evidence (e.g., surveys versus experiments) and which questions to seek answers to. Thus, in the study of Social Science as a subject, it is important to include a plurality of plausible interpretations, all arrived at with diligent and rigorous methods, and also an expanding range of questions with nuances. The awareness of students of this particular nature of Social Science must be developed, and therefore, a disposition of continuous inquiry, tentative explanations and conclusions, and avoidance of subjective value judgments should be encouraged.

d. **Social Inquiry:** Knowledge in Social Science helps us understand the relationships and interaction between social processes and social facts (values, cultural norms, social structures); this also enables a sense of 'social inquiry and criticality', in other words, seeking answers to questions and issues that could help improve society. The awareness of students of this particular nature of Social Science also must be developed.

e. **Social Science is Multidisciplinary and Requires an Interdisciplinary Approach:** It is a complex task to understand human beings and human societies, and this requires an interdisciplinary approach informed by and based on multiple disciplines, such as, Geography, Political Science, History, Economics, Sociology, Anthropology,

Psychology, Philosophy, Culture (including literature, art, traditions), and more. For practical purposes, up to Grade 10, the first four of these disciplines would mostly constitute the subject of Social Science, while not missing the relevant and important contributions of the other disciplines. Geography studies the physical features of an area and human relationships with their natural environment; History traces the journey of continuity and change from the past to the present of human life, and the major events that have impacted society and culture; Political Science deals with the socio-political existence of human beings; and Economics analyses economic activity and its impact on social and behavioural changes of human beings.

f. **Social Science is Sensitive to Context:** Socio-cultural beliefs and values are subject to their context, including historical, cultural, geographical, economic, and political. To understand any society holistically, Social Science evaluates the events and issues in keeping with the context of that time and space.

Section 5.3
Current Challenges

Social Science teaching and learning faces a few challenges in schools at present. The NCF attempts to address these systematically. Some of the key issues are as follows:

a. Social Science is usually taught as a subject that focusses predominantly on memorisation of facts, such as, dates in history, names of geographical features across the globe, the listing of fundamental rights and duties, and naming of economic institutions. The effort to understand, discuss, and appreciate concepts is often missing in Social Science classrooms. This, in turn, makes students lose interest in the subject.

b. Social Science is often divided into watertight compartments of History, Geography, Political Science, and Economics too early on in an extremely rigid manner. Students are rarely exposed to comprehensive engagement with any particular social phenomenon and usually learn to look at it through the lens of only one discipline. Therefore, the interdisciplinary thinking that students require to understand society is often not developed.

c. Information in the chapters is too often transacted in the classroom with little or no connection to the life of students. Since the subject is not made relevant or interesting to the students, it often ends up being boring, passive, or unrelatable.

d. The content in some books (including textbooks) is sometimes not based on verified evidence and arises from inadequate inquiry, lopsided interpretations, entrenched stereotypes, or specific biases.

Section 5.4
Learning Standards

Social Science as a separate subject begins at the Middle Stage. It builds on the capacities built in the Preparatory Stage, primarily through the study of the subject The World Around Us. In the Middle Stage, these general capacities of observation, data collection, and the

basic understanding of social life are further sharpened to enable methods of inquiry and understanding of conceptual structures within Social Science. While in the Middle Stage, understanding and capacities are developed in an integrated manner, in the Secondary Stage (Grades 9 and 10), students more formally enter the disciplinary domains of History, Geography, Economics, and Political Science. This enables them to develop disciplinary rigour in both, the methods and concepts of Social Science. Students get adequate exposure to Social Science as a discipline and with this understanding, they can make informed choices about pursuing Social Science as a specialisation in Grades 11 and 12.

5.4.1 Curricular Goals and Competencies

5.4.1.1 Middle Stage

CG-1 Comprehends and interprets sources related to different aspects of human life and makes meaningful interpretations	C-1.1	Collects and interprets multiple sources of information (primary and secondary) to understand the historical, cultural, geographical, and socio-political aspects of human life
	C-1.2	Represents and analyses data related to various aspects of human life given in the form of text, tables, charts, diagrams, and maps
CG-2 Explores the process of continuity and change in human civilisations through specific examples from their context and a few historical episodes	C-2.1	Explains and analyses major changes in the past and their impact on society
	C-2.2	Recognises elements of the continued prevalence of certain beliefs, relationships, practices, and activities in human society, notwithstanding major changes in society
CG-3 Draws connections between the causes and effects of different social and historical events or episodes and connects them with the overall impact on human life	C-3.1	Analyses the effect of various changes in early human society from nomadism to settled life and early civilisation (such as, the emergence of agriculture, changes in food habits, basic technologies like construction, transport, pottery, metallurgy), and changes in human habitation, family structures and relationships, the nature of work, people's socio-cultural beliefs and concepts over time (e.g., *Ahimsa*, and the fallout of major wars or invasions) that significantly impacted human societies
	C-3.2	Identifies reasons behind harmony and conflict among social groups and communities, in their region and in other parts of the world, and their impact on human societies
CG-4 Understands the functioning of social, cultural, and political institutions and their impact on society, and the way individuals and collectives shape these institutions	C-4.1	Collects, organises, and interprets information about various social, cultural, economic, and political institutions in their vicinity and region, and realises its significance for human society
	C-4.2	Assesses the influence of social, cultural, and political institutions on an individual or group or community or society in general

CG-5 Understands various forms of inequality and prejudice in society, from those prevalent in a family to those at a community or regional or national level and also the initiatives and efforts at various levels to address these issues	C-5.1	Identifies, explains, and raises questions about different forms of inequality, prejudice, and discrimination prevailing in one's own family, locality, region, and national and global levels
	C-5.2	Identifies, explains, and appreciates efforts (being) made at different levels through various (including social, cultural, economic, and political) mechanisms and institutions, and what individuals can do, to address these to ensure equity, inclusion, and justice
CG-6 Understands the spatial distribution of resources (from local to global), their conservation, the interdependence between natural phenomena and human life, and their environmental and other implications	C-6.1	Explains key natural phenomena, such as, climate, weather, ocean cycles, soil formation, the flow of rivers, and how they are spatially distributed
	C-6.2	Identifies the distribution of resources, such as, water, agriculture, raw materials, and services across geographies
	C-6.3	Analyses Indian perspectives on and efforts towards conservation and sustainability in society, and advocates the importance of the same, and what more needs to be done in these directions including in the context of global climate change
	C-6.4	Correlates the existence of different patterns of livelihoods with different types of landforms, availability of resources, and climatic conditions and changes (in local, regional, national, and global contexts)
CG-7 Appreciates the importance and meaning of being Indian *(Bharatiya)* by understanding (a) India's rich past and present including its glorious cultural unity in diversity, pluralism, heritage, traditions, literature, art, architecture, philosophy, medicine, science, and other contributions to humanity, and (b) other integrating factors despite the geographical diversity of India	C-7.1	Explains India's unity in diversity by recognising commonalities in its rich and diverse cultural elements, languages, art, philosophical ideas, values, clothing, cuisines, traditions, festivals, trade, commerce, and health practices including *Ayurveda* and yoga
	C-7.2	Discovers the topographical diversity of the Indian landmass from the semi-arid zone in the west and the areas of heavy rains in the north-east to the long coastal areas in the south and the snow-clad mountains in the north, as well as, the rich biodiversity of the country
	C-7.3	Appreciates India's tradition of inclusion across communities and social groups, and its influence in vast parts of the world through its cultural elements

CG-8 Understands and appreciates the process of development of the Constitution of India and upholds its importance to promote democratic values in Indian society	C-8.1	Understands the need for a constitution for any country during the last few centuries, especially in a country, such as, India and its deeper objectives
	C-8.2	Explains the process of formation of the Indian Constitution and understands the ideas and ideals of the Indian national movement enshrined in it as well as those drawn from India's civilisational heritage
	C-8.3	Explains the working of the three tiers of local self-government and appreciates its significance in upholding democracy at the grassroot level
CG-9 Understands the processes of economic activities (production and consumption, trade, and commerce)	C-9.1	Explains the key elements of trade and commerce (commodity, production, consumption, and capital) and its impact on individual life and society
CG-10 Understands and appreciates the contributions of India through history and in the present times, to the overall field of Social Science, including the different disciplines that constitute it	C-10.1	Knows and explains the significant contributions of India to all matters (concepts, explanations, methods) studied within the curriculum, in an integrated manner along with the particular matter, illustratively, understands the strengths of India's democratic traditions through its history
CG-11 In the curricular goals CG-1 to CG-10, there is a basic and adequate understanding of the history, geography, and culture of the locality, region, and country		***Note:*** *Competencies for this Curricular Goal have already been incorporated under CG-1 to CG-10*

5.4.1.2 Secondary Stage (Grades 9 and 10)

CG-1 Understands and analyses the important phases in Indian history and draws insights to understand present-day India	C-1.1	Explains historical events and processes using different types of sources, with specific examples from Indian history
	C-1.2	Explains and analyses the chronology of human life on the Indian subcontinent, from prehistory to its civilisational beginnings and beyond, and its relations with other civilisations over time, such as, those in Mesopotamia, Greece, Central Asia, China, South-east Asia, Arabia, and Eastern Africa.
	C-1.3	Traces aspects of continuity and change in different phases of history across the Indian subcontinent (including cultural trends, social and religious trends and reforms, and economic and political transformations)
	C-1.4	Explains the growth of new indigenous ideas across India including in Mathematics, Philosophy, Science and Technology, Medicine, Architecture, Agriculture, Literature and Art, and Social Science (such as, zero and the Indian number system, *Ahimsa,* the six systems of Indian philosophy, *Ayurveda,* yoga, the 22 *Shrutis* of Indian music, horticulture, use of herbs and spices, etymology, metres, and grammar) and how they affected the course of Indian and world history
CG-2 Analyses the important phases in world history and draws insights to understand the present-day world	C-2.1	Explains historical events and processes with different types of sources, with specific examples from world history
	C-2.2	Explains and analyses the chronology of human life from its beginnings to nomadism to settled life and other phases of human civilisation
	C-2.3	Traces aspects of continuity and change in different phases of world history (including cultural trends, social and religious reforms, and economic and political transformations)
	C-2.4	Explains the growth of new ideas and practices across the world (including humanism, mercantilism, industrialisation, scientific developments and explorations, imperialism, colonialism, the rise of new nation-states across the world, and various technologies including the most current) and how they affected the course of world history
	C-2.5	Recognises the various practices that arose, such as, those in C-2.4, and came to be condemned later on (such as, racism, slavery, colonial invasions, conquests, and plunder, genocides, exclusion of women from democratic and other institutions), all of which have also impacted the course of world history and have left unhealed wounds

CG-3 Understands the idea of a nation and the emergence of the modern Indian Nation	C-3.1	Analyses the meaning of nation and how the concept evolved over time across the world and in the specific context of India, including its roots in the rich civilisational history of the Indian subcontinent
	C-3.2	Identifies and analyses important phases of the Indian national freedom struggle against British colonial rule, with special reference to the movement led by Mahatma Gandhi and other important figures as well as those that led to independence, and understands the specific Indian concepts, values and methods (such as, *Swaraj, Swadeshi*, passive resistance, fight for *Dharma*, self-sacrifice, *Ahimsa*) that played a part in achieving Independence
CG-4 Develops an understanding of the inter-relationship between human beings and their physical environment and how that influences the livelihoods, culture, and the biodiversity of the region	C-4.1	Locates physiographic regions of India and the climatic zones of the world on a globe or map
	C-4.2	Explains important geographical concepts, characteristics of key landforms, their origin, and other physical factors of a region
	C-4.3	Draws inter-linkages between various components of the physical environment, such as, climate and relief, climate and vegetation, vegetation and wildlife
	C-4.4	Analyses and evaluates the inter-relationship between the natural environment and human beings and their cultures across regions and, in the case of India, the special environmental ethos that resulted in practices of nature conservation
	C-4.5	Critically evaluates the impact of human interventions on the environment, including climate change, pollution, shortages of natural resources (particularly water), and loss of biodiversity; identifies practices that have led to these environmental crises and the measures that must be taken to reverse them
	C-4.6	Develops sensitivity towards the judicious use of natural resources (by individuals, societies, and nations) and suggests measures for their conservation

CG-5 Understands the Indian Constitution and explores the essence of Indian democracy and the characteristics of a democratic government	C-5.1	Understands that the Indian Constitution draws from the great cultural heritage and common aspirations of the Indian nation, and recalls India's early experiments with democracy (assemblies in Mahajanapadas, kingdoms and empires at several levels of the society, guilds, *Sanghas* and *Ganas*, village councils and committees, Uthiramerur inscriptions)
	C-5.2	Appreciates fundamental Constitutional values and identifies their significance for the prosperity of the Indian nation
	C-5.3	Explains that fundamental rights are the most basic human rights, and they flourish when people also perform their fundamental duties
	C-5.4	Analyses the basic features of a democracy and democratic government and its history in India and across the world and compares this form of government with other forms of government
	C-5.5	Analyses the critical role of non-state and non-market participants in the functioning of a democratic government and society, such as, the media, civil society, socio-religious institutions, and community institutions
CG-6 Understands and analyses social, cultural, and political life in India over time, as well as, the underlying historical Indian ethos and philosophy of unity in diversity, and recognises challenges faced in these areas in the past and present and the efforts (being) made to address them	C-6.1	Understands how the Indian ethos and the cultural integration across India did not attempt uniformity, but respected and promoted a rich diversity in Indian society, and how this harmonisation and unity in diversity, with a historical respect for all cultures, women have counted among India's great strengths by promoting peaceful coexistence
	C-6.2	Understands that, despite C-6.1, forms of inequality, injustice, and discrimination have occurred in different sections of society at different times (due to internal, as well as, outside forces, such as, colonisation), leading to political, social, and cultural efforts, struggles, movements, and mechanisms at various levels towards equity, inclusion, justice, and harmony, with varying outcomes and degrees of success
	C-6.3	Analyses aspects of differential treatment or discrimination that may exist in Indian society, based on, e.g., socio-cultural background, region, language spoken, and what individuals and societies can do to eradicate such differential treatment
	C-6.4	Understands that a progressive society and nation, such as, India is one that recognises not only its civilisational strengths but also its socio-economic, cultural, and political challenges and continuously makes efforts to address those challenges to become ever more prosperous, inclusive, just, and harmonious

CG-7 Develops an understanding of the economy of a nation, with specific reference to India	C-7.1	Defines key features of the economy, such as, production, distribution, demand, supply, trade, and commerce, and factors that influence these aspects (including technology)
	C-7.2	Evaluates the importance of the three sectors of production (primary, secondary, and tertiary) in any country's economy, especially India
	C-7.3	Distinguishes between 'unorganised' and 'organised' sectors of the economy and their role in production for the local market in small, medium, and large-scale production centres (industries), and recognises the special importance of the so-called 'unorganised' sector in Indian economy and its connections with the self-organising features of Indian society
	C-7.4	Traces the beginning and importance of large-scale trade and commerce (including e-commerce) between one country and another, the key items of trade in the beginning, and the changes from time to time
CG-8 Evaluates the economic development of a country in terms of its impact on the lives of its people and nature	C-8.1	Gathers, comprehends, and analyses data related to income, capital, poverty, and employment in one's locality, region and at the national level
	C-8.2	Understands and analyses the concepts and practice of the range of economic systems from free market to entirely state controlled markets
	C-8.3	Understands these features in the context of ancient India, with its thriving trade, both internal and external, and its well-established trade practices and networks, business conventions, and diverse industries, all of which made India one of the world's leading economies up to the colonial period
	C-8.4	Describes India's recent path towards again becoming one of the three largest economies of the world, and how individuals can contribute to this economic progress
	C-8.5	Appreciates the connections between economic development and the environment, and the broader indicators of societal well-being beyond GDP growth and income
CG-9 Understands and appreciates the contribution of India through history and present times, to the overall field of Social Science, and the disciplines that constitute it	C-9.1	Knows and explains the significant contributions of India to all matters (concepts, explanations, methods) studied within the curriculum, in an integrated manner

Section 5.5
Content

As mentioned in the beginning, the approach, principles, and methods of selecting content have commonalities across subjects, those have been discussed in Part A, Chapter 3, 3.2 of this document. This section focusses only on what is most essential to education of Social Science in schools. Hence, it will be useful to read this section along with the above-mentioned section.

5.5.1 Principles of Content Selection

The content selection in Social Science must fulfil the Curricular Goals, account for the nature of knowledge, and should systematically address the current challenges of Social Science teaching and learning.

These considerations inform the principles below, which should be used while selecting the content:

a. **Content must be adequate to develop relevant knowledge and capacities:** The topics chosen should together be able to help achieve the relevant knowledge and capacity goals of the curriculum. At the same time, there must not be content overload, which has been a significant cause of ineffective Social Science teaching and learning. This balance of having appropriate amount of content is one of the key challenges in developing Social Science curricula.

b. **Content must be based on verified evidence and narratives:** A good Social Science study of any concept or event requires engaging with evidence from a range of sources, references, and consequent interpretations and narratives. The range of what is admissible evidence for Social Sciences will draw from the socio-cultural contexts of India and from multiple pieces of evidence verified rigorously from various sources; it should give a sampling of differing interpretations or narratives (if justified by verified evidence) of a single event or phenomenon. For example, good understanding of the Gandhian philosophy of non-violence should be accomplished through the readings of multiple writers, or the usefulness and limits of markets should be seen from varied perspectives.

c. **Content must be interdisciplinary in approach:** Social Science, by its very nature, is an interdisciplinary subject. The discipline-wise division of History, Geography, Political Science, and Economics, and others such as Anthropology, Philosophy, Psychology, and Sociology cannot be seen as separate areas in isolation. None of these disciplines can be taught (or understood) without referring to another. For example, the concept of India's cultural unity in diversity cannot be taught without introducing the student to India's geographical unity in diversity, or to its shared philosophical and political concepts. Students should learn to investigate a concept from multi-dimensional and cross-disciplinary perspectives to develop an expansive view.

d. **Concepts must be built from the simple to the complex:** The content in Social Science should be organised, with simpler concepts leading to more complex ones, enabling the construction of whole meaning with building blocks. This must be done progressively, including by considering the developmental trajectory of cognitive

capacities of students. For example, for teaching historical inquiry in the Middle Stage, the content would first focus on the identification and differentiation of sources of information or evidence, taking a local case study as starting point where possible. As a second step, students should interpret the evidence to draw meaning out of it. Third, where possible, they should attempt to collect and analyse evidence from multiple sources for a single event, engaging in discussions if such evidence at times appear to point to differing conclusions. And finally, where possible, they should do a comparative analysis between two or more similar events based on findings made through multiple sources. Such an exercise can be done at a basic level, to familiarise the student with the methodology in a light way.

e. **Content to progress from local to global:** As much as possible, conceptual understanding should start from the local context. For example, understanding geography is best achieved by first engaging with local terrain (streams, lowlands, uplands) in the locality, and then moving to features of the regional and national terrains. The same method is applicable to History and to other areas of Social Science.

f. **Content to include real and diverse experiences of people:** As Social Science deals with human beings and society, the study is incomplete with just theories and concepts. Without references to the real-world experiences of people, past or present, concepts do not 'come to life'. For example, the concept of an uprising against colonial rule cannot be grasped without an appreciation for the courage of the people through a few first-hand accounts or testimonies; or discrimination and efforts to address it cannot be taught without introducing the students to accounts of people who have faced it personally and those who have been helped by measures taken at various levels. Real experiential accounts also help develop values and dispositions, such as, empathy, sensitivity, and pride in our heritage.

g. **Content must enable development of capacities:** Social Science aims at developing decision-making and problem-solving capacities in the social context to enhance social, cultural, and environmental harmony, which involves the interpretation of facts, relying on evidence, and connecting concepts to form rational and forward-looking opinions. The content in Social Science should not merely present facts but also help develop these capacities and enable inference, analysis, and a grasp of the complex, integrated nature of human life and society while being open to other perspectives.

h. **Content must enable the development of values and dispositions:** The choice of content in Social Science and its tone of presentation should have both implicit and explicit influence on the values and dispositions of students. While the overall content must be valid and adequately representative of a range of perspectives, it should also be deeply informed by the values and dispositions that it will foster.

5.5.2 Choice of Topics and Optimal Curricular Load

The 'topics' chosen to be studied as content must together enable the learning of relevant curricular goals of knowledge and capacity development.

In Social Science, perhaps more than any other subject, such a consideration leads to massive content overload. This is understandable because the scope and range of the subject is the entire range of human activity, phenomena, and society.

However, this content overload is self-defeating. It leads to students finding Social Science boring, with little relevance to their lives, and a mere memorisation of facts and figures. It also leaves no room for development of needful capacities.

Therefore, one of the most important matters in Social Science curricula is to have just the adequate 'amount of content'. The key matter is 'How can we arrive at this 'adequate' content?' This NCF suggests the following basic principles to be used for designing such content:

a. **Topics should be Selected for Development of Capacities:** The focus must be on the selection of topics (and also of pedagogy, assessment, and timetable space) that would help develop capacities, such as, sourcing evidence, analysis, and framing questions. This is because no amount of content can be enough to build adequate knowledge in Social Science. However, if the capacities are developed, students can start gathering and developing their own knowledge base.

b. **Address All Relevant Aspects:** Choice of topics must cover all key relevant aspects of Social Science, including economic activity, cultural norms, and historical causes of a phenomenon. All (or even a significant part) of 'knowledge' must not be attempted to be covered, but all aspects should be touched upon so that students can subsequently use their capacities to continually build their knowledge base.

c. **Make Things Interesting:** Topics chosen must make study of Social Science interesting and also demonstrate its usefulness in the lives of people. This is what will motivate students to develop their capacities and use them. A variety of pedagogical tools must be deployed for the purpose (refer 5.6.1).

5.5.3 Rootedness in India

While the entire Social Science curriculum would be strongly rooted in India, from the local to the national level, CG-10 (Middle Stage) and CG-9 (Secondary Stage) requires that the students must learn and understand the significant contribution of India and Indians to the concepts and methods in Social Science and the disciplines within as these are studied.

5.5.4 Content for Middle Stage

5.5.4.1 Summary of Approach

a. **On the Basis of Themes:** In the Middle Stage, the approach is largely based on studying 'themes'. Themes form the content of study; 'topics' are sub-parts of the themes, which may be used for practical purposes of drawing boundaries for a particular discussion/inquiry. Each Grade would have all the chosen themes.

b. **Study Themes from All Perspectives:** For all themes (or the topics within), study must happen from the angles and lenses of all relevant disciplines. This must cover historical, geographical, economic, and political science perspectives, as also anthropological, philosophical, psychological, sociological, cultural, and other perspectives. It is particularly important to note that:

   i. Such study should be undertaken through real-life, relatable questions and not be classified into disciplines, the disciplinary angles must be embedded within

the questions or study. The students would not be instructed that such question is from which discipline.

ii. One question may embed and involve multiple disciplines.

c. **All Themes should be Studied at Four Levels in Each Grade:** Local, regional, national, and global. At each level, the questions or study should be from the entire range of lenses from various disciplines.

d. **Teaching-Learning Materials:** (including textbooks), pedagogy, assessment, and timetable must support this entire approach.

5.5.4.2 'Themes' for Holistic Real-life Perspective Building

To develop an interdisciplinary, holistic perspective in the Middle Stage, the study of Social Science is largely based on themes rather than disciplines.

In essence, a 'theme' is any rich and complex human phenomenon that pulls together the lenses of multiple disciplines which in turn help obtain a good understanding of the phenomenon. For example, the concepts of continuity and change, governance, or migration are the sort of ideas that are so rich in nuances and so complex in multiple ways that a reasonable understanding requires the lenses of History, Geography, Political Science, Economics, and also Philosophy, Psychology, Anthropology, and more. Such concepts can be used as 'themes' in the study of Social Science:

a. It is useful and important to note that themes are likely to have related but different characteristics across different levels of human aggregation, implying that any of these themes, when studied at the very local community level as compared to the regional, or national, or global level, will have particular and different characteristics and dynamics. For example, the political and economic aspects of governance are vastly different at the local community level and at the national level.

b. Therefore, the themes should be studied at all four levels: local, regional, national, and global, with appropriate weightage given to each level in terms of the proportion of content. Needless to say, the study of all the themes at every level will be carried out with the same integrated multidisciplinary lens.

c. Within each of the themes (and for any of its constituent matters, which may be called 'topics') study must be done using the lenses of all relevant disciplines.

The list of themes in 5.5.4.5 is useful for such an approach for studying Social Science. It needs to be noted that while this list of themes is useful and important, it is not comprehensive, and curriculum developers may choose other themes as well. The key criteria for choosing the themes are described below:

5.5.4.3 Criteria for Choosing Themes

Below is a set of criteria that can be used to choose themes. These have been used to select the themes used in the document. Other themes may be chosen by curriculum developers using these criteria:

a. The human phenomenon (or idea or concept) being chosen as a 'theme' must have the complexity that requires multiple disciplines for its study. For example, 'the flow of rivers' is not a phenomenon requiring multiple disciplines to study, as it is primarily a matter of Geography. However, 'rivers and human life' needs the perspectives of multiple disciplines and therefore could be a suitable theme within this approach.

b. The matter being chosen as a theme must be relatable in the context of the immediate environment of the student. This is not only important to develop an understanding of one's own community and locality, but it is also important pedagogically to have a relatable understanding because students learn more deeply when they can relate to things with their own lives.

c. At the same time, the matter for a theme must be such that it has a regional, national, and global dimension and relevance and is not limited to only one or two levels.

d. The overall set of themes chosen should enable the development of a syllabus and content that is sufficient to achieve the Curricular Goals in that class and of that Stage.

5.5.4.4 Themes Cutting across Four Levels: Local, Regional, National, and Global/International

The themes should span from local to regional to country and then the world. Themes should be equally relevant and useful at all these levels.

This approach helps make the learning of Social Science observable, real-world, relevant, interesting, and connected to day-to-day occurrences for Middle Stage students, drawing them into thinking and talking about these occurrences while connecting them to the more expansive world. This would also give students a sense of their location in the world and the interconnections of matters between different levels of human aggregation.

For each of the Grades 6–8, the relative proportion of the content and of timetable space of the different levels are mentioned below. Within each level the themes should have roughly equal proportion of content. These are not tight rules, but directional guidance, and the exact proportions may vary reasonably based on other considerations:

a. **Content for the local level would be 20 per cent of the Social Science curriculum:** Students will explore various facets of their locality in terms of historical context, geographical variations, and its socio-political, cultural, and economic life in an integrated manner. This will be done through collecting information or data from multiple sources, comparing data, making meaning out of it, doing analysis, and learning how social scientists build knowledge about a society based on empirical evidence. This local level should:

   i. Build familiarity with the methods relevant to Social Science and develop the related capacities.

   ii. Make the subject relatable to real life.

b. **Content for the regional level would be 30 per cent:** The understanding and capacities developed by the local level content would be built upon to deal with content at the regional level. In this, a deeper interdisciplinary perspective would be acquired by the students, by identifying interconnections, similarities, and differences between their locality and the region. The 'region' must be chosen thoughtfully, it must of course be the region around the 'local' area; but it may be a part of the state where that locality is, or multiple states, or the entire state itself.

c. **Content for the national level would be 30 per cent:** Students are expected to learn the national context through a similar approach, including active engagement with secondary sources. This content could include a general survey of the relevant Indian

history and geography. The unity in diversity of our people and the richness of our cultural heritage, and the relevant concepts of Indian ethos, must also be introduced and studied here.

d. **Content for the global level would be 20 per cent:** An understanding of the culture and society of other countries would help students widen their worldview. Students can build a comparative understanding of life in other countries in relation to their own. This would lead to a sense of pluralism and appreciation of various cultures around the world. A comprehensive understanding of any three countries that meet the following (or similar) criteria may be chosen:

   i. The three countries must be from different continents with different socio-cultural and civilisational histories,

   ii. One country that has geographical challenges and has gone through rapid growth after struggling through challenging times in its history (e.g., Japan, South Korea),

   iii. One country that has geographical diversity, has been a colony, and has struggled through foreign rule and internal difficulties (e.g., South Africa, Nigeria),

   iv. One country that has grown rapidly and is influential in the global economy, with multi-ethnic composition (e.g., the United States of America, Australia, Germany).

Along with other TLM, content for the local level should be in the form of workbooks, specifically designed such that, Teachers themselves should be able use it for their locality. On the other hand, the regional, national, and global level, content(s) may be covered through textbooks.

5.5.4.5 Themes used in this Document

The themes chosen for illustration using the criteria mentioned earlier in 5.5.4.2 are: People and Cultures, Livelihoods of People, Human-Environment Interconnectedness and Interaction, and Democracy and Governance.

A brief description for each theme, in the form of some key questions that form the rationale, is given below. Under each theme, illustrative topics are also given to help curriculum, syllabus, and content developers relate to the approach:

a. **People and Cultures:** The first step of Social Science is to study the people around us and what shapes their lives. There are multiple factors: geographical, historical, economic, cultural, psychological, and political, that enable and influence building a society and result in certain socio-cultural practices and norms in that society. These norms not only influence individuals' lives, but also explain the functioning of group dynamics within a society. They enable us to understand the factors that influence coming together of people, or even the differences that may exist. The broader areas which this theme would cover are: What factors influence the coming together of people (trade, ideas, socio-cultural influences, people movements, whether due to pilgrimages or deliberate or forced migrations) across time and their current practices? What has changed and what has remained constant over time? What are the political, economic (education of people, clothing, livelihood), and social-cultural (language, festivals, practices) components of cultures and what are shared? What positive effect does cultural interaction have? Answers to these questions cannot be sought in isolation, and hence the other themes must also be studied in conjunction.

Illustratively, working on this theme for Grade 6, the topics may cover the following content at local and regional level:

i. **Topics that can be covered at local level**

- What kind of changes have happened in the cultural life of the family and community in last three to four decades and what has continued? What are the reasons behind these changes and continuity? Such a topic could lead to a discussion of the role and importance of the family unit in Indian society.
- What kinds of differences are observed in the beliefs and practices of members of the family? What is the basis of these differences?
- What has been the migration pattern in the family over three to four decades? Who has migrated and where? How has it impacted the basic structure of the family?

ii. **Topics that can be covered at regional level**

- What are the major characteristics of the culture of the people of one's own region?
- What were the cultural practices of the people of the region in ancient times? What has continued over this period of time?
- Which types of festivals are prominent in the region? What is its historical significance? What is the importance of festivals in bringing people together from different sections of society?

b. **Livelihoods of People:** Livelihoods remain at the centre of day-to-day activities of people and are also drivers of the cycles of interdependence in society. This in turn proceeds in defining the market dynamics, feeding the loop of demand and supply. For example, what goods and services does a society produce? Who controls the wealth and resources of a society? How and why have these changes occurred across time? What is the nature of the different markets (e.g., *Haat, Bazaar,* and *Mandi*)? Is it conceptually relevant to put *Melas* (fairs) as a form of market in India? How does the market influence the lives and occupations of the people? What and how are natural resources used and what is their effect on nature? What kind of governmental matters are linked to livelihood? This theme, thus, aims at enabling students to understand and interpret the dynamic relationship that the livelihoods of people have with the types of structures and institutions in the world, and their evolution. Finally, all of this must be understood in the context of the culture, aspirations of people, political environment, and more.

Working on this theme for Grade 8, the topics may cover the following content at regional and national level:

i. **Topics that can be covered at regional level**

- What do we mean by cottage, small-scale, and large-scale industries? How do geographical conditions define the possibilities of small-scale and large-scale industries in the region?
- What is the share of small-scale and large-scale industries in economy of the region? How does it impact the standards of people's lives?

- How has industrial development taken place in the region in the last 30-40 years and what are the major reasons behind this change? How have traditional ways of conducting business been affected by this change?
- What is the role of the state government in addressing the unemployment and poverty in the region?

ii. Topics that can be covered at national levels

- How do the climatic zones affect people's lives and play a role in determining their livelihood in a particular zone?
- Which types of agricultural practices and local industries develop in different climatic zones? How does it influence the livelihood of people?
- What type of power sharing mechanisms and control over resources have developed over time in different regions of the country?
- What are the impacts of globalisation on people's lives? What kinds of changes can be seen in occupations and livelihood patterns?
- Which types of occupations have emerged over a period of time? What is its impact on society? What is the role of different sections of society in economic activities?

c. Human-Environment Interconnectedness and Interaction: Individuals are shaped by and are an integral part of their social and physical environment. Everything that happens in society is influenced by its surroundings and its features, from what one wears, to what one eats, to what livelihoods thrive on. It is therefore important to know: How do humans adjust to the climate and terrain in which they live? How have changes in the natural world forced people to change their behaviour and practices? What positive and negative changes have people made to their environment? How has all this changed with time? What cultural factors have played a role and how? How are collective issues resolved? These questions are some of the key components for understanding the human-environment interaction.

Working on this theme for Grade 6, the topics may cover the following content at local and regional level:

i. Topics that can be covered at local level

- What are the key physical features of one's locality? Is it a plain, mountainous, plateau, or coastal area? How do the physical features of a place influence the living conditions of its inhabitants?
- Understanding the relation between crop patterns in one's locality and the physical features of that place.
- How are land and resources distributed among the people in the locality? What are the reasons behind the disparity in the distribution of resources, if any? For example, in access to safe drinking water and school education.
- What is a map? What are the key components of a map? What different kinds of maps are commonly made and consulted? What is the significance of a map in the lives of people? How do we make a map of one's own locality?

ii. Topics that can be covered at regional level

- What are the key physical features of a region? What are the climatic conditions of the region and how do they shape the lives of the people in terms of occupation and livelihood?
- What are the natural resources found in the region?
- What are the major crops and horticulture of the region? What are the major flora and fauna of the region and their interconnectedness with the lives and cultures of the people in the region?
- How does the environment affect people's behaviour, such as language, food, clothing, and what is the kind of diversity found in different regions?

d. Democracy and Governance: Having understood human settlement and the multiple factors influencing the way people live, a certain kind of social and political order is required for a stable society. Governance attempts to ensure social order in society, along with taking care of the availability of resources and services for each member in the society. Democratic governance is one such form of a political structure that aims towards the inclusive and harmonious co-existence of diverse people in the society. Governance is shaped by the past experiences of the people. It is influenced by and influences social and cultural forces and trends and is deeply interconnected with economic well-being and the terrain of the place being governed. This theme focusses on understanding democracy and governance, how they have changed over time, and how this change has influenced and been influenced by technology and the economy.

Illustratively, working on this theme for Grade 8, the topics may cover the following content at national and global level:

i. Topics that can be covered at national level

- What is the process of government formation at union level? What are the roles and responsibilities of union government? What is its relationship with people?
- How did India emerge as a modern democratic State? What are the values and principles that bind us together in the historical process? How does the Constitution of India address the aspirations of people and respects communities' beliefs and practices?
- What are the types of challenges that have been faced by Indian societies across periods of time? What are the processes, policies, and mechanisms developed by the government over the period of time to deal with these challenges?
- What types of challenges are being faced by Indian democracy in recent times? How does the government tackle these challenges to bring social and economic prosperity in society?

ii. Topics that can be covered at global level

- What are the key features of U.S. democracy? How is it different from Indian democracy?

- How has democracy evolved in the U.S. from its first freedom struggle to the civil war of the 1860s?
- What are the major issues of American society and how has economic development shaped its society?

5.5.5 Content for Secondary Stage (Grades 9 and 10)

In Grades 9 and 10 of the Secondary Stage, the study of Social Science is organised within the disciplines of History, Geography, Political Science, and Economics. To operationalise the curriculum for the Learning Standards, the topics would be chosen in a manner as to develop depth in that discipline, including its methods.

Equally, the Learning Standards, Content, and Pedagogy will also ensure that at the level of detail the actual study of these particular concepts or matters, a complete picture is built by ensuring consideration from the lenses of other disciplines, including Anthropology, Sociology, Philosophy, Psychology, Linguistics, and others. This approach will build disciplinary depth alongside interdisciplinary, holistic perspectives, from granular details to an integrated worldview and the capacities to grow this worldview.

The content in History should guide the student to understand the evolution of human society. Content must be aimed at developing a holistic view of the human past by interpreting primary and secondary sources. The content must be based on different sources and is expected to help students arrive at various plausible interpretations backed by cross-validated evidence about a particular event or period. It must cover important phases of the past which have shaped the present. In addition, the content must familiarise the student with and explain the concept through multiple valid narratives.

For example, in Grade 9, while covering the topic 'Nomadism to Settled Life in India and the World,' it may cover core historical questions along with the related questions from other disciplines, such as:

a. Questions related to History

i. How did early humans live across the world? Which types of tools did they use?

ii. How did early humans transform from being hunter gatherers to living in a settled agrarian society?

iii. What type of continuity and changes can be seen in the social structure from the beginning over different phases of history?

iv. How did the cultures of different regions interact? What are some items that cultures have passed on to each other over different phases of history?

b. Questions related to Geography

i. How did early humans adjust to the climate and terrain where they lived? What were the geographical features which favoured the early agrarian settlements?

ii. How did the agrarian societies change their natural world?

iii. What positive and negative changes occurred to the environment with settling down of societies?

c. Questions related to Political Science

i. What were the major factors behind one society heading their way to conquer the land and people of another society? How did one society gain control over others? How did a dominating society control and rule its subjects? What were the effects on conquered societies?

ii. How did the group or person in power keep or lose their power?

d. Questions related to Economics

i. What were the types of changes seen in the production of goods and services with the shift from hunting and gathering to agrarian and settled society?

ii. Who had the control over the wealth and resources in nomadic society? Which types of new economic activities emerged in agrarian society and how did it change the relationship of humans with nature?

Certain issues of history specific to the Indian context will need to be understood and discussed, often in an open-ended manner as they may not always lead to clear-cut answers, but always insisting on clarity of the concepts involved. For example:

i. What are the different ideas of a nation?

ii. How does the ancient Indian concept of a *Desh/Rashtra/Mandala* compare with the modern nation-state?

iii. In the context of India, how relevant are the concepts of a nation or of a civilisation? What role does cultural continuity play in the concept of civilisation?

iv. How to distinguish between political integration and cultural integration in the course of Indian history?

v. In what ways did the British invasion and colonisation destroy India's pre-colonial industrial and economic strength, and its indigenous educational and administrative systems? In what ways did it cause or greatly compound the severity of famines? How did it affect the vibrancy of India's rich culture, including India's languages, literature, art, philosophy, and heritage? Altogether, how did the British rulers, finding in the seventeenth century a culturally and economically prosperous India, leave it two centuries later in a weakened and impoverished condition? How has India recovered (and still is recovering) from this colonial experience and exploitation, economically and culturally, and what should India do to ensure its cultural (in terms of languages, literature, art, philosophy, heritage) and economic re-emergence?

In Geography, the content must focus on highlighting the interrelationship of human beings with their geographical environment and other life forms. Concepts highlighting the interdependence between humans and nature need to be at the core. The connection between various geographical phenomena and their socio-cultural effects must also be included.

Knowing about, for example, various climatic zones across the world in Grade 10, questions from both Geography and other disciplines may be explored to understand the human-environment relationship. It can be done in the following manner:

a. Questions related to Geography

i. What are the main factors that determine the formation of climatic zones on Earth?

ii. What are the characteristics and distribution of tropical, subtropical, temperate, and polar climatic zones, and how does this shape people's lives and cultures?

iii. Discuss the role of latitude in shaping climatic zones and provide examples of how it affects temperature and precipitation patterns.

iv. How does human activity contribute to climate change? Provide specific examples of human activities that release greenhouse gases into the atmosphere.

b. Questions related to History

i. How have climatic or environmental changes influenced the rise and fall of civilisations throughout history? Explain how climatic changes were initially mostly natural, while environmental changes were either natural (e.g., caused by a long drought) or anthropogenic (e.g., caused by over-exploitation of natural resources in a given region). Provide examples of historical events where climatic or environmental factors played a significant role.

ii. How have human societies adapted to or mitigated the impacts of climatic zones throughout history? Discuss specific strategies or practices employed by civilisations in response to changing climatic conditions. Include cases where attempts at mitigation were unsuccessful, leading, for instance, to major social or political reorganisation or upheaval.

c. Questions related to Political Science

i. How does climate change influence international relations and diplomacy? Discuss the political dimensions of climate change negotiations, agreements, and conflicts over resources.

ii. Explain how political decisions and policies can shape the adaptation and mitigation strategies related to climatic zones. Provide examples of government policies or initiatives that address climate change and its impacts.

d. Questions related to Economics

i. Explain the economic implications of climatic zones on agriculture, tourism, and natural resource-based industries. Provide examples of how climatic conditions affect economic activities in different regions.

ii. Discuss the role of climate change in shaping global trade patterns and economic relationships between countries. How do changing climatic conditions impact international trade and economic agreements?

In Political Science, the content should include an in-depth understanding of the subject of Political Science in India's history, from the *Arthashastra* of Kautilya to the modern Constitution of India. It should include democracy, its various definitions in ancient and modern times, and democratic life as the main concepts, while also familiarising students with other kinds of political structures and lives across the world. It should include the current-day, post-independence working of the Government in India through its network of social and political institutions. It should also include an

understanding of inequity and discrimination in society, and its reasons, alongside the progress that has been made and the ways and efforts that have been made towards inclusion and justice and its successes, failures, and challenges. Students are expected to explore probable solutions to these challenges, including what people can do individually to address these issues. The importance of Constitutional values and our democratic commitment to ensure a dignified life for all in society should be highlighted. Along with it, the presence of other disciplines would ensure that the student understands an issue in an in-depth manner.

For example, while studying about the Constitutional provisions for ensuring equality in India in Grade 10, the following questions across disciplines may be dealt with:

a. Questions related to Political Science

i. What are the varying inequities, social disparities, and harmful social practices prevalent in society based on identity? What are the reasons behind these?

ii. What have been the measures in our country to address these issues, and how successful have we become?

iii. What are the challenges in front of us for addressing such issues as a nation?

b. Questions related to Economics

i. Is there any relationship between social inequities and disparities and economic status?

ii. What could be the Constitutional ways to address these gaps, which can lead to improvement in the economic status of these sections of society?

iii. Does the identity of a person influence the nature of livelihood and occupations they practice?

c. Questions related to History

i. What Indian philosophical, historical, or ethical concepts have sought to counter inequities? What have been the major successes of these concepts in Indian society?

ii. Despite these successes, what are the causes of some of the inequities that currently exist in Indian society?

iii. What have been some of the measures that have been taken and can be taken, by individuals, society, and the nation, to address these issues?

d. Questions related to Geography

i. What is the habitation structure of societies (rural, urban) where identity-based clusters are formed?

In Economics, an introductory understanding of economic activities and the interrelatedness of these activities with human life, the market, and money should be included. The content areas encourage the students to understand, observe, and interpret economic life in their immediate environment. With this, they would be able to make sense of the economy in India and in the global world. Aligning with the interdisciplinary approach, understanding economics through the lens of other disciplines would add to the knowledge of the student. Illustratively, while studying about the three sectors (primary, secondary, and tertiary) and organised and unorganised sector in Grade 9,

questions from core Economics and other disciplines can be explored in the following manner:

a. Questions related to Economics

i. What do we understand by primary, secondary, and tertiary sectors of an economy?

ii. How is each sector dependent on each other, contributing equally for running of the economy?

iii. What is the difference between organised and unorganised sectors?

b. Questions related to History

i. What are the changes that have happened over time in trade patterns? (Will cover not only how initial trade was between primary products, but also how industrial revolution changed things at large)

ii. How did the difference between organised and unorganised sectors emerge historically? What has been and still is the special importance in India of the unorganised sector, both socially and economically?

c. Questions related to Political Science

i. What is the role of the government to regulate and secure the running of the market?

ii. How does the government protect people in the unorganised sector through social welfare schemes?

d. Questions related to Geography

i. How does a product reach you?

ii. What are trade routes and how are they decided?

iii. How does geography influence the nature of occupation of the people?

5.5.6 Materials and Resources for the Content

A Social Science classroom should include a variety of TLMs in addition to the textbook. Students must be exposed to social and cultural phenomena across time and space through sources, such as, local literature, folk songs, stories from one's region, ancient monuments and documents, magazines and newspapers, films and documentaries, autobiographies, biographies, memoirs and travelogues, audio-visual aids, and maps of all kinds. They must make sense of their own lives, the society they live in, and its institutions:

a. Textbooks: Social Science textbooks should be made interactive by including reflective prompts for the students. These prompts must help with connecting concepts with the current lives of the students and suggest activities they can do to explore the ideas in their immediate surroundings. Textbooks must have a large number of illustrations and activities that make students think deeply. The textbooks must refer to some original sources that students should examine. Also, by design, they must use and link multiple other learning resources. The current, sharp distinction between textbooks and workbooks must be avoided.

b. **Digital Material:** Content for Social Science should not be restricted only to textual forms. Students can engage with a concept through other mediums (songs, movies, documentaries, audio clips). Such diversity in content makes the class enjoyable through an enriched medium of learning. Unfamiliar content becomes easier to understand this way, and it becomes possible to give students access to a distant world (in time and space) virtually.

c. **Maps and Atlases:** A geographical basis for understanding any social event makes the learning of Social Science rooted in the physical world. A Social Science classroom should always have maps, globe, and atlases available for students to refer to. The collection of maps should have physical maps, political maps, along with thematic maps (population density, distribution of minerals). These should be of the locality, region, country, and the world.

d. **Literature:** Works of literature (fictional and non-fictional) are a very good source for a Social Science classroom. Literature that is representative of identities, cultures, phases of history, personalities and forms, such as, historical accounts, diary records, and folktales can be used to the advantage of the class. Oral traditions and narratives can be another rich form of literature.

e. **Sources from the Visual and Performing Arts:** Art forms which depict culture and traditions are good sources of information and conversation in a Social Science classroom. These would enrich class discussions. In addition, field visits or digital content can be used to introduce the students to the arts related to Social Science ideas.

Teacher's Voice 5.1

Past-Present-Polity

I teach Social Science to 36 students in Grade 6. It is easier to teach this subject if students are able to relate the content to their experiences or observations from life around them and establish connections between topics of different disciplines. Somehow understanding the interconnectedness of various parts of this subject makes it even more interesting!

Hence, when we were working on a topic of History in which we were discussing about various 'Sources in History' and how we use them to understand the past and present and the concept of 'continuity and change'; I planned a small discussion activity, keeping in mind the following objectives:

a. The students should be able to interpret the sources keeping in mind the context of the society the source represent

b. The students should be able to build a comparative understanding about past and the present and identify what things have continued from the past and what has changed.

With these objectives in mind, I gave a small excerpt about the administrative system of Gram Sabha in Chola period in India. The excerpt highlights the qualifications a person must have, to be a member of the Gram Sabha. Along with the excerpt, a set of questions were also given. The students first had to work on those questions individually and then a classroom discussion was done around the questions.

The excerpt

Who could be a member of a Sabha?

The Uttaramerur inscription lays down: All those who wish to become members of the Sabha should be owners of land from which land revenue is collected. They should have their own homes. They should be between 35 and 70 years of age. They should have knowledge of the Vedas. They should be well-versed in administrative matters and honest. If anyone has been a member of any committee in the last three years, he cannot become a member of another committee. Anyone who has not submitted his accounts, and those of his relatives, cannot contest the elections.

Set of Questions

a. The record mentions the qualifications of the members of the Gram Sabha. Why do you think such expectations were posed for a member to qualify for Gram Sabha?

b. There is no mention of electing common people and women as members. What would have been the reason for this?

c. Interact with the members of your Gram Panchayat and find out what kind of qualifications are currently prescribed for the election of members?

d. Which of these qualifications are such that cannot be applied to today's Gram Sabha members and why?

This activity took three periods to complete. In the first period I discussed what the students have to do and then gave time to read and respond to the first two questions. In the next period, a few members from Gram Panchayat were invited for a discussion in the classroom, in which the students had to come prepared for their questions about the present structure and rules of Gram Sabha. This discussion helped the students to discover the answers for the third and fourth questions. It was only in the third period that an elaborate class discussion was held and a shared understanding was built. We could draw some interpretations as a team about the Gram Sabha system in the Chola period, and how the concept of Gram Sabha has still continued, but the qualification expectations for joining the Gram Sabha have changed.

Section 5.6
Pedagogy and Assessment

The approach, principles, and methods of pedagogy and assessment has commonalities across subjects, those have been discussed in Part A, Chapter 3, 3.3 and 3.4 of this document. This section focusses only on what is most essential for Social Science and humanities. Hence, it will be useful to read this section along with the above-mentioned section.

5.6.1 Pedagogy for Social Science

Social Science is often taught as a fixed set of facts without an understanding of how interpretations play a role in its construction. This has pushed students towards memorising facts and figures from a textbook, which is not an actual learning of Social Science. A Social Science classroom must be participatory and interactive in nature. It is only when students are allowed to immerse themselves in the process of Social Science thinking that they learn the subject better.

5.6.1.1 Pedagogical Considerations

The following pedagogical considerations should be kept in mind while planning for Social Science classes:

a. **Classroom transactions should help students engage with the method of doing Social Science** so that learners can appreciate the methods for knowledge creation in Social Science. For instance, students may be encouraged to notice patterns in the distribution of different forms of government, such as, democracies, monarchies, and dictatorships across the globe and propose reasons (historical, geographical, socio-political, and economic) for the existence of those patterns.

b. **Classroom teaching should inculcate an awareness and appreciation of normative concerns.** Students should be given opportunities to reflect on various social and environmental issues in their own environment. This should lead to thinking and discussing of meaningful responses to these challenges.

c. **Multidisciplinary thinking should be encouraged and supported** to ensure that students develop a holistic and integrated understanding of concepts as they appear in society. Any event in history needs to be interpreted in the socio-political or economic contexts of its origin; any geographical phenomena should be evaluated from its impact on space and human lives and its influence on the economy and society. Similarly, any economic concept needs to be understood from its historical and socio-political contexts.

d. **A Social Science classroom should be a place for contesting ideas, debating, and arguing with empathy and care.** Students must be encouraged to share their diverse experiences and reasoning without the fear of being judged or ridiculed. The Teacher must refrain from imposing their own beliefs and biases on the students and should train students towards looking at one issue from several viewpoints. The entire pedagogy in a Social Science classroom should be an attempt to reveal newer dimensions of social reality and work towards creating self-awareness and introspection among Teachers and students.

e. **Facts and concepts in Social Science should be made relevant to the students' contexts and experiences.** Such sharing and interactions must be respectful of the cultural and socio-economic differences and multiple perspectives among students.

f. **Concepts in Social Science need to be clarified with adequate depth and rigour:** In a Social Science classroom, adequate time and attention should be given to concept formation and clarity. For example, students need to understand the processes of weathering and erosion to see their impact on topography and human civilisation; they must engage with the meaning of different types of sources of evidence to frame meaningful interpretations of historical events; and develop a comprehensive understanding of concepts of plurality and democracy to appreciate the values enshrined in the Constitution and those stressed upon in NEP 2020. The overall classroom environment should encourage academic rigour in acquiring knowledge.

g. **The opportunity to engage with various social-political and environmental matters** through investigating and interpreting multiple sources of evidence available, such as, documentaries, literature (books, local stories, travelogues), newspaper reports, and relevant films should be undertaken. Selecting materials that are relatable

to students and help in developing curiosity about the discipline should be prioritised. At the same time, care should be taken to ensure that materials are taken from reliable sources of information and do not depict biases for or against a particular thought, philosophy, group, or people.

h. **Authentic tasks or performance-based tasks, such as, project-based learning activities and assignments, should be incorporated** to give learners an opportunity to develop different types of capacities such as, surveying, data analysis, problem solving, and collaborative skills to validate and investigate their assumptions and beliefs.

5.6.1.2 Pedagogical Strategies

To design lessons around these considerations, there are many strategies that Teachers can deploy. Illustratively:

a. **Inquiry:** Inquiry-based methods help students understand how social scientists generate knowledge. For instance, students can make and test hypotheses about factors that influence migration in their locality or region, the genesis of various settlement patterns in their region, why specific types of occupations are more prevalent in specific regions, and so on.

b. **Issues-based Learning:** Issues-based learning can be a conducive tool for acquainting students with various aspects of social realities, integrating perspectives from different disciplines in investigating the causes of problems, and thinking about relevant social action. As a subject addressing normative concerns, it is also vital that students learn much of the Social Science content by engaging with real issues in their immediate or related context. For instance, students may consider the problem of drinking water shortage in their area, which may involve engaging with questions, such as, What are the available sources of water? How does water consumption differ across different parts of the region or locality? Are there wastages that can be avoided? How is water being made accessible to all sections of society? Is there unequal distribution? What steps are being taken to purify water? How is it being made available to the poorer sections of society?

c. **Conversations, Discussions, and Debates:** Conversations are extremely vital in a Social Science classroom. These conversations should lead to focussed discussions on concepts, ideas, belief systems, and value claims. Sometimes these discussions may turn into debates in the classroom. It is important to encourage such debates, as it provides students with the opportunity to put forth their perspectives, resolve conflicts, iron out contradictory ideas, and learn from each other. However, care must be taken that such discussions and debates do not hurt the sentiments of any social group. Some common topics for discussion could be on climate change, diversity in clothing and types of food as per historical and geographical reasons and practising democratic processes in schools.

d. **Role Plays and Simulations:** Role plays and simulations may help students explore decision-making processes and find means for conflict resolution. For instance, role plays of the Gram Panchayat or Corporation may be used as a vehicle to explain the functioning of a democratic institution.

e. **Community Service and Field Excursions:** Community service is yet another engaging strategy in a Social Science classroom. It not only involves concrete experiences for learning concepts from the curriculum, but also enables students to develop the desired values. Students may take up various projects to work with local government agencies to acquire first-hand experience of issues and work with people in need. Similarly, field excursions are meaningful ways of engaging with the content, e.g., nature walks, heritage walks, food walks, and visits to police stations, museums, post offices, planetariums, and government and digital archives.

f. **Reflective Essays:** Students can write reflective essays on various topics related to the curriculum. These essays can also be used by Teachers to assess the extent to which students have learnt the desired concepts and skills. For instance, a reflective essay topic could be, 'How will dams transform agricultural productivity in India?', 'What are the issues and opportunities of linking rivers?', 'What sustainable agricultural strategies could a region adopt if its main river turns seasonal or dries up?', or 'Is waste management and disposal the sole responsibility of municipalities and other government agencies?

g. **Project Work:** Effective Social Science teaching happens when students collaborate for a project or a specific task. These could be conducting surveys and interviews (e.g., household surveys, interviews with stakeholders of the society, such as, village sarpanch), drawing a map of their classroom, investigating historical sources in their region, tabulating the types of *bazaars* or markets. Such projects should be collaboratively designed along with students with sufficient time given to collect data, analyse it, and present it in the classrooms.

h. **Some Specific Opportunities for Projects to Create Models and Artefacts:** Students should be given opportunities where they can apply their knowledge to create models and artefacts. These could be in the form of poster-making, collections (old coins, newspapers, stamps, types of rocks, leaves, flowers, photographs, pamphlets), models (2-dimensional or 3-dimensional, e.g., monuments, volcanoes, still scenes), videos of rallies or *Haat bazaars* or book fairs or any social events in their surroundings.

5.6.2 Assessment in Social Science

Some of the Key Principles having Particular Relevance to Social Science

a. Students must be assessed for their understanding of core ideas, facts, and concepts in Social Sciences and their ability to demonstrate an integrated understanding of how society functions through an interplay of historical, geographical, social, cultural, economic, political, and other factors. The ability to look forward and think out possible strategies to tackle current or future social, political, environmental issues should also be evaluated (not for the effectiveness of those proposed strategies, which often cannot be assessed, but for the thinking processes the students engage in and their use of a range of materials, factors).

b. They should be assessed on the skills and dispositions that foster inquiry in Social Sciences, e.g., sourcing and interpreting evidence, tracing continuity and change, recognising spatial patterns, respect for diversity.

c. Students must be assessed through a variety of ways, e.g., answering questions using reasoning and evidence, conducting field surveys, map reading and interpretation, developing geographical models, participating in debates and discussions.

A few Teacher Voices below illustrate assessment samples for Social Science:

Teacher's Voice 5.2i

Different Types of Farming

I teach Grade 7. I wanted to assess my students' understanding of the difference between types of farming practised in India. Usually, I would ask my students to simply state the features of subsistence farming, commercial farming, plantation farming, and shifting cultivation, and their key differences. Both questions can be answered using rote memory. I tried something different this time. The question below is directly related to their understanding of types of farming, their differences, and how they appear in real-life situations.

Read the information below and answer the question:

Meena and Ravi are friends. Their families practice farming in the following ways. Please read below:

Meena	Ravi
• Owner of 1 hectare of land and grows rice; also works as a labourer on someone else's land. • All farming activities are done manually by Meena and her family members. • Yield from her land is low. • Whatever rice is grown is consumed by her and her family members.	• Owner of 5 hectares of land and grows rice. • Most of the farming activities are done with the help of machines. • Uses good quality seeds and fertilisers and the yield from the land is high. • Takes his produce (rice) to the wholesale market and gets a good price for selling them.

Identify the type of farming practised by Meena and Ravi from the options given below:

a. Meena practises commercial farming while Ravi practises subsistence farming

b. Meena practises subsistence farming while Ravi practises plantation farming

c. Meena practises shifting cultivation while Ravi practises commercial farming

d. Meena practises subsistence farming while Ravi practises commercial farming

e. Both Meena and Ravi practise commercial farming

Teacher's Voice 5.2ii

Applying Constitutional Provisions

I teach Grade 8. I wanted to assess my students' ability to apply their understanding of Constitutional provisions in an unfamiliar situation. Students tend to rote memorise and reproduce the conditions for contesting elections as seen in textbooks. This question presents a real-life situation where students must apply their knowledge.

Read the following passage carefully:

Ravi is 24 years old and comes from a poor family. He is a graduate and a citizen of India. He does not hold an office of profit under the Government of India or a State Government. He is physically and mentally fit and is planning to contest in the Lok Sabha elections. He filed his nomination papers for the election. However, his application has been rejected.

From the above passage, why do you think Ravi's candidature was rejected?

a. He comes from a poor family
b. He is just a graduate
c. He is 24 years old
d. He does not hold any office of profit

Teacher's Voice 5.2iii

Field Survey: Knowing Your Local History

I teach Grade 9. I find field surveys very useful for a comprehensive assessment of engaging with the history of one's locality and using the process of inquiry in Social Science.

The following survey enables the students to acquire first-hand experience using skills, like observing, recording, collecting sources, documenting, comparing, evaluating, and drawing conclusions. Working in groups also nurtures skills of communication, collaboration, and teamwork.

Activity: I used the following instructions to describe the field survey tasks to my students:

a. Identify at least 2 popular historical sites in your village or town e.g., temple, mosque, church, gurudwara, well, *bavar*/*bawri*, palace, ruins, other places of historical importance.
b. Collect information about these 2 sites using the following sources:
    i. Speak to at least 2 members from your family or neighbourhood about these sites, When was it built? What was it used for? Is there anything special about this site? And so on.
    ii. Visit these 2 sites in groups of 4. Observe and record the following: shape and form of the structure, type of materials used, anything special or peculiar about the site, e.g., inscriptions, carvings, folktales.
c. After collecting information, I asked students to prepare a project report in the following way:

Project Title: Use any imaginative title as per your group's choice.

Sites visited: You can provide photographs or sketches of the sites along with description.
What did you learn about these 2 sites from the people you spoke to and your visit?

Site 1:

Site 2:

What does this tell you about the history of your locality? Write down at least 3 conclusions based on the information collected.

Write any funny incident/story/fact that you learnt about this site which is memorable to your group.

I used the following rubrics to grade my students' performance:

Criteria	Grade A	Grade B	Grade C
Followed appropriate survey process	Information collected from at least 4 sources All suggested questions from the task were answered in depth Responses were documented neatly Student added more questions to get in-depth understanding of the sites	Information collected from at least 3 sources Attempted to answer all questions from the task Reponses from survey were sketchy in few places No new questions were added by the group	Information collected from one or two sources Details from the survey were inadequate to present a complete picture of the sites visited
Quality of project	Project title was catchy or creative Complete description of the sites visited using multiple evidence, such as, sketches. Photographs, maps, anecdotes History of the 2 sites was adequately constructed using multiple evidence from the survey Personal anecdotes or reflections were included in the project	Project title was clear. Description of the 2 sites using 1–2 evidence History of the sites was attempted-but the narrative lacked coherence and completeness Personal anecdotes were missing	Project title was clear Descriptions of the sites and evidence were inadequate Conclusions about the history of the place were missing

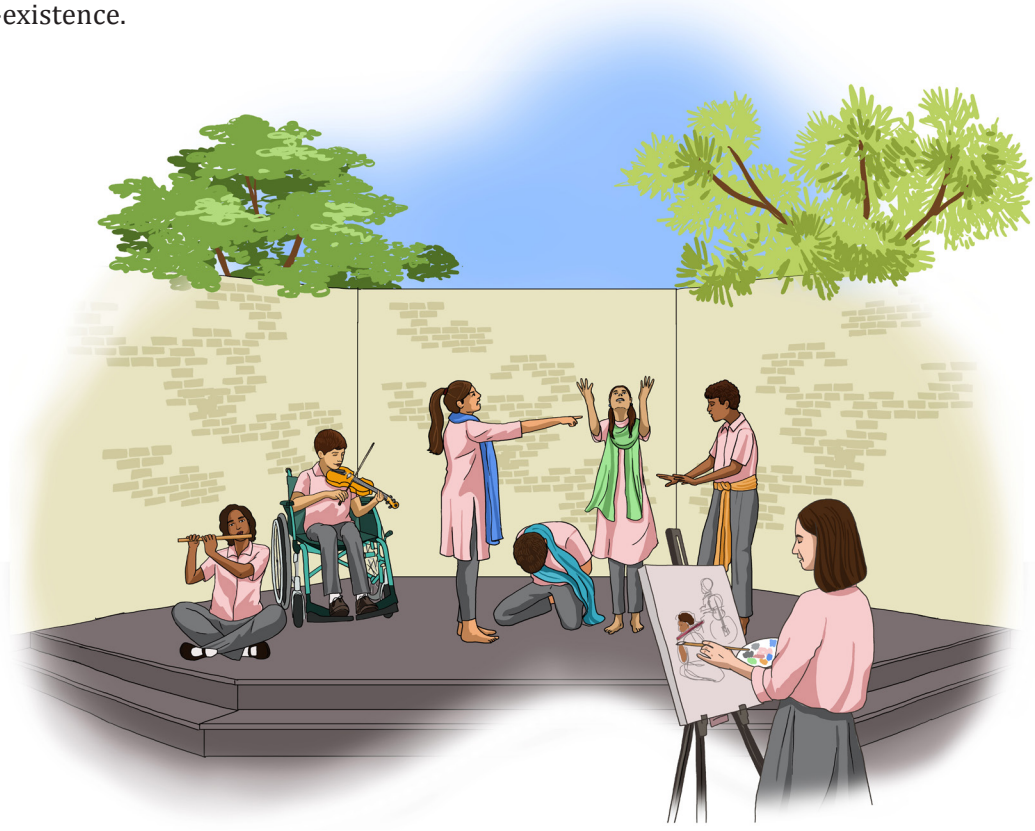
Chapter 6

Art Education

The Arts are a vast range of creative activities carried out by people in all cultures and societies. They involve innovative and imaginative ways of expression in different forms using a variety of materials and media. When people work with the arts, they not only create artwork, but also enjoy the experience of viewing and responding to many forms of cultural expression. The Arts can broadly be classified into the Visual, Literary and Performing Arts.

In the school curriculum, art education deals with developing creativity, aesthetic sensibilities, and cultural literacy in all students. Being culturally literate means having familiarity with the significant events, figures, and works of literature, visual arts, and performing arts that have shaped a society or have had a lasting impact on its development. This is done through various forms of visual arts, a variety of crafts (local living traditions), digital art, as well as, performing arts, such as, storytelling, puppetry, dramatics, music, dance, and movement. The range of genres could include traditional, classical, folk, popular, and contemporary styles of creative expression.

Art education in schools should give all students adequate opportunities to openly express their ideas and feelings through a variety of art forms. When they create artwork together and work collaboratively, they recognise one another strengths and develop deeper connections with the world around them. Such a process nurtures empathy, appreciation, cooperation, and trust, all of which are fundamental for developing social and human values, such as, *Ahimsa*, love, compassion, friendship, and peaceful co-existence.



Section 6.1
Aims

Art in school education helps every student develop creative thought and expression. This involves three important processes: making artwork, thinking creatively in the arts, and appreciating all forms of artistic expression.

The arts are known to enable socio-emotional well-being. Exposure to art and the experience of producing art can improve cognition and significantly impact individuals in their emotional awareness and regulation.

Through a complete engagement of the mind and body, the arts have the potential to create immersive experiences. Such immersive experiences have a positive and long-lasting impact on the development of aesthetic sensibilities, expression, imagination, observation, crafting skills, creativity, and students' overall confidence in their own abilities. They learn to find diverse ways of persisting and solving problems. All these are important for individual growth and contribution towards society.

By working with the arts, students connect with their culture and appreciate the diversity of artistic expression in other cultures. As a common language, the arts bring people together and lead them to develop acceptance, understanding, and mutual respect.

Through a good, effective art education programme, schools must aim to achieve:

a. **Joy in exploring and creating artwork:** This would mean gaining a variety of aesthetic experiences and deriving joy from all forms of art.

b. **Imagination and creativity:** Acquiring and applying creative thinking and artistic capacities through experimentation and sustained practice in the arts, is at the heart of art education.

c. **Empathy and sensitivity:** Meaningful experience in the arts has great potential to nurture empathy and sensitivity towards the expressions of others.

d. **Understanding of connections with other disciplines:** The arts teaches appreciation of beauty in nature and the observation of details and patterns. This approach to the understanding of disciplines makes for aesthetic experiences in themselves.

e. **Sense of belonging:** Through artistic engagement, students will find connections to their own culture and traditions, as well as, learn an appreciation for India's multicultural diversity and knowledge of contemporary artists and art practices.

Section 6.2
Nature of Knowledge

a. **Artistic work involves perceptual, procedural, and conceptual knowledge:** The arts strongly rely on perceptual knowledge, which is about experiencing the world through all the senses of our body. The arts also connect emotions and sensory experiences. Procedural knowledge in the arts is largely associated with the process of making or creating artwork. This requires us to know how to use materials, such as, tools and mediums of expression and how to apply artistic concepts while creating artwork. Conceptual knowledge in the arts is to know about space, colour, form,

movement, narration, materials, tools, balance, proportion, beauty, harmony, and other elements and principles.

Yatho hasta tatho drishti
Yatho drishti tatho manah
Yatho manah tatho bhaava
Yatho bhaava tatho rasa
Verse from the Natyashastra

Translation

Where the hand (action) goes, there follows vision
Where the vision goes, there follows the mind (thought)
Where the mind goes, there follows feeling (emotion)
Where the feeling goes, there follows aesthetic pleasure

b. **'Making' is at the centre of artistic work:** The above verse in sanskrit captures the essence of making art, where the creative process begins with making. It is then followed by thinking, feeling, experiencing, and appreciating. The concrete experience of 'making' or 'doing' is central to the arts. Along with this, how something is done defines its artistic nature, e.g., one can play with utensils to either make disturbing noises or create soothing music.

c. **Art inspires new ways of looking:** We are creatures of habit and adapt easily to routine and repetition. We enjoy the arts because it brings about a change in our routine ways of thinking and working. The arts give a sense of newness by inspiring us to experience the world differently, in ways that are unique, enjoyable, and thought-provoking. Such experiences are referred to as *rasa* or the aesthetic experience.

d. **Art reflects human aesthetic sensibilities:** Aesthetic sensibility is the ability to perceive beauty, arrive at considered judgments regarding the good and beautiful, and strive towards a sense of refinement in the art-making process. Art is a form of understanding beauty, shape, symmetry, pattern, and movement to express ideas and evoke feelings.

e. **Artistic creativity follows and expands rules and conventions:** As with languages, the arts also have rules and grammar that are evolving and being redefined with time. For instance, the creative exploration of *raagas* in classical music follows some basic rules while allowing for exploration and creativity. Instead of viewing these rules of form as constraints, artists use these as opportunities to challenge their own imagination and push the boundaries of creativity towards newer forms of expression.

f. **There are differences in the natures of Visual and Performing Arts:** The visual arts typically offer 'static' experiences to viewers. For instance, paintings and sculptures are viewed as completed artwork and do not undergo changes while viewing. The performing arts on the other hand, offer 'dynamic' (time-based) experiences to their audiences. For example, music, dance, and theatre are dependent on the passage of time for their audience to experience a completed work. Some art forms might offer a combination of both static and dynamic experiences, e.g., a tradition, such as, *Patachitra* combines aspects of painting and performance when the artist sings and narrates the story depicted in the scroll painting.

g. **Art is a holistic engagement:** The arts involve a holistic engagement of the mind and body through which ideas, expressions, and responses are communicated. Playing

the flute not only produces an aesthetic experience (*Rasaanubhava)* but learning to play it also develops an understanding of materials, sound, and its production. Theatre and the dramatic arts are by nature holistic knowledge systems that combine literature, music, movement, visual arts and crafts.

Section 6.3
Approach to Art Education

NEP 2020 mentions that:

> *...No hard separation among 'curricular', 'extracurricular', or 'co-curricular', among 'Arts', 'Humanities', and 'Sciences', or between 'Vocational' or 'academic' streams. Subjects, such as, physical education, arts and crafts, and vocational skills, in addition to science, humanities and mathematics, will be incorporated throughout the school curriculum.*

This NCF, therefore, places the arts as one of the main curricular areas. It recognises the vast diversity of cultural expressions that exist across the length and breadth of India. Local art and cultures would be the starting point for art education in all stages of school education. This approach aims to develop an understanding among teachers and students that the arts are around us as an integral part of our lives and an essential subject for students of all stages of education.

6.3.1 Stages of Aesthetic Development

a. **Development of Aesthetic Sensibilities:** At all stages of art education, students learn to express their views on what is 'aesthetic' and describe the characteristics of things they find beautiful. While subjective interpretations are encouraged, it is also important for students to assess the aesthetic qualities of artwork based on the commonly accepted criteria in the arts. These criteria are established through the art form, as well as, society and culture. For example, when proportion is chosen as one of the common criteria in the visual arts, what is considered a beautiful proportion may vary from one culture to another. It could also depend on the context, genre, or theme of the artwork. Making these connections is important for evaluating artwork and validating aesthetic choices. Students imbibe their aesthetic sensibility from the cultures that they are frequently exposed to. Art education helps them examine their aesthetics closely and expand their 'tastes' by participating in art processes.

b. **Aesthetic Development in Stages:** In the Foundational Stage, children are encouraged to express their views while responding to artwork, and they share their personal preferences. By the end of the preparatory stage, students can be expected to distinguish artwork by quality and level of completion. In the middle and secondary stages, students should be able to reflect on their aesthetic choices and not blindly conform to trends and cliques because of social acceptance. In these stages, they can learn to evaluate their aesthetic choices through gradual steps of inquiry, rigorous exploration, and practice. As students mature, their observation and sensitivity to detail develop, and this enables them to appreciate well-crafted objects and acquire sophistication in their artistic expressions. They develop aesthetic judgment and an ability to evaluate artwork based on common criteria.

All creative processes that take place in the art classroom need to encourage the pursuit of aesthetic qualities. This in turn reflects in their art-making process by setting higher benchmarks for creative refinement in thought, expression, and technical skills.

6.3.2 Art Integration

In addition to teaching and learning the arts as a subject, the arts must also be integrated into the classroom practices of all other subjects. According to NEP 2020:

Art-integration is a cross-curricular pedagogical approach that utilises various aspects and forms of art and culture as the basis for learning concepts across subjects. As a part of the thrust on experiential learning, art-integrated education will be embedded in classroom transactions not only for creating joyful classrooms but also for imbibing the Indian ethos through the integration of Indian art and culture in the teaching and learning process at every level.

Teachers of all subjects can explore art integration in their classes. It provides experiential and joyful learning opportunities for students by focussing on meaningful linkages between knowledge of the arts and the knowledge of other subjects.

a. **Art integration works well when teachers collaborate:** When teachers of other subjects collaborate with arts teachers, they share the responsibility of ensuring that every student understands concepts through various modes of engagement. This also helps students express their curiosity, inquiry, and creativity in multiple forms.

b. **Art integration works well when it addresses the goals and competencies of art, as well as, other subjects:** From the processes of planning, through classroom practices and to assessment, teachers must ensure that the goals of all subjects involved, including the arts, are given equal importance.

c. **Art integration identifies select concepts that are shared across subjects:** For example, patterns and tessellations are common to visual arts and mathematics, symmetry is common across visual arts, performing arts, and mathematics; music, sound, and acoustics can be linked through physics, biology, and performing arts; properties of materials and chemical reactions can be linked through pottery, textiles, physics, and chemistry; literature and history can be linked across drama, visual arts, music, dance, language(s) and social sciences.

d. **Concepts and processes are emphasised in art integration:** It is important to understand that not all activities that involve drawing and construction can be presumed to fulfil art goals. For example, copying a science diagram from a book is not art integration. Furthermore, the ability to observe, visualise, draw well, or build something is as much a desirable capacity in the sciences as it is in the arts.

e. **Arts integration cannot be a replacement for dedicated art classes in the school curriculum:** The arts have their own content, skills, methods, and processes that require dedicated space and time for developing knowledge and practice. This document focusses on art education specific to knowledge of the arts, along with learning standards in the visual and performing arts. This would not only guide teachers in teaching the arts as a subject, but also find meaningful connections with other subjects to integrate concepts, content, pedagogy, and assessment practices.

6.3.3 Emphasis on Process, not Product

Process, more than the product, is central to learning the arts. Art curricula across the world have recognised the educational value of developing frameworks for art education which focus on artistic processes, such as, ideation, creation, production, performance or presentation, response, review, and making connections. This ensures that teachers and students focus on all aspects of development (cognitive, affective, psychomotor, socio-emotional, and language) while learning the arts. Accordingly, the learning standards integrate the thinking, making, and appreciation processes that are fundamental to art education:

a. **Thinking processes** refer to a wide range of cognitive activities while working in the arts. The first is the process of generating ideas and innovating while creating artwork. The second is understanding and applying the elements of various art forms (line, form, colour, space, texture, and value in the visual arts; pitch, rhythm, volume, tempo, movement, speech, voice, story, and role in the performing arts). The third is inquiry and critical probing into art practices and aesthetic experiences. The fourth is to attempt newer, reasonable interpretations while working in the arts. The fifth is to connect the arts with other knowledge, as well as, one's own experiences.

b. **Making processes** are related to the execution and production of artwork. These processes engage the mind and body for expressing ideas and feelings. This includes various body movements and the use of materials, instruments, tools, and other resources. The making processes also focus on exploring techniques, refining skills, and practising creative improvisation while producing artwork.

c. **Appreciation processes** begin with the exposure to a wide range of art forms, artists, and their practices through structured art sessions or through the local environment and culture. This develops an awareness of how the arts communicate a variety of expressions. Furthermore, the process reveals how these expressions are interpreted differently by every individual. While viewing art, one also needs to consider the social, historical, and contextual background of an artwork and its viewers. Responding to art also requires the ability to describe aesthetic experiences and share personal interpretations or viewpoints. The capacity to assess artwork and develop aesthetic judgment is also an important part of the appreciation processes.

All these processes are interlinked and cannot be addressed in isolation if a meaningful and complete art learning experience is desired.

Section 6.4
Current Challenges

The status of art education in schools is troubled by several challenges, some of which are as follows:

a. **Lack of time, resources, and seriousness given to the arts:** Art activities are often limited to fun and entertainment during occasions and cultural events at schools. Art education is either not timetabled at all or is stopped before and during exams. Time allocated for art classes is often taken away for exam preparation or syllabus completion in other subjects. There is often little or no physical space allocated for art

activities and a rare utilisation of art resources in most schools. Added to this, there is rarely any planning, organising, assessment, and review in art teaching. There are no textbooks or handbooks to guide the art teacher and there is no serious assessment of learning in the arts.

b. **Reinforcing stereotypes and meaningless ideas:** In the name of art, students are mostly made to admire and reproduce stale and unoriginal images, e.g., drawings of landscapes with triangular mountains, a semi-circular sun, and a few trees, regardless of whether the student has witnessed such a landscape. Similarly, in dramatic arts, students often perform morally heavy plays based on themes with which they have no personal connections or dance to the tunes of popular songs that further reinforce social stereotypes. Art is reduced to occasional entertainment characterised by pomp and spectacle.

c. **Acute shortage of well-prepared art teachers:** Schools across the country need to recruit many more art teachers. Art teaching needs preparation. Artists, craftspeople, and performers cannot simply become teachers. Becoming an art teacher requires an understanding of educational perspectives, a capacity for educational judgment, as well as, initial guided practice in art teaching. Teacher education programmes do not have an appropriate art orientation for all teachers or an initial preparation of specialised art teachers. As a result, art teachers struggle to understand the requirements of art education and end up imposing inappropriate expectations on students. In cases where teachers of other subjects show an interest in the arts and an inclination to teach the arts, it is neither appreciated nor supported.

d. **Social aspirations:** There is a general lack of interest in art education in society since people lack awareness about its educational value in developing aesthetic, creative, and cultural capacities in students. The wide scope of pursuing the arts as a career also remains unknown to many.

Box 6.1

Addressing the Constraint of Teacher Availability

Many schools do not have dedicated art teachers or adequate space and materials for the Arts. In such cases, schools could choose from various forms of visual and performing arts that are already practised in the region, identify local artists who could be resource persons, and use natural materials and local resources for Art facilitation. Local potters, toymakers, basket weavers, painters (including *Gond, Warli, Madhubani, Maandana*), sculptors, photographers, book illustrators, and muralists in the locality could be invited to the school to lecture-demonstrate. With some education and initial support in learning pedagogical practices, these artists may even be employed as part-time or full-time teachers by schools. However, until such an arrangement happens, teachers need to ensure that art education aligns with the core principles mentioned in this document by being the primary facilitators. The role of the resource person is to introduce technical aspects of the arts processes during their interactions with students.

In the foundational and preparatory stages, art classes may be facilitated by any teacher in the school who has a basic orientation to art education for the respective stages, or with the assistance of local resource persons. They must encourage students to openly express their ideas and emotions and playfully experiment with a range of materials in the form of visual arts (*rangoli*, drawing, painting, textile arts, puppetry, sculpture, pottery).

By the middle stage, schools must prioritise recruiting at least one exclusively assigned art teacher who is familiar with any art form and is trained to facilitate the visual arts and performing arts. A teacher for the middle stage should have the capacity to provide appropriate encouragement and inputs to nurture the individual creativity of all students and stretch their artistic explorations.

In the secondary stage, schools need to ideally recruit one teacher for the visual arts and one teacher for the performing arts who have adequate knowledge of the arts, as well as, the education perspectives that are required for teaching the arts at the secondary stage. Until this is done, schools could collaborate with art organisations and the local art communities to fulfil the art education needs of the curriculum.

School libraries should include a wide range of books and audio-visual resources. These could be museum or exhibition catalogues with images of artwork, books on artists, art magazines or periodicals related to the visual and performing arts, children's literature with artistic illustrations, and so on. Songbooks with musical notations or literature for drama could also become important reference material for students and teachers.

Section 6.5
Learning Standards

In the foundational stage, the arts contribute towards the sensorial, physical, socio-emotional, aesthetic, and cultural development of young children. They use the space around them freely and imaginatively while creating body movements, sounds, and images to express themselves in various art forms. They experiment with objects, materials, and tools playfully and instinctively. They also express their responses to the arts in various verbal and non-verbal ways.

In the preparatory stage, students continue their own artistic explorations while also developing a curiosity towards local art forms and artists. They learn to exercise their choice of materials, tools, and themes for creative expression. In this stage, they are initiated into the processes of ideating, reviewing, editing, rehearsing, and completing artwork while working individually and collaboratively.

The objective of art in the middle stage is that students develop an appreciation for the artistic and cultural diversity of their region and other parts of India. They are introduced to basic concepts, techniques, and processes across the visual and performing arts, as well as, local art traditions from different parts of India. Through regular art practice, students in this stage are expected to enhance their imaginative and creative capacities, as well as, their appreciation of effort, originality, and refinement in artwork.

In Grades 9 and 10 of the Secondary Stage, students develop an awareness of the wide scope of applications in the visual and performing arts. Along with the rigorous practice of fundamental techniques and processes, students develop the capacity to interpret and evaluate artwork. The larger objective at this stage is to inspire meaningful connections between the arts and their own lives through a deeper engagement with diverse artistic expressions.

Across the stages, the arts nurture creativity and aesthetic sensibilities in all students. At every stage, collaborative work provides opportunities for developing mutual

appreciation, respect, love, compassion, patience, persistence, and hard work. Most importantly, the arts focus on instilling joy and pride in India's rich artistic and cultural diversity.

The learning standards in this section are for the visual arts, theatre, music, and dance and movement. All schools must aim to provide maximum opportunities for students to explore any form of visual arts and any form of performing arts (Music, Theatre, Dance, and Movement) across all the stages. The art forms that are chosen by the school should be appropriate, accessible to all students, and have relevance in their contexts. Based on the art forms that a school chooses, the relevant learning standards specific to the visual art form or performing art form can be applied. Teachers need to understand the importance of process in all art forms and ensure that students develop the necessary competencies by the end of every stage.

A 'Nested' Design of Learning Standards: As mentioned in Part A, Chapter 3, 3.1, giving due consideration to the time schools might require in the implementation of art education as a full-fledged subject across the stages (for example, appointment of teachers, acquisition of resources), this document contains 'Nested Learning Standards' for art education, wherein learning standards have two sets which have been detailed. The first set, called Learning Standards–1 details the full range of curricular goals and competencies across the visual and performing arts. These should be accomplished by all schools as soon as they add the required resources for art education. Nested within this is a subset called Learning Standards–2. These should be accomplished by all schools from the very initiation of the implementation of this NCF.

6.5.1 Preparatory Stage

6.5.1.1 Learning Standards–1

Visual Arts	**CG-1** Develops confidence to explore, depict, and celebrate human experience through the arts	C-1.1	Expresses enthusiasm to create a variety of images that depict their everyday life, emotions, and imaginations.
		C-1.2	Discusses a variety of ideas and responses while working collaboratively in the visual arts
	CG-2 Exercises their imagination and creativity freely in the arts	C-2.1	Creatively uses different combinations of visual elements (line, form, colour, space, texture) while depicting their everyday observations, personal experiences, and feelings.
		C-2.2	Compares and contrasts the visual elements, themes, and expressions of artwork shared in the classroom.

	CG-3 Explores basic processes, materials, and techniques in the arts	C-3.1 C-3.2	Makes choices while working with materials, tools, and techniques used in the visual arts. Practises steps of planning, executing, and presenting while creating visual artwork individually and collaboratively.
	CG-4 Explores beauty in their surroundings, and develops an interest in a variety of local art forms and cultural practices	C-4.1 C-4.2	Recognises visual elements in nature and describes their artistic qualities. Demonstrates curiosity towards local art forms and culture.
Theatre	**CG-1** Develops confidence to explore, depict, and celebrate human experience through the arts	C-1.1 C-1.2	Expresses enthusiasm to depict a variety of objects, people, situations, and experiences in drama activities. Discusses own thoughts and responses while working collaboratively in the dramatic arts.
	CG-2 Exercises their imagination and creativity freely in the arts	C-2.1 C-2.2	Creates and performs drama in the classroom based on everyday events, by combining various characters, roles, situations, spaces, and basic props. Compares and contrasts themes and elements of drama, and related artistic expressions created in the classroom.
	CG-3 Explores basic processes, materials, and techniques in the arts	C-3.1 C-3.2	Makes choices while working with materials, tools, and techniques used in the dramatic arts. Practises steps of planning, executing, and presenting while creating drama individually and collaboratively.
	CG-4 Explores beauty in their surroundings, and develops an interest in a variety of local art forms and cultural practices	C-4.1 C-4.2	Recognises elements of drama and movement in nature and describes their artistic qualities. Demonstrates curiosity towards local art forms and culture.
Music	**CG-1** Develops confidence to explore, depict, and celebrate human experience through the arts	C-1.1 C-1.2	Expresses enthusiasm to practice and perform music that is familiar to them. Discusses own thoughts and responses while working collaboratively in music.

	CG-2 Exercises their imagination and creativity freely in the arts	C-2.1	Practises and performs songs and rhythms in a variety of musical arrangements (arrangement of vocal, instrumental, solo, duet, ensemble or group).
		C-2.2	Compares and contrasts musical elements *(Laya, Taala, Sur, Bhaava),* lyrics, and expressions in a variety of musical styles introduced in the classroom.
	CG-3 Explores basic processes, materials, and techniques in the arts	C-3.1	Makes choices while working with voices, instruments, and arrangements used in music.
		C-3.2	Contributes ideas while selecting music for performance and participates in rehearsals.
	CG-4 Explores beauty in their surroundings, and develops an interest in a variety of local art forms and cultural practices	C-4.1	Recognises musical elements in nature and describes their artistic qualities.
		C-4.2	Demonstrates curiosity towards local art forms and culture.
Dance and Movement	**CG-1** Develops confidence to explore, depict, and celebrate human experience through the arts	C-1.1	Expresses enthusiasm to practise and perform dance and movement that is familiar to them.
		C-1.2	Discusses ideas and responses while working collaboratively in dance and movement.
	CG-2 Exercises their imagination and creativity freely in the arts	C-2.1	Creates and practises dance and movement sequences based on everyday actions and personal experiences.
		C-2.2	Compares and contrasts movements, rhythms, postures, themes, and expressions in a variety of dance and movement styles introduced in the classroom.
	CG-3 Explores basic processes, materials, and techniques in the arts	C-3.1	Makes choices while working with movement steps, instruments, costumes, and arrangements used in dance and movement
		C-3.2	Contributes ideas while selecting dance and movement sequences for performance and participates in rehearsals.
	CG-4 Explores beauty in their surroundings, and develops an interest in a variety of local art forms and cultural practices	C-4.1	Recognises elements of dance and movement in nature and describes their artistic qualities.
		C-4.2	Demonstrates curiosity towards local art forms and culture.

6.5.1.2 Learning Standards–2

CG-1 Develops an enjoyment of the arts and exercises their creativity and imagination in visual and performing arts activities	C-1.1	Creates and presents a variety of artwork to communicate their ideas and emotions in any of the visual and performing art forms (emphasis on variety in music, painting, drawing, crafts, drama, dance and movement, and local art forms).
	C-1.2	Describes the varied materials, tools, and processes used in the visual and performing arts and demonstrates familiarity with some of these in their own artwork [e.g., identifies and names some musical instruments and demonstrates simple beats on a *dholak*, *khanjira*, bells, utensils, or one's own body (clapping, tapping, making different sounds using mouth and voice)].
	C-1.3	Creates artwork collaboratively and shares own thoughts and feelings while responding to arts and culture in their surroundings.

6.5.2 Middle Stage

6.5.2.1 Learning Standards–1

Visual Arts	**CG-1** Develops openness to explore and express themselves through various art forms	C-1.1	Expresses confidently their personal and everyday life experiences through various visual art forms.
		C-1.2	Demonstrates flexibility in the process of collaboratively developing visual arts practice.
	CG-2 Applies their imagination and creativity to explore alternative ideas through the arts	C-2.1	Creates visual artwork based on situations or stories that challenge stereotypes observed in their surroundings (such as, gender roles).
		C-2.2	Connects visual imagery, symbols, and visual metaphors with personal experiences, emotions, and imaginations.
	CG-3 Understands and applies artistic elements, processes, and techniques	C-3.1	Demonstrates care and makes informed choices while using various materials, tools, and techniques in the visual arts.
		C-3.2	Refines ideas and techniques of visual expression from the stage of planning to the final presentation, and reviews the entire process.
	CG-4 Acquaints themselves with a range of aesthetic sensibilities in regional arts and cultural practices	C-4.1	Demonstrates familiarity with various local and regional forms of art.
		C-4.2	Describes the life and work of a few visual artists in their region and across India.

Theatre	**CG-1** Develops openness to explore and express themselves through various art forms	C-1.1	Expresses their personal and everyday life experiences through various drama activities confidently.
		C-1.2	Demonstrates flexibility in the process of collaboratively developing drama.
	CG-2 Applies their imagination and creativity to explore alternative ideas through the arts	C-2.1	Creates and performs drama based on situations or stories that challenge stereotypes observed in their surroundings (such as, gender roles).
		C-2.2	Connects elements of drama, themes and symbols with personal experiences, emotions, and imaginations.
	CG-3 Understands and applies artistic elements, processes, and techniques	C-3.1	Demonstrates care and basic stage etiquette; and makes informed choices while using various materials, tools, and techniques of dramatic arts.
		C-3.2	Refines ideas and techniques from the stage of planning to the final presentation in drama for external audiences, and reviews the entire process.
	CG-4 Acquaints themselves with a range of aesthetic sensibilities in regional arts and cultural practices	C-4.1	Demonstrates familiarity with various local and regional forms of theatre.
		C-4.2	Describes the life and work of a few theatre artists and performers in their region and across India.
Music	**CG-1** Develops openness to explore and express themselves through various art forms	C-1.1	Expresses confidently their personal and everyday life experiences through a variety of musical activities.
		C-1.2	Demonstrates flexibility in the process of collaboratively developing music practices.
	CG-2 Applies their imagination and creativity to explore alternative ideas through the arts	C-2.1	Creates and performs songs and musical compositions that challenge stereotypes observed in their surroundings (such as, gender roles).
		C-2.2	Connects elements of music (lyrics, *raagas*, rhythms, volume, tempo and patterns) with personal experiences, emotions, and imaginations.
	CG-3 Understands and applies artistic elements, processes, and techniques	C-3.1	Demonstrates stage etiquette and care for musical instruments and makes informed choices while using resources and techniques in music.
		C-3.2	Refines ideas and methods of musical expression from the stage of planning to the final performance, and reviews the entire process.
	CG-4 Acquaints themselves with a range of aesthetic sensibilities in regional arts and cultural practices	C-4.1	Demonstrates familiarity with various local and regional forms of music.
		C-4.2	Describes the life and work of a few local musicians and performers in their region and across India.

Dance and Movement	**CG-1** Develops openness to explore and express themselves through various art forms	C-1.1	Expresses confidently their personal and everyday life experiences through a variety of dance and movement activities.
		C-1.2	Demonstrates flexibility in the process of collaborating and developing dance and movement practices.
	CG-2 Applies their imagination and creativity to explore alternative ideas through the arts	C-2.1	Creates and performs dance and movement sequences that challenge stereotypes observed in their surroundings (such as, gender roles).
		C-2.2	Connects elements of dance and movement (*mudras,* gestures, and postures) with personal experiences, emotions, and imaginations.
	CG-3 Understands and applies artistic elements, processes, and techniques	C-3.1	Demonstrates stage etiquette and care for stage equipment, props, and costumes, and makes informed choices while using dance and movement techniques.
		C-3.2	Reworks ideas and methods of expression used in dance and movement from the stage of planning to the final performance and reviews the entire process.
	CG-4 Acquaints themselves with a range of aesthetic sensibilities in regional arts and cultural practices	C-4.1	Demonstrates familiarity with various local and regional forms of dance and movement.
		C-4.2	Describes the life and work of a few local dancers and movement artists in their region and across India.

6.5.2.2 Learning Standards–2

CG-1 Develops knowledge about various art forms of the region or state and develops artistic processes and skills in some of the art forms they are exposed to	C-1.1	Demonstrates basic skills in the arts they are exposed to and creates own variations (e.g., *Mandana or alpana or kolam or aipan,* narrating stories from the *Panchatantra* using local forms of puppetry, performing folk songs or dances of their region).
	C-1.2	Describes the different materials, tools, and techniques used in local art forms in their region and state, and uses them with care while creating their own artwork (e.g., describes the process of natural dyeing used in Kalamkari, and experiments with creating artwork using colours sourced from natural materials around them, such as, plants, vegetables, charcoal, soil, brick).
	C-1.3	Recognises multiple viewpoints and shares own thoughts and feelings while responding to a variety of arts and cultural practices from their region or state (e.g., watches a traditional folk-dance performance specific to their state and region either live or online, shares their responses and interprets meanings and emotions conveyed by different movements and rhythms).

6.5.3 Secondary Stage

6.5.3.1 Learning Standards–1

Visual Arts	**CG-1** Develops an understanding of their interest and aptitude in the arts	C-1.1	Evaluates own interest in visual art forms by considering its scope of practice and application (Fine arts, crafts, applied art or design, art research and management).
		C-1.2	Initiates discussions and takes steps to find more information and resources to pursue their interest in the visual arts.
	CG-2 Extends creative practices and artistic expression in different aspects of their life	C-2.1	Applies the elements and principles of visual arts into their artwork and incorporates these into their routine life.
		C-2.2	Analyses the development of visual expression across a series of works.
	CG-3 Develops their art practice through the knowledge of a wide range of Indian art forms	C-3.1	Extends explorations and refines techniques in the visual arts through regular practice.
		C-3.2	Incorporates ideas and elements from various genres of Indian visual arts (traditional, popular, contemporary) into their artwork.
	CG-4 Appreciates the commonality, interconnectedness, and diversity of aesthetic sensibilities across Indian and global art practices and cultures	C-4.1	Analyses commonalities and differences among diverse forms of visual arts, cultures, and aesthetic sensibilities in India and the rest of the world.
		C-4.2	Evaluates artwork based on creative expression, artistry, and social context.
Theatre	**CG-1** Develops an understanding of their interest and aptitude in the arts	C-1.1	Evaluates own interest in dramatic arts by considering its scope of practice and application (acting, direction and design, story or playwriting, backstage, research and stage management).
		C-1.2	Initiates discussions and takes steps to find more information and resources for pursuing their interest in dramatic arts.
	CG-2 Extends creative practices and artistic expression in different aspects of their life	C-2.1	Applies the elements and principles of drama into their performance practices and incorporates these into their routine life.
		C-2.2	Analyses the development of drama process and performance across a series of work.

	CG-3 Develops their art practice through the knowledge of a wide range of Indian art forms	C-3.1 C-3.2	Extends explorations and refines techniques in drama through regular practice and rehearsals. Incorporates ideas and elements from various genres of Indian dramatic arts (traditional, popular, contemporary) into their own drama work.
	CG-4 Appreciates the commonality, interconnectedness, and diversity of aesthetic sensibilities across Indian and global art practices and cultures	C-4.1 C-4.2	Analyses commonalities and differences among diverse forms of theatre, cultures, and aesthetic sensibilities in India and the rest of the world. Evaluates drama and theatre performances based on creative expression, artistry, and social context.
Music	**CG-1** Develops an understanding of their interest and aptitude in the arts	C-1.1 C-1.2	Evaluates own interest in music by considering its scope of practice and application (performance, composing, production, sound arts and design, recording, music research and management). Initiates discussions and takes steps to find more information and resources to pursue their interest in music.
	CG-2 Extends creative practices and artistic expression in different aspects of their life	C-2.1 C-2.2	Applies the elements and principles of music into their musical works and incorporates these into their routine life. Analyses the development of musical expression across a series of musical projects.
	CG-3 Develops their art practice through the knowledge of a wide range of Indian art forms	C-3.1 C-3.2	Extends explorations and refines techniques in music through regular practice and rehearsals. Incorporates ideas and elements from various genres of Indian music (traditional, popular, contemporary) into their own musical work.
	CG-4 Appreciates the commonality, interconnectedness, and diversity of aesthetic sensibilities across Indian and global art practices and cultures	C-4.1 C-4.2	Analyses commonalities and differences among diverse forms of music, cultures, and their aesthetic sensibilities in India and the rest of the world. Evaluates musical work based on creative expression, artistry, and social context.

Dance and Movement	**CG-1** Develops an understanding of their interest and aptitude in the arts	C-1.1	Evaluates their interest in forms of dance and movement by considering its scope of practice and application (performance, choreography, production, recording, dance and movement research and management).
		C-1.2	Initiates discussions and takes steps to find more information and resources to pursue their interest in dance and movement.
	CG-2 Extends creative practices and artistic expression in different aspects of their life	C-2.1	Applies the elements and principles of dance and movement into their performance work, and incorporates these into their routine life.
		C-2.2	Analyses the development of expression in dance and movement work across a series of movement projects.
	CG-3 Develops their art practice through the knowledge of a wide range of Indian art forms	C-3.1	Extends explorations and refines techniques in dance and movement through regular practice and rehearsals.
		C-3.2	Incorporates ideas and elements from various genres of Indian dance and movement (traditional, popular, contemporary) into their own artwork.
	CG-4 Appreciates the commonality, interconnectedness, and diversity of aesthetic sensibilities across Indian and global art practices and cultures	C-4.1	Analyses commonalities and differences among diverse forms of Indian dance and movement, cultures, and their aesthetic sensibilities.
		C-4.2	Evaluates dance or movement work based on creative expression, artistry and social context.

6.5.3.2 Learning Standards–2

CG-1 Develops capacities in any one form of visual or performing arts and develops an appreciation for diverse art practices and traditions in India	C-1.1	Demonstrates rigour and regularity in art-making processes, rehearsals, and performance or displays at the school level and inter-school events (e.g., regularly practises drama or music and rehearses specific pieces for performance at an event, allocates a few hours a week to practise vocal or instrumental techniques, and rehearses group song with peers).
	C-1.2	Imaginatively applies artistic techniques, tools, and materials to express their ideas and feelings while working in the visual or performing arts (e.g., experiments with a variety of threads, needles, and stitch patterns in embroidery; experiments with found materials to create musical instruments).
	C-1.3	Appreciates diverse forms of artistic expression on the basis of artistic qualities and social context (e.g., appreciates the different forms of classical dance practised in India).

Section 6.6
Content

The approach, principles, and methods of selecting content has commonalities across subjects, those have been discussed in Part A, Chapter 3, 3.2 of this document. This section focusses only on what is most critical to education of Art in schools. Hence, it will be useful to read this section along with the above-mentioned section.

6.6.1 Principles for Content Selection

The selection of content for art education should take into consideration the following principles:

a. **Ensure age-appropriate content:** While choosing themes or tools and techniques for art activities, the students' age group, developmental stage, and diverse learning abilities must be given consideration.

b. **Include a diversity of context, resources, and artistic genres:** Starting with the familiar and local for the younger age groups, content could gradually expand to examine the diversity in regional, linguistic, national, and international contexts. As the content progresses in the different stages, it must cover a breadth of genres, which include classical, folk, tribal, popular, and contemporary forms of art. Materials and resources that are locally or naturally available must be prioritised.

c. **Uphold the dignity of all types of work:** Content should not reflect any hierarchies among art processes. It must give equal importance and value to all kinds of physical, intellectual, and emotional work. Similarly, the content should present a wide scope of skills (Ranging from simple to complex) and in roles (ranging from minor to major). For example, the role of a stage designer in the performing arts cannot be undermined by the role of actors.

d. **Include traditional and contemporary practices in the arts:** Students are exposed to a variety of art forms through their local culture and traditions, as well as, entertainment channels in the media and the internet. Therefore, the content in art education must consider what students are already exposed to and know and provide opportunities to discuss and reflect on emerging trends and practices in the cultural space.

e. **Encourage questioning and critical reflection:** Although, the arts can be subjective in nature, artistic expression and discussion should encourage students to reason their choices, compare and analyse the processes, and connect them with their aesthetic preferences.

f. **Uphold values:** The chosen content must teach students an appreciation for multicultural diversity and inclusion, concern for democratic values, respect, and compassion for a variety of artistic expressions, and an interest in working towards justice through creative modes, peaceful dialogue, and cooperation. Dialogues around art and aesthetics must aim to develop multiple perspectives and respect diverse viewpoints.

6.6.2 Organisation of Content

6.6.2.1 Elements and Principles of Art

There are several approaches and traditions of teaching and learning the arts. Most approaches introduce students to the fundamental elements and principles related to the art form that is being taught. The framework of elements and principles is widely accepted for creating and evaluating artwork. The elements of various art forms, as well as, the methods and aesthetic principles have also been systematically codified in ancient Indian texts, such as, the *Natyashastra, Abhinaya Darpanam, Shilpashastra,* and *Chitrasutra*. While some of these (e.g., *Bhaava* or emotion) may be common across different art forms, some elements are specific to the visual arts and others to the performing arts.

Students need to know the fundamental elements and principles of various art forms while creating artwork. It also helps them develop an art vocabulary to describe, discuss, and evaluate works of art.

The following table is a suggested illustration of the elements and principles of the visual arts and performing arts, which could be introduced at every stage. This is informed by the developmental stages that occur in students. Elements introduced in the early years will continue to be applicable in the later years, with a gradually increasing level of complexity.

Table 6.1

Progression of Elements and Principles Across the Stages

Visual arts		
Preparatory	**Middle**	**Secondary**
Space, Line, Shape, Form, Colour, Texture, Pattern, Focus, Emphasis (creating visual importance to any one part of an artwork to draw viewers' attention), Emotion, Narrative.	Light, Shadow, Contrast, Value (colour tonality), Perspective (creating the illusion of three-dimensional space in a two-dimensional artwork), Ratio and Proportion, Likeness, Form and Function, Symbols, Icons, Metaphors	Compositional structure (e.g., symmetric or asymmetric composition), Visual balance, Visual Aesthetics.
Music, and Dance and Movement		
Naada (Sound and volume) *Shruti/ Sur* (Pitch) *Swara/ Swar* (note) *Laya/ lay* (tempo) *Taala/ taal* (rhythm) *Gaayan* (vocals) *Vaadan* (instrumentals) *Nritya* (Dance and Movement) *Alankaara* (Elaboration, melodic variations, decoration)	*Laya or Lay* (tempo) in the commonly performed speeds of *Vilambit or Vilamba-kaala (slow tempo)* and *dhrut or madhyama-kaala (medium-fast tempo)* or *gati* in dance *Matra Bol, Theka, Sam, Khaali, Laghu, Dhrutam, Anudhrutam, Aavartam* in *Taala or taal* *Saptak (Mandra, Madhya, Taar)* (Scale) *Aaroh, Avroh* (ascending and descending sequence of musical notes)	*Gamak, Meend, Tihai* in musical compositions *Samay of Raaga* *Navarasa* (Nine Aesthetic experiences) *Rasika* (audience or connoisseur) Choreography *Nritta* (pure abstract movement in dance) *Naatya* (abstract movement and *abhinaya*), Harmony

Saahitya (Lyrics or literature) *Bhaava* (emotion) *Mudra* (hand gestures, symbols) Body Parts, Postures, Sides, Positions, Upper body, Lower body Levels (High, Middle, Low)	*Raaga* (basic *raagas* used in the musical forms of the region) *Sāhitya* (Literature) Composition *Abhinaya* (action, movement, and expression) *Tatkar or Adavu or Chali* (fundamental movement steps in classical dance)	*Gamak, Meend, Tihai* in musical compositions *Samay of Raaga* *Navarasa* (Nine Aesthetic experiences) *Rasika* (audience or connoisseur) Choreography *Nritta* (pure abstract movement in dance) *Naatya* (abstract movement and *abhinaya*), Harmony
Theatre		
Audience, Action, Emotion, Movement, Plot, Story, Posture, Rhythm, Role, Character, Setting, Place, Situation, Sound, Music, Space, Voice	Climax, Conflict, Convention, Dramatic Moment, Energy, Mood, Atmosphere, Relationships, Time, Timing, Tension	Contrast, Focus, Emphasis, Language, Text, Dramatic Metaphor, Spectacle, Structure, Symbol, Theme

6.6.2.2 Materials, Tools and Techniques

Materials, tools, and techniques play a critical role in every art form and even shape traditions, styles, and genres. The focus of art education is to provide wide exposure to a range of materials, techniques, and tools before developing excellence in any one art form or process. Therefore, an age-appropriate introduction to materials, tools, and techniques must be followed across all stages. A premature introduction to advanced tools or an overemphasis on technique alone can prevent a student from enjoying the explorative and innovative aspects of creating artwork:

a. Materials: Materials could be chosen based on the school's geographical location (weather conditions, native flora or fauna), local culture, and locally available resources. Schools can, like many traditional art practices, conscientiously source materials and tools from nature. It is recommended that all schools avoid purchasing plastic, styrofoam, and thermocol as materials and explore recycling the same from used packaging, if necessary. Safety and hygiene should be prioritised in all situations when students use recycled material. Processes, such as, creating art using papier mache can be introduced as sustainable alternatives to recycling paper for creative use in the arts.

Examples of materials sourced from nature: Natural elements, such as, water, air, and light, play an important role in many material transformations and processes. Other natural materials could be soil, sand, mud, clay, pebbles, rocks, stone, minerals and metals, sticks, dried logs, wood, brick, charcoal, seeds, seed pods, leaves, stems, flowers, fruits, vegetables, natural rubber, natural gum, grains and their powder, shells, feathers, and natural fibres (cotton, jute, palm, wool).

Teacher's Voice 6.1

Art from Natural Materials

My students in Grade 5 know and tell many stories, and they have even written and created their own illustrated stories. This time, I decided to assign a task that is related to story illustrations that would not be on paper or in the form of a book. In fact, it would be impermanent. They had to work in groups and create outdoor artwork in which they used only natural materials or found objects sourced from the school campus. Of course, they were also given the condition that they could not harm plants by plucking flowers and had to source material from what had fallen on the ground.

During the activity, each group selected a story and decided on a scene that they would depict in their artwork. Once outdoors, they quickly got to work as they picked stones, pebbles, twigs, leaves, flower petals, and so on. They busily discussed their ideas as every material triggered their imaginations to improvise on the spot, make changes to their visuals, and even come up with their own stories. The students had to think differently and be creative to find the objects to convey the shapes, forms, colours, and ideas they had in mind. One group decided to use a drinking water tumbler with a little water to become a well in their artwork. The time limit to complete their work in one period also made them be mindful of their plan, and they worked energetically and efficiently. Some groups borrowed ideas from others as they saw them using different materials.

When all groups completed their artwork, each group presented their story along with the artwork and the others responded to their artwork by telling them what they found interesting in their use of materials, how their compositions conveyed different ideas and stories, and what they each learnt from the process. The groups also reflected on their collaborative experiences within their groups.

Examples of materials available in stores: Chalk, crayons, pastels, paints (watercolour, poster colour, tempera, acrylics), inks, *rangoli* powder, a variety of fibres and threads for textile arts (cotton, nylon, wool, silk), gums and adhesives, paper and cardboard in various sizes and thicknesses, fabric in a variety of textures, prints, and patterns; rubber, wooden boards and blocks (in smooth, textured, and carved variants), plates and sheets of different metals varying in lustre and thickness; beads, wires, straws, and rods made of different materials.

b. Tools: While selecting tools and instruments across the arts, the student's age group, their prior knowledge, and exposure to various tools and instruments need to be considered. Students learn the knowledge of:

i. Appropriate selection of tools and instruments.

ii. Grasping, holding, and operating tools and instruments.

iii. Safety precautions in using the tools and instruments.

iv. Care for the tools and instruments.

Examples of tools and instruments used in the visual arts: Pencils, pens, markers, brushes, rollers; erasers, sponges, palettes, sharpeners, scissors, cutters, scrapers knives, needles, pliers, punch, potter's wheel, wooden modelling tools, spoons, spatulas, palette knives, carving tools, hammer or mallet, chisels, files, saw, hand drill, measuring instruments (such as, measuring tape, scales, compass, protractors, weighing scales), recording equipment (such as, cameras), digital software, and applications. Sewing machines can be introduced at the Secondary Stage.

Examples of tools and instruments used in the performing arts: Natural materials, pitch pipes, tuners, traditional, electronic, or digital forms of *Surpeti/Shruti-box, Tanpura/Tambura,* metronome, tabla and other *taala* aids*, ektara,* a variety of percussion instruments, selected string instruments, wind instruments, harmonium, keyboards, bells, *Ghungroo,* lighting equipment for stage, sound equipment (such as microphones, amplifiers, mixers, speakers), recording equipment for video and audio, costumes, jewellery, make-up, stage props, and sets.

c. Techniques: All art forms can be introduced to students across stages with age-appropriate techniques and relevant adaptations in materials and tools. Teachers must choose techniques and processes that are suitable for students based on their age, attention span, interest, prior knowledge, and experience. They would also have to consider knowledge, skills, and dispositions that are desirable at every stage. For example, the technique of working on a potter's wheel requires a variety of motor skills and strength, which may be more appropriate for students in the later middle or secondary stages. At the preparatory stage, students can be introduced to pottery techniques that do not require a wheel, such as, pinch pottery or coil pottery techniques. As a precursor to the technique of weaving, students in the preparatory stage can be introduced to the techniques of braiding using palm fronds or thick jute ropes. In the middle and secondary stages, students can learn to make simple handheld looms, weave with wool and jute and try basket weaving too.

Examples of techniques and processes used in the visual arts: Drawing, sketching, journalling, painting, dyeing, printing, pottery and ceramics, photography, film and video, animation, collage, assemblage, construction, building, modelling, carving, engraving, etching, embossing, digital fabrication, braiding, weaving, knitting, cutting, sewing, and embroidery.

Examples of techniques and processes used in the performing arts: Warm up games, exercises, and activities for voice, instruments, and body movement; brainstorming, mind mapping; noting and visualising ideas on the board; drama

games, image making, or tableaux (motionless individuals making a still scene), improvisations and their different variations, scene work, stagecraft, rehearsal techniques, run throughs, techniques for ensemble or group performance, solo performance, movement choreography, composing music, reading and writing poems, stories, scripts, and musical notation.

6.6.2.3 Artists and Their Practice

Students must learn about the lives and art practices of various artists. Along with this, they also need to learn about the various environmental and social factors that support artists. These inquiries can enhance their appreciation for the arts and sensitise them to cultural issues. Schools can organise lecture demonstrations by various artists (men, women, and transgender) who are known locally, regionally, nationally, and internationally to inspire students to engage with the arts.

6.6.2.4 Art Etiquette and Ethics

Students of all stages must be introduced to art etiquette and ethics, e.g., conventions of salutation, bowing to the audience, acknowledging all the people involved in the production, and participating as a respectful and appreciative audience. In the process of making artwork, students must be taught about copyright laws, fair use, the ethics of sharing art content, and the practice of including credits of people and other resources that were involved in production. Students must also practise the habits of cleaning and caring for art equipment and spaces.

6.6.2.5 Familiar Themes

Familiar themes make the thinking, making, and appreciation of art more accessible to students. Examples of themes could be the life and work of people, traditions and cultures, characteristics and arrangements of objects, living beings in the natural environment, stories, folk tales, myths, legends, poetry, and other forms of literature; values, such as love, friendship, equality, and justice; and concepts, such as, war, peace, education, and health.

6.6.2.6 Interdisciplinary Practice

Learning the arts very often overlaps with knowledge from other disciplines. The social sciences and the arts are closely interlinked. History, art, archaeology, architecture, conservation, contemporary crafts traditions, and contemporary art practices can all be explored while learning about art and society. Similarly, language, literature, and art are to be viewed as different forms of cultural expression and human communication. Concepts, such as, symmetry can be explored through the visual arts, crafts, dance, movement, and mathematics. Sound and its properties can be studied through music, drama, physics, biology, and language. Colour can be explored through visual arts and craft practices, such as, natural dyeing, geography, chemistry, physics, biology, and political science (issues of race and colour). More such content can be chosen for art integration practices.

6.6.3 Content Packages for Students and Handbooks for Teachers

Art Education will require the thoughtful designing of content that encourages creative exploration and art appreciation. The conventional format of a textbook may need to be reimagined to suit the nature of art and its related activities. All art forms would require a well-organised archive of resources (online and offline versions) that contain good quality images, audio, and videos that are adequately supported by text or audio information to describe the artwork. Content in the archives must represent the artistic and cultural richness of every region in the country, from the past to contemporary. Such archives could be used for designing modules for each art form while allowing room for the local art too.

Content packages for students must include exploratory exercises that encourage them to interpret artwork, experiment with materials and tools, exercise their imagination, and express their ideas and feelings openly. All content should be inclusive and accessible to students with disabilities. Active student exploration, engagement, guided and independent practice, reflection, reattempting expression, and building aesthetic capacities across age groups are the spirit and vision of art education. Content packages must reflect these demands.

Visual design must be given utmost importance while creating content packages in the Art. Resource materials and books that are well designed can themselves model aesthetic principles and instil artistic sensibilities in teachers and students.

Well-designed handbooks and other supportive art resources would be required for teachers of every stage. These resources would help them develop their understanding of the aims, learning standards, and appropriate content and pedagogy for art education through illustrative classroom examples. They could include suggestive lesson plans, pedagogic illustrations, and assessment frameworks for various art forms. Pre-service training and in-service training can orient teachers to meaningfully use the content and methods suggested in the handbooks and other art resource materials.

Section 6.7
Pedagogy and Assessment

The approach, principles, and methods of pedagogy and assessment have commonalities across subjects, those commonalities have been discussed in Part A, Chapter 3, 3.3 and 3.4 of this document. This section focusses only on what is most critical to art education in schools. Hence, it will be useful to read this section along with the above-mentioned section.

6.7.1 Pedagogy for Art Education

For an effective pedagogy for art education, it is important to know how students learn the arts across various age groups. The following are some things to keep in mind in this regard:

a. Developmental stages in children correlate to their aesthetic development: Recent research has found that very young children make free associations with art

based on their own experiences, without much external influence. As they grow, they develop a preference towards realism and appreciate the artists' technique, skill, patience, and hard work. In their adolescent years, they begin to value originality, emotional expression, and creativity. These phases of artistic development can be observed across the visual and performing arts. The ages are not absolute and valid for each student, as some may skip individual phases in the development of their artistic expressions or, at times, fall back on an earlier one.

b. All students, regardless of their differing abilities, can engage in art activities: They must be encouraged to openly exchange ideas and express themselves. Art classes must foster peer learning and an appreciation of diversity. Exploring and building on capacities must be the essence of art classes.

Art Education not only develops skills or craft of making or performance, but also parallelly develops broader creative thinking capacities. This allows for expression of emotions and aesthetic sensibilities. Therefore, the art teacher needs to have a deep knowledge of the arts and of how students learn and respond to artwork. The approach to teaching the arts should focus on all these skills, and not driving all students to become professional artists themselves.

Box 6.2i

Teaching Art

An art teacher in the preparatory stage must have a clear understanding of the aims of education and the aims of art education. They should be familiar with the curricular goals for each stage, competencies for each stage described in this NCF, and related learning outcomes. They need to have a basic understanding of the nature of art forms as areas of knowledge, and a high inclination towards continuous self-study in the arts.

Added to the expectations mentioned for teaching in the preparatory stage, an art teacher for the middle stage must have an awareness of local art and cultural practices. They must have the ability to connect local art and cultural practices with the stage-specific competencies of art education. Teachers for this stage should help students develop respect towards multiple art forms and cultural practices from their region and across the country.

A secondary stage art teacher must have disciplinary specialisation and a rigorous understanding of the arts. They must be able to develop an interest amongst students in any one form of visual or performing arts and develop an appreciation for diverse art practices and traditions in India. They must demonstrate rigour and regularity in art practice as a part of their teaching methodology (rehearsals, performances, preparing for exhibitions and displays at the school level, and inter-school events). They should be able to motivate students to imaginatively apply art knowledge in a variety of contexts. Art teachers for this stage should have the ability to create an environment of respect for multiple viewpoints. They should also have a good understanding of art-historical contexts and spend their time with students looking at and engaging with a variety of artwork from across the country and the world.

c. Content and pedagogic processes are effective when they are Stage-specific: For example, in the preparatory stage, the emphasis would be on expression and communication, whereas by the time they reach the middle and secondary stages, they would be introduced to specific skills in the thinking, making, and appreciating processes.

Based on this understanding of children learning the arts, some common underlying pedagogic principles applicable across all stages of school education are below:

a. **Art education must be primarily process focussed:** The products of art and performances are organic consequences of the various artistic processes that are enjoyable and become markers of learning achievement. A teacher would, therefore, need to closely observe every student's involvement in the processes of thinking, making, and appreciating artwork while giving the final products of art and performances their 'smaller' due place.

b. **Pedagogy must be driven by students' experiences and collaboration:** When students' expressions become the starting point in art classes, they would be able to connect art concepts more meaningfully. This provokes them to discover new ways of understanding their own experiences. Art activities lend themselves well to dialogue and collaborative work, where the sharing of ideas nurtures care and concern for multiple viewpoints and expressions. For example, the chances of students identifying and using different shapes in their artwork are greater after the group discusses the variety of organic and geometric shapes seen in embroidery patterns, *rangoli*, or architectural details, than when the teacher draws a triangle on the board and tells students to use it in their artwork.

c. **Variety and variations must be encouraged:** It is important for students to seek variety and create variations even while repeating or reproducing tasks in art. The focus of the arts is to discover newness even in the most familiar experiences. Art pedagogy should, therefore, encourage students to stretch their imagination to find multiple ways of looking at the world, and multiple ways of expressing their ideas and emotions in all aspects of their lives.

d. **Pedagogy that connects multiple art forms:** Drama and Theatre by nature are composite art forms that include knowledge and processes of visual arts, crafts, design, literature, music, dance, and movement. It is important for students to not only learn specific art forms in a focussed manner, but also discover the connections among various art disciplines. For example, the connection between dance and music is commonly known. However, students are very rarely encouraged to perform music themselves for a dance performance instead of playing a readily available recording. The potential for exploring multiple art forms within a single production or artistic project needs to be consciously encouraged.

e. **Local resources, art and culture must be emphasised:** The inclusion of local culture in art pedagogy could provide variation in perspective to counter popular culture while also making room for inquiry, analysis, and critical appreciation. NEP 2020 suggests:

> *...The hiring of outstanding local artists, writers, crafts persons, and other experts as master instructors in various subjects of local expertise; accurate inclusion of traditional Indian knowledge, including tribal and other local knowledge, throughout the curriculum, across humanities, sciences, arts, crafts, and sports, whenever relevant.*

Schools could invite local artists, crafts persons, and performers, as well as, archaeologists, museum curators, and other relevant art administrators to share their work through lecture-demonstration workshops and art melas in schools. These

programmes or interactions need to be planned and mediated by the art teacher or any of the other teachers in the school.

f. **Many opportunities for art exposure and aesthetic appreciation must be made:** The larger aim of developing aesthetic sensibilities and cultural literacy can only be achieved, when students are sufficiently exposed to good examples of art from different parts of India and the world. Within the school, students could be shown appropriate examples of film, video, animation, photography, and images of original works of the visual arts and the performing arts. All viewing sessions require time for discussion and reflection. In higher grades, students can be encouraged to write art reviews and include them in the *Deewar Patrika* (wall newspaper) or a monthly school magazine. Assemblies and cultural events must also be seen as opportunities for constructively reviewing performances. They must also be encouraged to review and critique the aesthetic arrangements and visual presentation. Besides classroom teaching, art pedagogy could include workshops, projects, exhibitions, visits to archaeological sites, monuments, museums, galleries, local art centres, and performance events. The teacher should plan specific activities and learning projects for students to work on-site during such exposure visits. They can also be given assignments and projects that can be done after such visits.

g. **Students with disabilities must be included:** Students with disabilities must be given equal opportunities and access to participate in all art activities. Their participation and engagement will depend on the level and severity of the disability. Focusing on what they 'can do' independently rather than what they 'cannot do' would empower them as learners. They should be given the choice of mediums and levels at which they can engage with the activity with adequate encouragement and support from the Teacher. For example, some suitable visual art activities for them might include clay work to build dexterity, dabbling with paints, blending to create new colours, cutting shapes and pieces out of different materials to glue and form abstract patterns, tracing along the outer edges of stencils (as tracing along the inner edges might be difficult for them), and painting with fingers, if holding the brush is a problem. Some suitable performing arts activities could include listening to different kinds of music that they are interested in, playing musical instruments, such as, any kind of drum, or encouraging them to create free-form dance and movement to music. Students with disabilities must be included in all art processes, including discussions. Their responses could be verbal or non-verbal, and these must be acknowledged, appreciated, and included in the pool of responses and opinions in the classroom.

h. **The physical space, materials, and resources must be prepared before class:** Teachers need to ensure that the materials and the space where art activities are conducted are prepared and safe for all students. For example, in the visual arts, clay may need to be prepared in advance so that it can be shaped or modelled into different forms. The teacher can either choose to prepare this themselves or, in the case of Middle and Secondary Stages, teach the students to prepare clay. In schools where there may be limited space for the performing arts, the teacher could think of moving furniture around to make space for movement activities. Time must also be allocated for students to clear the space, clean the used tools, and put away their materials after work.

i. **Teachers' preparation should reflect their knowledge of effective pedagogic strategies in the arts:** Being a good artist does not automatically imply being good at teaching art. However, a teacher who may not have specific art skills can facilitate interesting and effective art sessions for students if they have the required knowledge of art pedagogy and the relevant pedagogic skills. For example, if a teacher wants students to achieve variety and variation in their artistic exploration while also learning a specific process or technique, they can choose to introduce only the essential steps or skills and not reveal the end product. After that, based on the different learning abilities of students, they can set different targets and challenges for different groups of students. The students can be asked to explore and build further on the technique or process they are introduced to, incorporating their own expressions.

Box 6.2ii

Pedagogic Illustration: Theatre Teaching Plan for the Preparatory Stage

Improvisation is a method used in the dramatic arts. It involves spontaneous, unscripted action or role play based on any given location or situation during practice. This illustration shows how this method can be introduced at Preparatory Stage. The corresponding curricular goals, competencies, and learning outcomes are also indicated to map the pedagogy.

Curricular Goal	*CG -2 Exercises their imagination and creativity freely in the Arts*
Competencies	*C-2.1 Creates and performs Drama in the classroom based on everyday events, by combining various characters, roles, situations, spaces, and basic props*
Learning Outcome(s)	*Improvises situations in role play by expressing various ideas and moods of the characters, e.g., improvises actions in a scene with humour by sitting down and extending laughter for a longer duration; adds own lines while playing a role*
Content	*Introduction to Improvisation*
Activity	*On-the-spot improvisation for group role play and situation building based on given locations*
Learning Objectives	*To understand roles and characters in different situations for Drama work*
Considerations	***Developmental stage of students:*** *their improved capacity to imagine and role play characters according to given situations* ***Group size****: 5 to 7 students per group* ***Time****: 10 counts, as facilitated by the teacher* ***Elements of Drama being explored****: Character and situation* ***Orientation of exploration*** *towards peer groups in the classroom*

Activity Process followed at the Preparatory Stage

1. ***Group size:*** *The teacher divides the whole class into 6 sub-groups of 5 students each*
2. ***Time:*** *One by one, each group comes to the area marked as the performing space in the classroom*
3. ***Elements of drama being explored:*** *The teacher assigns three locations to each group for them to imagine and develop a situation or scene involving different characters and actions through role play. Locations could be home, railway station, sabzi mandi (vegetable market), Principal's room, hospital, Panchayat Bhawan, playground, and so on.*
4. ***Orientation of exploration:*** *In 10 counts given by the teacher, the students discuss the characters, fix their roles, and start playing the situation immediately, spontaneously. The students must go on playing until the teacher says 'freeze' to stop the role play.*

5. ***Developmental stage of students:*** *After the presentation of each group, the Teacher can lead the session for reviewing the exercise with the following suggested questions:*
   - *What did you do in this exercise?*
   - *What did you like in this exercise?*
   - *What did you achieve through the exercise, as a team and as an individual?*
   - *How did you decide the characters and situation?*
   - *What were the challenges you faced while discussing and playing the situation?*

   The review can be done by the teacher from two points of view: i.e., own review of the performing groups and that of other groups as an audience.

   The teacher writes the reflections of the students on the board while also introducing details of the technique of role play and situation building.

6.7.2 Assessment in Art Education

Assessment in art education must be approached with the fundamental belief that all students can be creative.

Assessment of learning in art education needs to be based on evidence from the students' art-making processes, creative thinking processes, and their capacity to respond to and appreciate the arts within and beyond the school context.

A few teacher voices to illustrate different kinds of assessments are given below:

Teacher's Voice 6.2i

Art Portfolio

All students in our school have an individual folder in which they store their artwork, which are in the form of drawings, collages, paintings, and fabric artwork. I also take photographs of their three-dimensional artwork in clay and paper and have a digital folder on the school computer. At the end of every term, I devote one or two classes for students to manage and consolidate their folder of drawings. They check that the artwork is properly dated and has their name on it. In case they have forgotten to write the date, they check with their peers and write it down. While they do this, I have individual conversations with some of the students to review their work and reflect on the changes that they observe over time. I have found that most students are able to self-assess and express what they have learned and what they can do better. I take notes during this process. In the higher grades, students are

asked to select artwork from their folder to present in an informal classroom exhibition. They also include any artwork of pottery, sculpture, textile art, story illustrations, posters, and so on that they have created during the term. Some students also write about their art and art processes. If possible, we invite students and teachers from other grades to view the exhibition and provide their feedback. The students enjoy the process since they don't see it as an 'exam' and are enthusiastic to exhibit their artwork and share it with a larger audience.

I used four criteria and a four-scale rubric to assess their work, as given below:

Criteria	Grade D	Grade C	Grade B	Grade A
Originality or Uniqueness of ideas	Conventional, stereotypical, or repetitive.	Repetitive with few instances of originality.	Shows considerable instances of originality.	Completely unconventional, unique, and innovative.
Sophistication of technique	Demonstrates little control of materials and tools and requires support in completing artwork.	Demonstrates some control of materials and tools and completes artwork.	Demonstrates considerable control of materials and tools and completes artwork.	Demonstrates exceptional control of materials and tools, as well as, refinement in completed artwork.
Variety in expression	Demonstrates a limited range of expressions in artwork.	Explores some variations in expressions based on familiar examples.	Demonstrates considerable variety of expressions in artwork.	Demonstrates a wide variety of expressions in artwork.
Aesthetic sensibility	Communicates aesthetic preferences only as likes or dislikes.	Communicates a few varying degrees of aesthetic preference (good, better, best).	Compares and connects ideas and aesthetic experiences of different artworks.	Appreciates a variety of aesthetic experiences and art forms.

Teacher's Voice 6.2ii

Group Performances

I teach music from Grade 1–8. In Grade 7, I wanted to assess my students' group performances. I had informed the students which day the assessment would take place so that they had time to form their groups, choose a musical piece, and practise it. I usually ask them not to exceed the number in each group beyond 7, so that it is easier to observe all students during the performance.

The assessment usually takes about 2 periods to cover all the groups in the class. I prepare a list of criteria that would form the basis of assessment for group performance and share the same with the students for them to assess their peers.

Each group had 3 to 5 minutes for their presentation. The students were briefed about the criteria and their respective indicators. I clarified their questions and doubts. While every group performed, the remaining students and I observed their performances, made notes, and graded them according to the criteria.

We also had a brief review after each performance, and a few words of appreciation and suggestions were shared by the students who were in the audience.

The following criteria was used to assess the students:

Criteria for assessment	Grade C	Grade B	Grade A
Choice of musical composition	Chooses musical composition by random selection.	Chooses musical composition based on abilities of all members of the group.	Chooses musical composition based on group ability, as well as, the context of time or season or occasion or event.
Presentation	Performs only the first few lines of the musical composition fluently and in unison.	Performs considerable portions of the musical composition fluently and in unison.	Performs the complete musical composition in unison and demonstrates coordination among all members of the group.
Creativity	Reproduces existing songs and musical compositions without adding own ideas or expressions.	Demonstrates uniqueness in one or two aspects of performance (choice of music, arrangement of vocals or instruments, generation of unusual sounds and patterns).	Demonstrates uniqueness in many aspects of the performance (choice of music, arrangement of vocals or instruments, generation of unusual sounds and patterns).
Performance skills (pitch, tempo, audibility, vocal or instrumental technique, remembering the lyrics)	Demonstrates few performance skills inconsistently.	Demonstrates basic performance skills consistently through the musical composition.	Demonstrates basic performance skills consistently, as well as, a few advanced skills in the musical composition.
Bhaava or expression	Performs musical compositions without feeling and emotion.	Performs some parts of the musical composition with feeling and emotion.	Performs the entire musical composition with feeling and emotion.

Teacher's Voice 6.2iii

Creativity and Imagination

I teach language and the Arts in Grade 5. I decided to assess the creativity and imagination of students in my class through a reading comprehension task. Through this activity, I planned to teach students self assessment. I provided students with a story from the textbook that they hadn't read yet and asked them to read the story and work in groups to present it through any art form. They were given a day to prepare.

One group chose to dramatise the story and develop a short play. Another group created a visual storyboard, and the third group chose to create simple puppets for the main characters as they narrated the story.

I observed that every group visualised the story in their own unique way. The group that created storyboards showed their creativity by writing the names of characters in place of facial features. This gave it an unusual look and served the purpose of identifying the characters. The group that presented the drama used interesting props to show the locations of scenes and suggest animal characters. The group that created puppets used everyday materials and discarded cardboard to create their own colourful puppets. They

also made an effort to modulate their voices and express different moods and emotions in the story. Although the students worked in groups, I could observe their individual participation and engagement in the creative process. The students used the following rubrics that I designed to assess their own learning.

Criteria	Grade C	Grade B	Grade A
Visualisation	Visualises the main characters and sequence of events as given in the text.	Adds a few details from their own imagination while visualising characters and sequence of events of the given story.	Imagines and creates multiple possibilities while visualising characters and sequence of events of the given story.
Collaboration	Has difficulty sharing ideas and materials while working with peers and shows limited participation.	Gives suggestions and shares materials with peers but has difficulty accepting or considering the ideas of others.	Demonstrates openness to receiving and giving ideas; and shares materials with peers.
Presentation	Presents work in partial completion with limited technique and skill.	Presents complete work with considerable technique and skill.	Presents complete work with exceptional technique and skill.

Chapter 7

Education in Interdisciplinary Areas

Of the important thrusts of NEP 2020, two matters have a deep underlying alignment. First, the importance of interdisciplinary learning and study. Second, developing the sensitivity, capacities, and understanding for living in harmony with nature, including the range of urgent issues around climate change and the environment.

This NCF gives specific emphasis to developing interdisciplinary knowledge and capacities, as also their use for development of values and dispositions, including those related to the environment.

All subjects would include this interdisciplinary approach and aspects of living in harmony with nature, and these would be addressed appropriately at each stage.

a. In the Foundational Stage, Curricular Goals are organised around the domains of development, and not specific curricular areas or subjects. Therefore, inter-disciplinarity is inherent at this stage.

b. In the Preparatory Stage, The World Around Us (TWAU) is designed as an Interdisciplinary Area, specifically meant to help students observe, engage with, and understand their immediate social and natural environment.

c. At the Middle Stage interdisciplinary curricular goals are embedded within specific curricular areas. Interdisciplinary learning, including learning about the environment, is developed through specific goals and competencies in the Learning Standards, and all the related curricular arrangements for achieving those from content, and pedagogy, to assessment.

d. In the Secondary Stage, a specific curricular area called Interdisciplinary areas is introduced to promote interdisciplinary knowledge, capacities, and thereby values and dispositions.

   i. In Grades 9 and 10, the following essential subjects will be offered under Interdisciplinary areas:

      1) Individuals in Society (developing moral and ethical reasoning) in Grade 9.

      2) Environmental Education (EE) in Grade 10.

   ii. In Grades 11 and 12, Interdisciplinary areas will include a range of subjects, illustratively, sustainability and climate change, public and community health, media and journalism, legal studies, commerce, family and community sciences, and Indian knowledge systems. The list and offering of subjects would depend on other practical considerations, such as, availability of teachers and interests of students. The specific aims of each interdisciplinary area subject would be to develop an integrated understanding of the chosen subject matter, while developing interdisciplinary capacities.

This chapter deals with The World Around Us in the Preparatory Stage, and the two essential subjects, Individuals in Society and Environmental education in Grades 9 and 10 of the Secondary Stage.

Section 7.1
Aims

The study of interdisciplinary areas develops interdisciplinary thinking, which in turn prepares students for responding effectively to real-life problems since real-life situations are interdisciplinary.

Interdisciplinary areas in schools should aim to achieve:

a. Holistic understanding through interdisciplinary thinking: The study of Interdisciplinary areas must teach students the ability to view their natural and social environment and related issues and events, in an integrated manner. Developing the capacity to use knowledge and methods of inquiry from more than one discipline to analyse any phenomena with multiple perspectives will enrich students' approach to understanding the world. Interdisciplinary areas should break down the silos of disciplines which often render knowledge gained within disciplines unrelatable to the real life of the individual.

b. Living in harmony with nature: An interdisciplinary approach must form the foundation for understanding nature and learning to live in harmony with it.

   i. **Sensitivity towards and appreciation of the environment:** Interdisciplinary areas should help students see the connections between the natural environment and social processes. They must develop an awareness and appreciation of the

interdependence between the natural and human-made environments and the various economic, socio-cultural, political, historical, ethical, and aesthetic dimensions of human societies. The need for balance between the environment and human society will be part of this learning.

ii. **Environmental literacy:** Interdisciplinary areas should develop an understanding of ecological systems, natural resources, environmental issues, and interconnections between human activity and the environment. This will enable students to make intelligent and informed decisions about individual and collective work to solve current problems and prevent new ones.

c. **Ethical and moral reasoning:** Key ethical and moral questions based on a comprehensive understanding of issues or events are integral to Interdisciplinary areas. Students must learn to reason the ethical and moral dimensions of an issue or event in the light of the human and constitutional values mentioned in NEP 2020. They must develop the ability to take informed positions based on evidence and reason and advocate suitable action.

Box 7.1

Environmental literacy prepares students for active participation in dealing with environmental issues. An environmentally literate person is someone who, individually and collaboratively, makes informed decisions concerning the environment; is willing to act on these decisions to improve the well-being of other individuals, societies, and the global environment; and participates in civic life. Environmentally, literate individuals possess the knowledge and understanding of a wide range of environmental concepts, capacities, dispositions, and values that enable environmentally responsible behaviour in a range of environmental contexts. It requires going beyond fragmented thinking about the environment and thinking in terms of interactions of human and natural systems. The production of environmentally literate citizens through formal education will enable the knowledge, cognitive capacities, and attitudes acquired in the classroom to be transferred to the decision-making process of students throughout their lives.

Section 7.2
Nature of Knowledge

In the Preparatory Stage, knowledge in The World Around Us is concrete and related to the real world. It is situated in exploration, discovery, dialogue with peers and adults, visits and excursions, observations, and creating artefacts, as well as, stories, poems, folklore and other forms of arts and literature.

The World Around Us brings together the understanding of different aspects to derive generalised concepts related to students' immediate environment. These concepts are largely around patterns, processes (social and natural), and interconnections between the environment and human society. Through this curricular area, students develop capacities of inquiry that are useful to make sense of and interact with the immediate natural and social environment.

In the Secondary Stage, the knowledge base of both Individuals in society and environmental education is interdisciplinary, and rooted in knowledge, capacities, values, and dispositions developed across subjects.

A comprehensive understanding at this stage requires being able to apply understanding, values, and dispositions, from other subjects. An understanding of events in the local community, state, nation and world in terms of priorities and concerns (in the context of individuals in society and environmental education), as well as, along multiple dimensions (social, moral, ethical, political, economic) comprises this comprehensive understanding.

Importantly, an appreciation of the fact that there are no definitive answers to human issues, different interpretations and actions could be appropriate when seen from different perspectives, or when placed in different contexts.

These subjects provide the opportunity to critically explore and analyse the co-existence of multiple truths and realities. They offer multiple interpretations of a situation or an event, which must converge into equitable, just, and sustainable solutions.

Section 7.3
Potential Challenges

Given that this is a new curricular area, challenges can only be anticipated. Primary among them is teacher preparedness. This challenge has been already manifested in the teaching of Environmental Science (EVS) in Grades 3–5 as per the existing curriculum. As there is no formal structure to prepare teachers for EVS, they often tend to focus on concepts related to their subject specialisation (e.g., language, mathematics). Presently, there are hardly any course on environmental education, and none that prepare teachers for this subject. The case is similar with individuals in society.

It has also been generally observed that content related to the natural environment is managed with greater ease by teachers, but they find issues connected to the social environment challenging.

While the capacity development of teachers is critical, until pre-service teacher education makes the necessary transitions, the capacity for academic support in institutions will also need to be developed (in terms of both the understanding of people and the building of resource material) particularly for the secondary stage.

Section 7.4
Preparatory Stage: The World Around Us

Young children are intuitively inclined to observe their natural and social environments. They interact with family members and neighbours, and with the living and non-living world around them. They observe adults and develop the necessary understanding and skills required for them in their specific contexts.

The World Around Us curriculum uses this natural curiosity of students to help them gain a more systematic understanding of the natural and social environment in their immediate context.

As students engage with their environment, they represent and express their understanding in different ways. This helps them develop competencies related to the other subjects of Language, Mathematics, and Art as well.

7.4.1 Approach

The approach will be to focus on the immediate environment of students, with gradual progression of some aspects beyond the city or town or village at the end of the Preparatory Stage, in order to gain foundational knowledge of science and social science, as well as, a grounding in environmental and vocational education. The interdisciplinary approach taken will reflect the lives of students. This will also ensure that students develop a holistic view of the world, with an understanding of relationships and interdependencies.

Knowledge, values, and dispositions will be developed through various sources from the locality, region, and country. Focus will be on stories, poems, narratives, folklore, histories, and games from diverse sources.

Vocational education will be integrated in The World Around Us through the development of prevocational capacities. Capacities related to understanding the occupations around them, observing, and engaging with animals and plants, and creating simple objects lay the foundation for development of vocational capacities in the Middle Stage. The pedagogy at this stage will also lend itself to the development of prevocational capacities, e.g., maintaining flowerpots or kitchen gardens, clay modelling, and dialogue with shopkeepers during visits to the local markets.

7.4.2 Learning Standards

The curricular goals and competencies for The World Around Us indicate the expectations from students related to understanding of the social and physical environment at this stage. A structured exploration of this environment develops understanding, as well as, the capacities to deepen and extend this understanding.

7.4.2.1 Curricular Goals and Competencies

CG-1 Explores and engages with the natural and socio-cultural environment in their surroundings.	C-1.1 Observes and identifies the natural (insects, plants, birds, animals, geographical features, sun and moon, stars, planets, natural resources) and social (houses, relationships) components in their immediate environment. C-1.2 Describes relationships (including between humans and animals/nature) and traditions (art forms, celebrations, festivals) in the family and community. C-1.3 Asks questions and makes predictions about simple patterns (season change, food chain, phases of the moon, movement of stars and planets, shapes of trees, plants, leaves, and flowers, rituals, celebrations) observed in the immediate environment. C-1.4 Explains the functioning of local institutions (family, school, bank/post office, market, and *Panchayat*) in different forms (story, drawing, tabulating data, reports), and analyses their roles. C-1.5 Uses local materials to create simple objects (family tree, envelopes, origami animals) on their own for display or use in classroom processes.

CG-2 Understands the interdependence in their environment through observation and experiences, developing the basis for appreciation of the idea of *'Vasudhaiva Kutumbakam'.*	C-2.1 Identifies natural and human-made systems that support their lives (water supply, water cycle, river flow systems, seasons, life cycle of plants and animals, food, household items, transport, communication, electricity in the home). C-2.2 Describes the relationship between the natural environment and cultural practices in their immediate environment (nature of work, food, festivals, traditions). C-2.3 Connects changes in the environment and the lives of their family and community, as communicated by elders and through local stories (changes in occupation, food habits, resources, celebrations, communication).
CG-3 Explains how to ensure the safety of self and others in different (normal, as well as, emergency) situations.	C-3.1 Describes the basic safety needs and protection (health and hygiene, food, water, shelter, precautions, awareness of emergency situations, abuse, and unsafe situations) of humans, birds, and animals. C-3.2 Discusses how to prepare for emergency situations (smoke, fire, small injuries, burns, electrical safety, unseasonal rains, fallen trees) based on discussions with family and community, or personal experiences. C-3.3 Develops simple labels and slogans, and participates in roleplay on safety and protection in the local environment to be displayed/done in school and locality.
CG-4 Develops sensitivity towards social and natural environment.	C-4.1 Observes and describes diversity among plants, and birds and animals in their immediate environment (shape, sounds, food habits, growth, habitat). C-4.2 Observes and describes cultural diversity in their immediate environment (food, clothing, games, different seasons, festivals related to harvest and sowing). C-4.3 Describes usage of natural resources in their immediate environment. C-4.4 Demonstrates how natural resources can be shared, maintained, and conserved (trees, use of rainwater, benefits of millets). C-4.5 Identifies needs of plants, birds, and animals, and how they can be supported (water, soil, food, care). C-4.6 Identifies the needs of people in different situations, in terms of access to resources, equal opportunities, work distribution, and shelter. C-4.7 Learns about basic social and behavioural norms, values, and dispositions that benefit our social and natural environments and that help our society function smoothly (using dustbins, standing in queues, conserving water, using public transportation, keeping one's environment clean, always helping others in need regardless of background).

CG-5 Develops the ability to read and interpret simple maps.	C-5.1 Explains a line drawing of their school, village, and ward. C-5.2 Draws a sketch of their school, village, and ward using symbols and directions. C-5.3 Reads simple maps of city, state, and country to identify natural and human-made features (well, lake, post office, school, hospital) with reference to symbols and directions.
CG-6 Uses data and information from various sources to investigate questions related to their immediate environment.	C-6.1 Performs simple inquiry related to specific questions independently or in groups. C-6.2 Presents observations and findings through different creative modes (drawing, diagram, poem, play, skit, oral and written expression).
CG-7 Gains foundational familiarity with basic concepts and methods from the natural sciences (life sciences, physical sciences, and earth and space sciences) and engineering.	C-7.1 Gains familiarity with using the scientific method in investigations, as well as, familiarity with other crosscutting concepts, such as, energy, matter, and systems that apply across the domains of science and engineering. C-7.2 Gains familiarity with disciplinary core ideas in the natural sciences, as well as, in engineering, technology, and applications of science, which reflect the content that will be learned across subject areas in later Grades.

7.4.3 Content

The approach, principles, and methods of selecting content have commonalities across subjects, those have been discussed in Part A, Chapter 3, 3.2 of this document. This section focusses only on what is most critical to The World Around Us. Hence, it will be useful to read this section along with the above-mentioned section.

7.4.3.1 Principles of Content Selection

The following principles will inform the selection of content for The World Around Us:

a. Content selected must enable the development of essential process capacities (observation, making hypotheses, experimentation to test hypotheses, data collection and analysis, discussion). For example:
   i. Assign tasks based on the natural curiosity of students with reference to specific questions or assumptions or hypotheses, they could be asked to observe and record the growth of plants from seeds under different conditions (in different kinds of soil, under different amounts of sunlight).
   ii. Extend this experience to students' own lives and ask them to describe their observations and hypotheses on how crops or plants grow in pots. They can discuss the various uses of plants.
   iii. Organise visits to local markets, fairs, museum, and monuments, and share observations and experiences throughout the processes using different modes.
   iv. Conduct hands-on experiments to test hypotheses and make informed conclusions. Experiments can be conducted in groups to encourage collaboration, teamwork, and social interaction.

b. Content selected should enable maximum possible social interaction, and interaction with the natural environment. For example:
    i. Identity and relationships within family and community; plants and animals; own body; geographical features; transportation and communication; local institutions; migration of families; different habits in different communities (food, practices, traditions); food habits and shelter of animals; various local traditional art forms; festivals and celebrations; community melas and marriage celebrations; day and night, time of sunrise and sunset, patterns; sun, moon, stars, and planets.

c. Content selected should reflect diversity and must be inclusive while developing sensitivity and breaking stereotypes. For example:
    i. Diversity of geographical characteristics, flora and fauna around them.
    ii. Impact of hot weather or excessive rain on plants and animals.
    iii. Practices related to work especially with reference to gender-division of labour at home, food distribution in families, understanding the context of migrant labourers.

d. Content must move from the local context to an understanding of social and natural environments beyond the immediate environment as students progress across grades:
    i. Content should be contextual and related to the immediate environment in lower grades of this stage.
    ii. Gradually increasing exposure to other contexts through comparison and analogy is important, such as, multiple geographies, genders, communities. For example, if the concept of 'Transport' has to be discussed, content can include a pictures in the textbook, discussion of modes of transport in the community, sharing of narratives of travel by students, local news reports related to transportation, instances of use of these roads by the local community, videos of modes of transport that are not available in the locality (e.g., understanding trains in a school in the upper Himalayas).

e. Content selected should be in a way that it can be presented in multiple ways, which go beyond the textbook. For example, students should have the opportunity to explore the same content in various modes as indicated below:
    i. Case studies
    ii. Visual representation through pictures and simple maps
    iii. Using ICT-based resources; videos to give evidence for discussions and/or support discussions on specific issues.
    iv. Poems, stories, plays, games, and news stories
    v. Folklore, folk songs, oral histories, and oral narratives
    vi. Visual art projects
    vii. Building of models, scientific tinkering, and engaging in hands-on experiments to test hypotheses.

f. Environmental values and dispositions must be integrated in the content and should enable pedagogy that is not didactic prescriptive. For example:
   i. Judicious use of water
   ii. Dignity of all living beings
   iii. Impact of humans on the environment
   iv. Needs of plants and animals

g. Content must incorporate Indian knowledge and local culture. For example:
   i. Food preservation.
   ii. Processes to conserve resources, including local wells and stepwells.
   iii. Local literature; alignment with contemporary knowledge, natural disasters, and human-nature conflicts.

7.4.4 Pedagogy and Assessment

The approach, principles, and methods of pedagogy and assessment have commonalities across subjects those have been discussed in Part A, Chapter 3, 3.3 and 3.4 of this document. This section focusses only on what is most critical to The World Around Us. Hence, it will be useful to read this section along with the above-mentioned section.

7.4.4.1 Pedagogy for 'The World Around Us'

Environment, for students in the Preparatory Stage, is what is immediately around them and affects their lives. Students learn about the environment through structured interaction with their natural and social environment, exploration, discussion of experiences and observations, interaction with adults and peers, exemplars, task-oriented activities, structured observations, experiments, surveys and visits.

This engagement with the immediate environment provides a base for moving into exploring larger systems (from locality to district to region to state to nation to world), broader issues (from home to community to larger society), and an expanding understanding of concerns, connections, and consequences. Thus, students' engagement with their immediate environment leads them to an understanding of distant environments, they are able to apply their understanding from 'near' to 'far', and vice versa.

Values and dispositions, e.g., collaboration, respect for diversity, inclusion, scientific temper, sensitivity towards the social and natural environment are best developed if they are demonstrated by adults in the school. Students must also get the opportunity to practise them in their interactions.

7.4.4.1.1 Pedagogical Approaches

Students' questions and experiences related to the social and physical environment, and of social processes around them (including schools and family) must be given space. This establishes trust and empathy between the teacher and students.

Teachers need to help students develop conceptual understanding instead of accumulating facts. This implies that sufficient time must be provided for surveys, exploration, visits to institutions, excursions (including within the school campus), observation, experiments, simple inquiry, dialogue with teachers and peers, role play, questioning and the communication of ideas.

Task-oriented work, wherein they take up some small tasks, helps students connect learning to doing. Through the creation of simple models and toys, they can communicate their understanding and make learning concrete in the process. Allowing students to take the lead in material development, through a variety of modes like art and craft, story, drama, and hands-on experiments provides space for them to be involved in several small-scale and large-scale assignments and projects. This is also invaluable for the development of prevocational capacities.

Teachers must also be aware of values and dispositions that can be developed through activities, and plan deliberately to offer students experiences. They should also make the values and dispositions explicit for students by drawing attention to them. They should also make them explicit for students by drawing attention to specific values and dispositions. For example, collaborative learning, developing a scientific temper, working in diverse groups, analysing work distribution at home, caring for the environment, cleanliness, standing in queues.

Teacher's Voice 7.1i

Bal Shodh Mela

I teach Grades 3, 4, and 5 in a rural school. Over the years, *Bal Shodh Mela* have become an integral part of my pedagogy to give my students an interdisciplinary exposure. *Bal Shodh Mela* or Children's Research Festivals are intended to encourage students' inherent sense of curiosity and interest in exploring their surroundings and excitement to engage with new learning. *Bal Shodh Mela* encourages students to engage in research.

I scaffold them to conduct simple inquiries on local issues or topics by formulating questions, collecting data and drawing conclusions. The process encourages creative expression, and independent reading and writing, as well as, collaboration among students. It is also a wonderful way for me to strengthen relations with the community, since community members are also invited to the *Mela* organised to close the process. Through this process, learning happens in an integrated way, capacities developed across subjects are used by students and learning is concretised within their own contexts.

A few illustrative topics that my students have taken up for research are, my house; the history of our village or area; the geographical and natural location of our area; trees and vegetation around us; business and work, birds, and animals around us; means of transport; demography of our village or ward; local folklore and folk tales; folk sayings and phrases.

I have fellow teachers who use this even in crowded urban contexts as there is plenty of scope for exploration there too. For example, towns and cities go through a tremendous change and usually have people from diverse communities living there, not all of whom are originally from there. So, students can collect stories, such as, when was a shop set up; where is the shopkeeper originally from; what conditions prompted them to migrate, and so on. After all, the objective is to collect stories, and what can be more interesting than the stories of the people around us?

7.4.5 Assessment in 'The World Around Us'

A few key principles of assessment are:

a. Students must be assessed for understanding of concepts and for the ability to demonstrate capacities particular to this subject, e.g., observation, making hypotheses, testing hypotheses via suitable experiments, identification, and classification.

b. Students must be assessed using oral, written and other performance tasks in a variety of ways, e.g., answering good questions, making presentations based on group work, creating artefacts, designing or replicating experiments, analysing data and results and participating in discussions.

A few Teacher's Voices illustrate different kinds of assessment below:

Teacher's Voice 7.1ii

Types of Shelters

I teach Grade 5. I wanted to assess my students' understanding of the types of shelters and why different regions need different kinds of shelters. Instead of asking students the usual kind of question on the types of houses in different regions, I tried something different.

The question below has an illustration that helps students visualise a house with a particular kind of roof and why is it so. Even if they do not recall that rainy and snowy areas have houses with sloping roofs, they are able to logically deduce the reason for this kind of roof from amongst the given answer choices.

In places with heavy rainfall, houses have sloping roofs because such roofs:

a. Protect the house from strong sunlight.

b. Protect the house from wind and dust.

c. Provide more storage space in the house.

d. Prevent rainwater from collecting on the roof.

Teacher's Voice 7.1iii

Prevocational Capacities

I teach Grade 4. The task below is intended to assess both students' prevocational capacities, as well as, students' understanding of environmental concerns. This is instead of simply asking them to respond to a direct question on how the planet can be kept healthy.

1. You have been given chart paper, crayons, pencil, sharpener, rubber, scale, *bindis,* coloured paper and glue.
2. Create a poster on the theme 'Grow Plants to eep the Planet Healthy'.

I used the following criteria to grade my students:

Criteria	Grade C	Grade B	Grade A
	Uses only a few materials	Uses most of the materials	Uses all materials in a meaningful way.
Understanding of the task	Creates a drawing that does not convey the theme	Creates a drawing according to the theme	Creates a thematic representation to convey the theme.
Cleaning up after completion of task	Leaves materials lying around	Puts materials together in one place	Differentiates between waste and reusable material and places material in appropriate places.

Teacher's Voice 7.1iv

Signs and Symbols on the Road

I teach Grade 5. The following question assesses students' understanding of signs and symbols encountered during road travel, as well as, their ability to interpret them. Instead of asking them directly about different types of milestones, this question gives them visual clues that can be used to respond to the question.

Imagine you are travelling to Raipur from Surat. You will see many milestones on the way. Given below are two milestones, both showing the distance to Raipur, but are different. One is painted yellow and white, while the other is painted green and white.

a. What does the yellow and white milestone tell us?

b. What does the green and white milestone tell us?

Marking Scheme (Total 5 points)		
Question	**Response**	**Points**
Question A (Total 3 points)	Yellow and white milestone tells us we are on a National Highway.	1
	The yellow and white milestone tells us that we are on National Highway 53.	1
	The yellow and white milestone tells us we are at a distance of 85 km from Raipur.	1
Question B (Total 2 points)	The green and white milestone tells us that we are on a State Highway.	1
	The green and white milestone tells us we are at a distance of 30 km from Raipur.	1
Note: Students do not need to respond in the exact words given in the marking scheme, the idea should be the same. No points should be deducted for aspects like grammar and spelling.		

Section 7.5
Secondary Stage (Grades 9 and 10)

The Secondary Stage would introduce interdisciplinary areas as a curricular area. In Grade 9, the subject individuals in society would aim to develop capacities for ethical and moral reasoning, and in Grade 10, the subject environmental education would then further develop and apply these capacities in the context of environmental awareness.

7.5.1 Grade 9: Individuals in Society

Ethical and moral reasoning involves thinking about fundamental questions related to everyday events, like what is right or wrong? Can right or wrong be identified? What actions are justified? What is the 'right' thing to do? What are the reasons that justify the 'right' thing? This type of reasoning is necessary for responding rationally to situations, instead of impulsively or instinctively.

For example, the instinctive reaction to some situation may be driven by short-term self-interest. But the process of ethical and moral reasoning enables determining the right actions, not only for oneself but also for others in the same situation.

These questions are equally applicable across common situations that we encounter in real life. For example, on one hand a road may bring material prosperity to a village, but on the other hand it may affect the natural environment and influence the cultural community, what is the right thing to do? Tourism will alleviate poverty in a region, and also permanently change the area and its inhabitants, so what should be done? Can a war be termed just if it is fought to protect the interests of the disadvantaged?

Responding to these questions requires systematic reasoning in the following way:

a. To begin with, it requires an awareness of events, the context, the factors affecting it, and the people involved.

b. Second, it requires identification of ethical and moral questions, whether there is violation of basic human and constitutional values or any danger of the well-being and/or rights of any individual or community being affected.

c. Third, arguments need to be constructed for and against possible actions.

d. Fourth, deciding what is the 'right' thing to do, the evidence used to make this claim, and how the action(s) will be carried out.

e. Finally, identifying possible consequences of the proposed actions and what other steps can be taken to counter these.

These capacities cannot be developed in a vacuum. Socio-cultural, economic and political issues, and current affairs are best suited to meet the aim of developing them.

Ethical and moral reasoning in this context requires the application of understanding gained from multiple subjects, as well as, the moral and ethical values that are developed as a part of other curricular areas. Therefore, this subject is a part of Interdisciplinary areas.

7.5.1.1 Learning Standards

In the Middle Stage, students develop multiple capacities, including values and dispositions related to human and constitutional values. They engage with various concepts, particularly those related to science, social science, as well as, the environment. Individuals in society is intended to enable students to use these capacities and understanding in an interdisciplinary manner in the secondary stage. Through this, they will develop the capacity for ethical and moral reasoning in the context of issues or events with a wide impact and current affairs.

7.5.1.1.1 Curricular Goals and Competencies

CG-1 Develops capacity for ethical and moral reasoning.	C-1.1 Examines an issue or event from multiple perspectives: socio-cultural, economic, political, and environmental. C-1.2 Articulates ethical and moral questions on an issue or event. C-1.3 Identifies different positions related to an issue or event, and provides arguments supported by rationale for each. C-1.4 Identifies the human values, including those from Indian cultural heritage and the Indian Constitution, relevant to an issue or event.

CG-2 Develops capacity to analyse current affairs from multiple perspectives.	C-2.1 Uses authentic sources of news, views, and opinions to develop an understanding of current affairs, particularly current affairs in India. C-2.2 Communicates and advocates opinions and alternatives through a variety of modes (writing, speaking, debates, discussions).
CG-3 Applies ethical and moral reasoning to engage with current affairs related to the local community, state, nation, and the larger world.	C-3.1 Identifies and explores issues or events within the community from multiple perspectives (historical, social, cultural, economic). C-3.2 Discusses issues or events at the district, state, national and international level.

7.5.1.2 Content

The approach, principles, and methods of selecting content has commonalities across subjects, those have been discussed in Part A, Chapter 3, 3.2 of this document. This section focusses only on what is essential for individuals in society. Hence, it will be useful to read this section along with the above-mentioned section.

To meet the Curricular Goals, the content must draw from all the important domains of an individual's participation in larger society. While these domains can be categorised as socio-cultural, economic, and political, specific focus on the environment is also necessary. Therefore, students must gain adequate exposure to issues or events within all the following domains:

a. Socio-cultural domain
b. Economic domain
c. Political domain
d. Environmental domain

All issues or events will fall primarily within these domains. At the same time, these domains are not watertight, some issues or events may have dimensions falling within one or more of the domains.

7.5.1.2.1 Principles of Content Selection

Two sets of content will be required for this subject:

a. Content related to existing issues or events with wide-reaching impact.

The purpose of this first set will be to help students engage with specific issues or events that reflect larger concerns, which may have been persisting for a long time (even centuries), through case studies, short films, and documents.

The reason for the inclusion of this content is to simulate the process of exploring multiple perspectives, identifying core issues or events, the debates that arose, and how they were resolved or remain yet to be resolved. Students will be able to understand the long-term consequences of these events and appreciate the importance of taking moral and ethical positions. This content will help them strengthen their own values and principles, and also help them experience the process of reasoning that is necessary for taking an informed position.

The principles that will inform the selection of this content are:

i. Sufficient content should be available, with information, opinion pieces, data, debates, news reports, and similar material, to enable an understanding of multiple perspectives.

ii. The content should make these moral and ethical questions explicit and offer well-rounded arguments based on evidence and reasoning for responding to each of these questions.

iii. There should be a sufficient record of actions, consequences, and positive changes. There should be scope to examine different perspectives for change and the consequences of these changes.

iv. Even if the matter under discussion is not recent, there should be sufficient material to evolve ethical and moral questions, and how they have been addressed explicitly (e.g., concerns related to the environment).

Illustratively, gender inequality, unequal access to resources, debates related to the role of science and technology, political participation, and environmental concerns could be some areas around which materials could be made available.

b. Content related to current affairs

The second set of content is related to current affairs. This set will be dynamic–it will be selected by the Teacher and students based on their interest in current affairs. This content will integrate the learning of students in several curricular areas and help them apply the capacities developed through engaging with the first set of content. It will comprise two kinds of content: (i) news reports, articles, clippings of TV (Television) news, videos on social media and data, and (ii) interviews with community members and reports of surveys within the community.

The reason for inclusion of this content is to develop among students interest and understanding to engage with current affairs. The following set of principles will inform this choice:

i. Content should be related to all four domains. Illustratively:

   1) Content from the socio-cultural domain could be around gender, class, sports and media.

   2) Content from the economic domain could be around public investment, wealth gap, employment and schemes.

   3) Content from the political domain could be around rights and duties, civic engagement, democratic processes, crime, safety and security.

   4) Content from the environment domain could be around health and hygiene, climate change, pollution and biodiversity.

ii. Content should enable students to engage with different dimensions and allow greater scope for ethical and moral reasoning. Illustratively:

   1) Whether the acquisition of agricultural land for developing airports is justified by the increased livelihood opportunities and improved access to other cities.

iii. Content should be close to the students' life and experiences, and current learning across disciplines. Illustratively:

1) Students may find it difficult to relate to mass shootings in other countries. On the other hand, effect of long-term use of chemical fertilisers in rural settings and the rich-poor divide in urban settings can be taken up.

iv. Content selected should not lead to confrontation among students or lead to backlash from the community. Illustratively:

1) Content that touches religious sentiments.

2) Content related to an area that has already polarised communities and is likely to excite passions.

v. Content should be of various kinds, for exmaple, digital, text, readings, opinion pieces, newspaper reports, parliamentary debates, research reports, data, as well as, discussions with community members.

vi. In this age of information overload and fake news, it must be ensured the material is from a reliable and valid source. Illustratively, content must be from:

1) Reliable magazines and newspapers or their websites

2) Videos of acknowledged experts in the field

3) Websites of reliable agencies or government departments or institutions or universities.

7.5.1.3 Pedagogy and Assessment

The approach, principles, and methods of pedagogy and assessment have commonalities across subjects, those have been discussed in Part A, Chapter 3, 3.3 and 3.4 of this document. This section focusses only on what is most essential for individuals in society. Hence, it will be useful to read this section along with the above mentioned section.

7.5.1.3.1 Pedagogy for Individuals in Society

The Curricular Goals of this area will be best met through giving students the opportunity to engage with different content in different ways. To this end, the pedagogical principles should be:

a. Students must be supported through the process of engaging with an issue or event before they work independently. This must be done through a set of questions and ongoing discussions to help them examine content from different perspectives. The process itself, how students engaged with content, how they identified what was important, how it made them feel, the questions they felt the need to reflect on or discuss, how they looked for answers to these questions, whether they satisfied with the answers, how they chose a view or opinion and why must be discussed.

b. Students must be encouraged to look for information to answer any questions they may have, or for supplementary materials. Illustratively, they can ask community members, teachers, any experts they know, or they can visit the local library and search the Internet.

c. Students should engage with as much content as possible, and with different kinds of content. They should explore this content independently or in groups.

d. Students must present not only their learning but also their opinions on what they have read. For example, if they have read a case study on biodiversity collapse, they must present both what they have learnt and also their opinions on how this collapse can be managed in their locality.

e. Students must have the opportunity to present opinions that may differ and learn the process of listening to each other, put forth well-thought arguments and be able to 'agree to disagree'.

Teacher's Voice 7.2i

Mission to Mars

One of my students brought a newspaper clipping on a manned mission to Mars to class. I asked her to read it out to the other students. There was a lot of excitement, I have tried to capture the conversation below:

Student A: I don't think humans can live on Mars! In our science class, Madam was saying that the conditions on Mars are not alright for human life.

Student B: They will not be able to live like we do on Earth! They will have to live inside something like tents. But how will the tents be kept cool? How will they get water? How will they get electricity?

Student C: The report says it will take seven months to reach Mars. What if an astronaut gets sick on the way? Will they come back? Even if doctors are on board, what if they need specialised equipment?

Student A: The report says the trip will cost billions of dollars. That is many 100 crores of rupees!

Student D: Don't we have many other things to spend the money on? And the astronauts will be in danger. And what will they do on Mars?

Student E: But going to Mars is like what travelling the seas was for ancient travellers! If they had thought about dangers and stayed at home, imagine what the world would be like! Maybe we wouldn't have invented airplanes because everyone was happy to stay at home.

At this point, I thought this would be a good area to explore. I asked students 'What if we try to answer the question: Is such a mission to Mars important for humankind?'

The students were excited about the idea. I asked them to think about the following questions, and any others they could think of:

a. What is the manned mission to Mars? Who planned it? Why has it been planned? Who is paying for it? Who will be going on this mission? When is it expected to take off? What are the challenges? Any other questions?

b. Do you see any challenges related to the well-being of the astronauts? How will they and their families deal with the separation? Will their sacrifice be worth it? Can the money being spent on this mission be used elsewhere to improve human existence? We have seen that human entry into space has created space debris, has space exploration affected the environment in any other way? Any other questions?

c. What are the arguments for and against a manned mission to Mars? Any other question?

d. What do you think is the right thing to do? Why do you feel this is the right thing? Any other question?

e. What will happen if your position is accepted? What will be the results? Are there any other step that can be taken? Any other question?

7.5.1.3.2 Assessment in Individuals in Society

A few key principles for assessment are:

a. Students must be assessed for understanding the context of a situation or event, the ability to identify ethical and moral dimensions, and the ability to recommend actions based on sound rationale and awareness of the consequences of the action.

b. Assessment of engagement with current affairs must never be only on the basis of general knowledge. It must be assessed with reference to specific situations or issues students are made aware of.

c. Assessment must be based on specific situations, issues, or caselets.

A few Teacher Voices illustrate different kinds of assessments below:

Teacher's Voice 7.2ii

Real vs. Fake News

I teach Grade 9. The question below assesses students' understanding of how to verify whether a particular piece of news is real or fake. It provides a specific situation as a context, instead of simply asking them about different ways of verifying news as real or fake.

While reading the newspaper today, you came across an article that surprised you. It said that it will be mandatory for citizens to file their income tax returns twice a year instead of once a year. This is to make the process more manageable for the Income Tax Department.

How can you verify this news? Please choose the most appropriate option:

a. You can check if other newspapers and television are carrying the same news.

b. You can check if there is a notification regarding the same on the IT department's website.

c. What are the arguments for and against a manned mission to Mars? Any other question?

d. You can carefully check who has written the article and the sources cited.

e. a and b

f. All of the above.

I used the following marking scheme: a-1, b-1, c-1, d-0, e-4

Teacher's Voice 7.2iii

Analysing a Case

I teach Grade 9. The question below assesses students' capacity to identify what is right or not in the context of a specific case. The questions do not have just a single correct answer. Students are required to pick what they think is the most appropriate choice. I feel that asking them to weigh choices is better than asking them to state responses directly.

In May 2016, the government had passed the Real Estate Regulatory Authority (RERA) Act to ensure safe and transparent transactions related to private and commercial properties. While several reforms have been made, issues still persist, particularly in urban areas. Of late, news related to demolition of illegally constructed multistorey buildings or of

construction being stopped due to legal issues in urban areas have appeared. For example,

- In January 2021, the Supreme Court ordered demolition of four tower blocks that violated environmental norms in Kochi. About 350 families were displaced after years of uncertainty while the case was being heard in various courts.
- In June 2022, the National Consumer Disputes Redressal Commission (NCDRC) ordered a real estate development company to halt construction of an eleventh tower, for which the builder did not have permission, in its residential project in Gurugram. Flats in the tower had already been sold. About 50 families who had invested in flats in the illegal tower have been affected, after more than a year of uncertainty.
- In August 2022, two 40-storey towers were demolished on the orders of the Supreme Court in Emerald Court, Noida, as the builders had violated building norms. About 600 families were affected, after years of uncertainty while the case was being heard in various courts.

1. Why do you think the Supreme Court and NCDRC took this position? Choose what you think is the most important reason:
   a. They are bound to go by the law and the rules for building.
   b. If they allow violations, other builders will also not obey the rules.
   c. Violations are dangerous as they affect the strength and stability of structures.
   d. All builders must be aware of rules for multi-storey buildings.
2. What do you think was the impact on families who bought the flats? Choose what you think is the most important impact:
   a. They suffered monetary losses as they had to stay on rent while having paid for a flat.
   b. They suffered loss of time as they had to keep going to court and to meet the builder.
   c. They suffered mental harassment due to uncertainty from the long waiting period.
   d. Their rights as consumers were violated as the builder failed to meet the contract.
3. People say that while buying flats from builders, homebuyers should be more alert. Whose responsibility is it to ensure homebuyers have all the information they need before investing in a flat?
   a. It is the responsibility of the homebuyers themselves to check whether the builder has all necessary approvals.
   b. The website of the RERA must carry information regarding approvals for all building projects in simple words.
   c. It is the responsibility of the builder to give all information in writing and provide updates.
   d. It is the responsibility of the state government to ensure the builder has all necessary permissions.

   The marking scheme that I used was as follows:

Question 1	Question 2	Question 3
a: 1	a: 1	a: 0
b: 1	b: 1	b: 2
c: 2	c: 1	c: 1
d: 1	d: 2	d: 0

Teacher's Voice 7.2iv

Multiple Perspectives

I teach Grade 9. The following question assesses students' understanding of what is right and why, of multiple perspectives related to a single issue, and their ability to identify actions at multiple levels and provide a rationale for these actions.

Panchmura village, near Bishnupur, Bankura District, is one of the main hubs of terracotta in West Bengal. Terracotta came into existence in Bengal due to the unavailability of stones and large endowments of alluvial soil left by the main rivers in the Bankura district, Damodar, Dwarakeshwar and the Kangsabati. Thus, the soil gets a perfect blend and high density for it to be crafted intricately and fired in order to produce the required terracotta products.

Terracotta is of high interest in both the national and global markets. However, the artisans face issues of equipment, transportation, and other logistical problems. There is lack of interaction between the artisans and the urban consumers in Kolkata, and the artisans are mostly dependent on local patronage. Since they are not able to make much money, capital for further investment in tools and materials is limited. Further, sluggish marketing and falling demand are causing these marginalised artisans to become extinct; the lack of interest from the new generation further add to the woes.

The terracotta temples in Bishnupur show a much better quality and precision than the artefacts being produced today. For example, the details on the terracotta tiles used in the temples are much more intricate and portray a more complex network of lines, curves, and dots. With the improvement in technology and instruments, how is this possible?

Extinction of skill-specific labour is the answer to this. According to the locals, previously, the process of terracotta production in Bankura included three major classes of workers: the clay collectors and seivers, who would give a fine texture to the clay; the artisans who would add the intricate details, and finally the market traders. There is no specific class of labour anymore for each of these three roles. Also, Bankura artisans gradually scattered to different parts of the country, especially with young people moving to Kolkata to earn money. The remaining few of Panchmura are still struggling to keep this art form alive.

Source: *Adapted from: Bhowmick, Soumya. (2019). Bankura's terracotta: Can timely measures facilitate socio-economic revival of potters' community? Observer Research Foundation.*

Based on the passage above, please respond to the following questions:

1. Why do you think it is important to keep the art of terracotta alive?
2. Should the artisans of Panchmura continue to struggle to keep their art alive? Give reasons for and against their doing so.
3. If you were in a position to do so, what would you advise the artisans of Panchmura, and why?
4. If you were in a position to do so, what would you advise the Government of West Bengal and the Development Commissioner of Handicrafts, Ministry of Textiles, and why?

I used the following criteria to mark my students performance:

Student's responses	
Question 1	
Gives reasons based on the passage	1
Goes beyond the reasons given in the passage, including preservation of socio-cultural traditions	2
Question 2	
States a few reasons for artisans to persist and face the challenges	1
Argues reasons for and against the artisans to persist based on reasons given in response to question 1	2
Question 3	
Suggestions are given without rationale	1
Provides concrete suggestions (e.g., setting up self-help groups, approaching the government for support) and how these will help overcome the challenges faced by the artisans	2
Question 4	
Suggestions are given without rationale	1
Provides concrete suggestions (e.g., facilitation of participation in crafts *mela,* setting up funds for preserving traditional crafts) and how these will help overcome the challenges faced by the artisans	2

7.5.2 Grade 10: Environmental Education

In Grade 10, students will engage with environmental education as a separate subject. They will focus on a holistic understanding of key concerns and issues related to environmental education through drawing upon their understanding across areas, and the capacities developed in Grade 9.

At this stage, students will deepen their environmental knowledge, assess issues, and analyse their causes across various areas, make informed judgments on statements and debates in media and society, and use a range of techniques developed in earlier grades to investigate, analyse, synthesise, question, critique, and draw their own conclusions. They will use multiple perspectives to develop an integrated understanding, and advocate actions at multiple levels.

While it is important that students in this stage acquire a conceptual understanding of environmental issues and challenges, as well as, an appreciation of the magnitude of the problem, it is equally important to ensure they do not get discouraged or despair for their future. The intent is not to scare students or pin responsibility on them to respond to the crises. Therefore, the presentation of alternatives through examples of actions taken to reverse or at least contain environmental damage must be ensured. At the same time, it is important to emphasise that the onus for mitigation cannot be solely on the individual, and the whole community and society must be mobilised for this.

7.5.2.1 Learning Standards

All students must be aware of what is happening around them related to the environment to be able to advocate and participate in necessary action. Environmental education intends to develop the environmental understanding necessary in all citizens, as well as, the methods and capacities they must employ as ordinary citizens. For example, problem identification, causes, future impact visualisation, prediction, policy actions, societal actions, as well as, actions at the level of individuals, and the ability to critique specific actions and their impact.

7.5.2.1.1 Curricular Goals and Competencies

CG-1 Understands key issues and challenges related to climate change, pollution, and biodiversity collapse	C-1.1 Explains how climate change, pollution, and biodiversity collapse affect human well-being (economic activity, migration, cultural practices) and the well-being of plant and animal species. C-1.2 Understands connections between and the causes underlying pollution, climate change, and biodiversity collapse.
CG-2 Appreciates the need for interconnectedness, balance, and harmony between human society and nature, the essence of *'Vasudhaiva Kutumbakam'*	C-2.1 Describes the place of humans within ecosystems, and illustrates how humans and natural ecosystems are interconnected and must co-exist. C-2.2 Illustrates actions at the individual, local, community, national, and international level towards mitigation of issues related to environmental damage. C-2.3 Identifies actions that can be taken at the level of the school or local community to counter environment-related concerns.

7.5.2.2 Content

The approach, principles, and methods of selecting content have commonalities across subjects, those have been discussed in Part A, Chapter 3, 3.2 of this document. This section focusses only on what is most essential for environmental education. Hence, it will be useful to read this section along with the above-mentioned section.

7.5.2.2.1 Principles of Content Selection

The following principles must inform content selection for environmental education at the secondary stage:

a. Content must reflect indigenous and global perspectives, and reflect actions and potential actions of individuals, bodies/institutions, and nations; it must develop the understanding that collaborative and sustained local and global solutions are needed. For example:
    i. The scientific basis and causes of climate system and climate change; causes of biodiversity collapse and its impact; causes and impact of pollution; interrelationships among them.

ii. Vulnerability of socio-economic and natural systems to climate change, consequences of climate change and options for adapting to it.

iii. Use of natural resources like petrol across the globe and how it has affected economies and cultures; loss of glacial ice; climate change and rising sea levels; flooding due to heavy rains; soil erosion in islands; shrinking of rivers.

iv. Measures taken to address these changes and sustainable practices.

v. Local and global efforts towards mitigation of or adaptation to climate change: United Nations Framework Convention on Climate Change; Kyoto Protocol (Carbon Credits, Emissions Reduction Purchase Agreement); Conferences of Parties; Cancun Agreement; Durban Platform for Enhanced Action.

b. Content must present strong qualitative case studies and quantitative data that indicate the impact of events and phenomena and enable analysis of contemporary impact. It should enable a holistic study, through offering multiple perspectives, and include stories of successful transformations. These case studies should be local which can be selected by the state curriculum developers or teachers, national and international. For example:

i. *Jal Jeevan* and projects to clean rivers, *Swachh Bharat Abhiyaan.*

ii. Sustainable homes with natural materials and cooling/heating systems in India.

iii. Astro-tourism for sustainable rural development in Ladakh and Africa.

iv. Developmental needs versus conservation of environment.

v. Disposal of e-waste, biowaste, medical waste (including radioactive materials).

vi. Case studies of work and impact of grassroots individuals and organisations.

c. Content should represent inter-and-intra-nation ethical dilemmas and conflicts related to the environment and cultures or countries, as well as, indicate how these have been/can be resolved. For example:

i. Sharing of river waters

ii. Carbon credits or offsets

iii. Displacement, environmental refugees

iv. Benefits for privileged groups versus vulnerable groups

v. Shrinking space for animals leading to human–animal conflict

d. Content should incorporate Indian and local knowledge and perspectives. It must engage the student with indigenous knowledge and viewpoints and enable them to present their analysis and findings through different mediums and perspectives. For example:

i. Cropping pattern

ii. Reviving lost crops

iii. Sustainable practices that have both evolved historically but have been lost in the country such as drainage, cooling, water systems; cultural traditions related to agriculture, forests, flora and fauna

iv. Stepwells, sacred groves

v. Animal rights; rights of other entities within nature; nature as our home and our caregiver whom we must respect and protect; indigenous perspectives

vi. Organic agriculture

e. Content must enable school-based actions. It should enable advocacy at different levels and through different means. For example:

i. Use of creative media that can enable recording of environmental issues, challenges, and positive actions and stories (e.g., videos).

ii. Development of materials (e.g., newsletter, scripts for motivation, articles) for dissemination in the community.

f. Content must enable informed and well-researched group discussions and debate. Debates that are topical and pertinent should be included, particularly around balancing development with preservation of the environment. For example:

i. Older and contemporary environmental debates; development versus environmental preservation; movement from cities for sustainable living.

7.5.2.2.2 Recommended Approach

Students will take up specific issues and examine their impact using an interdisciplinary lens. They will discuss root causes, impact, and mitigation of these environmental issues. While the approach can be varied, it is recommended that the triple planetary crisis–biodiversity collapse, pollution, climate change–comprise the themes to be taken up during the Secondary Stage.

To ensure a holistic understanding of all aspects with the required depth, it is recommended that experiential learning be enabled through case studies, site explorations, projects, guided readings, and other similar approaches. Whichever approach is taken, students should be able to examine the issue locally, and then extend their understanding into regional, national, and international concerns and actions. The underlying principle is to provide evidence-based understanding of both the crisis and its mitigation. Another principle is to ensure a holistic understanding as opposed to a fragmented understanding of perspectives from science, social science, human rights, politics, ethics, and justice. This principle is operationalised through approaching the content using a social-environmental systems framework.

Box 7.2i

A social-environmental systems framework: *provides a useful conceptual frame for understanding the interlinkages between society and nature that have implications for sustainability. The framework lays emphasis on interdisciplinarity, integrating conceptual frameworks and methods from the natural and social sciences for a holistic understanding of sustainability challenges. Central to the social-environmental systems framework are ideas of equity, environmental justice, and human well-being fundamental to the development of sustainable societies.*

The implications of the social-environmental systems framework in the school curriculum are to help students develop awareness of and concern about interdependence between the natural and human-made environments and the various dimensions (economic, socio-cultural, political, historical, ethical, and aesthetic) of human societies. They also appreciate the need for balance between the environment and human society.

These three selected themes, biodiversity collapse, pollution, and climate change, are central to the current planetary crisis and provide a comprehensive understanding of issues, as well as, mitigation. It may be important to highlight other issues as well. However, it is strongly recommended that the approach given below is followed. This approach balances all aspects while providing a comprehensive understanding of local and regional issues:

a. Students should be able to gain an understanding of the causes and history of each of the themes and key issues related to each of the three through case studies, guided readings, site explorations, projects, and similar approaches.

b. It is preferred that the content should be contextual (located in the community, region, or state where the school is located). If this is not possible, it must be ensured that at least a part of content students engage with is contextual.

c. Content being used should offer rigour while being simple. Teachers should refer to similar issues (which can be included in the textbook) to ensure a broader understanding.

7.5.2.3 Pedagogy and Assessment

The approach, principles, and methods of pedagogy and assessment have commonalities across subjects, those have been discussed in Part A, Chapter 3, 3.3 and 3.4 of this document. This section focusses only on what is most essential for environmental education in schools. Hence, it will be useful to read this section along with the above mentioned section.

7.5.2.3.1 Pedagogy for Environmental Education

Students must examine environmental issues not only from a scientific or technological lens but also from the lens of the social sciences and humanities. They must examine how the actions of individuals, communities, and nations, both historical and contemporary, can have far reaching consequences. Pedagogy must, therefore, be informed by the following:

a. Teacher must deliberately plan for the development of environmental values and dispositions. They should be made explicit for students by drawing attention to environmental values embedded in case studies and narratives.

Box 7.2ii

Environmental values encompass sensitivity towards social, political, economic, cultural, and natural environment and phenomena, and the ability and motivation to identify and raise questions related to dignity, justice, and rights. They also include aesthetic appreciation of surroundings including diversity of the physical and socio-cultural environment.

Environmental education critically addresses, both social and natural concerns. Social concerns include issues of gender and marginalisation, equity, justice and respect for dignity and rights. It also encourages students to develop knowledge about indigenous practices for prevention of environmental degradation. Natural concerns include issues related to survival of animal species and animal rights, and sustainable use of resources, like forests and rivers. Therefore, environmental education enables in students a well developed set of environmental values as well as the capacity to participate and initiate actions to remediate or prevent further degradation of the environment and promote sustainability.

b. Much of the content should be presented through debates and discussion and not as a definitely concluded position. This allows for the opening of possibilities and developing abilities for critical engagement. These abilities must be developed through investigation, analysis and problem solving, and similar strategies that are relevant to their own communities.

c. Debates around historical and contemporary issues in education enable the development of the ability to take actions through critical engagement with theory and practice.

d. Students must identify how they can express their understanding in the community, whether through advocacy or simply through dialogue.

e. Students must get as much exposure as possible at this stage through books, media, films, dialogue among peers and elders, interaction with peers from other schools, video conferencing with experts and peers outside the state or country.

f. Teachers must not consider self and textbook as the only sources but enable interaction with other persons and/or media to expand students' learning. Teachers must have a resource pool of persons who can support their learning.

g. A significant platform must be provided to students to share their experiences, findings, and reflections (school newsletter, seminars, publications, TV interviews, social media).

h. For continued learning throughout the year, students can take up a project or participate in an ongoing project. For example, cleaning rivers, community projects, sustainable school practices, green school, volunteering for local organisations dedicated to environmental causes.

i. Students must be encouraged to read materials on the environment, and present synthesis of readings; reviews of relevant books and films, videos, programmes, and reflections can also be shared.

Teachers Voices 7.2v

Case Studies

When I think about what I want my students to learn about the environment, I realise the question is difficult. They must be aware of the danger the world is in because of environmental degradation. However, the future seems so dismal that I don't want them to think that their lives hold no hope. My responsibility deepens because of this dilemma.

I plan to share the realities of the triple planetary crisis with them but also provide them with details of initiatives taken by individuals and communities to make small changes that have a positive impact on the environment. I also want to help them develop a sense of how to respond as members of a community to decisions and policies made by governments related to the environment.

I think the best way to achieve these goals is to give them detailed case studies to read. These case studies must help students understand not only the context and specific issues, but also actions taken to address these issues. There are several instances in our country of people who have revived traditional practices of conservation or used simple technology to devise solutions and alternatives. Reading these case studies will not only help students adopt a positive, solution oriented attitude; it will also help them see how communities can take action at a local level.

7.5.2.3.2 Assessment in Environmental Education

A few of the key principles for assessment in environmental education are:

a. Students must be assessed for understanding of environmental issues and concerns, as well as, their ability to identify actions that can be taken to mitigate these issues.

b. Assessment must be based on the context of a situation/event or use caselets.

A few Teacher Voices below illustrate the different kinds of assessments.

Teacher's Voice 7.2vi

Animal-Human Conflict

I teach Grade 10. The following question assesses students' understanding of animal-human conflict. Instead of directly asking them about the effect of shrinking spaces for animals, it refers to a recent event and assesses their ability to identify the most viable solution i.e., wildlife corridors.

A tiger was captured on CCTV cameras on the night of May 7, 2023, in Mhow, near Indore in Madhya Pradesh. It was captured again on the night of May 10, 2023, by CCTV cameras. Despite an intensive search, including through the use of drones, the tiger was not located. No attack on any human or animal was reported. Forest department officials say that in 2019–20, pug marks had been seen in Mhow, although no tiger was spotted. They confirmed that tigers have been spotted in the forests close to the town. Experts say that the tiger may have wandered into the town looking for a partner or maybe migrating to establish its own habitat.

What can be done to protect the persons living in the town while ensuring tigers are also allowed to thrive? Please choose the most appropriate option(s):

a. Forests near the town should be fenced in completely to avoid movement of tigers outside the protected areas.

b. People living in the town should avoid going out at night and keep domestic animals safely locked in shelters.

c. Lots of shrubs and trees should be planted in pieces of unused land between areas that are more thickly forested.

d. Cages should be set up to trap tigers, that can then be released into protected forest areas.

e. Other

I used the following marking scheme: a-0, b-0, c-4, d-0, e-0

Teacher's Voice 7.2vii

Biodiversity Collapse

I teach Grade 10. The following question assesses students' understanding of an environmental issue and strategies developed for mitigation. Instead of a direct question, students are asked to think of the case studies they have engaged with and choose one to elaborate. It also assesses students' holistic understanding of, both the issue, and why specific strategies work in that context.

Using any example, describe how biodiversity collapse affected a specific community. Illustrate how local action by the community helped mitigate the impact of the collapse. Why do you think their strategy or strategies are important?

This is the marking scheme that I used:

Student's responses	
States the aspect of the biodiversity collapse that was addressed by the community	1
Describes the social implications	1
Describes the environmental implications	1
Explains the strategy/strategies for mitigation	1
Explains why the strategy/strategies were identified	1
Explains how the strategy/strategies were implemented	1
States the result of implementing the strategy/strategies	1
Provides reasons for the success of the strategy/strategies	1
States why they chose to describe the strategy/strategies	1
Explains how the strategy/strategies can be used in other places	1

Teacher's Voice 7.2viii

Revival of Lakes

I teach Grade 10. The following question assesses students' capacity to synthesise various aspects of a situation and come up with possible actions based on a sound rationale. Instead of asking students to recall and state the strategies needed for revival of a lake, the question provides a specific context. Students can draw on this context, as well as, their broader understanding, to propose specific strategies.

Read the following extract and answer the questions below:

Najafgarh Lake: Despite a mention in the Delhi Gazetteer of 1883 and the Survey of India Map of 1911, currently the Delhi Government says that the Najafgarh Lake (Lat. 28°36'38.67'N, Long. 76°59'12.18'E, Alt. 216 m) no longer exists in Delhi.

Prior to the 1970s, Najafgarh Lake in South-West Delhi occupied more than 300 sq. km and was a biodiversity hotspot, home to various water birds and local wildlife. The fact that a vast lake ever existed here in the region comes as a surprise to most residents of the area and the need for resurrecting it is not a popular topic of discussion.

Status of Najafgarh Lake: Currently the lake stands as a topographical depression brimming with overgrown grass and garbage. As of 2015, the erstwhile lake has been removed from Delhi's map instead of reviving it. The lake's disappearance, and its use as a dumping ground has raised health concerns for the local population who are migrants from neighbouring states of Delhi.

The land owned by Delhi Development Authority (DDA) has been loaned to the Government Girls Senior Secondary School (II) in Dharampura with intentions to convert it into a park. Despite erection of benches and swings and placement of a fence around the area, the land suffers from poor maintenance. Pollution is rampant in the area and the Najafgarh drain, previously known as Sahibi river with its origin near Najafgarh lake, is now one of the most polluting sources, contributing to the degradation of the river Yamuna.

Lowering of the ground water table, encroachment, and concrete constructions have led to the lake drying up due to absence of proper water resource planning and scientific management by involved authorities. Residents reported the presence of fish up until 10 years ago and said the lake dried up 5 years ago.

Plans for revival: In 2019, the Delhi government announced a plan to revive Najafgarh lake and declare it a notified wetland. The government hopes that the lake's revival will help address water needs in south-west Delhi. However, not all residents are pleased with the idea, since they are apprehensive it will cause floods in the vicinity in the monsoon. Elders narrate stories of the troubles they faced due to flooding of the lake every monsoon. People who have encroached on the riverbed are also angry since they feel their homes are threatened. Some persons have even started farming on parts of the riverbed, and feel their livelihood is threatened.

Experts cited a Central Ground Water Board report in favour of the lake's revival. As per the report, water table in south-west Delhi is in the 'semi-critical' category. 'The presence of a large water body in the area would bring down the temperature by a few degrees. Once the water body is revived the soil in that area would be able to hold more moisture, which would, in turn, help the growth of trees. It would also help to prevent runoff during heavy rains and prevent flooding,' said environmentalist CR Babu.

Sources: *Rustogi, Paridhi and Singh, S.K. (2017). Revival and Rejuvenation Strategy of Water Bodies in a Metropolitan City: A Case Study of Najafgarh Lake, Delhi, India. International Journal of Advanced Research (IJAR), Pg 189-195.*

Roychowdhury, Adrija. (2019). Villagers divided over revival of Najafgarh lake. Hindustan Times, New Delhi. What strategies would you recommend to the Delhi government to make the lake revival project a success? Give reasons for choosing the strategies.

The marking scheme that I use is as follows:

Student's responses	
Picks only a few unrelated points from the passage	1
States one strategy without giving a reason	2
States more than one strategy with no reason	3
States multiple strategies with supporting rationale from the passage	4
Selects multiple strategies and states rationale based on a generalised understanding of the issue	5

7.5.3 Teachers

At the Preparatory Stage, we need teachers who have specific capacities; illustratively, pedagogical approaches informed by an understanding of the context, of students' ability to evolve understanding through discussion, and of the use of multiple methods; capacities like observation and experimentation; ability to connect beyond specific themes; and environmental awareness and sensitivity. Teachers of either science or social science can teach The World Around Us till pre-service programmes start offering this specialisation, provided they undergo well-designed in-service modules.

At the Secondary Stage, the Social Science Teacher should teach Individuals in society and the Science Teacher should teach environmental education. In Grade 9, there will be a need for teachers who are aware of issues or events in the four domains that must be

covered. Teachers of Social Science will be best placed for teaching Individuals in society. Training modules must focus not only on content, but must also require teachers to examine their personal moral and ethical frameworks. At the same time, teachers within the school must meet regularly to discuss current affairs, and strengthen their own capacity for discussion and debate, and the application of ethical and moral reasoning, as well as, applying interdisciplinary understanding. This will also help ensure inclusion of different perspectives, and subject-related expertise.

In Grade 10, the Science Teacher should handle environmental education, as content at this stage would include scientific concepts and ideas. If the Science Teacher is not available, the Social Science Teacher can take up this subject. However, the teacher should be cautious to not overemphasise content or capacities that are more aligned to their own subject of specialisation and bring in elements as needed from the other area. The teacher of environmental education should combine relevant understanding of both science and social science at the school level and be able to draw linkages between the two in the context of the subject. The pre-service curriculum must have environmental education as a compulsory component. Student teachers can also undertake projects and small research studies related to environmental education aligned to those expected from school students. Until this transition is made, well-designed training modules will be needed to capacitate teachers.

Chapter 8

Physical Education and Well-being

Physical education and well-being in school aims to help students learn to lead a physically active, vigorous, and healthy life. In this NCF, the term 'Physical Education' (or PE) has been used in the place of 'Physical Education and Well-being'. Physical Education consists of movements, drills, exercises, yoga, games, sports, and other activities that promote mind-body wellness. Physical Education should provide a wide range of age-appropriate and level-appropriate physical activities that develop knowledge of the body and of games and sports, together with a disposition towards perseverance, teamwork and sportspersonship.

KRCR 2019 states the role of Physical Education thus:

Physical Education is important for both physical and mental health and development. It helps improve a child's muscular and cardiovascular strength, flexibility, endurance, motor skills, and mind-body connection and wellness. It gives students the opportunity to set and strive for personal and achievable goals. Moreover, playing sports also helps students develop the qualities of teamwork, cooperation, problem-solving, discipline, perseverance, and responsibility. In general, physical activity is well established to be among the best releases for tension and anxiety and facilitates emotional stability and resilience. All these qualities and benefits are also relevant to

success in the classroom; studies show that students who stay physically active are more successful with other schoolwork as well. Finally, people who are physically active as young people tend to stay more fit as adults as well, leading them to lead longer, healthier, and more productive lives.

Section 8.1
Aims

Physical activity is integral to human life and therefore, integral to the school curriculum. For the individual student, sports and physical activities teach important motor skills, practices of physical fitness, socio-emotional awareness and regulation, associated cognitive abilities, as well as, the values of hard work, teamwork and a gracious acceptance of one's strengths and vulnerabilities.

Various forms of physical activities have unified people across the world over shared common interests and spirits, be it global sporting events or the spread of yoga. Sports, games, yoga and other such rigorous physical activities have allowed humanity to enjoy shared experiences, emotions, and excitement.

India has long recognised the centrality of a healthy body as part of any educational experience. A very rich heritage of physical activities and games, such as, yoga, wrestling, *malkhamb* and archery indicate this connection between body, health and the holistic development of a human being.

A good physical education programme is therefore considered important for everyone, regardless of the field of interest one wants to pursue in life. Physical Education in schools must aim to achieve:

a. **Appreciation for physical activity and sports:** Sports and physical activities should be valued for the opportunities it provides for good health, enjoyment self-reflection, and social interaction.

b. **Capacities for skilful engagement in physical activity or sports:** Physical Education should develop knowledge and capacity to execute different kinds of skills and movements of the human body and participate in and enjoy a variety of activities, games and sports.

c. **Resilience:** Physical education must develop resilience, tenacity and an interest in the pursuit of excelling in physical capacities.

d. **Empathy and cooperation:** Physical education must nurture empathy, cooperation, fair play and fraternity, which are relevant throughout one's life to be a good human being and a contributing member of society and learn to meet winning and losing with grace.

Box 8.1

Yoga

The origin of all forms of yoga practised today is in the Yoga Sutras, a collection of aphorisms written over 2000 years ago by Patanjali. The tradition has been passed on through generations and is in the form we see today. Yoga is not just a physical practice of Asanas (postures) but is much more than that. Patanjali enumerates 8 limbs of yoga (Ashtanga yoga). They are Yama (universal moral commandments), Niyama (self-purification by discipline), Asana (posture), Pranayama (rhythmic control of breath), Pratyahara (withdrawal and

emancipation of the mind from the domination of the senses and external objects), Dharana (concentration), Dhyana (meditation) and Samadhi (a state of super consciousness brought about by profound meditation). Yama, Niyama and Asana are the 3 stages of outward quests (Bahiranga Sadhana). Yama and Niyama aim to control student's passions and emotions to stay in harmony with fellow human beings. Through the practice of Asanas, student keeps the body and mind healthy, strong and in harmony with nature. These are largely the same aims as that of Physical Education in our school curriculum. We want students to be healthy, strong individuals who are in harmony with their surroundings and are contributing members of the community. Thus, the teaching of yoga is an integral part of the Physical Education programme. Yoga Asanas and practices, like Pranayama appear at multiple points in this document.

***Source**: Light on Yoga by BKS, Iyengar*

Section 8.2
Approach

In this NCF, Physical Education is seen as an important curricular area and not just an extracurricular activity. It has its own set of learning standards, content, appropriate pedagogies, and assessments. This curricular imagination is informed by some core principles that have been outlined in this section.

a. **Schools must have Physical Education classes for all Stages:** Students in the Preparatory Stage enjoy *free play* and want to participate in most games. We should encourage free play, creative manipulation of rules, and local games at this stage. In the Middle Stage, students should continue to play local games but should get oriented towards more widely practised games. They should also actively participate in competitive sports events. Students at the Secondary Stage should be encouraged to choose one sport or game or activity and develop proficiency to compete at a high level. All students across the Stages must have a compulsory physical education class as part of their timetable. In instances where certain students at a very young age become interested in participating in different interschool, local, state, national and international competitions, schools must make reasonable accommodations so that they can pursue their interests. The Additional Enrichment Period on the timetable or a similar after-school programme should be used for this.

b. **Schools must ensure adequate resources for Physical Education:** In cases where schools have no playground, they must ensure access to nearby public grounds or spaces for students. In instances where this is not possible either, schools must develop ways to conduct physical activities that do not require much space, such as, yoga, static exercises or movements, table tennis.

   Similarly, until a PE teacher is appointed, other teachers must be educated to conduct physical activities under the guidance of any PE teacher available in the school complex, school cluster, or nearby schools.

   In case of limited availability of equipment, the choice of games, sports, physical activity must be made accordingly. The non-availability of a playground, PE teachers, or use-worthy equipment should not be considered as limiting factors in the education and engagement of students in physical activities.

c. **Schools must give equal importance and status to the subject of physical education:** Health and physical education in schools have received lower importance as compared to other curricular areas. NEP 2020 recognises this and emphasises that it should be given equal importance and treatment in the curriculum. Physical education is equally important for all students and we must create enabling conditions for it in our curriculum, infrastructure and school operations, including appropriate time in the school calendar and teacher preparation.

d. **Schools must ensure equal opportunity for all students in physical education:**

   i. **Students of all levels of interest, inclination, and ability must engage in physical education:** Like all other curricular areas, some students may be more inclined towards physical education than others. This curriculum, therefore, suggests two modes for imparting physical education:

      1) **The compulsory physical education class:** All students must attend the regular physical education classes on the timetable. Activities in this class can be different for various groups based on their capacity and level of appropriateness. All students in schools will be part of this class and receive equal attention and support for learning, which means equal access to physical education teacher's time, equipment and opportunities to play.

      2) **The optional physical education after-school programme:** Those students who wish to engage in physical activity and sports on a deeper level can be part of this programme. Schools may organise special skill-building classes, provide physical education teacher support and access to equipment before or and after school hours. Such an arrangement must be considered as part of the curriculum and not as preferential treatment, as this opportunity should be available for all students who show interest.

   ii. **Students of all genders should regularly play together across all age groups**: keeping in mind safety considerations. Students become accustomed to playing together and grow in their maturity to play comfortably in mixed-gender groups over time. Therefore, this approach is best introduced as early as possible, right from the Foundational Stage. Schools can make choices about having mixed teams in contact sports, like *kabaddi* based on the socio-cultural attitudes in their locality or region.

   iii. **Schools must ensure the participation of students with disabilities in physical education to the extent that is possible for them:** This requires adapting play conditions through thoughtful accommodation or modification to enable them to participate. For example, accommodation can be made by increasing the time to finish a run and or allowing for individual differences in the skill levels expected of students with disabilities. Similarly, modifications can be made to the game rules that would ensure that students play cooperatively with differently skilled students and or plan a different game or sport altogether, e.g., wheelchair race.

e. **Schools must teach cooperation and teamwork through physical education:** Sports, particularly team sports, give opportunities for working together towards a specific goal. Participants must cooperate to improve the overall team's performance

and individual capacities that contribute to the team's performance. This cooperation is facilitated through dialogue (especially while strategising before a game or reviewing after a game) based on questions, such as, 'How did I behave when my competitor got injured?', 'How do we construct teams when we know different team members have got different abilities and each one is better than the others in one or two aspects?', 'Why are some abilities seen as more important?', 'How does one feel when they lose?', 'How must we react in such situations?', 'What were the few crucial moments of the game when the team was competing and lost the advantage?'

f. **Schools must ensure healthy competition and use it to explore personal capacities and limits:** The physical education curriculum aims to nurture empathy, cooperation, fair play, and fraternity. Healthy competition in the context of Physical Education needs to be viewed as a means to enable the holistic development of students. Students must be taught to compete without compromising the values of sportspersonship and positive regard for others. They must be encouraged to pursue excellence and perfection in practice and performance for their own sake rather than to defeat and overpower peers. The key is to challenge oneself to grow into the next level of competence. There are several implications for this position:

   i. Students must be grouped in teams with due consideration given to special needs such that it does not develop feelings of inferiority or superiority, as both have serious negative consequences.

   ii. Values, such as, empathy, cooperation, fair play, and fraternity must be promoted and celebrated each time there is a competitive event.

   iii. Winning or losing a game should be seen as an opportunity to help students reflect critically on feelings of undue pride, embarrassment or distress, the effectiveness of the strategy.

   iv. The selection of students for interschool competitions must be fair and transparent.

Section 8.3
Nature of Knowledge

a. **'To do' is 'to know':** Physical activity squarely falls under the category of practical knowledge, where 'to know' is acquired only by doing the activity. One cannot claim to know swimming without doing it. Once an individual has performed the activity, they can reflect, observe and explain how the activity is done. But it is not useful to reverse the sequence of this progression.

b. **Regular progressive practice and layered learning leads to proficiency:** Physical activities are learned over a period of time. One must perform an activity multiple times before gaining basic proficiency in it and to do it well. For example, to do *Tadasana* properly, the toes should be spread out evenly, the weight should be balanced equally between the right feet, left feet, forefoot and heel, the tailbone

should be tucked in, and the shoulders should be pushed back. It might take weeks of training to get these aspects right before moving on to others. It will involve a large element of muscle memory, so after a few weeks, these aspects are almost automatic. The instructor can then move on to other aspects of *Tadasana.*

c. **Teaches awareness of body and space:** Learning awareness of how the body can move in space in different contexts of sport and physical activity is an integral part of physical education. This 'embodied awareness' is about recognising what is happening in one's body, expanding the field of awareness around oneself and having an alertness towards others in the context of sports and physical activity. Along with this kind of embodied awareness, learning to strategise before and during a game and a wide range of skills in the use of equipment are also integral to playing well. For example, in cricket, the bowler bowls to the field and the batsmen find gaps in the field to hit their shots. In team sports like football and hockey, the players train in spatial patterns so that they know where their teammates are without looking.

d. **Learning is remembered for a very long time:** Another aspect of physical activity is that once learned, the knowledge stays with an individual for a long time and is like second nature. It is difficult to forget completely how to swim or hit a topspin shot with a table tennis racket once you have mastered it. One might be out of touch with these activities for years but can restart with some practice. In this sense, the knowledge of physical practice is embodied and stays with us.

e. **Enables understanding of physical and emotional limits and skills in working together:** This aspect of the nature of physical activity can be categorised into three components:

   i. **Knowledge of physical self and capacities:** A person who is regularly engaged in physical activities will have a better understanding of the body's capabilities and limitations. For example, someone who lifts weights regularly will know how much weight they can lift in a real world scenario (a sack of rice) against someone who does not. People engage in physical activities regularly are likely to be more sensitive to changes in their body in the short-term (need for rest or sleep, knowing when they are overeating) and in the long-term (improving their appetite, changing their sleep cycle).

   ii. **Knowledge of mental and emotional capacities:** Through regular participation (and reflection) in sports, a person also learns about how they feel and react under different circumstances. For example, one learns about how assertive they are, how they perform under pressure, how strongly they feel about an unfair situation, and how they react to it and so on.

   iii. **Knowledge of social surroundings and how to work with them:** Team sports require all the individuals in the team to understand each other, communicate at different levels (before, during, and after play), build common strategies and play different roles required within the team, teaching skills of being social and working together.

Section 8.4
Current Challenges

a. **Status of physical education in schools and community:** Physical education in schools is mostly considered as a subject to engage students during leisure time, recess, or when a subject teacher takes leave. It is feared that playing too much (sports, games, or other physical activities) will badly impact students' education. Schools lack an understanding of teaching and learning physical education. Whatever body of knowledge exists so far is more about the rules of games, playground dimensions, physiology of the body and nutritional requirements only.

b. **Lack of infrastructure and resources:** Physical education requires open spaces, indoor facilities, specific exercises and sufficient sports equipment to provide a better quality of learning. The lack of adequate infrastructure and resources is a huge challenge in most schools.

c. **Lack of availability of physical education teachers in schools:** In a vast education system like India, the availability of teachers has always been a challenge, particularly in subjects, such as, art, physical education and vocational education. Currently, we have very few good education institutions providing education programmes and training for physical education teachers and teacher educators.

d. **Inadequate scholarly literature in physical education:** 'What do we know?' and 'How do we know?' are perennial questions in the field of physical education. The lack of sufficient region-wise studies, research, and academic literature on physical education in India is not helpful for young scholars and researchers to pursue this area further. This is an area that would require sustained efforts and far more academic interest and work.

e. **Absence of school-wide Physical Education curriculum and focus on theoretical aspects:** In the absence of a well-defined curriculum till Grade 10 with specific learning outcomes and even lesser clarity on assessment possibilities, physical education has faced a serious pedagogical challenge. In schools, students are taken outside the classroom to perform activities or engage in playtime without structured and progressive guidance or learning standards. To worsen the issue, there is too much focus on theoretical aspects of sports, sometimes students are taught about the dimensions of a football, cricket ground, tennis courts rather than playing the sport.

f. **Inadequate nutrition for physical activities and sports:** For many students across India, the Mid-day Meal is the only substantial meal available for the day. This means their nutritional needs are grossly unfulfilled and this often compromises their ability to participate in many planned and rigorous physical activities.

Section 8.5
Learning Standards

Learning standards for physical education across stages flow across four core areas: motor and movement skills to participate in different physical activities, appropriate personal and social behaviours, mental engagement in physical activities, and setting

and achieving goals or targets. They progress in complexity and diversity along these four core areas across stages.

For example, movements and skills start with learning basic skills, such as, kicking, hitting, catching and throwing, which progress to the next level by combining them with movements, e.g., throwing while running. This further progresses to the next level by combining more than one movement with skills, e.g., running, jumping and catching simultaneously or anticipating, diving, and catching the ball on the move.

Similarly, personal and social behaviour ranges from simply observing and following rules at the Preparatory Stage to regulating one's own and teammates behaviour.

Mental engagement spans around observing and finding patterns at the Preparatory Stage and runs into game strategies by the end of the Secondary Stage. Setting targets and recording progress begins with simple things like being able to just record your progress against a target set by the teacher and goes on to assessing progress in terms of efforts, processes, and outcomes.

By the end of the Secondary Stage, all this ultimately leads to every student being able to:

a. Demonstrate skills and knowledge to participate in diverse physical activities and at least play or perform one sport or physical activity well.

b. Develop resilience, tenacity, and interest in the pursuit of excellence.

c. Nurture empathy, fair play, and cooperation.

A 'Nested' Design of Learning Standards: As mentioned in Part A, Chapter 3, 3.1, giving due consideration to the time schools might require in the implementation of physical education as a full-fledged subject across the stages (for example, appointment of teachers, acquisition of resources), this document contains 'Nested Learning Standards' for physical education, wherein learning standards have two sets which have been detailed. The first set, called (Learning Standard–1, LS–1) details the full range of curricular goals and competencies across physical education. These should be accomplished by all schools as soon as they add the required resources for physical education. Nested within this is a subset called (Learning Standard–2, LS–2). These should be accomplished by all schools from the very initiation of the implementation of this NCF.

8.5.1 Preparatory Stage

By the end of the Foundational Stage, most students would be able to demonstrate basic movements, motor skills, awareness of rules, and participation in activities and games. The emphasis in the Preparatory Stage would be to build on this to develop skills, such as, rolling, throwing, catching, dribbling, kicking, and striking. The focus should remain on basic skills, the joy of playing, and the ability to display appropriate behaviours and attitudes during activities. Students should recognise the value of rules, fair play, safety, and respect for others. At this stage, local games must be preferred and encouraged.

8.5.1.1 Learning Standards–1

CG-3 Demonstrates the use of basic skills (running, jumping, catching, throwing, hitting, and kicking) to participate in different physical activities/games/sports.	C-3.1 Practises a combination of movement, motor skills, and manipulative skills (catching, throwing, kicking, hitting a ball towards a target while moving, focussing on visual cues to hit the target). C-3.2 Moves purposefully their body to a beat/rhythm/ music. C-3.3 Demonstrates coordination abilities with a partner and objects (e.g., being able to move in coordination with a partner in three-legged race, hand-eye coordination while bowling, throwing). C-3.4 Demonstrates basic warm up exercises and stretching to develop strength and flexibility in the body.
CG-4 Develops an awareness of their personal and social behaviour towards themselves and others.	C-4.1 Demonstrates the ability to play games and activities which require and emphasise teamwork, cooperation, personal responsibility, and communication of ideas. C-4.2 Creates group norms and rules of the game/activity before playing and reviews them regularly. C-4.3 Exhibits sensitivity to injuries of others and acts empathetically when the other player is physically injured, emotionally stressed, or feeling unwell. C-4.4 Practises care and responsibility towards physical activity material, playground and facilities. C-4.5 Identifies characteristics of safe/unsafe touch in the context of physical activity and describes ways of reporting them.
CG-5 Demonstrates mental engagement in physical activity/game situations.	C-5.1 Explains the concept of some games, their rules, playing positions and basic moves. C-5.2 Expresses their emotions and thinking process during the game.
CG-6 Develops an understanding of the need to develop themselves and self-assess their progress.	C-6.1 Sets simple personal goals/targets and records progress (e.g., throwing a ball at 25 m, then 30 m, then 40 m; Jumping 1, 2, 3 feet high/long).

8.5.1.2 Learning Standards–2

CG-1 Learns the use of basic skills (running, jumping, catching, throwing, hitting and kicking a ball) to participate in different physical activities/games/ sports.	C-1.1 Practises a combination of movement, motor skills, and manipulative skills (e.g., catching, throwing, kicking, hitting a ball towards a target while moving, focussing on visual cues to hit the target). C-1.2 Demonstrates coordination abilities with a partner and objects (e.g., being able to move in coordination with a partner in three-legged race, hand-eye coordination while bowling, throwing). C-1.3 Demonstrates basic warm up exercises and stretching to develop strength and flexibility in the body.

CG-2 Exhibits awareness of personal and social behaviour towards themselves and others.	C-2.1 Demonstrates the ability to play games and activities that require and emphasise teamwork and cooperation. C-2.2 Creates group norms and rules of the game/activity before playing and reviews these regularly. C-2.3 Exhibits sensitivity to injuries of others and acts empathetically when the other player is physically injured, emotionally stressed, or feeling unwell. C-2.4 Practises care and responsibility towards physical activity material, playground and facilities. C-2.5 Identifies characteristics of safe/unsafe touch in the context of physical activity and describes ways of reporting them.
CG-3 Demonstrates mental engagement in physical activity/game situations.	C-3.1 Explains the concepts of some games, their rules, playing positions, and basic moves. C-3.2 Expresses their emotions and thinking process during the game.

8.5.2 Middle Stage

In this stage, students are in their adolescence, and differences in physical appearance, weight, height and gender-related experiences become pronounced. Preoccupation with appearance and self-image provides teachers with opportunities to talk about health and the need for physical activity. Physical education classes provide an ideal setting for adolescents to learn and practise skills of social and personal responsibility while following rules, regulations and safety procedures. It provides ground for students to perform, gain and give respect and build self-confidence. Cooperation is an important social skill for this age group and students must be taught to cooperate with their peers and accept responsibility for their behaviour. For this age group, winning becomes important, so teachers would need to emphasise that participation and playing well with the group as perhaps more important. Students also learn to refine, combine, and apply a variety of movement and motor skills in different physical activity settings. Games that promote all students playing together should be encouraged. It is recommended that students continue to play local games at this stage, and at the same time, get introduced to popular competitive games or sports.

8.5.2.1 Learning Standards–1

CG-1 Demonstrates intermediate body movements and motor skills to participate in different physical activities/games/sports and develop their understanding.	C-1.1 Develops power, speed, strength, balance, flexibility, judgment, and reflexes in motor movements (running and jumping with various speeds and in various directions, rolling and zig-zag movements, catching a moving object coming with speed or throwing/hitting a ball far with precision). C-1.2 Demonstrates rhythmic movement skills (locomotor, and non-locomotor), such as, smoothly moving, balancing, and transferring weight with intentional changes in direction, speed, tempo and flow.

	C-1.3 Performs two or more fundamental movements at the same time as receiving and passing the ball against a defender. C-1.4 Exhibits manipulation of space and equipment in the context of a game. C-1.5 Recognises correct warm up and cool down exercises to avoid injuries and long-term effects. C-1.6 Works on strength, endurance, flexibility, and agility through exercising and training with and without apparatus.
CG-2 Exhibits sensitivity in their personal and social behaviour towards themselves and others.	C-2.1 Reflects on their personal reactions during an interaction and activity with others. C-2.2 Demonstrates supportive behaviour in helping others during emotional setbacks and physical injuries. C-2.3 Creates and teaches the rules of game to others. C-2.4 Creates and applies safety rules and protocols for physical activity. C-2.5 Puts the larger interest of the team first, treats individuals as equals, makes ethical decisions, and takes responsibility for their mistakes. C-2.6 Identifies characteristics of bullying and mental and sexual harassment and describes the protocol to report it to the right person.
CG-3 Demonstrates and practises physical movements, motor skills, social sensitivity, and mental engagement in physical activity and game situations.	C-3.1 Designs multiple strategies for a game and chooses strategies according to the context. C-3.2 Demonstrates calmness and courage in difficult situations.
CG-4 Plans and achieves personal physical fitness goals with little help from teachers.	C-4.1 Identifies physical activity and fitness goals, such as, improving a shot or breaking their own 100 metre record.
CG-5 Learns the connection between physical activity with health, enjoyment, challenge, expression, and social interaction.	C-5.1 Discusses activities that bring personal satisfaction. C-5.2 Identifies different cultures with special reference to dance, physical activity, local games, and spaces to interact. C-5.3 Identifies the relationship between rhythmic movement and their aesthetic value.

8.5.2.2 Learning Standards–2

CG-1 Demonstrates intermediate body movements and motor skills to participate in different physical activities/games/sports and develop their understanding.	C-1.1 Develops power, speed, strength, balance, flexibility, judgment, and reflexes in motor movements (running and jumping with various speeds and in various directions, rolling and zig-zag movements, catching a moving object coming with speed or throwing, kicking, hitting a ball far with precision). C-1.2 Performs two or more fundamental movements at the same time as receiving and passing the ball against a defender. C-1.3 Recognises correct warm up and cool down exercises to avoid injuries and long-term effects.
CG-2 Exhibits sensitivity in their personal and social behaviour towards themselves and others.	C-2.1 Reflects on their personal reactions during an interaction/activity with others. C-2.2 Demonstrates supportive behaviour in helping others during emotional setbacks and physical injuries. C-2.3 Creates and teaches the rules of a game to others. C-2.4 Creates and applies safety rules and protocols for physical activity. C-2.5 Puts the larger interest of the team first, treats individuals as equals, makes ethical decisions, and takes responsibility for their mistakes. C-2.6 Identifies characteristics of bullying and mental and sexual harassment and describes the protocol to report it to the right person.
CG-3 Demonstrates self-awareness and mental engagement in physical activity and game situations	C-3.1 Designs and executes simple strategies for a game. C-3.2 Demonstrates calmness and courage in difficult situations.

8.5.3 Secondary Stage (Grades 9 and 10)

Students experience numerous physical and physiological changes during these years. Boys typically experience a period of rapid growth around Grade 9 or until about 14 or 15 years of age. On the other hand, in Grade 9, girls experience a slower rates of growth. Overall, by Grades 10 or higher, most students start experiencing a relatively slower rate of growth. This slowdown in growth rate, along with increases in the length and breadth of muscles, produces a higher level of motor ability and fitness. By this stage, students are able to select activities they would like to pursue and they should be able to identify one sport or game in which they would like to excel and build proficiency to participate at a high level.

8.5.3.1 Learning Standards–1

CG-1 Demonstrates high level of competence in the understanding of movement concepts, strategies, and principles while engaging in and performing physical activities including sports and dance.	C-1.1 Exhibits proficiency in all movement and motor skills required to participate and excel in at least one sport, yoga or any other physical activity (team, dual, individual). C-1.2 Explains role of rhythmic drills to improve their game. C-1.3 Exhibits the ability to use complex movement concepts and principles to develop and refine their game or sports skills. C-1.4 Exhibits and explains manipulation of space and equipment in the context of a game. C-1.5 Applies knowledge and understanding of movements and skills to develop a physical activity plan for themselves, follow a routine and assess independently.
CG-2 Exhibits sensitivity and learn to manipulate their personal and social behaviour towards themselves and others.	C-2.1 Reflects upon their and other's behaviour before, during and after the physical activity in the long term. This may include different but related behaviours, including emotional state of mind, physical fitness, fatigue, fair play, biases, personal interests. C-2.2 Articulates the importance of emotional and mental support to others, as well as, improving performance and encouraging others to perform by analysing the behaviour of student when someone is emotionally or physically hurt, and how their support may improve the others performance. C-2.3 Modifies and creates new games and rules that are more inclusive in nature. C-2.4 Creates and applies safety rules, protocols for physical activity, and visualises how they can be applied outside the field as well. C-2.5 Demonstrates fairness, and responsible behaviour in tough contexts and situations. C-2.6 Exhibits modesty after an exceptional performance, accepts defeat gracefully and enjoys the game.
CG-3 Demonstrates social sensitivity and mental engagement in physical activity and game situations.	C-3.1 Designs and uses multiple strategies in a game and has the ability to make new strategic moves in challenging game situations (e.g., a student's plan A and B both failed and strategises a plan C during the game). C-3.2 Understands and deals with their own and others' emotions and the thinking process during the game. C-3.3 Demonstrates calmness and courage in difficult situations and is able to calm their teammates. C-3.4 Regulates the intensity in different situations.

CG-4 Plans personal physical fitness goals independently and monitors them.	C-4.1 Sets multiple physical activity and fitness goals, such as, improving multiple shots or their overall match performance. C-4.2 Assesses their progress in terms of efforts, processes, and outcomes. C-4.3 Prepares, plans, and schedules their own exercises and warmups in consultation with their teacher to get maximum benefits.
CG-5 Learns about the value of physical activity for health, enjoyment, challenge, expression, and social interaction.	C-5.1 Illustrates the role of physical education for positive social interaction while discussing physical activity throughout history and culture. C-5.2 Examines the role of physical activity in improving self-confidence and self-esteem. C-5.3 Appreciates the aesthetic appeal of a performance, such as, someone's classy straight drive, a beautiful freekick, effortless smashing of the ball, well-placed drop shot, speedy smash. C-5.4 Expresses self through dance, gymnastics, or any physical activity.
CG-6 Assesses their own growth and development.	C-6.1 Examines the role of different factors which affect growth and development, such as, heredity, immediate environment, diet, diseases, state of mind and physical activity. C-6.2 Analyses the relationship of nutrition, physical activity, and mental health with skeletal health, muscles, strength, endurance, flexibility and agility. C-6.3 Classifies the common injuries of bones and muscles and describes protocol for seeking medical help for themselves and others in that situation, like providing first aid in such situations. C-6.4 Outlines and challenges the societal beliefs and taboos associated with different aspects of growth and development at adolescent age.
CG-7 Learns about tournaments at the international, national, state, district, and block levels.	C-7.1 Charts the various tournaments at international, national, state, district and block levels. C-7.2 Describes the participation criteria and rules of tournaments. C-7.3 Summarises the support or organisational structures to participate in tournaments. C-7.4 Explains the different forms and procedures for participating in tournaments.

8.5.3.2 Learning Standards–2

CG-1 Demonstrates competence in the understanding of movement concepts, strategies and principles while engaging in and performing physical activities, including sports.	C-1.1 Exhibits all movements and motor skills required to participate and play in at least one sport or yoga or any other physical activity (team, dual, individual). C-1.2 Exhibits the ability to use complex movement concepts and principles to develop and refine one's own game and sports skills. C-1.3 Applies knowledge and understanding of movements and skills to develop their own physical activity plan, follows a routine and assesses independently.
CG-2 Exhibits sensitivity and learns to regulate their personal and social behaviour towards themselves and others.	C-2.1 Reflects upon their own and others' behaviour before, during, and after the physical activity. This may include different but related behaviours, including emotional state of mind, physical fitness, fatigue, fair play, biases, personal interests. C-2.2 Articulates the importance of a team-member's support to improve performance in the game, by analysing the behaviour of students when someone is emotionally or physically hurt, and how their support may improve the performance of the others. C-2.3 Modifies and creates new games and rules that are more inclusive in nature. C-2.4 Creates and applies safety rules and protocols for physical activity and visualises how they can be applied outside the field as well. C-2.5 Demonstrates fairness and responsible behaviour in tough contexts and situations. C-2.6 Exhibits modesty after an exceptional performance and accepts defeat gracefully and enjoys the game.
CG-3 Demonstrates social sensitivity and mental engagement in physical activity and game situations.	C-3.1 Designs and executes multiple strategies for the game. C-3.2 Understands and deals with their own and others' emotions and the thinking process during the game. C-3.3 Demonstrates calmness and courage in difficult situations and can calm their teammates.
CG-4 Learns to connect physical activity with health, enjoyment, challenge, expression, and social interaction.	C-4.1 Discusses activities that bring personal satisfaction. C-4.2 Identifies diverse cultures with special reference to dance, physical activity, local games and spaces to interact.
CG-5 Learns about tournaments at the international, national, state, district and block levels.	C-5.1 Charts the various tournaments at international, national, state, district and block levels. C-5.2 Describes the participation criteria and rules of tournament. C-5.3 Summarises the support structure or organisational structure to participate in tournaments. C-5.4 Explains the different forms and procedures for participating in tournaments.

Section 8.6
Content

The approach, principles, and methods of selecting content have commonalities across subjects those have been discussed in Part A, Chapter 3, 3.2 of this document. This section focusses only on stage–specific variations that a teacher needs to keep in mind in the teaching and practice of the physical education curriculum in schools. Hence, it will be useful to read this section along with above-mentioned section.

8.6.1 Stage-specific Considerations

8.6.1.1 Preparatory Stage

At this stage, the students will spend most of their time in free play and only a little time in structured sessions. Free play allows students to use their imagination and develop creativity. It is widely known and accepted that free play develops many important skills for students in the Preparatory Stage. Not only do they learn physical capacities, such as, gross and fine motor skills, auditory perception, and visual perception, but also individual capacities, such as, language development, problem solving, independence and social capacities, such as, communication, collaboration, negotiation and empathy to name a few.

For free play to be effective and challenging for the students, the school can provide materials which allow students to creatively utilise objects and materials around them that are easily available in the neighbourhood. Objects, such as, different sized of softballs and bats, tyres, small spades (blunted), any kind of toy, clay, colours (crayons, sketch pens), boards, chart paper and musical objects. Having a sand pit and access to a small water source can also be considered. The objective is to provide students with enough objects and spaces to play different kinds of games either independently or in groups.

The teacher allows free play, but with some agreed-upon ground rules (boundary of the play area, hygiene, harming others, safety-related rules). Free play is not guided but is monitored. Teachers and facilitators need to be present and keenly observe all the students throughout the duration.

Planned sessions for the Preparatory Stage can use a range of local games. At this stage, planned sessions need to be fluid and not based on strict rules. The teacher can introduce simple games which do not require a lot of explanation and are intuitive. Planned sessions can also be used for specific purposes, such as, building motor skills, but it needs to be 'gamified'. The facilitator can either create or find games which are linked to specific skills that need to be taught. For example, jumping and hopping can be done through animal movement games like frog jumps, and running and dodging can be done through a game of tag or dodgeball. *Gilli Danda* can be used for hand-eye coordination.

8.6.1.2 Middle Stage

In the Middle Stage, students continue to play local games, but have more structured sessions. By this stage, students have higher proficiency with simpler games and can be introduced to popular sports gradually.

In the structured sessions, the teachers need to gradually bring in an understanding of more rules that will need to be remembered while playing. Specific skills needed to

play popular regional sports can also be introduced. Both objectives can be met through simpler versions of the sport to begin with, and with each grade, more skills and rules of the sport can be introduced. For example, for 'invasive games' (games where one team has to cross over to the other team's territory), such as, hockey, football, basketball and ultimate frisbee, simpler games involving just kicking, hitting, throwing on targets can be introduced (only playing penalties for football and hockey). For 'field-based games', such as, cricket, only bowling to a wicket or wall, only batting, or only catching and fielding-based games can be used. For 'net-based games', such as, badminton, volleyball, and table tennis, simplification can be achieved by games in which players need to learn to hit the ball or shuttlecock with the right technique (keeping the shuttlecock, volleyball, TT ball from falling by hitting it again and again into the air).

Slowly, the complexity can be increased by playing mini versions of the sport with most of the rules in place, while also building individual capacities, such as, observation, reflection, emotional regulation, expanding spatial awareness and peripheral vision and making quick judgments based on gameplay. Simultaneously, social capacities, such as, effective communication, collective decision making, working together towards a common goal and other such capacities also need to be taught.

The students at this stage will learn more about their bodies and learn individual practices, such as, yoga and strength exercises, in greater detail. They will learn to create their own warm up and cool down routines.

Emphasis also needs to be given to students taking more responsibility for building a culture of inclusive sports at school. They need to play an active role in ensuring all students feel safe and encouraged to play. This can be a challenge to achieve for students in this stage, but it needs to be worked on by the teacher through 'circle time,' where students get the space to express and reflect on their actions.

Box 8.1i

Circle Time: A Way to Ensure Values and Disposition in Physical Education

All the students sit in a circle and set some ground rules with the help of the teacher. Some essential ideas are:

1. *Everyone in the circle is equal; no one is more important than the others (It reflects in the seating as well. It is a circle, and everyone is sitting at the same level).*
2. *Everybody should respect each other and their feelings.*
3. *No one should interrupt while another person is talking and give their complete attention.*
4. *Everyone in the circle should get the opportunity to talk, and others should encourage it.*

With the ground rules set, the teacher can guide the session by asking everyone to share simple thoughts after any session. An easy method is to ask everyone to share a 'star' and a 'wish'.

A star is something that the student really enjoyed in the session. It could be something they or a team did, or any occurrence that positively affected the student. A wish is something that the student wish had happened in the session. It could be something you wish something that they or their team had done better. It could also be an activity they wish to be included or more time to play.

Every student can share a star and a wish, and 'tag' (pass the chance on to) another student (other than their close friends) to to share. The process continues till all the students have shared. This star and wish can be modified over a period to different abilities we want the students to pick up. This can be modified over a period to get students to observe themselves, their actions and feelings, and those of others. Sharing in this manner regularly with the

teacher with the basic etiquette observed can create a safe learning space for students. Some pertinent and powerful questions can be brought into this space to discuss, "Are we biased towards our friends when we play? Do we pass the ball equally to everyone? Are we including everyone equally in a game or are some people not having as much fun?" and so on.

8.6.1.3 Secondary Stage

At this stage, students can be given a choice to engage with certain sports more seriously (and build specific skills for them) than others, and for students to play multiple sports at the same time. The sport can be played with all the international rules and with all its complexity. Students who choose a sport more seriously can train more rigorously through sports-specific drills. Playtime for students needs to be balanced with drills based on student interest. Those who are not keen on building superior skills should be allowed 'free play' of different sports and not be forced to pick one sport. There should also be sufficient focus on building strength and flexibility through *Yoga* and strength conditioning. Students must be taught about common injuries and how to avoid them through practice.

The emphasis on circle time and building a culture of sport must increase at this stage. Students should be encouraged to discuss their emotional states while playing more openly with each other. Circle time at this stage can be used to talk about many things that are commonly seen in sports and are unhealthy. For example, a discussion on how different people feel when a captain or a coachshouts at their players, how decisions are taken in a team of students, or do team members have a say in who gets to bat or bowl first, and so on, would be valuable educational conversations.

Students in the Secondary Stage must be taught to set the right example for younger students and in helping the teacher with organising school sports events. For example, senior students can help organise athletic events on campus. They could also be referees or umpires for games conducted for younger students. Secondary students can be given leadership roles, which will help build their skills too. For example, a student can be asked to facilitate circle time, with the instructor only participating as an observer.

Box 8.1ii

Weather Conditions

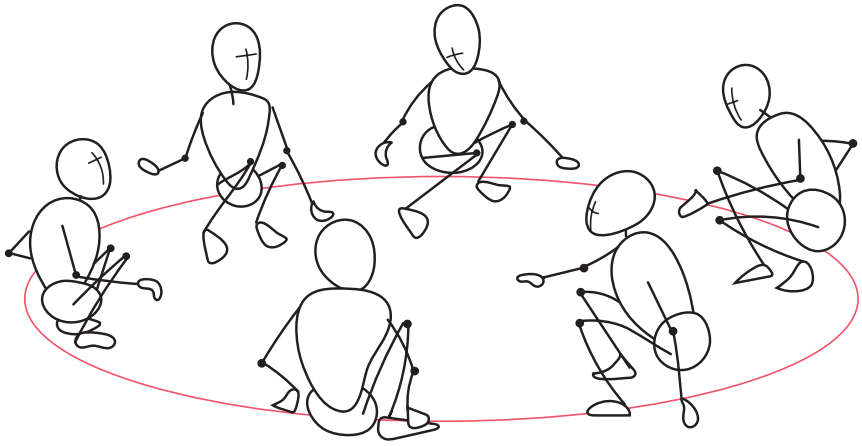
Physical education classes could be particularly challenging in tough or extreme weather conditions. India has very diverse weather conditions. Extreme cold, hot and rain are witnessed in several regions. The following suggestions can help in such cases:

Timetabling: *Areas which witness tough (not extreme) hot and cold weather conditions can consider working on rearranging their timetable. For example, in hot climates, the Preparatory and the Middle Stage students play in the morning and the Secondary Stage students play in the afternoon. In cold weather, the reverse can be done.*

Indoor Activities: *In extreme weather, when playing outside is not possible at all, Indoor Physical Education classes must be organised. Physical activities, such as, yoga, static movements, dance, theatre, High Intensity Interval Training (HIIT) and Medium Intensity Intermittent Training (MIIT) workouts can be considered. To enable more space per student, schools should make provision for access to a big hall in the school or in the vicinity which can enable these activities.*

Few examples of popular games in India are given below:

1. Fugdi

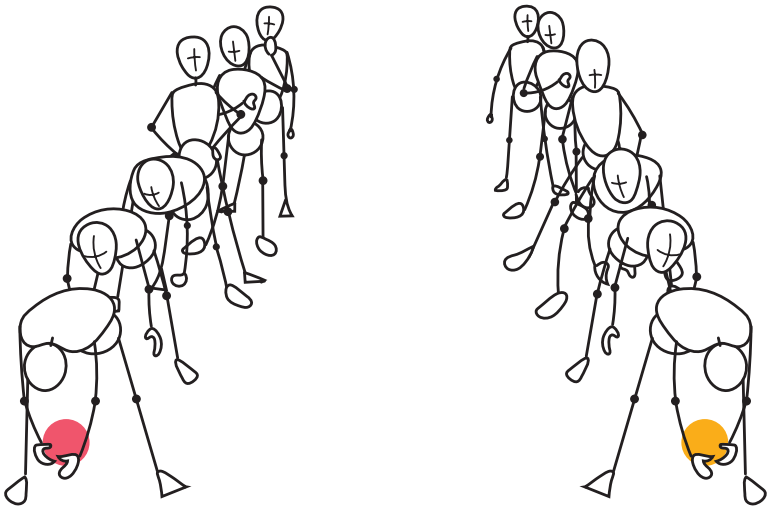


Region: Chhattisgarh, India.

How to Play: As the game begins, all the students sing a song (*gobar de bachharoo gobar de cahron khunta la leepan de*...) in unison. Four, six, or more students gather, sitting on their legs, keeping balance, and alternately moving their feet back and forth. The student who gets tired and stops moving is eliminated. The student who plays for the longest time is the winner.

Social Media Reference: https://www.youtube.com/watch?v=l7ol99k5E00

2. Tunnel Ball



Region: Across the world.

How to Play: Two teams are formed, with a minimum of 8 players in each team. Both teams stand in a different queue, 10–15 metres apart, facing the same direction. Each player in a queue should be at least 1 metre apart, and this can vary depending on the difficulty level of the

game. The players form a tunnel by spreading their feet apart; the first player passes the ball from under the tunnel, and the last player standing in the queue catches it. After that, the player with the ball comes running, stands in front of the line and passes the ball. The game continues until one team finishes first.

Social Media Reference: https://www.youtube.com/watch?v=qP05ssHZGP8

Section 8.7
Pedagogy and Assessment

The approach, principles, and methods of pedagogy and assessment have commonalities across subjects, those have been discussed in Part A, Chapter 3, 3.3 and 3.4 of this book. This section focusses only on what is most critical to physical education in schools. Hence, it will be useful to read this section along with above mentioned section.

8.7.1 Pedagogy for Physical Education

Several research studies confirm how students learn physical education. The following key ideas are useful to know how to teach the subject:

a. **Physical education follows the same teaching-learning principles that promote a students' learning in other subjects**: Giving space to students context, respecting students as individuals, providing them opportunities, connecting to their lives, giving them level-appropriate tasks, deciding content based on learning outcomes, understanding the learning levels of students, and providing periodic assessment and feedback are effective teaching-learning practices in physical education too.

b. **Physical education requires teachers to demonstrate:** So that students can observe, practise those skills or moves and learn. This is because physical activities fall under the category of practical knowledge, where 'to know' is acquired only by doing the activity.

c. **Providing time for interactions before and after the activity:** Improves the development of cognitive concepts, values and dispositions. Such interactions must be moderated by teachers, and students should be encouraged to voice their opinions freely.

d. **Students learn best when they have a diverse set of activities:** To choose from and equal opportunities. The practice of motor skills in diverse ways is fundamental to fitness and mastery of movement in physical education. This means designing a range of activities and sports for all students, including those with disabilities.

e. **Encouraging sportspersonship, avoiding personal comparisons, and focussing on skill acquisition will make physical education effective**: Teachers should implement methods to define skill attainment in terms of proficiency rather than comparison to others. A motivating environment and a focus on personal improvement rather than personal comparison of students provide students with a positive and satisfying learning experience.

f. **Planning and instructions**: Concrete planning of the Physical Education class is the key to one's instructions. Some aspects of planning to consider while planning the sessions are:

i. Planning to avoid injuries through warm up and cool down activities and ensuring safety in the use of equipment and space.

ii. Planning to be effective through teacher demonstrations and modelling.

iii. Planning for the right levels of challenge for different groups of students.

iv. Planning should be focussed on the learning outcomes that need to be achieved.

g. Participation and inclusion: Participation of students in all activities is the responsibility of the teacher. Some students tend to be overenthusiastic about playing, and the teacher must ensure that all students get their turn to participate. Games and activities must be chosen so that students of all genders and abilities can participate.

h. Motivation: Not all students will be enthusiastic about taking part in sports, particularly if they fear that they will not be good. Students may be kept motivated by teachers themselves demonstrating excitement and enthusiasm in the Physical Education sessions. Teachers must encourage active involvement, support students to acquire skills, acknowledge and appreciate growth and improvement rather than mere outcomes, instruct clearly, give everyone a chance to participate, be sensitive to students' feelings of pressure or anxiety, and treat every student fairly. All this would go a long way towards motivating students to give their full participation in the classes.

i. Safety: A safe environment in physical education has two components—the physical and the psychological. The physical refers to the need to ensure students do not get injured and that facilities and equipment are safe, teacher preparedness to handle emergencies with access to a doctor and proper supervision of all physical activities. The psychological component refers to the need to ensure that students feel emotionally and socially safe and receive respectful treatment, encouragement, support and fair redress of grievances during a physical education class.

Box 8.2

Safeguarding Against Sexual Harassment and Bullying

The sports and games field is a place of learning about capacities related to the body, its limits, working together with others as a team, and sportspersonship. However, it is also a place where certain kinds of aggression and uncharitable behaviour also show up. Given that students will be organised to engage in sports, games and related physical activity in a mixed-gender and mixed-abilities format, they must be explicitly educated about patience, sensitivity and care for physical boundaries. This would include formally teaching them about forms of sexually demeaning and harassing behaviour, ways of identifying them and empowering them with protocols and means to report such behaviours to their Teachers and the Principal.

Teacher's Voice 8.1i

Learning a New Game

My students in Grade 6 are very enthusiastic when it comes to sports, and most of them are eager to play a new game. I decided to introduce them to a new game, Handball and instead of directly going to the field, we began with a small discussion around it. As we discussed the history, rules and regulations of the game, the students showed keen interest by

listening and sharing information about similar activities they engage in within their communities. The students also shared the local games they play and the rules they follow while playing them.

In the field, we began with practising skills like dribbling, passing, movement, throwing, and catching, along with some basic warm ups. Initially, the students practised it individually, and then in groups. During the practice session, the students struggled working in pairs and groups as they complained about their partner not doing the drill properly. Most of the students struggled to catch the ball. I explained and demonstrated how the arms should be released while catching the ball. I also asked them to throw the ball in a direction that would be easier for their teammates to catch. It was a productive practice session, as it helped enhance their techniques.

To play a game of Handball, four teams were formed, and a 10 minute match was conducted between the two teams. Initially, the students struggled with coordination among the team members. They were encouraged to coordinate their movements and pass the ball effectively. Additionally, they were challenged to change direction while passing the ball, further enhancing their coordination skills and adaptability on the field.

Through consistent practise and guidance during the sports period, the students showed remarkable improvement and were able to overcome their challenges. The students who initially struggled to hold or throw the ball showed significant progress. The students also actively engaged in discussions and strategies after the match, fostering effective collaboration and communication.

8.7.2 Assessment in Physical Education

The following principles must inform assessment in physical education and well-being across Stages:

a. Students must be assessed primarily through demonstrated performance. Performance can be best assessed through observation of students during field activities, drills, and games against clear criteria for marking.

b. Values and dispositions must also be assessed through demonstrated performance.

c. Written tests can be used for assessment of specific competencies, e.g., knowing your body, growth, and development, the rules and regulations of games and sports, knowledge of tournaments.

d. Other tools include records maintained by teachers, reflective journals maintained by students, self-assessment and a viva voce to understand the students' thinking and understanding.

A few Teacher Voices illustrate different kinds of assessments below:

Teacher's Voice 8.1ii

Safety

I teach Grade 9 students. It is important for my students to understand precautions related to risk and safety while playing games and sports. I find that their understanding related to this aspect is more about not physically hurting others and themselves, and obeying rules and regulations while playing. They often neglect to warm up appropriately before the game in their hurry to start playing. Therefore, I decided to assess how many of them are

actually aware of this aspect. Instead of asking them to simply state safety precautions, I decided to create a multiple-choice question

Which of the following rules is the most important for managing risk and safety in any game and sport:

a. Number of participants and their roles
b. Clothing and footwear
c. Warming up appropriately
d. Fair competition

Teacher's Voice 8.1iii

Dodge Ball

I teach Grade 5 students, and I know they love playing dodge ball! I decided to use this game to assess my students' progress towards attaining the competencies of the Preparatory Stage. I decided to observe them while they played and assess them against a marking scheme that I developed.

I was conscious that I had to observe all eight players for the 30 minutes that the game would be played. I devised a system wherein I would focus on one player for about 4 minutes for the duration of the game in two sets–that is, 2 minutes at a time. Of course, this was a rough approximation, but it helped me to distribute my attention across all the students.

I used the following grading scheme to assess the students:

Rubric for Dodge Ball

Criteria	Grade A	Grade B	Grade C
Throwing a ball with force	Throws the ball with the required force with few exceptions.	Assesses force required to throw the ball most of the time.	Is not able to assess the force required to throw the ball.
Throwing a ball to the desired spot	Makes the ball reach the target with few exceptions.	Makes the ball reach the target most of the time.	Is not able to make the ball reach the target.
Catching the ball	Catches the ball when it comes towards them with few exceptions.	Assesses the force of the ball as it comes towards them, and catch it most of the time.	Gets hit by the ball soon after the game starts.
Shows team spirit	Leads coordinated attacks on the opposing team.	Shouts out instructions/ advice to team members when appropriate.	Sole focus is on protecting self.
Shows qualities of a sportsperson	Discusses the important points of the game with the other team and share tips.	Is polite with members of the opposing team.	Does not interact with members of the opposing team.
Care for safety of others	Guides other team members on safety rules.	Maintains appropriate distance from others. Warms up adequately before the game and keeps moving during the game.	Is not able to assess appropriate distance from others. Warming up is inadequate and movement during the game is not constant

Teacher's Voice 8.1iv

Viva-Voce

I teach Grade 7 students. I conduct a viva voce for students, choosing questions from a game of their choice, since I feel it is a good supplement to a written test and the observation of a game and sport. It gives me an opportunity to assess the competencies and learning outcomes that I have not been able to address through other means and gives students the opportunity to demonstrate their learning in an area of their choice. I assess student responses using a marking scheme I have prepared. Since there are so many students to be covered, I spend 10 minutes with each student. I usually try to keep it in the format of a discussion, so that students feel comfortable.

Please respond to the questions I will ask you related to a game or sport of your choice. Please take your time to respond.

Why did you choose this game for discussion? What do you like about it or why do you think it is important?

a. How do you prepare for the game? What do you do or think about before you start playing the game?

b. Why do you think rules and regulations are important? What would happen if there were no rules and regulations?

How do you think the person playing against or the opposing team should behave? Why do you think so?

Marking Scheme

Criteria	Descriptors and points
Understanding of chosen game/sport	Understands only the rules of the game or sport – 1 point. Understands rules and techniques/skills of the game/sport – 2 points. Understands effective game-playing strategies (individual or group) – 3 points.
Understanding of preparation for game/sport	Preparation is limited to clothing and equipment – 1 point. Preparation includes warm up – 2 points. Preparation includes warm up and discussion with team mates/coach and meeting opponent(s) – 3 points.
Understanding of rules and regulations	Understanding is based only on own experience of game/sport – 1 point. Has an adequate understanding of the game/sport – 2 points. Has an adequate understanding and is able to communicate why they are important – 3 points.
Understanding of sportpersonship	States expectation of behaviour in general – 1 point. States expectation of behaviour with reference to rules and regulations of the game/sport – 2 points. Goes beyond the 'written' rules to the 'unwritten rules', such as, integrity, care and concern, sensitivity – 3 points .

Chapter 9

Vocational Education

Vocational education prepares students for different kinds of 'work'. It enables the learning of specific knowledge, capacities and values, such that the students upon finishing school, are ready to work in a vocation of their choice and to deal with the day-to-day practicalities of life. School education must provide both possibilities to all students, to join the workforce or to pursue higher education.

Work provides not only economic sustenance for the individual and contribution to the economy but is also a significant part of a meaningful and dignified life for human beings.

In the Foundational and Preparatory Stages, multiple capacities will be developed through play and other activities, which will subsequently be useful in vocations. These capacities are termed prevocational capacities.

In the Middle Stage, exposure to a wide range of work will be given to students. This will equip them to achieve capacities (including specific skills) in a vocation of their choice in the Secondary Stage and help them progress towards gainful employment and contribute meaningfully to the economy.

Section 9.1
Approach to Vocational Education

Schools must provide students with a broad and experiential introduction to different kinds of work and develop a deep and defined set of practical competencies. Students must also learn to value all types of work based on the inherent dignity of all work, and the social hierarchies of work need to be eliminated.

Vocational education will also draw from and build on the competencies developed in other curricular areas. For example, mathematics for calculations and estimations, social science to understand the place of work in society and production chains and science to understand how things work and how their functioning can be improved. Thus, it is complementary to and builds on other curricular areas and is not an isolated area.

9.1.1 Objectives of Approach to Vocational Education

The approach to Vocational Education in this NCF aims to achieve the following objectives:

a. Vocational capacities, knowledge, and relevant values will be developed for all students, and this will create the possibility of their joining the workforce after school if they choose to.

b. Provide the possibility of learning range of vocations–ones that are aspirational, as also those that are most relevant locally and contextually (if different), also new and emerging vocations.

c. Provide exposure to various types of work to all students establishing the dignity of work.

d. Should be implementable with the current reality and resourcing of our schools, while providing a pathway to the future.

e. Must value the work that many of the children of India already do in their homes and communities.

While the first of the above stated objectives will be elaborated through this chapter, the other four objectives are described below:

9.1.1.1 Aspirational to Locally Relevant; and for the Future Education for a Range of Vocations

Given the extraordinary range of vocations that are available today and also the new vocations being created, the choice of 'which vocations to educate for' is very important. Schools and the education system must be able to address different kinds of demands which would inform this matter. Some vocations are more aspirational than others. On the other hand, some vocations may have greater opportunities for employment around. Often, the aspirational vocations are different from the ones that may have greater employment opportunities locally or in the vicinity.

Hence, the choice of which vocations to educate for must be made at the local level, perhaps the school or the district, considering these factors. The NCF enables these choices to be made appropriately by considering all the relevant factors for a school, including resourcing. Such an enabling framework also gives the flexibility to add new vocations as they emerge.

9.1.1.2 Dignity of Work and Wide-Ranging Exposure

While in the Secondary Stage students must learn specific vocations to get employed if they so choose, the earlier stages must build the foundation for a range of vocations. This will be enabled by ensuring that all students are exposed to the entire range of vocations from the primary sector including agriculture to machines and manufacturing, to various services including community health. Such wide exposure not only creates the base for the choice of vocations subsequently but also establishes the dignity of all types of work. Such wide exposure is also important because, for many students, experience of work is very limited to what they see around them. For example, in many rural areas, they will have no exposure to machines or services. On the other hand, children in large cities will have no exposure to land-based vocations.

9.1.1.3 Valuing Students Existing Work Experience

Millions of our children are already engaged in some kind of work. This is often within their homes or in their communities. They help on the farms or in the orchards or help with the care of their siblings or cook at home. Such life experience is invaluable and must find its due place in the school. Students who are already engaged in such work would benefit substantially more if School Education provides them exposure to other kinds of work. The knowledge and capacities that such students bring to the classroom can be used as a resource.

9.1.1.4 Implementable in Current Reality

As per NEP 2020, vocational education is to be integrated into school education. This NCF enables that by providing an approach such that vocational education can be integrated within schools within the constraints of existing teacher force and resources. For this, the NCF has developed appropriate Learning Standards which can be transacted by existing teachers (who currently teach mathematics, science or social science) with appropriate training and handbooks. They will also be trained to use the support of people from local communities who have expertise in certain vocations. In the Secondary Stage, specialised teachers will be required depending on the vocations that the schools want to teach.

9.1.2 Distinguishing between Vocational Education and Skills Training

As mentioned earlier in the NCF capacities are broader, deeper, and more complex human abilities, while skills are narrower and more focussed.

Most capacities are constituted by many skills. In other words, many skills are required to develop a capacity. For example, critical thinking is a capacity, while sorting data is a skill which is part of critical thinking. Appropriate irrigation of crops is a capacity, which requires the skills of reading the landform and its slopes, trenching and constructing channels, and understanding how much and when to water.

Vocational Education focusses on capacities relevant to particular vocations, however, a vocation requires more than capacities, which is why vocational education is also about developing the appropriate knowledge base and values. For example, the vocation of 'grooming and personal care' requires not only the skill of haircutting or pedicure, but

also requires the knowledge of different kind of hairstyles and their trends, and methods of pedicure, and the sources of knowledge for all these. It also requires a disposition of serving with dignity.

Thus, school education focusses on vocational education while the large skills training system complements it by focussing on skills.

Box 9.1

Capacities and Skills

In this NCF, we are distinguishing capacities from skills by the level of breadth and complexity. Capacities are broader human abilities that combine a variety of skills in a coherent manner to accomplish a complex job. Skills, on the other hand, are narrower know-how to complete a specific task. For example, cooking is a capacity, while cleaning, cutting, frying, and sauteing are skills.

9.1.3 Typology of Vocations for This NCF: 'Forms of Work'

The NCF has to reconcile two requirements. One, it must not and cannot determine which vocations must be taught and learnt in a particular school or set of schools, because there are too many vocations and too many considerations at the local level. Two, it must be able to provide a framework to educate students for vocational education. This reconciliation is possible with a valid and useful typology of work, which in this NCF is called 'forms of work':

- The vocations that have some fundamentally common elements are grouped together into the same type.
- They require similar or overlapping capacities and knowledge. New vocations that are created of the same type will continue to require similar capacities and knowledge.

This grouping would help develop a broad base of capacities for productive work from Grades 3–8, with greater specialisation in Grades 9–10 and specialised occupational capacities in Grades 11–12.

This NCF uses 'forms of work' as a guiding concept for designing the curriculum. Productive work at its most fundamental level can be divided into three categories: work with life forms, work with materials and machines, and work on providing human services:

a. **Work with Life Forms:** Right from the time of hunting and gathering to a more settled life of animal husbandry and agriculture, human beings have used their capacities to work with life forms to not just survive, but also to produce an adequate surplus to live a life of thought and reflection. Thus, the capacity to do productive work with plants and animals is fundamental to human survival and flourishing.

b. **Work with Materials and Machines:** The second significant achievement in human progress is our ability to use materials and machines in simple to very sophisticated ways. Be it for food, clothing, and shelter to meet our basic necessities or for far more complex ways to satisfy our curiosity and creativity, we have developed tools and machinery. Thus, the capacity to do productive work with materials and machines is fundamental to engaging with complex modern life.

c. **Work in Human Services**: Starting from trade and transport to media and entertainment, we have created different services that have allowed us to cooperate well beyond our kinship groups. These services have improved our lives tremendously well beyond what agriculture or industry could provide. Thus, the development of capacities to work in human services is truly relevant in this age of global exchange.

The school curriculum at the Preparatory and Middle Stages would endeavour to build relevant capacities in these three 'forms of work'. As we can easily observe, these forms of work not only provide the necessary breadth in capacities for productive work, but they also become the foundation for developing capacities in vocations in primary, secondary, and tertiary sectors of the economy, thus meaningfully contributing to the aim of economic participation.

In the Secondary Stage of four years, the first two years would be towards consolidating these capacities to develop transferable skills that serve students well in any vocation. In the last two years of schooling in the Secondary Stage, students will be given opportunities to specialise in specific vocations of their choice.

In addition, the skill training ecosystem should take off from where the schools leave. This ecosystem should ensure that a wide variety of skills courses are available for those students who want to enter the job market immediately after school certification.

It must be noted that the capacities and embedded skills for vocational education must be deeply integrated with the other capacities, knowledge, and values that school education develops. For example, critical thinking, communication, and learning-to-learn, capacities that overall school education is to develop, are equally important in the world of work.

In fact, in the unfolding scenario of ever more rapid changes across the world, not only in employment opportunities, but in the very nature of work, these fundamental capacities and knowledge base gained from school education must form the foundation for lifelong learning, which is what will enable a lifetime of gainful and fulfilling employment.

9.1.4 Other Specific Considerations

Along with the choice of vocations to be offered, the resources and materials required, and pedagogical and assessment approaches, the following are some important considerations for the Vocational Education curriculum:

a. **Age-appropriate:** The approach to Vocational Education must be age-appropriate. It will start from developing general capacities for work or prevocational capacities and move to more specific capacities for particular kinds of work. To elaborate, in the Foundational Stage, students will experience immersion in work through 'doing' and 'creating.' In the Preparatory Stage, this approach will continue, but students will also become familiar with local occupations, and factors related to participation and equality. In the Middle Stage, this understanding will become formalised with the introduction of a separate curricular area. At this stage, students will develop capacities in different forms of work. In the Secondary Stage, students will have opportunities to choose one or more vocations for specialisation.

b. **As localised as possible:** As far as possible, the content, materials, and machinery necessary for developing vocational capacities must be relevant to the local context and be locally available.

c. **Aspirational:** At the same time, students' aspirations must also be met through helping them learn vocations beyond those currently available in their village, town or city. This would require a range of vocations to be offered to meet the changing needs of both the economy and the aspirations of young adults.

d. **Exposure to different kinds of work:** Students must be deliberately exposed to the different forms of work so that they have the basic capacities for work in breadth. This makes them adaptable to the changing needs of the economy. Schools must also take into account the work that students do at home and ensure that they get exposure to other kinds of work not available in their home contexts (e.g., if a student works on land at home, the school must ensure that she spends most of her time in engaging with manufacturing and services).

e. **Equity considerations:** Existing social inequities must be consciously addressed. The school should avoid identifying particular types of work to specific communities or gender. Instead, the school must encourage engagement with different types of work for all students, irrespective of their home background and gender.

f. **Value for working with hands:** Vocational education offers an opportunity for all students to learn how to 'do' something with their hands and learn to value it. Education is incomplete without these experiences. So far, opting for a vocational course has meant that the student is either economically 'poor' or a 'poor performer' in school. This will change with this NCF with all students participating in vocational education, school education will function as an equaliser, and not a reproducer of inequity.

Section 9.2
Aims

Work is an important part of life. It prepares individuals to deal with practical things related to daily life and economic participation. Vocational education enables students to develop basic capacities in different kinds of work to identify what they would like to pursue in order to lead a meaningful and fulfilling life. It prepares them to contribute meaningfully to the economy while providing for themselves livelihoods and sustenance. It also equips them to contribute effectively to work at home.

KRCR 2019 states that:

> *This policy aims to overcome the social status hierarchy associated with vocational education and requires integration of vocational education programmes into mainstream education in all educational institutions in a phased manner. Beginning with vocational exposure at early ages in middle and secondary school, quality vocational education will be integrated smoothly into higher education. It will ensure that every child learns at least one vocation and is exposed to several more. This would lead to emphasising the dignity of labour and importance of various vocations involving Indian art and artisanship.*
>
> ***[KRCR 2019, 16.4]***

With this context, the aims of Vocational Education are:

a. **Developing understanding and basic capacities for different forms of work:** Students will develop a broad-based understanding of different forms of work, which

will equip them to successfully manage their personal affairs. This will also equip them to identify, create, and initiate business, work and community opportunities.

b. **Preparation for specific vocations:** Students will develop capacities to be gainfully employed in one or more specific vocations after leaving school.

c. **Respect for the dignity of labour and all vocations:** Students will develop respect for the dignity of labour through the acquisition of positive attitudes towards work and the workplace.

d. **Developing values and dispositions related to work:** Students will develop persistence and focus, curiosity and creativity, empathy and sensitivity, and collaboration and teamwork. They will be willing to do physical work and will pay keen attention to details.

Through these aims, schools will develop vocational knowledge, capacities, and dispositions in students, giving them livelihood opportunities, as well as, enabling them to contribute and participate in the economy of the country. The aims of many other subjects, for example, Language , Physical Education and Well-being, Science and Social Science, and Mathematics, are directly complementary to the aims of Vocational Education, and these form the larger set together, thus enabling a lifetime of fulfilling work.

These complementary aims, for all these subjects together and independently, include the development of critical thinking, capacity for inquiry, scientific temper, the capacities for communication and collaboration, creativity, adaptability, learning to learn, emotional and ethical capacities, initiative and resilience, a strong work ethic, sound knowledge of the immediate physical and social world and more. It is useful to note that many of these capacities and dispositions are sometimes referred to as '21st Century Skills' and in other contexts as 'soft skills'.

Section 9.3
Stage-wise Design

9.3.1 Foundational and Preparatory Stages: Developing Prevocational Capacities

In the foundational and preparatory stages, the focus is on developing prevocational capacities and not on the needs of specific jobs.

9.3.1.1 Foundational Stage

a. In this stage, an integrated approach has been taken where 'work skills' (e.g., children learn to complete their tasks, children learn to take care of the material they use) are learnt through the regular classroom process.

b. The focus on physical development and motor skills through movement and exercise, working and completing a task, and play-based education enables the development of age-appropriate prevocational capacities in the Foundational Stage.

c. One of the important curricular goals at this stage is also for children to develop a positive attitude towards productive work and service or *Seva*.

9.3.1.2 Preparatory Stage

a. Vocational Education is integrated into The World Around Us through the inclusion of prevocational capacities. Competencies related to students' understanding of occupations around them, observing, and working with animals and plants, and creating simple objects lay the foundation for the development of vocational capacities in the Middle Stage. Activities suitable for The World Around Us also lend themselves to the development of prevocational skills, e.g., maintaining flowerpots or kitchen gardens, clay modelling, and dialogue with shopkeepers during visits to the local markets.

b. 'Work allocation' in school will also be a part of preparing the ground for Vocational Education in the next stage (e.g., taking care of the plants in class, putting away books, and helping with cleaning after the Mid-Day Meal). All students must be allocated responsibilities equally for all tasks.

Box 9.2

Vocations and Professions

There is no categorical difference between 'vocations' and 'professions'. While the general usage of the two words in India tends to give 'higher social status' to 'professions' and 'professional education,' it is 'vocation' that has the connotation of 'higher calling.' The NCF does not differentiate between vocations and professions.

9.3.2 Middle and Secondary Stages: Developing Vocational Capacities

In the Middle and Secondary Stages, students begin a formal engagement in developing vocationally relevant capacities. In the Middle Stage, students develop breadth in vocational capacities in the three forms of work, while in the Secondary Stage, students specialise in one or more vocations.

Given the wide range of vocations, there is a need to organise the curriculum so that students receive adequate exposure while schools can manage within their constraints. The NCF will address this concern by identifying three forms of work that include a wide range of vocations with some commonalities within them.

9.3.2.1 Forms of Work

As mentioned in the previous section, the guiding principle for the Vocational Education curriculum is 'forms of work.' Different forms of work exist worldwide, distinguished by their operational characteristics, historical practices, and the usefulness of skills and values. As a result of this, different vocations and services emerge, such as, agriculture, textiles, and commercial art. Therefore, it is important to understand the different forms of work in order to comprehend how vocations and services are mapped from their respective forms. These forms of work will ensure that all students experience work in varied contexts. For example, students in rural areas are exposed to the vocation of agricultural practices much more than students in urban areas, while those in rural areas may not be adequately exposed to the services sector.

Providing opportunities for all students to learn across all categories of forms of work will enable equality of status and opportunity for all forms of work. Specific vocations within these forms of work will be as contextualised as possible. This study within this categorisation would be aligned with the NSQF:

a. **Working with life forms:** Working with Life forms involves developing capacities to do productive work that involves plants and animals. For example, a school could choose to develop a vegetable garden or a chicken coop as part of this category in the Middle Stage, and floriculture, dairy farming, sugarcane cultivation, or natural farming in the Secondary Stage. The abilities required for such work involves both practical skills, as well as, some knowledge of the biology behind these life forms, thus making school knowledge in science relevant and practical.

b. **Work with machines and materials:** Working with machines and materials involves comprehending how any machine or tool works. It incorporates the processes and tasks that lead to tangible outputs. Students can be involved in this form of work by introducing handicraft work using various materials, such as, paper, wood, clay and fabric. A student inclined to the work of tailoring uses basic tools, such as, scissors, cutters, thread, pins and machines, including the sewing machine, to sew cloth in a predetermined design. The student will develop manual skills, attention to detail and persistence to create high-quality products. Illustratively, a school could choose to offer high-tech machining, tailoring, carpentry and pottery in the Middle Stage and robotic welding along with advanced courses in carpentry and tailoring in the Secondary Stage. Students in Grades 11 and 12 can benefit from gaining skills in operating advanced machinery that is used in more automated manufacturing.

c. **Work in human services:** Work in human services involves interaction with people to understand their needs and requirements. It deals with the capacity to communicate well and understand the processes and resources involved in providing a particular service. So, a person inclined to work in a nursing home should be well informed about procedures and ways of communication with patients to deliver appropriate service. Through this form of work, students develop the essential skills required for that service, as well as, interpersonal skills and compassion for other fellow beings. Illustratively, a school could choose to help in a nursing home or work in a shop as part of this category in the Middle Stage. In the Secondary Stage, courses could, illustratively, be offered in housekeeping, wellness, beauty, tourism and hospitality.

9.3.2.2 Middle Stage

a. Students will develop basic skills and knowledge in all three forms of work: Working with life forms, working with machines and materials, and working in human services. At this stage, the skills for work are the focus and not specific vocations.

b. In each grade, three projects, one from each form of work will be implemented in schools. Thus, by the end of this stage, students will work on nine projects.

c. States or schools will choose vocations within the three forms of work, and design projects for each grade in each form of work. The selection of projects must consider the context of the school, locality, and age-appropriateness of students.

d. Projects that align with other curricular areas will be supported by the respective subject teachers. These projects can aid in interdisciplinary understanding by

integrating concepts from other curricular areas. For example, in the case of agriculture or animal husbandry concepts from botany and zoology can be integrated with the project.

e. Towards the end of the academic year, a *Kaushal Mela* (skills fair) will be organised in the school for students to demonstrate their projects to the school, community members and other stakeholders. This will include a presentation of the project work, key learnings, reflections and use of learnt skills at home.

f. It is to be noted that with this design in the Middle Stage, students will indeed be exposed to vocations and develop relevant capacities and knowledge; thus, this NCF does not use the phrase 'prevocational' for such learning in the Middle Stage, while that phrase has been used in other school education related documents.

9.3.2.3 Secondary Stage: Grades 9 and 10

a. Students will be given exposure to six vocations (two from each form of work) spread over two years. These will be at least equivalent to NSQF Levels 1 and 2, where relevant.

b. The vocations will be carefully identified considering the basic skills needed by students at this stage for each of the three forms of work.

c. The focus would be on developing the appropriate skills with hands-on experience with the tools and techniques involved; only the limited theoretical knowledge relevant to students will be included. The hands-on experience will be supplemented with internship opportunities at this stage.

d. These six vocations are chosen on the premise that exposure across these vocations will not only enhance exposure but also enable students to make an informed choice in Grades 11 and 12.

e. The choice of these vocations is also based on the premise that certain capacities in skills within cut across vocations. For example, a farmer needs to understand how motors and tractors work, and someone working in machine servicing needs similar capacities.

f. Students will learn the relevant skills for these vocations through both workshops conducted in the school, as well as, projects and internships in local sites of work.

g. Further, students will be given on-site exposure to industrial or agricultural spaces to broadly understand the functioning of vocations in the world of work. Schools must develop linkages with local industries, farms, service centres, cooperatives, relevant NGOs, state transport corporations, cottage industries, printing presses, call centres, software design companies, mobile operating companies, law companies, local water or electricity boards to enable students to spend part of their time gaining work or practical experience at these facilities as interns while they are still in school.

h. It is not likely that all schools will have a trained teacher for vocational courses. Hence, these vocational courses can also be taught by locally trained and experienced resource trainers and coordinated by regular teachers who have been relevantly trained, also with appropriate use of technology.

9.3.2.4 Secondary Stage: Grades 11 and 12

In Grades 11–12 students take choice-based courses in different Curricular Areas. Vocational Education is one of the Curricular Areas that should be available for students. Students choosing vocational courses from this curricular area would have in-depth training in a specific vocation over the period of two years. These will be minimally at NSQF levels 3–4 where relevant.

Section 9.4
Current Challenges

There are a few challenges with the implementation of vocational education that need to be addressed on priority:

a. Vocational education is often considered the 'last resort' for students who are not able to pursue higher academic education. This hierarchy in social status has undesirable influences on school education.

b. Vocational education has been facing curricular and resource-based constraints. For instance, with schools in remote or rural locations, resources related to industrial work are hard to access, thereby restricting the opportunity to give exposure to those students.

c. With the lack of proper infrastructure, it becomes a struggle to let students undergo practical exposure. Most equipment (if any), such as, computers and materials for home science is outdated or broken with no funds for repair or replacement.

d. There is a lack of understanding about assessments, especially given the emphasis on practical, hands-on learning.

e. There are no formal linkages with the world of work. As per KRCR 2019, students passing out from Grades 11–12 with Vocational Education often do not have well-defined pathways with their chosen vocation in higher education. Also, current forms of vocational education often push people into 'low-end' self-employment and contractual work of different forms rather than into 'good employment,' with little or no possibilities of income mobility. With such unclear directions, it is highly challenging to make connections with the job search in the market.

f. Teacher education programmes for the preparation of teachers for vocational education are not adequate.

Section 9.5
Nature of Knowledge

a. Capacities are at the core of vocational knowledge. These are procedural ('know-how') in nature and intended to accomplish specific tasks. This procedural knowledge enables further work-focussed activities, both in the world of work and in daily life. These capacities are of both kinds; specific to certain types of vocations and those that are not only useful across vocations but even more broadly in life, such as, communication, teamwork and collaboration, strong work ethic, critical thinking, and more.

b. These capacities are further enhanced through knowledge ('know-that') from other areas. Therefore, knowledge from other curricular areas, including Science, Mathematics, Language, and Social Science, is used where relevant, to support the development of vocational knowledge.

c. Vocational knowledge also includes developing an understanding of specific norms and guidelines for a particular job. For example, rules and regulations, safety concerns, markets, and transportation.

d. Vocational knowledge includes knowing how to work with people in teams, and in organisations. It develops sensitivity towards the environment, collaboration, integrity, waste management, and other values mentioned in NEP 2020.

Section 9.6
Learning Standards

Across the stages, students develop the essential values of persistence, creativity, collaboration, empathy and most importantly, the willingness to do physical work. Students develop the competencies to contribute to home-based tasks to become productive members of the family.

An integrated approach is taken into consideration for vocational education in foundational and preparatory stages so as to develop prevocational capacities and positive attitude towards productive work.

In the middle stage, students engage in different forms of work to learn a range of common capacities, knowledge bases, and values that form the basis for later specialisation. The objective is to make sense of the place of vocations in the world of work and inculcate 'working with hands' as an integral part of the vocation. Through exposure visits and opportunities to practise, students develop a systematic approach to completing the given task.

In Grades 9–10 of the secondary stage, students deeply engage in a few vocations involving rigorous practice and field-based exposure. The larger objective of this stage is for the students to develop efficiency while performing the tasks, and the ability to distinguish between effective and non-effective practices while delivering a fine product or service. In Grades 11–12 students will specialise further in chosen vocations, this is dealt with in Part C, Chapter 10, section 5.5.

As already discussed in the approach to vocational education, vocations offered in the curriculum will be organised in three forms of work: working with life forms, with machines and materials, and in human services in the middle and secondary stages. Each form of work will have a home curricular goal, which will include the competencies students develop to be able to contribute to home-based tasks. This Curricular Goal is essential for students to manage their personal life and resources more productively and meaningfully. It equips students with essential capacities to manage their day-to-day life better and establish them as competent and productive members of the family and society.

Competencies are to be attained at the end of the stage. Therefore, interim markers of learning achievements are needed so that teachers can observe and track learning and respond to the needs of learners continually. These interim markers are learning outcomes. Thus, learning outcomes are granular milestones of learning and usually progress in a sequence leading to the attainment of a competency.

However, vocational education is different from other curricular areas in terms of content and approach. While in most other curricular areas, it is possible to mark a clear progression in learning outcomes as students move towards attaining a competency, this is not possible in the same way in vocational education.

The progression across grades in vocational education is in terms of the development of capacities in different vocations. To see progression across different vocations as students move through grades is therefore difficult. Hence, the Learning Outcomes must be articulated in terms of learning a vocation in a single Grade. This implies that the Learning Outcomes will be the same for all grades for most competencies, they will just be for different vocations.

For example, let us assume students do a project on horticulture related to life forms in Grade 6, poultry in Grade 7, and animal husbandry in Grade 8. Some of the Learning Outcomes will be similar across the stages since they will be achieved in both the Middle and Secondary Stages. The real difference will be observed in the level of complexity in the Secondary Stage. For example, the Learning Outcome 'Follows safety protocols while handling tools' remains the same in both stages, but the complexity of following safety protocol increases with the usage of advanced tools or performing tasks of increased intricacies in the Secondary Stage.

At the same time, students will be a mixed group, with varying levels of pre-existing exposure and capacities. A majority of students doing some sort of work at home may already have the skills others do not, and will already have attained the Learning Outcomes of a higher grade. For example, some students may already be maintaining and handling equipment related to agriculture, machine and materials, while others may have capacities related to services because they may be supporting ageing grandparents or helping parents run a shop.

Learning outcomes, in any curricular area do not come with rigid grade-specific boundaries. They are enabling guidelines for teachers to plan their content, pedagogy and assessment towards achieving specific competencies. In the case of Vocational Education, context is key to content, pedagogy and assessment. For example, a Grade 6 student will be as capable of handling an agricultural tool in a rural setup as a Grade 7 student or even more so. On the other hand, students from an urban background may not have worked with their hands in fields. Therefore, it will be a challenge to assign specific learning outcomes for each grade for each competency.

9.6.1 Curricular Goals and Competencies

9.6.1.1 Middle Stage

In the Middle Stage, there are four curricular goals for each of the forms of work. Students will learn multiple capacities, knowledge bases, and values, which are common across many vocations. Each curricular goal deals with an overarching component from these:

- CG-1 involves the acquisition of knowledge and skills in the work;
- CG-2 involves the application of the chosen form of work in the world of work;
- CG-3 involves the values inculcated while working since they are not always measurable, they need to be observed in students' practices;

- CG-4 involves the application of knowledge and skills (learned through engaging in different forms of work) in home-based tasks.

Following are the Curricular Goals and Competencies to be developed for any form of work:

CG-1 Develops basic skills and allied knowledge of work and associated materials/ procedures.	C-1.1 Identifies and uses tools for practice. C-1.2 Approaches tasks in a planned and systematic manner. C-1.3 Maintains and handles materials/equipment for the required activity.
CG-2 Understands the place and usefulness of vocational skills and vocations in the world of work.	C-2.1 Describes the contribution of vocation in the world of work. C-2.2 Applies skills and knowledge learned in the area. C-2.3 Evaluates and quantifies the associated products or materials.
CG-3 Develops essential values/ disposition while working across areas.	C-3.1 Develops the following values/disposition while engaging in work: • Attention to detail • Persistence and focus • Curiosity and creativity • Empathy and sensitivity • Collaboration and teamwork • Willingness to do physical work
CG-4 Develops basic skills and allied knowledge to run and contribute to the home.	C-4.1 Applies the acquired vocational skills and knowledge in a home setting.

9.6.1.2 Secondary Stage

In the Secondary Stage Grades 9–10, there are three curricular goals for each of the forms of work. Each curricular goal deals with an overarching component:

- CG-1 involves the use of knowledge and skills in the work;
- CG-2 involves the values inculcated while working (Since they are not always measurable, they need to be observed in students' practices);
- CG-3 involves the application of knowledge and skills in home-based tasks.

Following are the Curricular Goals and Competencies to be developed for any form of work:

CG-1 Develops in-depth basic skills and allied knowledge of work and their associated materials/ procedures.	C-1.1 Performs procedures competently through required tools/equipment. C-1.2 Differentiates between effective and non-effective practices in completing the task.

CG-2 Develops essential values while working in a specific vocation.	C-2.1 Develops the following values while engaging in work: • Attention to detail • Persistence and focus • Curiosity and creativity • Empathy and sensitivity • Collaboration and teamwork • Willingness to do physical work
CG-3 Develops basic skills and allied knowledge to run and contribute to the home.	C-3.1 Applies the acquired vocational skills and knowledge in a home setting.

Box 9.3

Mastery of the Subject

Each curricular area comes with at least one expectation of making the learner attain mastery in the work. Be it becoming proficient to read with comprehension or to be skilled at balancing a bicycle while riding it. This expected competency certainly becomes an important outcome as it then helps the learner apply learnt skills to more cognitively challenging tasks (e.g., by learning to balance the bicycle, the learner can then learn to regulate the speed of riding). This mastery is important; to quote Dewey, "It is a commonplace that the mastery of skill in the form of established habits frees the mind for a higher order of thinking."

However, attaining mastery in any work is a subjective phenomenon, as it depends on the expectation that we set for learners to accomplish, depending on the Learning Standards. Attaining mastery of something can also be visualised as climbing a stairway where, at each step, students acquire the skills to become competent to learn new skills at the next step (different levels of mastery). It is noteworthy to mention that the skills learnt alone can hardly be utilised without deepening knowledge and making appropriate judgments about how to use skills in new situations.

Thus, in the Middle Stage, mastery in the context of Vocational Education means that students can understand the different forms of work, and how each connects to the larger functioning of the world. Mastery is the attainment of the basic skills and knowledge of the vocation, and their application in day-to-day tasks or at times of need. For example, if students learn the skill of cooking, they would not need to be dependent on others to cook for them late at night when they feel hungry.

Mastery by the end of the Secondary Stage is associated with the deepening of knowledge and a higher level of proficiency. By this stage, students should be able to comprehend and create products or services with indicated quality parametres. Mastery is also in the form of engaging in collaborative and productive work of utility. Last, but not the least, the efforts should result in not just skilled people but capable and cultivated human beings.

Section 9.7
Content

The approach, principles, and methods of selecting content have commonalities across subjects, those have been discussed in Part A, Chapter 3, and 3.2 of this document. This section focusses only on what is most critical to vocational education in schools. Hence, it will be useful to read this section along with the above-mentioned the section.

Content for vocational education will be selected at two levels. At the first level, a selection will have to be made of vocations within the forms of work (Section 13.2.3.1). At the second level, a selection will have to be made related to the specific tasks and understanding students will have to engage with.

9.7.1 Principles of Selection of Vocations from Within Forms of Work

The following principles are intended to inform the selection of vocations from the three forms of work, that is, the vocations to be offered by the school:

a. **As locally as relevant as far as possible:** Students will better connect to the locally contextualised work and will be able to utilise the acquired skills and knowledge in their daily lives. Resource persons and sites for practice will also be easily available. They will have greater chances of local employment. For example, in a rural context, for the different forms of work: (i) Agriculture and livestock rearing; (ii) Handling and repair of farm machinery, driving heavy vehicles for transport; and (iii) Catering to primary health needs of community members can be offered. In an urban setup, the different forms of work: (i) Floriculture, and nursery management; (ii) Handicraft work, welding, casting and (iii) Hospitality and tourism can be offered.

b. **Address and respond to students' aspirations:** Choices must also enable exposure to vocations that may not be practised locally but are aspirational, because of potentially attractive employment. For example, students in rural areas may not have hi-tech machining employment opportunities locally, but this may be aspirational. Similarly for employment opportunities in the financial services sector. The vocations selected should balance between giving exposure to different forms of work, the school's capacity to teach, the local context and aspirations.

c. **Levels must be aligned to the expectations outlined in the NSQF:** Alignment to the NSQF levels will allow them to pursue further engagement with the vocation of their choice later in life while offering recognition for employment. To enable this, content chosen in Grades 9–10 (NSQF levels 1 and 2) should progress into advanced offerings in Grades 11–12 (NSQF levels 3 and 4). For example, a student selecting livestock rearing in the Middle and Secondary Stages must be able to pursue the vocation of livestock management. Similarly, a student studying beauty treatment should be able to progress into specialisations in makeup and hairstyling.

Box 9.4

NSQF

The National Skills and Qualifications Framework (NSQF), notified on 27 December 2013, is a competency-based, outcome-focussed, framework, composed of ten levels each representing different levels of complexity, knowledge and autonomy, required to demonstrate competence commensurate for that level. Level one has the lowest and the level ten the highest complexity.

These levels, graded from one to ten, are defined in terms of learning outcomes that students must possess regardless of whether they are attained through formal, non-formal or informal learning. The first two levels largely expect students to be able to use materials and tools in a limited context, perform routine tasks under instruction and close supervision, become familiar with common terminology related to the vocation and workplace environments, and be able to differentiate between good and bad quality. The next two levels

largely expect students to be able to work in jobs of their choice, within familiar, predictable, and routine situations, acquire the vocabulary of the chosen vocation, deepen their understanding of workplace environments, and develop the ability to take responsibility for their own work and learning.

The alignment between the NSQF and the curriculum will enable students to be able to take up employment after school completion or join a higher vocational programme.

Students who are already involved in some sort of work at home (e.g., farming and food preservation) or who have pursued a special vocational interest will be able to obtain higher certification as a result of Recognition of Prior Learning (RPL). RPL has been formalised as part of the Pradhan Mantri Kaushal Vikas Yojana, a flagship scheme of the Ministry of Skill Development and Entrepreneurship, implemented by the National Skill Development Corporation, for workers aged 18–45 years. It enables the recognition of formal, non-formal or informal learning based on the learning outcomes defined in the NSQF. If students so wish, RPL will also enable them to move into a vocational course at a time of their choosing, including after gaining work experience post-school completion.

9.7.2 Principles of Selection of Content Within Vocations

The following principles are intended to inform content selection at the levels of specific tasks and understanding that students will have to engage with:

a. **Content must be age-appropriate:** This will ensure that students acquire the required competencies as per their developmental stage and learning in other curricular areas. For example, a student in the early Middle Stage cannot start working with building circuit boards before working with simple circuits.

b. **Content should be interesting and meaningful:** Content selected should allow for varied activities, with scope to critically observe processes, and offer challenges within the capability of students. For example, while students must follow the standard stepwise processes involved in farming, they must be able to enjoy and appreciate the process of a plant growing, observe significant changes that happen to a plant, the natural and man-made factors affecting the growth of a plant. They must have a sense of achievement once the plant is ready for use.

c. **Content must instil respect for the dignity of labour:** No particular work can be considered as a 'high level' work if every form of work is looked upon with equal respect and honour. The chosen content should also deal with the notions and beliefs associated with them, such that they give students a chance to see the importance of all kinds of labour. For example, they must realise the critical role each individual plays in any workplace from the manager of a restaurant to a chef to the person who cleans the kitchen.

d. **Content must enable exposure to different aspects of vocations:** Students must get comprehensive exposure to different kinds of work. For example, sometimes students do not need any exposure since they are already working (either with family members or through relatives and contacts) but need specific capacities in that work to be developed. For example, a student might know the use of digital media, but should also develop the capacity of gathering relevant information to improve processes. Another example is a student who is working on a family farm; this student must understand the process through which produce from the farm reaches the market.

e. **Content must enable exposure to the ecosystem within which the vocation is placed:** Each vocation operates within its own ecosystem. This ecosystem is local and also extends beyond a small geography. It also includes intangibles, such as, relationships with clients, informal and formal codes of conduct, technical language, and opportunities for improvement. For example, a tailor operates in an ecosystem comprising local suppliers of materials, technicians to help with machines, helpers to sew hems and clients. The larger ecosystem comprises farmers producing cotton, weavers, cloth mills, transportation, producers of design catalogues, websites offering technical advice and professional associations. Students must learn about both the local and larger ecosystems.

f. **Content must encourage students to develop and pursue specific interests:** Students should be encouraged to not just learn the skills of any work, but to develop a curiosity to know how the work takes place in different contexts, how tools and machines work, what will happen in the absence of these tools and machines. Such exposure helps students select from the forms of work available to them. Once the preferred interest of vocation is chosen by the students, the selected content should educate them on the gainful employment opportunities to contribute to the economy of the country as well. For example, students choosing to be in automotive services should be aware of the place of this service in the world of work, such as, in local shops, transport businesses and vehicle service centres.

g. **Content must provide hands-on exposure:** The essence of Vocational Education lies in the work being done practically. The relevant content, when it exposes students to multiple modes of hands-on tasks, enables them to attain mastery. For example, a student with no or minimal hands-on exposure to the work of carpentry will not be able to evaluate the quality of a finished product.

9.7.3 Illustrative Content, Materials and Tools

9.7.3.1 Content for Different Forms of Work Across Stages

The content indicated for each Form of Work in the table below is illustrative. In the Middle Stage, the focus is on specific skills and practices and that progresses into secondary stage with a focus on specific vocations.

Table 9.1i

Progression of Illustrative Content in different Forms of Work across the Middle and Secondary Stage		
Forms of work	**Middle**	**Secondary (Vocations)**
Life Forms	• Soil Management and basic earthwork • Different Agricultural/Horticultural practices	• Nature-friendly farming • Nature Conservation/ Restoration • Nursery Management • Livestock rearing • Financial Services • Grooming and Personal Care Industry

Machine and Materials	• Handicraft work using materials, such as, paper, wood, clay, fabric, paints, inks • Using basic machines including modern machines	• Tailoring • Carpentry • Welding and casting • Pottery • Local art • Robotic machining • Electronic Equipment Repair
Human Services	• Aptitude to communicate well and work in teams • Basics of Healthcare and Hospitality • Basic ICT and Technological skills	• Healthcare • Electrical work • Transport services • Sales and Marketing • Hospitality and Tourism • Intermediate ICT and Technological skills

9.7.3.2 Materials and Tools

Illustrative materials and tools can be used for different forms of work. Some are easily available in the local community, while some are hard to reach, thus requiring external support. The table below indicates materials and tools segregated as per the forms of work.

Table 9.1ii

Illustrative Materials and Tools Used in Different Forms of Work		
Forms of work	**Materials**	**Tools**
Life Forms	• **Naturally-sourced materials:** Soil, manure, water, fodder, plants • **Other materials:** Chemical fertilisers, pesticides	• Axe, shovel, hand cultivator, spade, tag applicators, watering troughs, feeding troughs
Machines and Materials	• **Tailoring:** Thread, needle, fabric, scissors, cutters, marker chalk, tape, paper • **Carpentry:** Wood, nails, screws, glue, sand sealer, plywood	• **Tailoring:** Sewing and stitching machine • **Carpentry:** Saws, grinders and chisels, hand planer, grinding machine, moulders
Human Services	• **Healthcare:** Medical instruments, scrubs, medicine list, health record • **Hospitality tourism:** Hotels, food, beverages, vehicles • **Sale marketing:** Brochures, websites, catalogues, videos • **Electrical work:** Electrical wire, cables, switches, connectors • **Automotive service:** Steel, aluminium, copper fibres, rubber • **ICT:** Hardware materials, such as, motherboard, CPU, mouse • Software materials, such as, electronic storage media, Informative tools, such as, the internet, and drive, constructive tool such as MS Word, PowerPoint	• The intrinsic tool to interact, empathise, show humility, serve, repair, and follow procedures to utilise the materials effectively.

9.7.3.3 Illustrative Projects in Middle Stage

The content in the Middle Stage will be operationalised in schools in the form of projects taken from each form of work. In each grade, one project from each form of work will be undertaken by students, totalling 3 projects in a year. Thus, by the end of the Middle Stage, students will be able to work on nine projects.

The selected projects must be contextual, with relevance to the world of work, students' lives, and their age-appropriate learning. The teacher can decide the execution strategy of these projects based on the geography, availability of additional resources, budget, and number of students. The crucial element which needs to be kept in mind is to provide as much real-life experience of the vocation as possible in order to achieve the Learning Standards.

Some vocational projects will also align with the concepts of science and social science subjects, so the respective teachers can also add theoretical and practical inputs to enrich the learning experience of students. These projects should be such that they give students creative and engaging opportunities to work on them beyond the dedicated hours of vocational education at schools. For example, if the project of tailoring enables the student to stitch independently, they will also be able to apply that skill in home-based tasks and support their family.

Following is the illustrative list of projects with the brief descriptions under each form of the work:

Table 9.1iii

Illustrative Project List for the Middle Stage	
Projects (Life Forms)	**Description**
Kitchen Garden	The kitchen garden project will engage students in working with soil and agricultural equipment to produce simple fruits and vegetables on the school ground or available premises near the school.
DIY: Biogas plant Model	The project of creating a biogas plant model will engage students in learning a new source of energy using biological material and how it is utilised in the daily lives of people living, preferably, in rural areas. The Science teacher can be involved in this project to bring out the chemistry in the conversion of waste matter into combustible gas.
Urban/Rural farming	By growing at a larger scale than a kitchen garden, students will learn the basics of soil preparation, sowing, irrigation, protection of crops from weeds and properly storing the harvested crop.
Mobile Nursery	The Project Mobile Nursery will enable students to plant and manage the growth of different plants. They will learn to grow plants through different methods (cutting, grafting) and using different plant parts (vegetative propagation).
Care for Animals	Students will systematically learn to take care of a few animals in the vicinity, e.g., dogs, cows, sheep, goat
Projects (Machine Materials)	**Description**
Solar Panel Model	The project will engage students in learning about this renewable source of energy. The components of the project will include building the basic concepts related to solar energy, a demonstration of constructing the model by the teacher, followed by assembling the model and observing how it functions with students.

Stitch and sew	The project will enable the students to learn the basic skills of stitching, creating patterns on fabrics, shaping fabrics, and eventually designing a basic garment of their choice.
Carve the wood	The woodcarving project will engage students in creating aesthetic wood crafts. The components of the project will include an introduction to basic woodcarving tools, drawing or planning an object to carve on wood, rough carving through chisels, detailed carving and polishing of the product.
Let's (dis)assemble!	The disassemble project will include the process of assembling, disassembling and repairing a basic vehicle, such as, the bicycle. The components of the project will involve a basic introduction to assembling and repairing tools, repair of tyre punctures, replacing brakes and assembling wheels.
Potter's clay	The project on pottery making will expose students to the rich craft work of the country. The students will learn to work with different kinds of clay, and practise making objects of varying complexity, depending on the level of skill they have learnt.
Project (Human Services)	**Description**
School's salon	The project of school salon will enable the students to develop the best practices in providing beauty wellness through various modes.
First aid	The first aid project will enable students to acquire basic knowledge of simple over-the-counter medicines and their application in providing the first form of aid. Students will learn to handle the medicines and relevant materials diligently while taking care of the injured or sick patient.
Food Fair	The project will be the school's annual fair with students taking the lead in serving food from different localities and different cuisines. This project will enable the students to learn the operationalisation processes of food from the basics of cooking to presenting and serving.
School's MIS	The project will enable the students to develop several computer skills to be able to form basic management information system of the school. The components of the project will include the basics of learning office productivity tools, creating information-based MIS on student and teacher details and the budgeting report on Mid-Day Meals.
Mehandi Art	The *'Mehandi Art'* project will engage students in developing the basic concepts of how *Mehandi* is prepared and used for multiple purposes. It will allow students to explore *Mehandi* businesses running in their neighbourhood and understand the different ways people use *Mehandi* in shops and homes. The components of the project will include making a *Mehandi* mix and putting it in cones, applying *Mehandi* patterns on hands and learning ways to take care post the application.
The Library Project	The library project will involve the management of the school library by students under guided support. Students will be able to participate in organising and managing the library books and space through effective practices.
School Shop	This project will enable the students to learn the management skills of running a shop on the school premises. The shop can consist of materials (stationary, snacks) which are of relevant utility to the school or which promote the local craft (artworks) made by students. They will be able to learn to manage expenses, coordinate running the shop and provide effective customer service.

9.7.3.4 Illustrative Course Design in Secondary Stage: Grades 9–10

In the Secondary Stage, there will be 6 core vocations covering two from each form of work. The illustrative core vocations include agriculture, plumbing, and beauty and

wellness in Grade 9, and gardening, carpentry, and nursing and care in Grade 10. These core vocations represent all forms of work.

The design of the course will be as below:

Table 9.1iv

Courses in the Secondary Stage		
Form of Work	**Grade 9**	**Grade 10**
Working with Life forms	**Agriculture** a. Familiarity with and operating basic agricultural equipment b. Seed bed preparation, seed selection, proper spacing, row cropping, intercropping c. Fertilisation and soil management d. Pest and disease identification and control	**Gardening** a. Gardening tools: Familiarity with, usage, organising and maintenance b. Techniques of plant propagation c. Dealing with weeds d. Dealing with pests
Working with Machine and Materials	**Plumbing** a. Measure, cut, thread, or bend pipe to required angle, using hand or other tools b. Installation of household equipment such as geyser, RO c. Identify minor plumbing issues and resolution	**Carpentry** a. Measuring, cutting and sawing using basic hand tools, such as, planes, chisels, sandpaper, mallets b. Joining wooden pieces, driving nails c. Basics of painting and finishing restoration of old wooden items
Human Services	**Beauty and wellness** a. Introduction to beauty and wellness b. Manicure, pedicure, and *Mehandi* services c. Hair care d. Customer service orientation	**Nursing and care** a. Basic concept of health and nursing b. Patient care and counselling c. Measuring vital signs d. Service orientation

Section 9.8
Pedagogy

The approach, principles and methods of pedagogy and assessment have commonalities across subjects, those have been discussed in Part A, Chapter 3, 3.3 and 3.4 of this document. This section focusses only on what is most critical to vocational education in schools. Hence, it will be useful to read this section along with the above-mentioned section.

Knowledge, capacities and values related to vocational education are acquired through consistent practice of doing and exposure to on-site work. This, work must result in productive outcomes, and students must be able to experience actual workplaces and meet people in these workplaces. They must have opportunities to discuss their experiences and reflect on their own learning.

9.8.1 Pedagogical Principles

9.8.1.1 Balance of Doing and Thinking

Productive work without applying intelligence risks becoming mechanical and only understanding theory in vocational educational does not make any sense at all. Thus, the teacher must plan a judicious mix of theory and practice.

In the Middle Stage, the focus will be on not just the capacities of the selected vocation, but also the broader knowledge of the domain (e.g., if students are preparing to work as nursing assistants, then the domain will be healthcare) and its place in the world of work.

In the Secondary Stage, the proportion spent on the practical application must be greater. Students must also build an in-depth understanding of the place of the vocation in the world. At this stage, apprenticeships can be offered to students, under the guidance of resource teachers and master instructors in nearby facilities where the chosen work is practised.

9.8.1.2 Workshops and Project-based Learning

Having short duration (40 minutes) classes with individual plans for instruction for each class is not very appropriate for developing capacities for productive work. These require a longer duration of engagement. Thus, workshops and long-running projects are more suitable for vocational education.

Workshops are appropriate for developing specific skills and these workshops can be planned on 'bagless' Saturdays. For example, cleaning, cutting and cooking for the entire school can be done in a workshop mode. Similarly, disassembling and assembling a motor pump can be done in a workshop. In workshops, usually the focus can be on individual work.

Projects are of longer duration and can run over multiple weeks or even months. Working on a kitchen garden would involve preparing the land, planting seeds, periodic and consistent care and attention to the plants, including weeding and pest-control and harvesting. Projects are usually better done as groups and students get to learn to work in teams.

Teacher's Voice 9.1

A Day in the Woodwork Shed

It was a regular morning at the woodwork shed. Six girls and four boys, 11 year-olds, stood around scanning all the tools and pieces of wood stacked in the room. Finally, they laid their eyes on the small square pieces of recycled teak wood, chisels, and mallets placed before them. These were arranged at a two-plus feet distance around the large central table and on two other smaller tables in the corners of the shed.

After enthusiastically welcoming them to their first woodwork class, we started by establishing basic rules of safety for working in the woodshed. After each one of them came up with a rule of their own, including not throwing instruments at each other, I declared that there are five basic rules in the woodshed:

1. No running around in the shed.
2. No 'playing' with the tools, but observe them and learn to use them.

3. Initially, all students will work in the shed only when I am around.
4. All students must help with setting up for and putting away materials after every class.
5. Keep footwear on and exercise alertness when moving around in the shed.
6. And most importantly, observe closely, listen carefully, and follow instructions obediently.

Muffled giggles erupted reminding me that those were six rules! I grinned sheepishly.

I started by demonstrating the use of tools with simple instructions. Typically, the most basic tools for the first few classes in woodcarving are flat chisels without handles, semi-curved chisels and wooden mallets. I also showed them how to use the clamp to hold a block of wood down to the table. Students began touching the wood surface, feeling and smelling it. I shared that it was Burmese teak that was once used as part of a village house around the school and that recycled wood cut to small squares at the local sawmill is an excellent carving material.

I gave them the specific plan for the day. They were to carve out a small square in the wood clamped before them. Students first drew a square on the wood with pencils and rulers. They then practised the action of holding a chisel and a mallet. They picked up the flat chisel with their non-dominant hand and the mallet with their dominant hand. I demonstrated the two ways of holding the flat chisel, calling the first one a 'full fist hold' and the second hold as a 'feather hold.' I gave them five minutes to experiment with the holds. They were quite engrossed.

They began using the wooden mallet and struck gently on the head of the chisel. I suggested that they observe the amount of force they were applying to cut into the wood. Also, I urged them to explore the angles at which they will hold the chisel against the wood. I showed them that a ninety-degree angle will push the chisel deeper than a less-than-ninety-degree angle. A forty-five-degree angle of the chisel to the wood will drive the chisel diagonally and a very low degree, say a ten-degree angle, will do something different which I asked them to find out for themselves. They all worked in silence, rather attentively, experimenting with the angles and the striking.

The class ended with students having made moderate progress in carving out small squares in their blocks of wood. As I watched them putting away their materials, feeling very pleased, a student made and quick dash towards me with a semi-curved chisel displeased that I forgot to show them how to use that tool.

9.8.1.3 Learning in Work Contexts

The pedagogy of vocational education will require different sites to ensure opportunities to learn in real-life work contexts. While this is not always possible, pedagogical approaches in the classroom must also align with real life. Starting with exposure visits, opportunities for internships and apprenticeships provide adequate opportunities for developing vocational capacities:

a. **Exposure Visits:** Exposure visits to nearby workplaces to observe productive work and interaction with people involved in productive work gives an experiential understanding of the work involved. For example, a visit to a hospital to understand the roles and responsibilities of nurses and healthcare workers or to nearby factories and cottage industries can be organised with specific objectives in mind. Students must get an opportunity to engage with persons in these workplaces and teachers

could organise follow-up visits as well inviting people from these workplaces to give guest lectures and demonstrations in the school.

b. Internships: Internships are short-duration placements in a workplace to learn about a specific job role. NEP 2020 emphasises the importance of an internship, '

"All students will participate in a 10-day bagless period during Grades 6–8 where they intern with local vocational experts, such as, carpenters, gardeners, potters and artists. Similar internship opportunities to learn vocational subjects may be made available to students throughout Grades 6–12, including holiday periods." [NEP 2020, 4.26]

An internship enables students to experience a workplace environment that cannot be simulated in a classroom. They can observe and put forth questions to adults who are working at different jobs. This 'real' experience provides students to explore and decide whether they would like to take up the related vocation for further study. It also helps them identify the values and dispositions relevant in the workplace.

Students must have opportunities to engage with work that is aligned with their current capacities. A comprehensive orientation of both students and the individuals at the workplace will be required, with regular follow-up discussions. Members of the workplace will have to be sensitised to ensure the safety of students: physical and emotional.

Specific examples of workplaces where this internship can take place are:

- **Working with Life Forms:** poultry, dairy farms, pest control units and nursery;
- **Working with Machines and Materials:** local mechanic workshops, carpentry workplaces and tailoring units;
- **Working in Human Services:** hotels, restaurants, hospitals, gyms, old age homes and beauty salons.

Assessment could be in the form of a reflective note or presentation at the end of the internship. Students could also do a short project during the duration of the internship.

c. Apprenticeships: In the Secondary Stage, students will need to be given advanced on-site exposure in industrial or agricultural spaces to broadly understand the functioning of vocations in the world of work. Schools must develop linkages with local industries, farms, service centres, cooperatives, relevant NGOs, state transport corporations, cottage industries, printing presses, call centres, software design companies, mobile operating companies, law companies, local water or electricity boards to enable students to spend part of their time gaining work or practical experience at these facilities as apprentices while they are still in school.

Apprenticeship involves on-site work experience over a long-term period to gain experiential skills and knowledge under the supervision of a mentor. Apprenticeship in the Secondary Stage will enable students to gain capacities to enter the workplace after completion of schooling or help them decide whether they would like to pursue a specific vocation.

An apprenticeship enables hands-on practice at on-site locations. Students develop an understanding of the culture, values and dispositions, vocabulary of the workplace and factors that affect functioning. They can develop a portfolio of their work to demonstrate their readiness for gainful employment.

Mentors will be experienced workers, with the ability to engage with students. They will need to undergo a short course offered at the DIET or BITE that will prepare them to be effective mentors.

A detailed design for the apprenticeship will have to be put in place. Modes could include an apprenticeship of about a month and a half during the summer vacation. Alternatively, students could spend 2 hours after school hours a few days a week.

Assessment could be through a demonstration of work by students, or a portfolio maintained during the apprenticeship. This should also include observations of students by the mentor.

Box 9.5

Since, the educational importance of 'apprenticeship' in vocational education is enormous. It is important to use this as an integral part of the pedagogical approach. Thus, 'apprenticeship' integrated within school curricula must be firmly distinguished from other (equally useful) forms of 'apprenticeship,' which happen after students graduate from schools.

It is therefore important to note that in this NCF 'apprenticeship' is used as an essential pedagogical approach to gain 'know-how' knowledge, while the students are in school. This must not be seen from the lens of the Apprentice Act 1961.

9.8.1.4 Inclusion

One of the fundamental principles mentioned in NEP 2020 is equity and inclusion to ensure that all students can thrive in the education system. In vocational education, all students should be given equal access in terms of working with tools and resources.

Teachers must ensure no discrimination takes place towards students with having disabilities or students from specific genders or socio-economic backgrounds, not only in the school premise but also at external workplaces by other students, external trainers or associated stakeholders.

Schools must coordinate with resource centres having special educators to meet the rehabilitation educational needs of learners with severe or multiple disabilities. An understanding of how to teach students with specific disabilities (including learning disabilities) must be an integral part of all teacher education programmes.

Rigid gender roles still exist in society. Awareness must be built among stakeholders that the capacity for doing any work is independent of gender. Training modules for teachers, as well as, resource persons or master instructors will need to address this aspect. For example, a boy is capable of working as a nurse, and a girl is capable of working as a welder.

Assistive devices and appropriate technology-based tools must be made available to help students with disabilities integrate more easily into classrooms and engage with peers, in addition to textbooks and manuals in Braille or audio-visual formats.

Collaboration with specialised agencies, such as, the National Association for the Blind (NAB), National Institute for Visually Handicapped (NIVH) and other institutions to design and customise Vocational Education courses across stages of school education can be ensured by NCERT. A similar approach can be done for placing students for employment.

9.8.1.5 Safety

Safety considerations related to vocational education involve both the physical and emotional safety of students. Physical safety relates to the use of equipment that has the potential to harm students. Emotional safety relates to protecting them from exposure to experiences that may distress them, as well as, sensitising persons who will interact with them within and outside the school.

Forms of work involving the use of materials and complex tools need to be first instructed and demonstrated by the teacher. The teacher must indicate the necessary precautionary steps. Correctly holding the tools (e.g., while using a shovel, needle, or cutters) while performing a task can prevent injury and help create efficient products. Students should also be encouraged to take care of the tools and materials and not use them for fun or to tease fellow students. Teachers will have to be very observant of students' practices with the tools and materials to guide them appropriately.

Exposure visits, internships and apprenticeships will have to be carefully planned in consultation with parents or guardians to ensure safe transit between school, home, and workplace. Preferably, a teacher should accompany students in the Middle Stage when they go for an internship; if not possible, then a volunteer from the community can accompany the students. It is even possible for secondary stage students to be apprentices at the same place to assist middle school students.

All resource persons or master or instructors, as well as, other employees must be sensitised and be aware of legal provisions related to the safety of students. Vocational education coordinators must be in regular contact with them to discuss any challenges they may be facing related to students. DIETs or BITEs must also develop follow-up modules for resource persons or master or instructors based on an analysis of their needs.

Section 9.9
Assessment

The approach, principles and methods of assessment have a lot in common across subjects. Thus, to avoid repetition, these matters are not being repeated in this chapter. Please refer to Part A, Chapter 3, 3.4 for Assessment. In this section, only a few examples that are illustrative of good assessment practices in vocational education are described based on the principles and methods in the above-mentioned chapters. Some key principles of assessment in Vocational Education are:

a. Students must be assessed on the capacities and values and dispositions related to the form of work they have engaged with, such as, systematic organisation of tasks, knowledge of the use of safety protocols, working in groups, attention to details, as well as, persistence and focus, curiosity and creativity, empathy and sensitivity collaboration and teamwork.

b. Students must be assessed primarily through demonstrated performance. Written tests may be included to assess capacities, such as, conceptualisation and planning. Portfolios maintained by students will be the basis of an oral test (viva voce). A consolidation of teacher observations can also be used, particularly for the assessment of values and dispositions.

c. Students may also be assessed on their experience, the challenges they faced, the efforts to overcome the challenges, and their own assessment of the final product that they created. This can be done through written self-reports and reflection and viva voce.

A few teacher voices illustrate assessment in vocational education below:

Teacher's Voice 9.1i

Assessing through Multiple Choice Questions

Objective: To assess students' comprehension on the processes required to complete the task.

I teach Grade 7 and, this year, my students have done the following projects: a kitchen garden, a solar cooker model and a library project. I wanted to assess how well they understood the process of planning. I used an MCQ related to planning in a different situation. I could have directly asked them to list the steps for any specific project, but I thought it would be better to assess their understanding of the general process.

Question: As you are aware, planning is a very important part of doing any work. Imagine you are working with a potter, and she has asked you to make a simple pot. What is the sequence of steps that you will follow?

a. (i) Selection of clay; (ii) Designing the pot; (iii) Preparing the clay; (iv) Preparing the wheel; (v) Creating the pot; (vi) Sun drying or baking in a kiln

b. (i) Selection of clay; (ii) Preparing the clay; (iii) Designing the pot; (iv) Preparing the wheel; (v) Creating the pot; (vi) Sun drying or baking in a kiln

c. (i) Designing the pot; (ii) Selection of clay; (iii) Preparing the clay; (iv) Preparing the wheel; (v) Creating the pot; (vi) Sun drying or baking in a kiln

d. (i) Preparing the wheel; (ii) Selection of clay; (iii) Preparing the clay; (iv) Designing the pot; (v) Creating the pot; (vi) Sun drying or baking in a kiln

Marking scheme: a-0; b-0; c-4; d-0

Teacher's Voice 9.1ii

Assessing through Viva-Voce

Objective: To check my students' understanding of the task through their reflections

I teach Grade 8. I plan to conduct a viva-voce based on the portfolio students have maintained throughout the year. I plan to do this instead of simply assessing the portfolio since I will be able to assess their learning more comprehensively. The portfolio consists of any products they have made during the year, or photographs and reflections. This year, the students did projects on basic bicycle repair, making a biogas plant model, and sewing garments for children. The duration of the viva voce will be 10 minutes.

I asked the students to pick any of the projects that they liked best and asked them a few questions about it:

1. Why did you choose this project for discussion? Why do you think it is important?
2. How did you prepare to do the project? How did you plan? Where did you get materials?
3. Did you make any change to your plan? If yes, what were the changes, and why did you make them? If not, is there any change you could have made?
4. What do you think of the quality of your work?
5. If you could do it again, what would you improve?

Marking Scheme

Criteria	Descriptors and points
Reason for choosing specific project work	Is able to give reason(s) for choice – 1 point Is able to give reason(s) and justification – 2 points Is able to give reasons, justify them and connect it to the world of work and home life – 3 points
Planning	Preparation is limited to getting materials together – 1 point Preparation includes the above and sequencing of tasks – 2 points Preparation includes the above and design of end product – 3 points
Execution	Did not make any changes in plan – 1 point Explains change(s) in plan but cannot state reason(s) – 2 points Is able to state challenge(s) faced and reasons for change in plan – 3 points OR Did not make any change in plan – 1 point Explains why there was no change(s) in plan– 2 points Is able to explain what could have been changed and to what effect – 3 points
Self-assessment	Simply states whether likes the work done or not – 1 point Gives reasons for self-assessment based on the end product – 2 points Gives reasons for self-assessment based on both the process and the end product – 3 points
Learning from project	Does not specify which improvement is necessary – 1 point States what improvements can be made in the end product – 2 points States what improvements can be made in the process and end product – 3 points

Teacher's Voice 9.1iii

Assessing through Demonstration of Competencies

Objective: To assess the efficiency of students in performing the task

I teach Grade 9. I plan to assess students on Tie-and-Dye. The duration of the examination will be of 3 hours, which should be sufficient for them to demonstrate the competencies required to tie and dye using a single colour. That is sufficient for me to assess without waiting for the final product. I prefer this mode of assessment to a simple question in a written test since I can observe them as they work. I have chosen to assess only the process they follow and not the product they create.

Instructions: Your task today is to tie and dye using a single colour. There are T-shirts of different colours, as well as, dyes available. You can use the worktables and the sink in the workshop to do your work. Remember, we will not be able to complete the process, once you have done the first rinse, you can show me your T-shirt, and then take it home to complete. You have 3 hours.

Rubric for Assessment

Criteria	Grade C	Grade B	Grade A
Design	Randomly ties the T-shirt and applies the dye	Uses a design for Tie-and-Dye.	Uses a design that makes the best use of the colours of the T-shirt and the dye.
Process	Process is unplanned	Process is planned but time is not used effectively.	Carries out process in an organised manner and makes optimal use of time .
Interaction with peers	Is in a hurry to get materials and use the equipment	Chooses materials with consideration of others and waits for their turn to use the equipment.	Coordinates with others for optimising the selection of materials and use of equipment.

Section 9.10
Enabling Conditions

9.10.1 Teachers and Master Instructors or Resource Persons

The current B.Ed. and D.Ed. colleges do not offer specific courses for teaching vocational education. Therefore, till such time these programmes are available, existing teachers will have to take vocational education in the Middle Stage, with support from resource persons, also referred to as master instructors in KRCR 2019. However, the Secondary Stage will demand specialisation in specific vocations.

KRCR 2019 proposes that:

Special shorter local teacher education programmes will also be available at BITEs, DIETs or at school complexes themselves for eminent local persons who can be hired to teach at schools or school complexes as 'master instructors', for the purpose of promoting local professions, knowledge and skills, e.g., local art, music, agriculture, business, sports, carpentry and other vocational crafts [Para 5.25].

Part C

Therefore, guidelines for preparing these resource persons or master instructors will have to be developed by SCERTs, and appropriate modules developed by DIETs or BITEs. The content of these short-term training courses must orient them not only to school pedagogy but the need for sensitivity and inclusion while interacting with students; they must also be aware of legal provisions related to school education.

It follows that the first step would be to create a pool of 'master instructors' locally on priority. These 'master instructors' have an important role to play, since they will supplement the expertise of the regular teachers. These master instructors may be artisans (rural and urban), health practitioners, mechanics, technicians, farmers, folk artists, local entrepreneurs, persons involved in poultry farming or fishing, persons retired from the defence services, IT professionals, and beauticians. They can be brought in as guest faculty and can either impart knowledge of both theory and practice in their respective vocations or provide only practical training. In cases where specialised practical training is being provided to students outside schools, external instructors can also be brought in to teach the theoretical aspects along with mentors at the workplace.

Student internships and apprenticeships must take place in the workplace these resource persons or master instructors are associated with. Schools must assist these master instructors to become comfortable in an academic environment, to handle students, and to comply with broader definitions of curricular and assessment frameworks in their work, through the short-term training courses provided at the DIETs or BITEs or the school or school complex itself.

9.10.2 Conducive Space and Resources

The support of the community can also be taken to borrow materials and tools for use in schools. For example, agricultural or nursery tools can be taken from the local farmers or nurseries for a brief period to grow plants on the school grounds.

Relevant exposure to machines and equipment will also be required for students to apply the skills and knowledge acquired. Collaboration with the local shops and industries (e.g., art galleries, carpentry and automotive shops), nearby farms and nurseries, hospitals, and tours and travels businesses (e.g., healthcare, tourism and hospitality, automotive service) will help provide necessary exposure and learning to understand the relevance of the vocation in the world of work.

A Skill Lab can be set up in schools to provide a 'real work' environment for students to work at. These skill labs can also be accessible for nearby schools to utilise. By channelling the investment of governments and CSRs, conducive spaces can be formed, even in remote locations.

Chapter 10

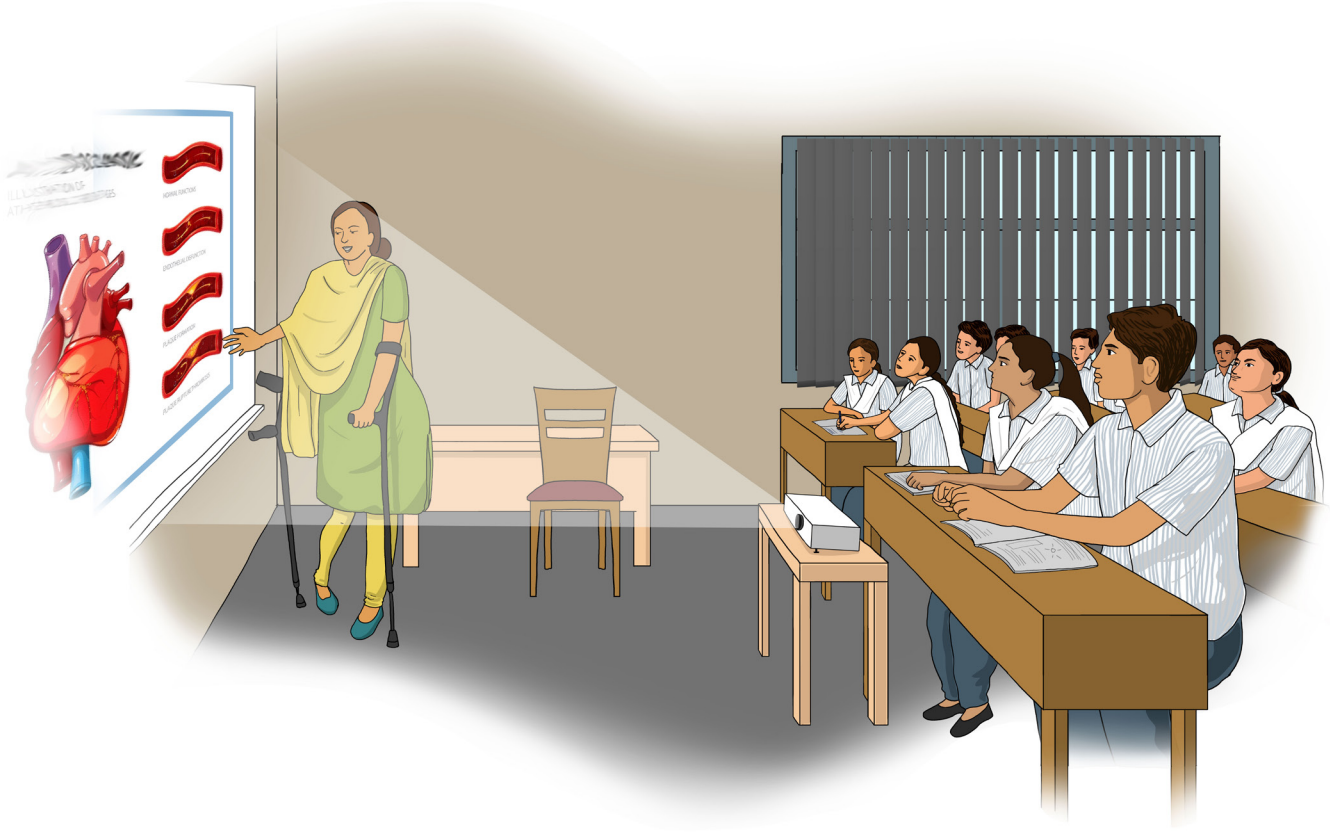
Subjects in Grades 11 and 12

The design of the Secondary Stage including Grades 11 and 12 is detailed in Part A, Chapter 2. This chapter details the design of the subjects that students will study in Grades 11 and 12.

As described in Part A, Chapter 2, in Grades 11 and 12, students will have flexibility and choice for the subjects that they want to study. They would choose from the subjects on offer from the schools. To truly enrich the education in these grades, schools should offer a wide range of subjects. As this NCF starts getting implemented, due to practical reasons, the schools may start with a few additions to their subject list. However, in the medium term and long term, this should cover the entire range of curricular areas and disciplines within them.

This chapter has only an illustrative set of subjects for Grades 11 and 12. The intent of this chapter is to lay out the principles by which the subjects and the content therein would be designed. While the requirements from students and schools in Grades 11 and 12 will ensure a breadth of study providing multidisciplinary exposure, the study of each subject must also provide depth of study. The approach and the principles described below intend to provide depth of study in each of the subjects taken up.

As with all such situations in curricular design, depth of study will not come from loading an excessive load of content on to the student. The content must be 'just enough' and appropriate to give an understanding of the most important conceptual structures



and paradigms in the subject to the key questions in the subject and the nuances of methods of enquiry. The expectation must be that having studied the subject in Grades 11 and 12, students should be able to pursue it further, independently or in a higher education institution.

The chapter describes what can be the 'generic curricular goal' for the subjects in Grades 11 and 12. The 'actual subject goals' and curriculum must respond to these generic curricular goals with specific matters that are relevant.

Generic curricular goals for subjects in Grades 11 and 12: Students develop an understanding of the subject, including its key conceptual structures, paradigms, range of questions, most contemporary issues and subfields of study, and methods of inquiry at a level of depth that enables them to pursue the study of the subject independently or in higher education.

The rest of this chapter has taken up some subjects as illustrations. Each illustration has the principles for design for Grades 11 and 12 and illustrative content areas which could be spread over these two grades. These content areas together make for adequate content for grades 11 and 12 to achieve depth. Other content areas may also be chosen, but they must be adequately comprehensive as these areas are together. It must be noted that, as with the list of subjects here, even the content areas within each subject are illustrative they are intended to convey a sense of what the subject design may look like for these grades.

Section 10.1
Social Science

The Social Science and Humanities Curricular Area will, illustratively, offer history, geography, political science, psychology, psychology and mental health, economics, development economics, sociology, anthropology, archaeology, and philosophy.

10.1.1 Philosophy

This is an illustration for Philosophy.

10.1.1.1 Principles for Designing Courses in Philosophy

The aim of teaching philosophy in Grades 11 and 12 is to create independent thinkers, rooted in the local context, but with the lifelong capacity to apply abstract ideas to a range of different contexts through the acquisition of necessary tools and skills.

The courses for Philosophy must be designed keeping the following in mind:

a. Students will understand and appreciate the rich traditions of Indian philosophical thought.

b. They will be able to explore contemporary issues in light of classical Indian philosophy.

c. They will understand the synthesis of ancient Indian and later Western ideas from the view of 20th century Indian thinkers.

d. They will develop an ethos that will enable them to become better citizens.

The study of this discipline in Grades 11 and 12 must take a comparative approach, rooted in Indian thought and the Indian context, but also encouraging dialogue between different traditions and time periods. This approach will allow students to see how

ancient ideas can shed light on current problems. They will also be able to see how solutions from one context can address problems from another context. Such an approach requires not only thinking critically, but thinking creatively, imaginatively, and innovatively.

10.1.1.2 Illustrative Content Areas

Given below are illustrative content areas for philosophy in Grades 11 and 12:

Content Area 1: Reasoning

The focus will be on different kinds of reasoning, both formal and informal, drawing from the rich tradition of Indian logic, using ideas from texts, such as, the *Vaisesika-sutra*, *Varsaganya's Sasti-tantra*, and *Aksapada's Nyaya-sutra*. Students will learn to identify, reconstruct, and evaluate arguments, as well as, different techniques for responding to arguments. This will enable them to participate in rigorous debates but with a focus on cooperation rather than competition based on the classical Indian model of *Vaada*. They will be introduced to formal (deductive) reasoning through identifying what is wrong with an argument (propositional calculus), as well as, engaging with probabilistic reasoning. Finally, they will study inductive reasoning with a focus on arguments from analogy and inference to reach the best explanation. They will refer not only to examples taken from their own lives, but also texts, such as, *Nagarjuna's Mula-Madhyamaka-Karika* and *Yogacara-Bhumi-Sastra*.

Content Area 2: Knowledge and Scepticism

This content area is based on the classical Indian theory of knowledge, *Pramana-sastra*, which is concerned with the idea of *Pramana*, how we come to have knowledge. The three main types of *Pramana*: perception, inference and testimony, proposed by ancient thinkers will be studied, along with later voices in western philosophy, and the ideas applied to understand contemporary issues. Questions explored by students will include, 'How do we come to know anything at all? And how can we be certain of what we know? We live in an age where it seems that knowledge can be accessed by anyone with a smartphone, but is this real knowledge?' This content area will include ideas put forward by *Advaita Vedanta*, *Carvaka*, *Yogacara*, and *Kumarila Bhatta* in his commentary on the *Mimatsa-sutra*, and Buddhist thinkers. Students will also be introduced to a lively debate between *Prabhakara Mimamsa* and *Nyaya* that will help them in getting a firmer grasp on this problem. They will focus on the problems of trust, testimony, and expert knowledge through exploring questions, such as, 'How do we know whom to trust when even experts cannot agree on a given issue? How can we trust some witnesses as believable and others as not in a court of law? On what grounds can we judge that a given website or news source is biased?'

Content Area 3: Ethics

Through this content area, students will be introduced to ethical reasoning as a way of thinking about moral issues (cheating, violence, plagiarism, littering, tolerance, equality, empathy) they face in day-to-day life, enabling them to consider the ethical dimensions of these matters. This will help students understand ethical dilemmas by showing them normative ways of thinking about various issues. Students will develop the ability to be practical problem solvers while thinking about what it is to live an ethical and virtuous

life themselves. This will be done through an introduction to ethics through writings from both Indian tradition (Buddhist thought, stories from *Panchatantra*, *Jataka*, *Hitopadesh*, *Purusarthasiddhyupaya*) and the western tradition. Students will be enabled to take a multi-perspective approach to ethical reasoning, where they will be encouraged to develop their ethical views on these issues in cooperation with each other. Students will particularly be enabled to think about traditional Indian values and the values enshrined in the constitution from an ethical point of view.

Content Area 4: Philosophy of Mind

What exactly are we? What is the nature of the *Atman*? This was, along with questions about knowledge acquisition, one of the most divisive questions in classical Indian philosophy. On the one hand, substance dualism in the *Upanisads* and the texts of the *Nyaya-Vaisesika Darsana* sees the self as an eternal immaterial substance, while on the other hand, materialists, such as, the *Lokayata Darsana*, see the self as no more than a conscious body. Some Buddhists deny that there even is such a thing as the self and argue that this illusory belief in *Atman* is the source of all suffering. In the contemporary context, these debates about the self usually end up as debates about personhood, the mind, and the brain. Through this content area, students will examine how these ancient debates about the self can help us think about current issues around the mind, consciousness, and artificial intelligence. The Jainas believed that there were many kinds of *Jiva,* such as, some philosophers today argue that non-human living beings, such as, animals (and even sophisticated computers) have minds. What are the implications of such a view? Students will focus on arguments for and against the implication of views, as well as, examine the social and ethical implications of these various stances on the nature of the mind or self.

Content Area 5: Environmental Philosophy

Through this content area, students will be able to think abstractly about questions related to environmental issues, such as, 'Who is to blame for climate change, and are current solutions ethical? Is damage to the environment bad only because of its effects on humans, or do ethics reach beyond humanity? How should we change our political systems to take into account the rights of non-human animals? Is a carbon tax unfair to developing countries? What is climate justice?' Students must be enabled to have an idea of potential answers and an understanding of how to adjudicate between these. They will be introduced to Indian and western philosophical perspectives on the environment through engaging with environmental ideas from *Vedas*, *Upanishads*, *Charaka Samhita*, *Matsya Purana*, *Panchtantra*, and *Jataka*, as well as, Gandhi and Amartya Sen. They will also undertake a close study of grassroots environmental movements, such as, the Chipko Movement, Green Revolution, and *Navdanya*. The problems and questions addressed are at the foundations of environmental science and environmental economics and also draw on environmental history.

10.1.2 History

This is an illustration for History.

10.1.2.1 Principles for Designing Courses in History

The aim of teaching history is to inculcate a historical sensibility about the past while acquiring disciplinary understanding and knowledge.

The courses for history must be designed keeping the following in mind:

a. Students will examine the Indian subcontinent from a historical lens spanning from prehistory and early history to the birth of the nation.

b. They will receive a strong grounding in the substantive content of Indian history while remaining aware of India's place in the world.

c. They will engage with perspectives on the emergence of modernity across the world, with a specific focus on key transformations in Europe.

d. They will understand the impact of events that occurred in one part of the world on other parts of the world over a period of time.

e. They will acquire the methods of history including the interpretation of literary texts and the methods of archaeology.

Students will develop a historical consciousness by engaging with necessary disciplinary foundations, methodological tools, and comparative frameworks.

10.1.2.2 Illustrative Courses

Given below are illustrative content areas for History in Grades 11 and 12:

Content Area 1: Ancient World

Through this content area, students will take a comparative and methodological approach towards understanding the prehistory and early history of the Indian subcontinent in the context of other parts of the world. It will cover the earliest population of the Indian subcontinent, followed by the spread of agriculture in the fertile crescent and South Asia, and the emergence of the earliest known cities and city-based civilisations in Mesopotamia, Egypt, and the Indian subcontinent. Students will examine the ancient literary (mythological and religious) works produced in India, Greece, and Syria, also covering the rise of new religions and philosophies in India and China. Methodologically, students will be introduced to the basics of the archaeological and historical methods and will learn to interpret early literary texts, as well as, material culture to produce a historical narrative.

Content Area 2: States and Empires in India

Through this content area, students will be introduced to various kinds of large and complex political formations (such as, states and empires) in India from about the 5th century to the 16th century. They will learn about the formation of more centralised state systems than those that existed in the previous periods. They will critically examine the nature of these states, especially the structures of power and levels of control over diverse geographies and communities. Students will also be introduced to the widespread agricultural ecology and economy in India, as well as, to the Indian Ocean trade networks and overland trade routes, such as, the Silk Road, to see how India was deeply connected to the rest of the world in those times.

Content Area 3: Towards Modernity

Through this content area, students will be introduced to the emergence of modernity, as a temporal period and a concept, especially in the context of Europe. They will engage with the transformations to modern cultural, state, and economic institutions in Europe. In the cultural realm, Europe witnessed several key transformations, including the

Renaissance and Reformation, the Scientific Revolution, Humanism, and the emergence of the nation-state. Economic aspects of modernity included the emergence of mercantilism and the concurrent search for the New World, the Industrial Revolution, and the spread of capitalism and colonialism. While the content area will focus on key historical transformations in Europe, it will also consider the impact these transformations had on the rest of the world, especially in America, Africa, and Australia.

Content Area 4: Birth of the Modern Indian Republic

Through this content area, students will chart the emergence of colonial rule in India, from the 16th century, when the first European joint stock trading company arrived in India, to the birth of the modern nation-state in 1947, extending the moment of this birth up to the integration of princely States and the adoption of the Constitution by our Republic in 1950. Students will be familiarised with the struggle between European colonial powers for control over various parts of India, and the various forms of Indian resistance, including peasant and *Adivasi* resistance movements. Students will also be introduced to the vast administrative, educational, and social reforms that were introduced during the colonial period. Finally, students will discuss India's freedom struggle, including not only its well-known figures but also some lesser-known figures.

10.1.3 Sociology

This is an illustration for Sociology.

10.1.3.1 Principles for Designing Courses in Sociology

The aim of teaching Sociology is to help students understand society as a form of reality, as a level of human existence which exists within and beyond the individual. They must be able to connect sociological knowledge to understanding, actions, and strategies in the everyday world, as well as, in building strategies for structural change.

The courses for Sociology must be designed keeping the following in mind:

a. Students will be enabled to better understand their own selves and the social institutions and structures which shape their lives.

b. They will be able to grasp our shared humanity across all the variations that occur in different social locations.

c. They will be able to understand how gender, material conditions, and social groups and identities shape our subjectivities so that they can start building greater intersubjectivities.

d. They will become aware of different ways of seeing society, including from Western and Indian perspectives and different social locations within India.

The emphasis must be on doing Sociology rather than only reading it, thereby offering students reflexive, analytical, and emancipatory ways of seeing the world.

10.1.3.2 Illustrative Content Areas

Given below are illustrative content areas for Sociology in Grades 11 and 12:

Content Area 1: Introduction to Sociology

Through this content area, students will be introduced to the sociological perspective through the exploration of certain social patterns that are fundamental to life in the

contemporary era. These will include institutions, such as, family, marriage, and kinship. They will also include the growth of capitalism, rationalisation, industrialism, and the State. Students will be introduced to sociological ways of understanding various forms of ethnicity and nationalism. Through these, the basic concepts and methods of sociology will be learnt, such as, roles, norms, social structures, and culture. Students will also be introduced to some basic research methods of sociology and how sociological knowledge is constructed. A 'sociological imagination' will thus be learnt through which students will be able to see their selves within a broader changing social context.

Content Area 2: Social Structure Identity and Self in India

Students will be introduced to the study of India's social structure and how to connect it with patterns of subjectivity, such as, the formation of the self and identity. They will learn to look at these from functionalist, conflict, and interpretivist perspectives. Important aspects of India's social structures will be introduced, including the differences between rural and urban social life. The focus of the content area will be social structures that can lead to social inequalities and diversities related to gender, class, caste, tribe, and religion, as well as, how unity and harmony with these diversities can be achieved. Their historically changing contours will be studied along with the social forces changing them. The social construction of the self and various kinds of identities will be discussed along with the relationship between the micro and the macro in social life. The ways in which agency operates to change social structures, as well as, the ways in which social structures affect our subjectivity, will be discussed.

Content Area 3: Politics, State and Development in India

Politics is a way of deciding between contending points of view and can be a way of reconciling them or asserting one over the other. Through this content area, students will be introduced to the institutions and cultures involved in making decisions related to social life in India. They will also learn about various social forces that act to influence politics. The State is one of the major institutions which balances and decides between conflicting voices and strives for unity. Different approaches to the State will be introduced along with the challenges of bureaucratisation. Democracy will be discussed as a way of connecting the State with different interest groups and social forces. Its trajectory in India will be explored along with challenges to it. Social movements will be discussed as a way of exerting pressure from outside the established system of power, which can provide an important corrective impulse. The relationship between politics, the State, and the economy will be introduced. Students will learn the different ways in which humans adapt to their environment and their systems of production, distribution, and consumption. Capitalism as the pre-eminent contemporary way of organising this will be discussed, along with the challenges it poses. The changing and contested role of the State will also be discussed, along with different views on privatisation. The trajectories of development in India and its experience by different social groups will be studied. The impact of globalisation on the state, culture, and the economy will be traced.

Content Area 4: Sociology of Culture: Mass Media, Education and Religion

Through this content area, students will learn about the importance of culture in human existence and the different institutions which shape and contest it. The major ways of understanding culture will be introduced, including culture as the entire way of life of a

community, and culture as a code of symbols and practices. The multi–layered and overlapping character of culture will be illustrated through different examples in the mass media, where many voices exist at the same time. The politics of culture will be introduced through ideas of hegemony and counter, hegemony in mass media. Cultural power and the assertion of interpretations as a method of domination will be explored through examples of communities, castes, religions, languages and so on. Status groups and their politics will also be discussed. Connected with this will be the problem of social location and objectivity in knowledge. The sociological perspective on culture will be deepened through the study of education and religion. The functions of religion in social life will be introduced along with its relationship with other social structures and processes, such as, family, gender and politics. The social and cultural processes changing religion will be explored. The functions of education along with interpretivist and conflict perspectives on education will be introduced through examples from India. A particular focus will be to understand differences in educational access and achievement in India.

Section 10.2
Science

The Science Curricular Area will, illustratively, offer Biology, Chemistry, Physics, Modern Physics, Computational Biology and Earth Sciences.

10.2.1 Biology

10.2.1.1 Principles for Designing Courses in Biology

The aims of teaching biology are for students to explore the subject at different scales and have an appreciation for the process of science, and the progression of scientific ideas. Students will develop the capacity to engage more deeply with any area in the discipline.

The courses for biology must be designed keeping the following in mind:

a. Students will be able to see the integration of different fields of biology and highlight the interconnections between these fields.

b. They will develop capacities for observation, documentation, and familiarity with quantitative reasoning and multi-disciplinary approaches.

c. They will engender sensitivity towards biological issues (environment, health) in their surroundings and be aware of how citizens can contribute to their local communities and to science.

d. They will be aware of bioethical concerns that arise in biology today.

e. They will also be exposed to diverse careers in the life sciences.

Biology has a reputation for being descriptive and students often have to remember many facts without having any context. This produces students who have a lot of factual knowledge but are ill-equipped to meet the challenges of modern life sciences. To align school education with current practices in life sciences, the content must be streamlined. Whenever description-heavy content is included, an attempt must be made to provide appropriate context.

Students must be exposed to a multi-pronged approach to studying life sciences, and a balance between breadth and depth in covering different themes must be maintained.

10.2.1.2 Illustrative Content Areas in Biology

Given below are illustrative content areas for Biology in Grades 11 and 12:

Content Area 1: Biodiversity and Biogeography of India

Through this content area, students will be given an overview of the scope of life sciences, the various length and time scales at which biological phenomena occur, and the methods employed by scientists to investigate these phenomena. Students will be encouraged to think like a scientist by using case studies from India. They will develop an appreciation for natural history, and an understanding of biodiversity and the factors which affect the richness and diversity of life in different regions. A broad exposure to biodiversity in India will be complemented by a deeper exploration of biodiversity in their local region, and an introduction to systematic practices of studying biodiversity through taxonomy and nomenclature. Students will engage with units on the impact of climate change and the importance of conservation efforts. Through the theme of biodiversity and biogeography, students will develop general capacities for quantitative reasoning (interpretation of graphs, computation of summary statistics), as well as, observation skills through activities requiring them to identify and classify species in their surroundings. Students will also be made aware of careers in ecology, sustainability, and other allied fields and how citizens can contribute to scientific research.

Content Area 2: The Unity of Life

Through this content area, students will engage with the common structures and processes that underpin all of biology. This area will include a discussion of cell theory and our current understanding of cellular structures and processes. Subsequently, students will explore important classes of molecules that are constituents of cells and the functions they perform. In this context, students will learn about the identification of DNA as genetic material. This will be followed by a historical account of genetics and how Mendel identified the fundamental principles of heredity and how they were rediscovered later. An essential aspect that must be discussed is how evolutionary processes can provide a framework for investigating biological phenomena across scales. This will involve an overview of the development of the theory of evolution by natural selection through the work of Darwin and Wallace, a discussion of the modern synthesis, and an introduction to phylogenetics through the study of the 'Tree of Life'. Students will also be introduced to molecular biology (Central Dogma, Genetic code) and gene regulation. Case studies (e.g., antimicrobial resistance) will be used to illustrate the importance of an integrated understanding of biological systems in modern life sciences. Students will become familiar with concepts that are essential to study any biological system. They will also appreciate that scientific theories and ideas take time to develop and that there is value in understanding the historical context of their origin.

Content Area 3: Organismal Biology

Through this content area, students will explore many aspects of the biology of non-human organisms (microbes, fungi, plants, animals) using an evolutionary framework. Representative examples of development and simple illustrations of the genetics of the

body will be given, along with a small set of topics related to the physiology and anatomy of plants and animals. Topics in ecology and the biology of food production will be covered, including population, community and behavioural ecology, energy flows, and the interaction between different species. A diverse set of examples (spanning the tree of life) will be used to illustrate concepts. Food production, food security (including challenges of climate change and diseases, the role of biotechnology) and sustainability (resource use, environmental impact) will be discussed. Students will be encouraged to draw connections between food security challenges, and physiological and ecological constraints.

Content Area 4: Agriculture and Animal Husbandry

Through this content area, students will explore commercially important organisms along with some examples of the developmental biology, anatomy, and physiology of these organisms. The role of breeding and biotechnology will be discussed followed by ecological and environmental constraints and challenges to food production. Students will study the topic of disease management and the possibilities of biocontrol. They will recognise why an understanding of physiology and an ecological sensibility is essential for sustainable food production.

Content Area 5: Human Biology

Through this content area, students will explore the evolutionary history of the genus Homo and the human genome project. Thereafter, they will learn about major organ systems in a manner that connects with discussions of the genome, and concepts of physiology and evolution, as well as, health and well-being. After discussions on the importance of diet and nutrition, an overview of communicable and non-communicable diseases will be provided. Coverage of diseases will be accompanied by methods of preventive care, diagnosis, the biology behind administering medication and treatments, and the role of pharmaceutical companies. Given the age group, concerns of reproductive health, mental health, substance abuse, and addiction will be explored. Students will be made aware of many careers related to human health. They will also explore the connection between individual health and planetary health, and why one must view health from a community perspective rather than just an individual one.

10.2.2 Chemistry

This is an illustration for Chemistry.

10.2.2.1 Principles for Designing Courses in Chemistry

The aim of teaching chemistry is to progressively build a clear framework that gives a coherent overview of the subject, explain why it matters and shows how different areas of content are connected.

The courses for chemistry must be designed keeping the following in mind:

a. Students will be equipped with tools to begin understanding how chemistry works rather than knowledge of the facts of chemistry.

b. They will develop the necessary conceptual foundations and, at the same time, develop an overview that is a sufficiently broad introduction to the discipline.

c. They will be able to understand and represent chemical phenomena at three levels: macroscopic, molecular, and symbolic; to identify patterns and form connections that underlie all chemical phenomena.

d. They will recognise that chemists are uniquely qualified to contribute meaningfully to frontier research areas related to climate change, environmental issues, materials science, biology and medicine.

At this level, students must deal with content at an appropriate level of rigour to build a certain amount of comfort with using all three levels of representation to enable the transition from facts enumerated through rote learning in a fragmented way to connecting phenomena at the molecular scale to those at the astronomical scale. Curriculum content must ensure that students have, and recognise they have, appropriate intellectual resources and know how to connect these resources as they construct and revise explanations or predictions.

10.2.2.2 Illustrative Content Areas in Chemistry

Given below are illustrative content areas for chemistry in Grades 11 and 12:

Content Area 1: Structure, Bonding, and Properties in Chemistry

Through this content area, students will develop a perspective that sees the universe as a collection of fundamental particles and their combinations. It will lead them to the realisation that properties of materials, compounds and molecules of life are all consequences of the fundamental principles that chemistry establishes. The interconnectedness of structure to bonding patterns, and thereby their influence on observable properties, will be elucidated, and the connections will be explicitly made. As concepts are accumulated, the connections to the real world will become progressively more comprehensive. This model fundamentally removes the inherent abstraction in chemistry via observations of the wonders of science that the student can see, smell, hear, taste, and touch. This area will cover the structure of the atom and its electronic distributions, the classification of elements in the Periodic Table, and their periodic properties. Building on these principles, the combination of elements to form compounds, the nature of these bonds, and molecular geometry will be detailed. To illustrate, principles of structure, and bonding hydrocarbons and their functional groups will be introduced alongside their variations in connectivity and spatial arrangement via isomerism, and the structure property relationships in transition metal complexes will be included.

Content Area 2: Principles of Reactivity

Through this content area, students will focus on the study of chemical systems; how and why the reactions occur, drawing upon the properties of elements, bonding, and structure learn previously. They will focus on the application of sub-microscopic models of matter and structure property relationships to explain, predict and control chemical behaviour. Students will be introduced to concepts regarding chemical thermodynamics, acid-base equilibria and chemical kinetics from the perspective of the transformation of matter and the underlying principles that govern the reactivity of chemical substances. Reactions of organic and inorganic compounds will be used to illustrate the concepts of enthalpy, free energy, equilibrium and kinetics of reactions. Students will explore patterns of reactivity in organic and inorganic systems, functional group chemistry, kinetics, mechanisms and catalysis. They will initiate the systematic study of the common classes of organic compounds, emphasising theories of structure and reactivity. Students will consider and measure the energies and rates of the chemical reactions and predict the

products. Through this content area, students will be able to connect observations of chemical reactivity at the macroscopic level with the changes at the molecular level and use principles studied to predict reactions and use these reactions to make modifications to small molecules.

Content Area 3: Modern Applications of Chemistry

It is essential to provide students with meaningful contexts in their life and provide a 'big picture' of chemistry. Through this content area, students will have the space to integrate the essential concepts with applications of chemistry, thereby enabling them to realise the interrelatedness of chemistry, society, and technology. They will explore synthetic approaches, analytical methods, and structure property relationships of some vital chemicals needed or used in our daily lives, in addition to the analysis of their impact on the environment. This includes natural substances, such as, biological macromolecules, as well as, anthropogenic chemicals, such as, drugs, food substances, colourants, and cosmetics. It also includes a structural understanding of inorganic and hybrid materials. Students will examine classification, preparation methods, applications, and the environmental concerns of polymers, and gain insight and information on fuels and energy and the contribution of chemistry to sustainable energy technologies. Finally, students will focus on the structure and behaviour of chemical compounds contributing to the biomedical and agricultural fields and the application of fundamental chemical principles to industrial manufacturing processes.

10.2.3 Physics

This is an illustration for Physics.

10.2.3.1 Principles for Designing Courses in Physics

The aim of teaching physics is to enable students to explore the methods of physics, and how theories are built and tested. They are intended to help students engage with the empirical nature of Physics, as well as, how these theories help explain phenomenon around them.

The courses for physics must be designed keeping the following in mind:

a. Students will develop the ability to formulate scientific questions about their observations of and experiences in the real world.

b. They will be able to make connections between their experiences and observations to what is transacted in the classroom and laboratory.

c. They will develop the ability to represent real-world phenomena in mathematical terms.

d. They will develop the ability to test laws and theories of Physics through observation and experimentation.

An interdisciplinary approach, integrating mathematics, biology and chemistry must be taken. Content from mathematics, such as, calculus, vector analysis and trigonometry must be included, as and when necessary.

10.2.3.2 Illustrative Content Areas

Given below are illustrative content areas for Physics in Grades 11 and 12:

Content Area 1: Mechanics

Through this content area, students will focus on the essential concepts related to motion in one and two dimensions, force and mechanical work, various forms of energy, and the conservation of energy illustrated through various examples. Differential calculus will be taught as part of the unit on motion. Some notions of energy and length scales in matter will be discussed through examples in everyday life, thus introducing students briefly to some of the modern ideas in condensed matter and biological physics. Applications of these concepts to other disciplines will be emphasised through various examples. Here, the focus will be on giving a hands-on experience and relating this to the phenomena in everyday life.

Content Area 2: Electricity and Magnetism

Through this content area, students will get a broad overview of the main phenomena, including the historically significant experiments starting from Gilbert's work on static electricity and properties of magnets to Hertz's experiment confirming the existence of electromagnetic waves. Related theoretical ideas will also be covered, along with familiarising students with basic experimental techniques and relevant foundational mathematical concepts. For example, students will learn the techniques of basic integral calculus that are needed for understanding and applying Gauss' Law and Ampere's Law. This content will help students appreciate the links between all the above aspects and understand certain everyday natural phenomena and technologies from the lens of physical principles.

Content Area 3: Waves and Optics

Through this content area, students will build on ideas related to mechanics, and electricity and magnetism. This will involve building a connection between various topics in physics and also a bit of repetition of those topics, which will help students assimilate and appreciate various phenomena. Topics include the pendulum and spring–mass system as simple harmonic oscillators, basic acoustics, the Doppler effect, ray optics and optical instruments, and finally ideas in wave optics keeping in mind interference and diffraction.

Content Area 4: Thermodynamics and Properties of Matter

Through this content area, students will engage with coherent and integrated handling of thermodynamics, properties of materials, and essential topics, such as, collection of particles, basic gas laws (such as, the law of Avogadro), energy and energy transfer and radiation as a mode of energy transfer. They will learn about hydrostatics, motion of fluids, ideal gas laws, laws of thermodynamics, phase changes, modes of heat and energy transfer including blackbody radiation, and the photoelectric effect.

Section 10.3
Mathematics and Computational Thinking

Mathematics and Computational thinking will illustratively offer core Mathematics, Business Mathematics, Advanced Mathematics and Computer Science.

10.3.1 Core Mathematics

This is an illustration for Core Mathematics.

10.3.1.1 Principles for Designing Courses in Core Mathematics

The aim of teaching core mathematics is to develop the capacity of students to think logically and analytically, and at the same time, discover their own strengths and interests in the discipline.

The courses for Core Mathematics must be designed keeping the following in mind:

a. Students will engage in mathematical processes, such as, reasoning, modelling, visualisation, problem solving and formal communication while engaging with the content areas of mathematics, such as, algebra and geometry.

b. They will develop an appreciation of the structure of Mathematics as a discipline, making connections between areas of mathematics, as well as, with other disciplines of study.

c. They will be introduced to powerful ideas of mathematics, such as, infinite sums, limits and probability, towards developing a deeper understanding of mathematics as a discipline.

d. They will develop a healthy predisposition to formal problem-solving as an opportunity to promote self-learning and reflection, as well as, the application of concept learning.

Students must be exposed to a structure that places importance on problem solving through building concepts, skills, processes and metacognition. They should progress in the content areas of number systems, algebra, geometry and trigonometry, and engage with coordinate geometry, calculus and probability and statistics. New representations help students make connections between algebra and geometry; they must also get opportunities for modelling.

10.3.1.2 Illustrative Content Areas

Given below are illustrative content areas for core mathematics in Grades 11 and 12:

Content Area 1: Mathematical Foundations

Through this content area, students will strengthen their capacity for mathematical reasoning and be able to understand the need for proof, as well as, what constitutes proof. A powerful proof technique, the principle of mathematical induction, is introduced. Students learn the language of sets, functions and relations. They engage with a range of functions that students may have already encountered (in algebra, geometry) and with newer functions (trigonometry) to understand the domain and range in each case.

Content Area 2: Algebra and Geometry

Students learn to go back and forth between geometric objects on the plane, and their algebraic expressions. Linear equations and their solutions are related to their geometric visualisation. Their representation by matrices provides a powerful tool for computation and helps the transition to three dimensions. Geometric objects, such as, parabolas, ellipses, circles, and hyperbolas, are studied as loci of points in motion.

Content Area 3: Calculus

An informal understanding of the notion of limit leads to a similar notion of continuity, which is adequate to understand the Mathematics of motion and rate of change. Students

learn the gradient of a curve at a point and the notion of a second derivative, with its application to maxima minima problems. Integration is understood as the reverse process of differentiation. Students learn to evaluate definite integrals and use this to compute the area of a region bounded by a curve and lines parallel to the axes.

Content Area 4: Probability and Statistics

Students learn to select between ways of representing raw data (and explain why). They learn to use measures of central tendency and variation and use these to compare two sets of data. They learn permutations and combinations and use them in calculating probabilities of events. The notion of sample space is introduced, and students learn to set up one. The basic laws of probability, independence of events and conditional probability are learnt.

Section 10.4
Art Education

The Art Education Curricular Area will, illustratively, offer Indian classical music, folk music, contemporary music, theatre, puppetry, sculpture, fine arts, folk painting, graphic design, motion pictures, photography and textile designing.

Art education aims to help students achieve more depth in a chosen art form, while also providing flexibility to explore related areas of study. Content should be based on the art and culture of their region, and by considering the resources and infrastructure that can be set in place for these programmes to operate efficiently.

Students who choose art education as one of their areas of study will need to decide which of the two categories they would like to specialise in art practice or art appreciation and management. Within these categories, they will choose a form visual arts, theatre, music, or dance and movement. Based on this choice, students must engage largely with content in the chosen category, with some engagement with content from the other. For example, if a student chooses art practice, they will focus on content related to this category and also study some content in art appreciation and management. This is to ensure that the student gains breadth in both art appreciation and management and art practice while allowing them to go deeper in one of the categories.

10.4.1 Art Practice

This is an illustration for the category of Art Practice.

10.4.1.1 Principles for Designing Courses in Art Practice

The aim of art practice in Secondary Stage is to develop capacities in a specific art form and refine students' aesthetic sensibilities. They will learn the structure of the form, develop an appreciation for it, and be able to creatively express themselves through it.

The courses for art practice must be designed keeping the following in mind:

a. Students will engage in embodied and experiential learning through the making, thinking and appreciation processes.

b. They will undergo rigorous practice in a chosen form.

c. They will be able to link practice to theory, art history and contemporary issues relevant to each art form.

10.4.1.2 Illustrative Content Areas

The table below contains an illustrative set of areas for study in Art Practice:

Table 10.1i

Areas for Study in Art Practice				
	Visual Arts	**Theatre**	**Music**	**Dance and Movement**
1.	Drawing	Theatre for social change	Indian classical vocal	Indian classical dance
2.	Painting	Introduction to acting	Indian classical instrumental	Indian folk dance
3.	Sculpture and Ceramics	Theatre in education	Indian folk music	Yoga and indian martial arts
4.	Textile Arts and Design	Participatory theatre	Indian light-classical and film music	Contemporary dance and movement
5.	Indian decorative arts and crafts traditions	Indian folk theatre	Orchestra, bands, and ensembles	Costume and stage design for dance and movement
6.	Photography	Indian classical theatre	Recording, editing, and production	Dance and movement choreography
7.	Graphic design and new media	Theatre design and stagecraft	Song writing	Dance for physical fitness and wellbeing
8.	Film, video, animation	Scriptwriting for theatre	Music and new media	Dance drama

The table below illustrates content areas for visual arts in the category of art practice:

Table 10.1ii

Content Areas for Visual Arts		
Category	**Content Areas**	**Other Related Content Areas**
Art practice	Drawing	Indian decorative art and crafts traditions Theatre design and stagecraft, film, video, animation, portfolio development
Art practice	Sculpture	
Art appreciation and management	Visual arts in India (Past to Contemporary)	
Art practice (elective)	Textile Arts and Design	

Content Area 1: Drawing

Drawing serves as a foundation for a wide range of creative disciplines: painting, sculpture, architecture, visual communication, engineering, or fashion design. The ability to draw

well contributes to developing effective communication skills. Through this content area, students will learn key skills and techniques across artistic mediums and applications.

Content Area 2: Sculpture

Through this content area, students will learn to develop their own artistic ideas and expression by creating sculptural objects. They will learn to refine their skills and techniques in any medium of their choice (clay, wood, fabric, mixed media) through rigorous practice.

Content Area 3: Visual Arts in India (Past to Contemporary)

Through this content area, students will be introduced to the history of Indian Art through selective examples from pre-history to contemporary times. Every example will provide students with an opportunity to study the aesthetic qualities of the artwork, as well as, understand the social and cultural context of artists through history. Students will also have space to explore archives and find artwork or artefacts of importance on their own. They will learn to interpret artworks, develop perspective and appreciate diverse artistic expressions.

Content Area 4: Textile Arts and Design

Through this content area, students will be introduced to the world of textiles, and their diverse forms and functions in our lives. Students can experiment with various materials, fibres and fabrics, understand their properties of colour, texture, insulation, opacity, longevity and explore their applications in multiple contexts (clothing, sports gear, safety gear, interior design, and architecture, as a medium for artistic expression). Based on the local traditions, students could be introduced to techniques of embroidery, knitting, weaving, applique, textile dyeing and quilting.

10.4.2 Art Appreciation and Management

This is an illustration for art appreciation and management.

10.4.2.1 Principles for Designing Courses in Art Appreciation and Management

The aim of teaching art appreciation and management is to develop among students the capacity for appreciation of the arts through engaging with theoretical, historical, and contemporary perspectives. They will also develop an understanding of managing art exhibits (conservation, curation, and event management in the arts).

The courses for art appreciation and management must be designed keeping the following in mind:

a. Students will acquire knowledge of art history and aesthetics.

b. They will refine their skills of interpretation, writing, documentation, community engagement, and organisation.

c. They will develop a meaningful appreciation for the arts.

10.4.2.2 Illustrative Content Areas

An illustrative set of areas for study in art appreciation and management is given in the table below:

Table 10.1iii

Areas for Study in Art Appreciation and Management				
	Visual Arts	**Theatre**	**Music**	**Dance and Movement**
1.	Visual art in India (Past to contemporary)	Indian classical theatre and its theories	Indian classical music theory	Indian classical dance and its theories
2.	Visual art from around the world (Past to contemporary)	Theatre traditions from around the world	Musical traditions from around the world	Classical dance traditions from around the world
3.	Crafts traditions from India and the world	Indian folk theatre	Folk music traditions from India and the world	Folk dance and movement traditions from India and the world
4.	History of visual design and communication	Theories of acting	Study of Indian musical instruments	History and traditions of yoga and Indian martial arts
Common to all forms				
5.	Indian aesthetics and *Rasa* theory			
6	Museums and archives (Conservation and Documentation)			
7.	Curation and event management in the arts			
8.	Portfolio development (Particularly for students who wish to apply for higher education in the Arts)			

The table below illustrates content areas for Music in the category of Art Appreciation and Management:

Table 10.1iv

Content Areas for Art Appreciation and Management in Music		
Category	**Content Areas**	**Other Related Content Areas**
Art appreciation and management	Museums and archives	Indian aesthetics and *Rasa* theory. Curation and art event management.
Art appreciation and management	Indian classical music theory	
Art Practice	Indian folk music	
Art appreciation and management(Elective)	Portfolio development	

Content Area 1: Museums and Archives

Through this content area, students will be introduced to the importance of museums and archives in preserving and promoting art and culture. Students will study museum collections and their resources through visits to local museums, as well as, online resources of museums across India and the world. Students will also learn about the various processes of maintenance, conservation, research and outreach programmes that

museums undertake. Students will be required to work on their own projects to design, visualise and present a select collection of artefacts, objects or documents in a museum.

Content Area 2: Indian Classical Music Theory

Through this content area, students will be introduced to the philosophy, canons and compositional structure that characterise different aspects of Indian music. Students will learn about different *srutis* and scales, frequencies of notes, arrangements of notes in *Raaga*, emotions and *Rasas* evoked through *Raaga, Taal* patterns, their styles and combinations, as well as, important composers, music theorists, and developments that have occurred in Indian classical music through history.

Content Area 3: Indian Folk Music

Through this content area, students will be introduced to the practice of folk genres from different parts of India. Students will explore and practise different styles of folk music to develop an understanding of musical styles, themes, instruments and performance techniques that are used in folk music.

Content Area 4: Portfolio Development

Through this content area, students will be introduced to the concept, design and development of portfolios for the purpose of external viewership. Students will be exposed to various samples of portfolios to analyse their design, structure, content and effectiveness in representing an artist's work. Through such exercises, they will be guided to conceptualise their own portfolio, make selections from their existing portfolios and create new works to strengthen them. They will write about their own motivations and ideas for their artworks and develop a visual consolidation and presentation of the portfolio.

Section 10.5
Vocational Education

The Vocational Education Curricular Area will offer subjects to be aligned to the National Skills Qualifications Framework NSQF, within the three forms of work. Illustratively, the Curricular Area will offer agriculture, gardening, automotive, automobile servicing, machining, electronics, community health, accounting services, data entry and management, banking services, retail services and textile and garments.

10.5.1 Principles for Designing Courses in Vocational Education

The aim of Vocational Education is to enable students to acquire the necessary understanding and skills related to a specific job role. They will be equipped to take up a job after leaving school if they so wish. With this in mind, the courses will be aligned with Levels 3 and 4 of the NSQF or higher. It must be noted that NSQF is a 'outcomes based' framework and the levels are not tied to years of study.

The courses for vocational education must be designed keeping the following in mind:

a. Students will acquire the necessary knowledge to perform routine jobs of their choice.

b. They will demonstrate necessary skills and follow routine processes based on an understanding of appropriate rules and equipment.

c. They will acquire the vocabulary of their chosen vocation.

d. They will acquire a basic understanding of the social, political, and natural environment the vocation is located in.

Schools will offer courses in at least one vocation in the three forms of work, engaging with life and nature, engaging with machines and materials and engaging with human beings.

Students will engage with actual practice; as far as possible, this will be enabled within schools through setting up appropriate workshops with available resources. In addition, students will undergo internships, as well as, an apprenticeship in their chosen vocation. These will enable students to experience working under supervision and develop an understanding of the workplace and its place in the larger world. The combined time spent on internship and apprenticeship should be at least 40 per cent of the total time allotted for this curricular area.

Box 10.1

It is important to note that, in this NCF, 'apprenticeship' is used as an essential pedagogical approach to gain 'know-how' knowledge, while the students are in school. This must not be seen from the lens of the Apprentice Act, 1961. See Part C, Chapter 9.

10.5.2 Illustrative Content Areas

Below is a list of illustrative areas of study, one area has been elaborated for each of the forms below in this table:

Table 10.2i

Work with life forms	Work with machines and materials	Work in human services
Dairy Farming • Introduction to dairy farming • Maintaining healthy performance of livestock • Workplace culture and practices • Apprenticeship	**Agricultural machine operation** • Introduction to agricultural machines • New technology and the future of agricultural machinery • Workplace culture and practices • Apprenticeship	**Frontline health worker** • Introduction to community health and public health • Roles and responsibilities of frontline health workers • Workplace culture and practices • Apprenticeship
Sericulture • Introduction to sericulture • Production of silk from young age and old age silkworms • Workplace culture and practices • Apprenticeship	**Irrigation service technician** • Introduction to irrigation • Operation and maintenance of irrigation systems • Workplace culture and practices • Apprenticeship	**Vision technician** • Basic introduction to ophthalmology • Making optical prescriptions • Workplace culture and practices • Apprenticeship

Small Poultry Farming • Introduction to small poultry farming • Rearing and maintaining poultry birds • Workplace culture and practices • Apprenticeship	**Plumber (General)** • Basic sanitary fittings and fixtures: installation and repair • Advanced sanitary fittings and fixtures: installation and repair • Workplace culture and processes • Apprenticeship	**Heritage Tour Guide** • Role and relevance of a heritage tour guide • Managing different kinds of heritage tours • Workplace culture and practices • Apprenticeship
Soil and Water Testing Lab Assistant for Agriculture • Introduction to Soil and Water Testing • Managing Plant Nutrients • Workplace Culture and Practices • Apprenticeship	**Hi-tech technical services** • Kinds of equipment and uses [e.g., drones, computing part of machines, mobile communication infrastructure] • Basic design and diagnosis • Physical and computing solutions • Escalation and remote support • Workplace culture and practices • Apprenticeship	**Beauty therapist** • Introduction to Beauty Wellness Industry and Beauty Therapy • Basics of Different Kinds of Beauty Services • Workplace Culture and Practices • Apprenticeship
Gardening • Managing gardens and nurseries • Landscaping and ornamentation • Workplace culture and practices • Apprenticeship	**Field technician—washing machine/air conditioning/ refrigerator** • Basic electricity and electronics • Repair and maintenance of washing machine/air conditioner/refrigerator • Workplace culture and practices • Apprenticeship	**Yoga instructor** • Philosophy and practice of yoga • Yoga and the human body • Workplace culture and practices • Apprenticeship
Floriculture • Fundamentals of floriculture, nursery, and seed production • Simple and tongue layering, ground layering, air layering or Gootee • Workplace culture and practices • Apprenticeship	**Auto service technician** • Introduction to engineering geometrics and drawing • Serviceability, maintenance, replacement or repair of engine components • Workplace culture and practices • Apprenticeship	**Hair stylist** • Introduction to hair care • Basics of hair styling • Workplace culture and practices • Apprenticeship
Mushroom Cultivation • Medicinal and nutritional value of different types of mushrooms • Mushroom cultivation and the economic benefits of growing mushrooms • Workplace culture and practices • Apprenticeship	**Baking** • Baking Bread, Pastries, Cakes, Chocolates, and Desserts • Quality and marketing • Workplace culture and practices • Apprenticeship	**Dietician** • Food habits, discipline, and a balanced diet • Food chart for pregnant women, kids, adults, anti-ageing food habits, healthy food habits for women • Workplace culture and practices • Apprenticeship

Sheep / goat farming	Jam, Jelly and Ketchup processing	Home health aide
• Different varieties of sheep/ goat and seasonality in sheep/goat farming • Developing a business model, availing government support • Workplace culture and practices • Apprenticeship	• Fruit and vegetable processing • Quality and marketing • Workplace culture and practices • Apprenticeship	• Clinical skills essential in providing basic healthcare services • Infection control, hygiene, safety, usage of protective devices • Workplace culture and practices • Apprenticeship

Schools should offer areas of study that respond to multiple considerations weighed adequately, for example, aspirations of students, school's ability to transact the curriculum, local needs, future needs of society.

Also, it is important for school education to have the widest possible range of such offerings and not be restricted by any constraint or restraint. For example, areas of work, where actual employment is governed by any licensure requirements, does not imply that that area of work cannot be studied in schools, only that the school study should be integrated within the licensure requirements, or that the student will have to fulfil the licensure conditions after graduating from school in order to be eligible for employment. Equally, since the NSQF levels are not tied to years of study, it should be possible to prepare students for higher NSQF levels, if required by the licensure requirements.

Work with Life Forms: Gardening

This is an illustration for Work with Life Forms. Given below are illustrative content areas for Gardening in Grades 11 and 12:

Content Area 1: Managing Gardens and Nurseries

Students will be introduced to the care and maintenance of gardens and nurseries. Gardens will include small home gardens and pot gardening. Nurseries will include those at both, small and large scale. Students will learn to grow and maintain plants grown in the region, from the preparation of pots and soil to nutrition and irrigation. They will identify and correctly use the appropriate tools and equipment. They will also understand the marketing of plants, including flowers.

Content Area 2: Landscaping and Ornamentation

Students will learn to visualise small and large spaces as aesthetically pleasing gardens. They will learn how to identify ornamental plants suitable for the climate in the region, where to source them, and how to grow them. They will learn how to establish and maintain lawns, ranging in size from a small patch to a large park. Students will also be able to identify and place elements (e.g., bird baths, garden furniture, wind chimes, stones, rocks, arches, waterfall, ornamental pots, trellises, follies) that help make a garden functional and attractive.

Content Area 3: Workplace Culture and Practices

Students will engage with the culture of the workplace, as well as, practices specific to the nature of the vocation they have chosen. This will be enabled through on-site exposure, videos, and discussions in the classroom. On-site exposure will be through internships at relevant different facilities, where students will get a chance to observe

and interact with persons working there. They will also be required to view videos of different kinds of facilities (e.g., practices related to the maintenance of large parks, ornamental gardens, gardens in heritage monuments). Discussions will help them consolidate their observations and draw general principles of work. This will be conducted jointly by the Teacher and Resource Persons.

Apprenticeship

Students will work as part-time apprentices in an actual place of work, this will be one of the facilities in which they were placed as interns. This will enable them to have an on-site work experience and understand the different factors involved in actually doing a job. It will help them become aware of the culture and language of work and the factors affecting its functioning. Students will gain experiential skills and knowledge of the work under the supervision of a mentor. The mentors will be identified persons already working in the chosen facility, with sufficient work expertise, who will undergo a short course to prepare them to work with students. Students will also be required to maintain a portfolio containing products they have created or processes they have followed.

Work with Machines and Materials: Jam, Jelly and Ketchup Processing Technician

This is an illustration for Work with Machines and Materials.

Given below are illustrative content areas for a Jam, Jelly, and Ketchup Processing Technician in Grades 11 and 12:

Content Area 1: Fruit and Vegetable Processing

Students will be introduced to the possibilities and processes of fruit and vegetable processing, as well as, the science that underlies it. They will learn different techniques to prepare jams, jellies, and ketchup. They will be given a basic introduction to food microbiology so that they understand how food is preserved and what causes it to spoil. They will learn how to prepare, clean, and maintain materials, as well as, work areas for processing.

Content Area 2: Quality and Marketing

Students will gain an understanding of food quality and sanitation laws for processed food products. They will learn how to correctly package jams, jellies and ketchups and maintain necessary documents and records. Students will also understand concepts related to occupational health and hygiene and basic first aid in case of accidents. They will learn about appropriate pricing, and also about channels through which processed fruit and vegetables can be sold for different target groups.

Content Area 3: Workplace Culture and Practices

Students will engage with the culture of the workplace, as well as, practices specific to the nature of the vocation they have chosen. This will be enabled through on-site exposure, videos, and discussions in the classroom. On-site exposure will be through internships at relevant different facilities, where students will get a chance to observe and interact with persons working there. They will also be required to view videos of different kinds of facilities (e.g., they can view processes in large, automated facilities and small businesses run from home). Discussions will help them consolidate their observations and draw general principles of work. The Teacher and Resource Persons will jointly conduct this.

Apprenticeship

Students will serve as part-time apprentices in an actual place of work, this will be one of the facilities in which they were placed as interns. This will enable them to have an on-site work experience and understand the different factors involved in actually doing a job. It will help them become aware of the culture and language of work, and the factors affecting its functioning. Students will gain experiential skills and knowledge of the work under the supervision of a mentor. The mentors will be identified persons already working in the chosen facility, with sufficient work expertise, who will undergo a short course to prepare them to work with students. Students will also be required to maintain a portfolio containing products they have created or processes they have followed.

Work in Human Services: Tour Guide

This is an illustration for Work in Human Services.

Given below are illustrative content areas for Tour Guide in Grades 11 and 12:

Content Area 1: Role and Relevance of a Tour Guide

Students will be introduced to the tourism industry and its importance for individuals and the local economy. They will understand the context in which the tourism industry operates and its potential as a vocation. They will also understand the job role of tour guides and their place or role in the tourism industry.

Content Area 2: Managing Different Kinds of Tours

Students will engage with a variety of tours in which the tour guide plays an important role, e.g., pilgrimages, wellness and medical tours, tours for leisure and recreation, gastronomy tours, cultural tours and tours for sporting events. While understanding the specific requirements for each of the different kinds of tours, they will be encouraged to draw general principles related to communication with clients and colleagues, gender and age-sensitive practices, health and hygiene, safety practices, etiquette, and hospitable conduct.

Content Area 3: Workplace Culture and Practices

Students will engage with the culture of the workplace, as well as, practices specific to the nature of the vocation they have chosen. This will be enabled through on-site exposure, videos and discussions in the classroom. On-site exposure will be through internships at relevant different facilities, where students will get a chance to observe and interact with persons working there. They will also be required to view videos of different kinds of facilities (e.g., they can watch a city tour, a heritage tour, or a tour on a train visiting different places). Discussions will help them consolidate their observations and draw general principles of work. The Teacher and Resource Persons will jointly conduct these.

Apprenticeship

Students will serve as part-time apprentices in an actual place of work, this will be one of the facilities in which they were placed as interns. This will enable them to have an on-site work experience and understand the different factors involved in actually doing a job. It will help them become aware of the culture and language of work, and the factors affecting its functioning. Students will gain experiential skills and knowledge of the work under the supervision of a mentor. The mentors will be identified persons already

working in the chosen facility, with sufficient work expertise, who will undergo a short course to prepare them to work with students. Students will also be required to maintain a portfolio containing products they have created or processes they have followed.

Section 10.6
Physical Education and Well-being

In Grades 11 and 12 of the Secondary Stage, the NCF caters to three broad categories of students, who may wish to pursue physical education and well-being in different forms after completing school:

a. Students who want to continue sports and physical activity for recreational purposes. Such students can also be nodal persons for physical educational knowledge for a community. This group can take up physical education for community wellness. Illustratively, courses that could be offered in this category include yoga and lifestyle.

b. Students who are interested in taking up sports based vocational opportunities in growing areas, such as, sports education and fitness industry, sports management, sports analytics, sports psychology, or even allied medical fields, such as, sports physiotherapy. This category can take up physical education as a vocation. Illustratively, courses that could be offered in this category include physical education for children with disabilities.

c. Students who are interested in taking up playing sports professionally or are interested in allied fields of professional sports. These are students who have already achieved some proficiency in a particular sport, game, or practice (yoga or Tai chi). Such students will have the option to pursue it further, develop advanced skills, and compete at the highest level. This category can take up physical education for a professional sportsperson. Illustratively, courses that could be offered in this category include Sports and Nutrition and Biomechanics and Sports.

10.6.1 Physical Education for Community Wellness

This is an illustration of physical education for community wellness.

10.6.1.1 Principles for Designing Courses for Physical Education for Community Wellness

The aim of teaching physical education for community wellness is to prepare students to continue their interest in sports and physical activity from a recreational and wellness point of view. Students will build their capacities to contribute to community wellness through enabling community events related to sports and physical activities.

The courses for physical education for community wellness must be designed keeping the following in mind:

a. Students will build a foundation for understanding the different aspects of sports and physical activities, as well as, wellness.

b. They will be introduced to the domain of community wellness.

c. They will be prepared to engage with members of the community in the capacity of a coach and manager.

10.6.1.2 Illustrative Content Areas

Given below are illustrations of content areas physical education for community wellness:

Content Area 1: Sports and Fitness: An Introduction

Through this content area, students will be introduced to basic human anatomy and physiology and its connection with physical activity and fitness. In addition, aspects of nutrition, injury prevention and basic first aid will also be included.

Content Area 2: Community Coaching (for a chosen sport)

Through this content area, students will be prepared to develop capacities for engaging in team sports for community development. Basic coaching skills relevant to the sport and the interconnection between developing life skills through team sports will be the focus.

Content Area 3: Sports and Fitness Advanced Basics

Through this content area, students will be introduced to the practices required for strength and conditioning training. Maintaining strength, endurance, and flexibility is necessary for any sports or physical activity. Students will get an understanding of how to develop these capacities in other persons, including the use of practices like yoga for developing strength and flexibility.

Content Area 4: Sports Management (basic)

Through this content area, students will be introduced to different aspects of managing teams for participating in sporting events. These sporting events are often important aspects of building a community around sports. Students will engage with team management, event management, resource management (sourcing and maintaining equipment and playing areas), and some aspects of sports promotion, sponsorships, endorsements, and so on.

10.6.2 Physical Education as a Vocation

This is an illustration for physical education as a vocation.

10.6.2.1 Principles for Designing Courses for Physical Education as a Vocation

The aim of teaching physical education as a vocation is to develop capacities and skills to be able to work in vocations based on sports and fitness. Students will be introduced to various options available in sports, fitness, and wellness domain.

The courses must be designed based on the following principles:

a. Students will acquire a holistic view of sports, fitness, and wellness practices.

b. They will develop an understanding of the physiological, nutritional, socio–emotional and ethical aspects of sports, fitness, and wellness.

c. They will develop capacities in at least one form of vocation connected to sports, fitness and wellness.

Since there are multiple growing areas in this domain, a specific focus could be offered within a content area.

10.6.2.2 Illustrative Content Areas

Given below are illustrations of content areas for physical education as a vocation:

Content Area 1: History of Sports and Wellness in India and the World

Through this content area, students will be introduced to the rich heritage of practices related to sports, fitness and wellness in the Indian subcontinent. It will also give an overview of how these practices have travelled to other countries. Students will be introduced to a few key systems of fitness and wellness practices across the globe, along with sports that originated in India and in different parts of the world.

Content Area 2: Sports and Fitness Advanced Basics

Through this content area, students will go deeper into the practices required for strength and conditioning training. Maintaining strength, endurance and flexibility is necessary for any sports or physical activity. Emphasis will be on giving students an understanding of how to develop these capacities in others. Students will also engage with the use of practices like yoga for developing strength and flexibility. They will also be introduced to malpractices and the problem of doping in sports.

Content Area 3: Focus on a Specific Aspect

Through this content area, students will focus on one of the following:

a. *Introduction to sports coaching (in a particular sport)*
    i. Safeguarding in sports
    ii. Strength and conditioning
    iii. Teaching skills
    iv. Strategy and tactics in sports
b. *Introduction to sports officiating (in a particular sport)*
    i. Rules and regulations of sport
    ii. Sport officiating guidelines
c. *Introduction to sports education*
    i. Safeguarding in sports
    ii. Strength and conditioning
    iii. Teaching skills
    iv. Teaching life skills through sports
d. *Introduction to sports physiotherapy*
    i. Human anatomy and physiology
    ii. Sports injuries: prevention and management
e. *Introduction to sports management*
    i. Operations and planning in event management
    ii. Marketing, sponsorships, endorsements, and publicity
    iii. Finances and accounting in events

iv. Team management
v. Athlete management
vi. Ethics in sports

f. *Introduction to sports analytics and statistics*
   i. Strategy and tactics in sports
   ii. Basic python programming
   iii. Using sports data for strategy

g. *Introduction to sports photography and videography*
   i. Introduction to equipment and maintenance
   ii. Basics of photography
   iii. Action photography

h. *Introduction to sports media and journalism*
   i. History of sports media and journalism
   ii. Journalism: Ethics and norms

10.6.3 Physical Education for a Professional Sportsperson

This is an illustration for Physical Education for a Professional Sportsperson.

10.6.3.1 Principles for Designing Courses for Physical Education for a Professional Sportsperson

The aim of teaching physical education for a professional sportsperson is to strengthen the capacities and skills in students towards pursuing sports and physical activities at a professional level. The assumption is that many of these students will already be undergoing coaching in their respective choice of sport and these courses will aid their development.

The courses must be designed keeping the following principles in mind:

a. Students will engage with important aspects of the anatomy and physiology of the human body.
b. They will develop skills to build their endurance, strength, and flexibility through different systems.
c. They will learn and apply techniques and strategies in a specific sport.

Students must be offered specific content aligned to the specific sport or activity they have chosen to specialise in.

10.6.3.2 Illustrative Content Areas

Given below are illustrative content areas for physical education for a professional sportsperson. Since practice is a particularly important component of this area of study, half the time should be allotted to individual practice and training:

Content Area 1: Sports and Fitness Advanced Basics

Through this content area, students will engage with the practices required for strength and conditioning training. Maintaining strength, endurance, and flexibility is necessary for any sports or physical activity. Students will get an understanding of how to develop these capacities and also use practices like yoga for developing strength and flexibility. Students will also be introduced to malpractices and the problem of doping in sports.

Content Area 2: Focus on a Specific Aspect

Through this content area, students will focus on a specific sport or physical activity that may be aligned with the sport they intend to pursue professionally or that is of deep interest to them. They will also be supported in building their individual capacity for playing sports. The focus areas could be:

Focus on Specific Sport or Physical Activity

a. Basic skills and techniques in sport (in a particular sport)

b. Tactics and strategy in sport (in a particular sport)

c. Basics of Pilates

d. Basics of Tai-chi

Individual

a. *Pranayama* and understanding yoga *sutras.*

b. Endurance and cardiovascular training (in a particular sport)

c. Advanced strength and conditioning

Section 10.7
Interdisciplinary Areas

The Interdisciplinary Areas Curricular Area will, illustratively, offer business studies, accounting, sustainability and climate change (Environmental Education), media and journalism, family and community sciences (the current form of Home Science), Indian knowledge systems, and legal studies. This list may be enhanced continually.

Illustration of content areas sustainability and climate change, and media and journalism is outlined below:

10.7.1 Sustainability and Climate Change

This is an illustration for sustainability and climate change.

10.7.1.1 Principles for Designing Courses for Sustainability and Climate Change

The aim of teaching sustainability and climate change is to enable in students a deeper engagement with environmental education and explore the interconnectedness with sustainability and climate change grounded in the Indian context.

The courses for sustainability and climate change must be designed keeping the following in mind:

a. Students will engage with complex environmental problems without being overwhelmed by them.

b. They will describe and summarise environmental challenges linking society and the environment.

c. They will understand trade-offs and ethical dimensions of sustainability and climate change challenges.

d. They will develop environmental literacy, enabling them to engage in environmental action.

Addressing environmental challenges requires an interdisciplinary perspective incorporating science, society, economy, and politics. The content for sustainability and climate change must be developed using the framework of social-environmental systems that conceptualises environmental issues as complex, non-linear in cause and impact, subject to shocks, and with tipping points. Central to the framework is equity and environmental justice, which must be emphasised.

Students must engage with sustainability and climate change challenges at different scales. They should learn both about the need for and limitations of individual versus systemic change, and technological fix versus participatory action. They should also be involved in analysing case studies of successful interventions at different scales that have addressed environmental problems without being overwhelmed by the complexity of the challenge, which is an important learning for the students.

10.7.1.2 Illustrative Content Areas

Given below are illustrative content areas for sustainability and climate change in Grades 11 and 12:

Content Area 1: Environmental Science from a Social-Environmental Systems Perspective

Environmental challenges can no longer be addressed by traditional approaches where there was a clear separation between pure science and social science. As humans, we are today an intrinsic part of our environment, and our actions result in impacts on the environment and humanity. With this is in mind, students will study about the threats to the earth, the interconnected nature of planetary boundaries, and thresholds that are breached, as well as, explore using the systems perspective to examine the tipping points. The need for going beyond individual behavioural change to requiring interventions at a systemic level for environmental sustainability will be emphasised. Students will also understand how the use of technology alone (via new approaches to waste management or energy production) cannot completely address sustainability objectives, which require working adaptively with people, culture, markets and policies.

Content Area 2: Environmental Pollution–Air

Air pollution is one of the major environmental challenges faced today with serious implications for human health. Students will understand concepts around air pollution, such as, meteorology, composition (SPM, NOX, SOX), and sources (industrial, vehicular). They will examine the effects of air pollution on plants, animals, as well as, human health, the economic implications and issues of pollution and environmental justice. They will also examine air pollution control measures, from technological to behavioural.

Content Area 3: Biodiversity

Students will start by refreshing concepts of biodiversity (ecosystems, species, natural landscapes) and why biodiversity is important for human existence on this earth. They will then understand the threats to biodiversity, and how this has affected biodiversity at a global and national scale. The impacts of the loss of biodiversity linked to human dependence will also be included. This content area will provide a context to the history of biodiversity conservation, with a focus on a critique of Indian legislation (laws, protected areas, community conservation) and their implications. Students will also learn a few methods of documenting local diversity using tools, such as, citizen science and People's Biodiversity Registers (PBRs).

Content Area 4: Climate Change

Climate change is reshaping the world's environment with major implications for humanity in the coming decades. Students will be introduced to the science of the earth's climate system and will explore issues of climate justice and changing weather patterns. They will be introduced to national and international agreements on climate change action, and to positive steps that can be taken for climate change adaptation and mitigation at different levels from the local level to the national and international levels.

10.7.2 Media and Journalism

This is an illustration for media and journalism.

10.7.2.1 Principles for Designing Courses in Media and Journalism

The aims of teaching media and journalism are to introduce students to media in its diverse forms, technology, and function, and to enable them to develop media literacy and production skills. The courses for Media and Journalism must be designed keeping the following in mind:

a. Students will critically examine the role of media in society through a set of broad-ranging engagement with diverse media forms, ranging from traditional media to the news space on social media.

b. They will engage with a comprehensive history of media in its global and local scope.

c. They will understand the basic elements of different mass media and acquire the basic tools of journalism.

d. They will be able to produce media on a smaller scale using available tools and technology.

10.7.2.2 Illustrative Content Areas

Given below are illustrative content areas for Media and Journalism in Grades 11 and 12:

Content Area 1: Media Literacy

Through this content area, students will be enabled to develop into discerning consumers and analytical appraisers of media texts. They will be equipped with knowledge about their working methods. They will be able to distinguish between different media and identify salient features of different media forms. Through real-world examples, they will explore the key characteristics that set each mass medium, including newspapers, radio,

television, the internet, and social media, apart from others. They will learn how our perceptions of the outside world are affected by popular media.

Content Area 2: History of Media

Through this content area, students will be supported in identifying socially responsible media practices in India, through historical examples set against the larger background of various social movements and historical developments. Among other things, they will also learn about key figures of the Indian national movement and social reform, such as, Mahatma Gandhi and B.R. Ambedkar, as journalists. They will develop a fairly broad understanding of the postcolonial Indian State and the media institutions, and media policies developed by the State. They will also be provided an overview of such developments in print, broadcast and digital media.

Content Area 3: Basics of Journalism

Through this content area, students will be introduced to the fundamentals of Journalism, covering newspapers, broadcast media and social media. They will gain a foundational understanding of reporting, news gathering, interviewing and story pitching. They will learn about journalistic ethics and how to act socially responsibly, as well as fact-checking techniques while gathering news. They will engage with the journey of a news story within a given span of time, the various stages of mediation it goes through, and learn to be cautious of disinformation. They will be introduced to the tools and techniques for checking news. They will learn how to differentiate between various news story types and how to report them. Students will also practise reporting in various genres and formats by exploring issues and themes of interest to them.

Content Area 4: Media Making Project

Through this content area, students will work on themes of local relevance and use available resources to create one or more newsletters or school magazines or wall magazines. They will develop capacities for research and planning, gathering data, writing, editing, design and production. Using available tools and technology, they will create audio and video stories and curate them on social media platforms.

Section 10.8
Languages

A range of languages must be offered in Grades 11 and 12. Illustratively, languages native to India, foreign languages, classical languages and literature of different languages. The illustration given in this Chapter is of English Language and Literature.

10.8.1 English Language

This is an illustration for English language.

10.8.1.1 Principles for Designing Courses in English Language

The aims of English language teaching in the Secondary Stage are to develop communicative competence and build language proficiency. Students will build capacities for enhanced language use in real-life contexts and develop cultural awareness and appreciation for the diversity of English-speaking societies.

The courses for English language must be designed keeping the following in mind:

a. Students will explore and understand the history and evolution of the English language in India.
b. They will develop the ability to communicate effectively in a variety of contexts, including formal and informal settings.
c. They will widen their language base for personal, academic, creative, and vocational pursuits.
d. They will develop the ability to comprehend and evaluate texts, and explore rhetoric, reading, and writing in different real-life contexts.

10.8.1.2 Illustrative Content Areas

Given below are illustrative content areas for English language in Grades 11 and 12:

Content Area 1: English in India

Through this content area, students will learn about the history of english, briefly in England and subsequently in other parts of the world, with a specific focus on India. A sense of the many 'kinds' of English spoken globally, including Indian English and English in India, is crucial to young people's understanding of themselves in the history of a once colonial and now international language. They will engage with perspectives on cross-language borrowings and enhance vocabulary skills, with a focus on etymology and material on English words from Indian languages. Students will also produce reflections on their family histories of language, mapping their respective families' locations on the language grid, and their own individual language related abilities, achievements and aspirations.

Content Area 2: Functional English

Through this content area, students will begin to develop functional language proficiency within and beyond academic contexts. The focus will be on effective language use in a range of contexts, through which students can: (i) improve their practical language skills in everyday encounters; (ii) widen and develop their language base for academic, creative and vocational pursuits; (iii) acquire widely applicable study skills; (iv) reinforce proficiency skills gained in middle-and early secondary-school classes; and (v) become increasingly independent and confident users of English.

Content Area 3: English for Communication

Through this content area, students further enhance their ability to move from the academic context to communication in a real-world context. Using Communicative Language Teaching (CLT) methods, students will be enabled to use language in simulated real-life contexts. The target language (English) will be used by students to perform tasks requiring communicative competence and performance. The focus will be on effective communication, while the production of language in prescribed forms will be a secondary activity. Apart from face-to-face communication, phone conversations would be considered, as well as, the various forms of digital communication. In the process, students will develop skills in negotiation, critical thinking, and collaborative work. Also, the classroom would come as close to the real world as possible in terms of language use.

Content Area 4: English Language and Composition

Through this content area, students will learn about the power of language in communication. They will gain skills in using language to influence and persuade others, as well as, understand the ways in which people communicate ideas and meaning through both spoken and written language. By learning about rhetoric students can develop the abilities needed to communicate effectively, analyse arguments critically, and engage in discourse. Emphasis will be on non-fiction texts, and students will be provided opportunities to identify and analyse the persuasive language used by authors to shape and influence discourse. Students will gain the tools they need to analyse and put forth arguments, contributing to their development as informed and engaged citizens.

10.8.2 English Literature

This is an illustration for English literature.

10.8.2.1 Principles for Designing Courses in English Literature

The aim of teaching English literature is to foster in students both critical and creative skills and a deep love for literature in all its variety.

The courses for English literature must be designed keeping the following in mind:

a. Students will engage with a breadth of literary texts from across India, including those translated from Indian languages.

b. They will engage with and understand the language and the formal aspects of texts through writing.

c. They will use the English language as a tool for creativity and self-expression.

d. They will appreciate the richness and diversity of India through literary and cultural texts.

Literature is the means, the 'subject-matter content,' for fluent oral and written communication. Immersion in the English language is an important focus of literature. Therefore, students must engage with reading selections grouped around possible themes of interest to secondary school students, including young adult and school life, environment, magic and wonder, science fiction and nature. While the focus will remain primarily on written texts, students choosing English literature will be able to extend their critical and creative skills to other textual forms.

10.8.2.2 Illustrative Content Areas

Given below are illustrative content areas for English literature in Grades 11 and 12.

Through these content areas, students will be introduced to a range of literary forms and acquaint them with texts from India and abroad, in English and in translation:

Content Area 1: Reading Literature

Through this content area, students will learn to interpret texts and communicate their understanding orally and in writing. Students will be aware of the variety of written forms that are a part of our world, ranging from classical literary texts to newspapers and WhatsApp messages. Students can then be introduced to prose and poetry from different periods of time and diverse cultural contexts. They will learn to identify the formal features of texts and their thematic concerns. Students will individually and in

groups rewrite texts by changing words, settings and beginnings and endings to understand how meanings are produced.

Content Area 2: The Short Story and the Novel

Through this content area, students will be introduced to the idea of human beings as fundamentally narrative creatures with an urge for 'logical' conclusions and of storytellers as the first custodians of community histories. Students will read some examples of short story precursors (such as, jests, anecdotes, parables), as well as, some of their non-western counterparts (including the Indian *katha* and *qissa*). They will then move on to folk and fairy tales and the fable in western and eastern traditions. Students will engage with the short story in its modern avatar, examining how it has developed out of earlier forms and reading four or five examples from various parts of the world. Among other things, they will inspect what fantasy means in the shorter genres, why realism came to take over the short story at a particular time, and why fantasy has made something of a comeback today. Students will briefly learn about the history of the novel and read extracts from some early novels. Finally, they will engage with a complete novel and analyse it in detail.

Content Area 3: Introduction to Poetry and Drama

Through this content area, students will experience a direct engagement with the form, content, and effect of the works themselves. These will be foregrounded over an author- and tradition-centric approach to prescribed texts. Poetry-specific activities will direct students to note the relationships between words, sounds, affect, images, and cultural contexts. Drama-centric activities will also include reflections on the continuity and differences between texts and performances, on performance traditions closer home, and on the many spaces of performance (theatre, radio, streets, marketplaces, religious spaces, festivities, television, film, performance art, sketches).

Content Area 4: Reading and Writing: Poetry/Essay/Short Story/Drama

Through this content area, students will concentrate on one of four forms. They will read more advanced texts in the form chosen and engage with them critically. Students will become familiar with the formal and structural elements of the chosen form, as well as, with elements of its literary history and its adoption into different literary traditions in India and abroad. They will also engage in a series of writing exercises that will help them gain familiarity with the form on a practical basis and explore the possibilities it offers for their own self-expression. Students will take ownership of the chosen form and adapt it to suit their own contexts. Students will undertake a creative writing project where they will write their own stories, poems, essays, or plays.

Section 10.9
Grades 11 and 12, and Higher Education

'The current nature of secondary school exams, including Board exams and entrance exams-and the resulting coaching culture of today, are doing much harm, especially at the secondary school level, replacing valuable time for true learning with excessive exam coaching and preparation. These exams also force students to learn a very narrow band of material in a single stream, rather

than allowing the flexibility and choice that will be so important in the education system of the future.'

[NEP 2020, 4.36]

In recent decades, there has been an unfortunate trend in India to see Grades 11 and 12 as merely a means to gain admission into higher education. The curricular logic often gets twisted due to this kind of instrumental thinking.

The curricular logic of the NCF is oriented towards realising the aims and goals for school education. The learning standards, content, pedagogy, and most crucially the assessments are designed towards achieving these aims. The purpose of the Secondary Stage of schooling, particularly Grades 11 and 12, must not be imagined as a mechanism for selecting and sorting students for different programmes in higher education. This curricular logic is derived from the four fundamental principles articulated by NEP:

a. Flexibility, so that learners have the opportunity to choose their learning trajectories and programmes, and thereby choose their own paths in life according to their talents and interests.

b. No hard separations between Arts and Science, between curricular and extra-curricular activities, and between vocational and academic streams. This will eliminate harmful hierarchies among, and silos between, different areas of learning.

c. Multidisciplinarity and a holistic education across the sciences, social sciences, Arts, humanities, and sports for a multidisciplinary world in order to ensure the unity and integrity of all knowledge.

d. Emphasis on conceptual understanding rather than rote learning and learning for exams.

The curriculum for Grades 11 and 12 is guided by these motivations, rather than as instrumental 'preparation' for selection into higher education programmes.

NEP 2020 has made a sincere attempt to delink the school education processes from the admissions processes of higher education.

The National Testing Agency (NTA) will work to offer a high-quality common aptitude test, as well as, specialised common subject exams in the sciences, humanities, languages, arts, and vocational subjects, at least twice every year. These exams shall test conceptual understanding and the ability to apply knowledge and shall aim to eliminate the need for taking coaching for these exams. Students will be able to choose the subjects for taking the test, and each university will be able to see each student's individual subject portfolio and admit students into their programmes based on individual interests and talents.

[NEP 2020, 4.42]

It must be emphasised here that the specialised common subject examinations envisaged by NTA should be broad in terms of focussing on the key conceptual structures and methods of investigation in the discipline. If these subject examinations test narrow content knowledge, it would be misaligned with the goals and approaches of the NCF.

Part D

School Culture and School Processes

This part discusses the kind of ethos schools need to create that is essential to achieve the Aims of Education envisaged in this NCF. Developing and maintaining such a culture and ethos needs conscious and deliberate effort. The result of such efforts is an immersive experience for students and this experience should enable a positive learning environment as well as result in acquiring desirable values and dispositions.

Chapter 1 *on* ***School Culture*** *outlines ways in which a school can cultivate a rich, vibrant, and shared life of learning for all its members.*

Chapter 2 *on* ***School Processes*** *discusses various aspects of administrative and academic functioning that schools can consider to become effective in achieving their organisational and educational goals.*

Chapter 1

School Culture

School culture plays a significant and direct role in learning. It enables an effective learning environment by ensuring that students are actively motivated to learn with attention and enthusiasm, kept engaged and excited, and encouraged to develop attitudes of curiosity and wonders that are important for learning. In addition to having a positive impact on learning, school culture is one of the biggest influences on the development of values and dispositions amongst students, which are important Curricular Goals.

Hence, school culture must be systematically shaped towards achieving the desired goals. NEP 2020 states:

> *All participants in the school education system, including Teachers, Principals, administrators, counsellors, and students, will be sensitised to the requirements of all students, the notions of inclusion and equity, and the respect, dignity, and privacy of all persons. Such an educational culture will provide the best pathway to help students become empowered individuals who, in turn, will enable society to transform into one that is responsible towards its most vulnerable citizens.*
>
> *[NEP, 6.19]*

School culture must be a carefully integrated dimension of the curriculum, which will play a significant role in developing the values and dispositions that this NCF aims for. It must also enable a deeply engaging and active environment for the students, enabling learning in all its dimensions.

There are other aspects, such as, the engagement and motivation of teachers and the involvement of the community, that directly affect students' learning. While these are important, they are not taken up in detail in this NCF.

Section 1.1
What is School Culture?

School culture has two aspects. The first is values, norms, and beliefs, which form the school culture; and the second is behaviours, relationships, and practices, in which the culture is manifested and experienced.

The elements that form the culture, and its manifestation are deeply interrelated, but it is important to distinguish between these two aspects, because students learn from the manifestations. It is these manifestations and, thus, the experience of the students that must systematically enable the achievement of Curricular Goals.

We see these manifestations or constituent elements of the experience of culture can be seen in three categories:

a. **Relationships:** This refers to how the school's staff members, students, and other stakeholders relate and work with each other. For example, teachers listening to students patiently and showing concern about their physical and emotional well-being, collaborating with other teachers to provide a more wholesome experience for students, and welcoming parents' participation in the learning process demonstrate the culture of the school.

b. **Symbols:** These are about what is considered worth displaying and celebrating in schools. For example, there are various kinds of visual displays that we find in schools, displayed or written on school walls, and the pictures and paintings in the school corridor, which communicate what is valued by the school or the students lauded in the school assembly for specific actions.

c. **Arrangements and Practices:** These are arrangements related to various classroom, and school processes that signal the kind of culture the school has already established or aims to achieve. An example of an arrangement is seating, and an example of

practice is how age groups or genders are distributed in sports or housekeeping activities.

Schools must fully utilise the potential and impact of such culture-related aspects of organising daily life, enabling valuable opportunities for making full educational use of learning spaces, and possibilities, not limited to classroom teaching.

Section 1.2
School Culture and its Impact on Learning

School culture contributes to student learning in two ways:

a. By creating a safe, encouraging, and nurturing learning environment which is necessary for all kinds of learning engagements that are organised at school.

b. By directly contributing to the attainment of Curricular Goals through the development of desirable values and dispositions as discussed in Part A, Chapter 1, Section 1.3.1 of this NCF.

1.2.1 Developing an Enabling Learning Environment

The learning environment of a school can be characterised either by constraint, compliance, and control, or it could be an atmosphere that enables individuals by instilling trust and self-discipline, inspiring them to stretch their perceived limits and achieve their goals. In reality, this may be a continuum and not an 'either/or' situation, however the basic 'tone' does convey which side of the continuum the school desires to be.

An inclusive and nurturing culture forms the bedrock on which all school activities and pedagogical practices rest, grow, and succeed. Mutual respect, a non-threatening environment, and healthy relationships among students and Teachers are essential for dialogue and collaboration. Without these, learning become tedious for everyone involved. Along with a vibrant and caring environment, acting responsibly, and demanding rigour in learning are equally important characteristics of a school environment that contribute to achieving Curricular Goals.

The table below maps the key characteristics of such an enabling learning environment and some constituent elements of school culture that contribute to achieving them. We can see that these elements are relationships, symbols, arrangements, and practices.

Table 1.1i

Characteristics of an Enabling Environment	Constituent Elements of School Culture (some key examples)
Inclusive	• Participation of all students in classroom activities as well as other school processes is ensured. • No discrimination occurs based on gender, caste, religion, or any other factors. • Content, pedagogy, and assessment practices are carefully designed to ensure inclusion.

Violence-free	• Teachers and senior students can be observed going about their tasks and routines responsibly. • Clear expectations are set on behaviour and work, and ample support for fulfilling these expectations is given. • Persistence to complete one's work even when it may take time (or seem challenging) is encouraged. • Individuals are encouraged to admit to their faults and mistakes humbly. • Individuals are encouraged to acknowledge and express gratitude for the help received from others.
Encouraging good habits of learning	• Teachers and senior students can be observed going about their tasks and routines responsibly. • Clear expectations are set on behaviour and work and ample support for fulfilling these expectations is given. • Persistence to complete one's work even when it may take time (or seem challenging) is encouraged. • Individuals are encouraged to admit to their faults and mistakes humbly. • Individuals are encouraged to acknowledge and express gratitude for the help received from others.
Caring	• Teachers check on student's health, try to know how they feel, their interest areas, what makes them happy, and the challenges they are facing. • Teachers and students find ways of celebrating small achievements and progress made by students. • Immediate help is provided when someone is not well or going through a difficult time. • School is concerned about the student's family when warranted.
Responsibility	• Teachers and senior students can be observed being punctual, and following the school timetable. • Teachers and senior students can be seen attending to their tasks diligently. • Students share responsibilities in the school assembly, *Bal Sabha*, various student committees, and assignments given by teachers. • Students participate actively in decision-making processes in the classroom, in peer groups, and student committees.

1.2.2 Development of Values and Dispositions

a. Need for systematic and deliberate effort: Students derive their values and dispositions from two main sources, their family and community, and their school. In both these spheres of their lives, the quality of relationships, symbols, arrangements, and practices (which are the constitutive experienced elements of culture) determines what they imbibe and how they behave in these spaces.

The School Principal and Teachers often tend to stay with what they inherit as the prevailing school culture and processes, and their own values and dispositions. While principals tend to focus their energy on administrative compliances, most teachers remain confined to the demands of syllabus completion, and the focussed work of developing values remains poorly attended. As an outcome, schools may miss developing desirable values and dispositions, and may also end up inadvertently

(or in some cases, advertently) reinforcing various kinds of discriminatory social practices related to caste, gender, class, religion, region (migration, language), disabilities, physical appearance, perceived talent (smart versus weak students), and more.

Systematic and deliberate efforts are needed for the development of values and dispositions. The approach to this must be comprehensive, and done with all seriousness very much like the efforts needed for the teaching of subjects.

b. Values and dispositions articulated as goals in NEP 2020: NEP 2020 gives us a comprehensive list of values that need to be fostered through schooling. All these values are individually meaningful and important. However, because of certain common core characteristics and similarities, the values can be clustered together. The table below list these clusters of values and dispositions and also provides some constituent elements of school culture that will enable their development.

Table 1.1ii

Values and Dispositions	Constituent Elements of School Culture (some key examples)
Empathy Respect Sensitivity *Ahimsa* Respect for Elders Courtesy Forgiveness Compassion	• The practice of calm, respectful dialogue rather than violent reactions when one breaks school rules. • No corporal punishment, bullying, threatening and verbal/non-verbal abuse. • Mistakes are seen as a natural part of the learning process. • Refraining from carrying grudges and all individuals are encouraged to practice forgiveness, and support each other to heal from unpleasant experiences. • Encouragement and support are available for all. • Teachers care about students' health, feelings, and interests. • Respect is expressed in various forms towards elderly members of the immediate community, larger society and nation. They are remembered through readings and discussions about their life and achievements. They are invited for interaction and inspiration.
Responsibility Swachchta Respect for the Environment Patience Respect for Public Property Sustainability	• Individuals follow school rules and regulations, and complete tasks and assignments on time. • Sharing of school-level responsibilities in school assembly, *Bal Sabha*, various student committees • Students and Teachers participate in cleaning duties and community service periodically. • Students participate in decision-making processes in the classroom, in peer groups, and student committees. • Individuals practise judicious and sustainable use of resources within the school and outside. • There is a practice of proper upkeep of one's belongings, classroom and school property, and repair and restoration of damaged property and equipment regularly.

Honesty Integrity Satya	• Individuals practise being truthful, and school staff and senior students are equally encouraged to do the same. • Demonstrating the right action even through difficulties and challenges (persisting to complete one's work even when it may take time or seems challenging). • Individuals are encouraged to admit to their faults and mistakes humbly. • The school community credits and acknowledges others who have been helpful and supportive. • There is active reading and sharing of literature, real stories exemplifying honesty, integrity, and *Satya*.
Fraternity Patriotism Tolerance Peace Rootedness and Pride in India	• Students receive a lot of exposure to various forms of diversity and richness of traditions and cultural practices of our country, through school assemblies, displays on campus, and excursion visits to important places. • All subjects talk about the Indian contribution to the world in that discipline. • Celebration of national festivals. • Students learn about the Indian freedom struggle.
Justice, Equity and Fairness Diversity Pluralism Gender Equality Liberty Respect for All	• The school discourages all discriminatory practices, and adheres to the laws of the nation. • There is mingling and bonding between students and teachers from diverse backgrounds. • The school ensures equal opportunities for all genders and students from all socio-cultural backgrounds. • Respect and space are given for varied opinions, interest areas, and talents in the school community. • There is care for students' health, feelings, and interest areas. • The school provides nutritious meals to all and encourages togetherness in eating the meal. • The school provides accessible physical infrastructure and assistive devices, ensuring the participation of all students in all school activities.
Seva Nishkam Karma Sacrifice Helpfulness	• Individuals help those in need within the school and outside. • Periodic community service opportunities are available to students. • There is a focus on performing one's duties and tasks rather than on personal gains and other benefits. • There is an active appreciation for relinquishing one's desires and comforts for the sake of tasks for the greater good. • Focus on teamwork and the growth of all individuals in the school.
Rational Thought and Scientific Temper	• The school encourages questions and inquiry-driven exploration. • Seeking evidence that supports facts is deemed important. • There is an active discouragement of rumours and misbeliefs. • Analysing information from multiple sources and viewpoints is encouraged. • Exploration of new methods to solve various problems occur regularly.

Creative imagination	• There is encouragement for creative tasks among students and teachers in different subjects. For example, students create their own books, prepare display boards, and apply their learning to solve hypothetical imaginary or real-life problems. • Available physical space and other resources are creatively used. • Students are involved in the creation and use of TLMs. • Students are involved in enhancing the aesthetics of the school environment and greenery on school premises.
Hard work and Commitment	• Consistency and regular practice of all learning tasks and routines are maintained. • There is an expectation that individuals take their learning seriously and complete tasks that they begin. • Students work towards goals set by the Teachers and the Principal. • Literature, storytelling, and in-person sharing by people on hard work and commitment happens regularly.
Courage and Resilience	• Individuals explore multiple strategies while solving problems. • They persist with learning tasks despite errors and failures. • Efforts are made to resolve conflicts peacefully through dialogue. • There is open sharing of vulnerabilities, fears, and other emotions and help is sought when required.

The following sections detail the constituent elements, as relationships, symbols, arrangements, and practices of a school culture that can lead to these outcomes.

Box 1.1

Working through Challenges

Building a school culture that reflects the practices discussed in this section is likely to face a lot of internal and external challenges. Internally, the challenge may come from the staff and students when their beliefs and behaviour do not align with what is being proposed here. Similarly, the prevailing cultural practices in families and society may conflict with what is being attempted here. For example, it would be challenging for a school to inculcate the practice of gender equity when there are strong beliefs enabling gender discrimination at home or in the local community. These kinds of challenges and conflicts are often inevitable but surpassable in the journey of establishing desired school culture. A tenacious and steadfast engagement with these challenges would be required to see long-lasting changes.

Section 1.3
Constituent Elements of School Culture

1.3.1 Relationships

Relationships are, in this context, those that exist in a school, the essential expectations in them, and how these expectations are fulfilled responsibly. While at the core of school culture is the 'Teacher-student' relationship, the quality of student-student, Teacher-principal, and parent-Teacher/Principal relationships too have a direct or indirect bearing on students' learning.

The following are core characteristics of strong and inspiring relationships that a school needs to develop:

a. Mutual trust and respect

b. Openness, communication, and collaboration

c. Care

d. Responsibility

These core characteristics are seen in the context of school and learning. These are interrelated and not water-tight categories. When you trust someone, you are open to sharing and collaborating. Similarly, a sense of responsibility naturally leads to caring for others.

1.3.1.1 Mutual Trust and Respect

Trust and respect are fundamental to all relationships. Trust in this context, refers to the basic belief in the human capacity to learn and the intent to exercise that capacity to pursue worthwhile goals. By respect, we mean recognising and valuing an individual's presence, views, identity, and fundamental rights bestowed by the Indian Constitution.

In teacher-student relationships, teachers must openly show that they trust the capability of students and that they can all learn. They respond appropriately to every student's pace of learning and make efforts to understand them as individuals and their backgrounds. Teachers foster good relationships by helping students feel a connection with the whole school community while building an identity and space for themselves, and by listening to students patiently and caring about their physical and emotional well-being. Students will feel respected when teachers give them time and space to share their feelings, views, and work.

For enriching student-student relationships, conscious efforts must be made to create opportunities for students to work collaboratively with peers from different socio-cultural and economic backgrounds, age groups, genders, and abilities. From an early age, students need to be encouraged to speak politely, pay attention to one another, and demonstrate care and helpfulness at any given opportunity.

The respect and status that teachers once enjoyed as Gurus need to be restored. In Teacher-Principal or administration relationship, trust and respect are critical for sustaining motivation, commitment, and collaboration. It is done by providing good working conditions, i.e., having formal and informal ways of listening to teachers' views and experiences, including them in decision making, giving them space to exercise their professional expertise within the larger policy guidelines, and appreciating their hard work. Another important aspect is the Teacher-Teacher relationship. All teachers from diverse backgrounds, genders, age groups, and experiences must be respected and supported by other teachers. They need to be provided opportunities to learn from each other, and to work collaboratively. Apart from academic sharing, teachers also need the opportunity to rejuvenate themselves, this could be purposively planned, be it engaging in sports, and cultural activities or having some celebrations or excursions.

Schools need to build trust and respect in their relationship with parents and their wider community. Parents need to feel comfortable in approaching School Principals and Teachers. When the school reaches out to them, welcomes them, gives them regular updates, consults them on relevant matters, and tries to use their knowledge and expertise, parents feel valued and respected. Schools must work towards the community feeling a sense of constructive and positive 'ownership' of the school.

1.3.1.2 Openness, Communication, and Collaboration

Openness, communication, and collaboration are characteristics of healthy relationships. When there is trust and respect in any relationship, people become open to sharing and listening to one another empathetically. They are then more than ready to engage in collective tasks because they derive pleasure and strength from cooperative working together. Here are a few ways in which schools can enable these qualities in their members:

a. There should be spaces for open conversations such as circle time in classes and daily diary sharing in school assemblies, as well as encouragement for reaching out to Teachers and School Principals for honest sharing.

b. Many opportunities must be created for teachers and students to work together. This helps them strengthen mutual trust and respect for each other. This will also help them reflect on their own conditioning and to build interpersonal skills.

c. Art, Music, Drama, and Sports naturally provide opportunities where we need to work in groups. So, finding space for these subjects in the school timetable is necessary. Such creative and collaborative time is also required for teachers.

d. It is very likely that with greater openness and communication, and working together, differences and conflicts will become more easily expressed and known. This should be seen as an opportunity rather than an impediment to understanding and working with differences collectively. Some individual differences may get resolved, some may take longer, while a few may seem very challenging to resolve, but all this should not dampen the spirit and come in the way of continuing to work collaboratively on tasks that matter for the advancement of the school.

All collaboration must be directed towards the 'pursuit of excellence'. Students should be encouraged to set high expectations for themselves and be supported in their hard work to achieve their goals.

Relationships often get tested when faced with a situation where classmates or schoolmates engage in a competition with each other, be it in sports or some other type of competition, such as, debates, essay writing, or olympiads for maths and science. School cultures should help students strive hard to excel in their pursuits and, at the same time, teach sportspersonship and sportiveness, and how to deal with both success and failure gracefully. One can compete without compromising values of cooperation, empathy, resilience, appreciation of effort, and excellence. The feeling of *'Mudita'* (rejoicing in the achievement or success of others) can also be developed this way.

1.3.1.3 Care

Care is an essential expression of nurturing relationships when one feels related to and responsible for the other. Typically, caring means acknowledging the presence of others

in simple ways through smiling, greeting, mindfully sharing the space with others, and voicing one's views and suggestions honestly. When we care for others, we make efforts to get to know them better as individuals with their strengths and weaknesses, likes and dislikes, and gather some sense of what they have been through in life. All this is important information that help individuals live and work together with care for other people.

The need for caring is truly felt when an individual is undergoing difficult times, i.e., when one is feeling unwell, facing challenges in their personal life, or going through challenging emotions for some reason. This is when others need to extend support in ways that give strength, and help the person cope and be well through that situation.

Care is what people remember, both timely expression of it, as well as not having it when it was needed. The timely expression of care goes a long way towards nurturing relationships.

1.3.1.4 Responsibility

A relationship will be challenging to sustain if the related parties do not act responsibly towards each other. In the context of school-based relationships, behaving responsibly means following the agreed upon rules and regulations of the school, not acting in ways that hurt others, and working towards completing one's tasks for achieving one's goals. This applies to all who are part of the school community. Students paying attention, following instructions, asking questions, expressing their thoughts and doubts, working cooperatively in groups, working hard, completing tasks, supporting their peers, practising consistently, and applying what they have learnt to real-life situations are what acting responsibly would mean in the student-teacher relationship. Similarly, for teachers, making efforts to know individual students and their levels of learning, listening to them, planning for effective and engaging ways of teaching, giving appropriate learning challenges and supporting them, and assessing the progress of their learning to make necessary changes in teaching is acting responsibly.

Ultimately, acting responsibly is about every role that an individual has in life. Students learning responsibility as integral to all roles in life is best achieved through observation of behaviour of adults around them.

1.3.2 Symbols

Schools try to communicate a lot through the use of symbols. A symbol is any form of visual sign, writing on the wall, paintings, idols, or arrangements of physical objects that conveys what the school values as important. Such symbols may not only be displays, but also the kind of things celebrated or recognised as valuable in other ways. In some schools, one comes across this phrase, '*Shiksharth Aaiye, Sewarth Jaiye*' (Come to learn, go to serve), right at the entry gate. This is a daily reminder to students about why they are coming to school and what they are expected to do with their learning.

Here are a few more symbolic displays that we generally come across in schools:

a. Schools display hoardings and boards to emphasise what they feel is valuable about the school. It could be pictures of students who secured top ranks in Board examinations or different facilities the school provides. It could be about having smart classes or providing coaching in different sports.

b. There are lots of 'sayings' or 'quotes' written on school walls.

c. One may also find pictures of important and famous people and even idols representing certain religions either in principals' rooms, staff rooms, classrooms, or school corridors.

d. The choices and arrangements of physical objects also carry huge symbolic value. Principals' chairs often look very different from chairs for the staff. A school may choose not to provide chairs for teachers in classrooms so that they must remain standing and move about the classroom, and keeping themselves busy. The arrangement of furniture in classrooms also communicates the school's beliefs about Teaching-Learning processes.

e. Some schools paint entire walls with pictures, while others use display boards where student work is presented.

f. The kind of achievement or behaviour celebrated in the assembly or praised in public.

Schools need to consciously and carefully decide how to effectively use the power of symbols and celebration. They must be in alignment with the values that schools are fostering. They will have to be inclusive, give space to a diversity of good ideas, and allow all students to contribute and learn from them. Here are some good practices in this regard:

a. Instead of having permanent 'sayings' or 'quotes' on the walls, a better way would be to have a dedicated space for 'Thought of the day' and students could take responsibility for writing that on a small whiteboard. This can become a practice of inclusion in itself, as not only interesting thoughts by established, well-known personalities may be written, but also valuable sayings from lesser-known individuals belonging to different communities can be displayed. This can be used as an occasion to talk about the values these people held important and lived their lives by.

b. There could also be dedicated spaces for exhibiting artefacts representing local, regional, and national cultural heritage. Here, again, refraining from having permanent displays will help student learning. These could be a display of group project work too and they can remain there for a month. All students can be expected to read it and a quiz or sharing session in the school assembly based on that display would make for enjoyable learning.

c. School corridors can have display boards where each class can display what they are learning, so others get a good sense of classroom work just by taking a walk around the school. Selection of student work for display will be crucial, and one need not select the 'perfect' looking or more visually appealing work. Display of work done by all students showing varied levels of capacity is far better as it fosters a sense of dignity for all levels of sincere work.

d. Schools may also name some rooms or halls, even classes or buildings, with the names of renowned personalities, rivers, and constellations. There may be names given to student houses in larger schools. These should also reflect the diversity of our country.

e. School uniforms also have symbolic value. The colour, as well as the kind of clothing chosen, communicates to the world the beliefs of the school. One may opt for a more traditional, modern, or gender-neutral uniform. Consideration of local climate, safety, easy availability, and cost-effectiveness will reflect the school's sensitivity.

f. There could be a permanent notice board in each school where some school-related information for visitors and some important phone numbers (such as, child helpline, hospital, school helpdesk), and key behavioural expectations from all on campus can be displayed.

g. There could be a thoughtfully constructed list of matters that should be highlighted in the assembly and recognised.

h. Sometimes, schools practise symbolic representation of hierarchy in unnecessary ways. For example, there may be a different cup or mug in which the principal is served tea. Such practices need to be avoided as they go against the values a school must foster.

1.3.3 Arrangements and Practices

All schools require the help of certain classroom-level and school-level processes to function well. All school processes require arrangements, and practices. For example, the Mid-day Meal (MDM) is an important daily process in public elementary schools. To run the Mid-day Meal smoothly, arrangements for procurements have to be made, and a plan for cooking and serving is necessary. Schools have to organise menu preparation, quality checks, serving of food, and proper utilisation of food waste. The nature of these arrangements and practices reflects inherent attitudes and fosters the beliefs and values (about care, nutrition, and people's participation) of a school as well as of the education system.

In this section, arrangements and practices around major school processes, such as, classroom processes, school assembly, mealtime, sports activities, and engagement with parents and community have been taken up. There are other processes too, but the ones selected here are the key processes found in all schools. Matters of school processes are dealt with more exhaustively, beyond the arrangements and practices which constitute school culture, in the subsequent chapter.

1.3.3.1 Classroom Practices

Different classroom practices, directly and indirectly, promote different values:

a. **Seating arrangement:** If all students always sit facing the blackboard in the classes, it conveys a perception that the primary source of learning is the blackboard and the teacher. A circular, semi-circular, or small group seating arrangement from time to time allows for different learning experiences, as students can interact with their peers and work collaboratively. If there is a practice of placing students who are considered smart and enthusiastic in the front rows and others get seated at the back of the classroom, then this practice in itself will reinforce how learning happens in a group and who learns and who does not. Separate seating for boys and girls, and students sitting on the floor on mats while the teacher is always on a chair, and other such arrangements that have the potential to establish unnecessary differences and hierarchies can easily be avoided with alternative arrangements.

b. **Availability and accessibility of TLMs:** A classroom can be filled with rich learning possibilities with interesting educational material on the walls, and in open racks collected over time. These can be made accessible by planning for their use in the schedule of learning activities for the class. When there is sufficient relevant material

and students can make use of it, they are engaged meaningfully at different levels. This would make the learning in the class lively and more vibrant. Having a 'reading corner' with a collection of books that are suitable for the learning levels and age groups of the students would encourage a culture of reading. Such practices clearly show the school's commitment to ensuring learning for all.

c. **Giving ownership and responsibility to students in the learning process:** A classroom culture where students are wholly dependent on the teacher's instructions and reluctant to take initiative makes for a spiritless class. On the other hand, students actively taking charge of their learning process makes for spirited and vibrant learning. Students can be involved in preparing TLMs, displaying them on the walls, maintaining their own progress portfolio file, leading peer learning sessions, and even being asked to do short teaching sessions under the guidance of teachers.

d. **Cleanliness:** The cleanliness and tidiness of the classroom can be the responsibility of students. Before closing the day, the classroom can be cleaned and made tidy again for the next day.

e. **Learning rituals:** There can be certain educational rituals that are followed during classroom processes. Different teachers may initiate and sustain different class preparation or learning rituals which can make these different classes diverse learning experiences. One teacher may make the whole atmosphere relaxed but focussed, while another may make it tense and intimidating. For example, some teachers start by having an informal chat and listening to what students would like to share before moving on to their teaching plan, while another teacher may just expect all those who could not do their homework to stand up and give an explanation. Movements, speaking, interactions, praise or scolding, and expressing happiness and concern all may take forms that either prove detrimental or add richness and joy to the learning process.

1.3.3.2 School Assembly

A lot can be achieved in the culture of the school through assemblies if this space is utilised effectively and creatively. Different groups of students can take the lead in organising small group or whole school assemblies under the guidance of teachers. It could be a forum where not only the home language, but also the whole range of language diversity in India can be given importance. Students can be encouraged to give presentations, sing songs, and perform skits in several languages. Even if students learn to sing one song from a part of India other than their own, they feel some familiarity and connectedness. If there is enough space available, the whole group could dance to diverse forms of music selected from different parts of India.

On important days, teachers and students can talk about different people or events that make that day memorable. Real stories of courage and resilience, *Nishkam Karma* and *Seva* can be narrated. Opportunities for sharing what students are learning in various subjects, ranging from their library class to activities at home, may be created. Students would be motivated to pay attention to display boards if there are a set of quizzes on them in the school hallway. Roleplays and skits can be performed on various social issues to sensitise students, and these can serve as springboards for discussion on current issues faced by our society and nation.

The duration of the assembly, seating arrangement, anchoring responsibility, proper communication on what will be done each day of the week, use of musical instruments and a sound system, and preparation for the assembly all need to be paid close attention to from a cultural perspective. For example, it would be difficult to have the whole assembly standing. Asking students to sit in class-wise lines may not be needed, as mingling with other students can be allowed. Even younger students can shoulder anchoring responsibility with seniors.

1.3.3.3 Mealtime

The quality of the food served at mealtimes, seating arrangements, and serving practices are all important cultural aspects that help members feel satisfied with the food that they partake in. Students from various socio-cultural backgrounds must sit and enjoy the meal together. For many students, this may be the only proper meal that they get during the day, so schools must pay the required attention to its preparation and nutritional value. Teachers need to check the quality of the meal as well as participate in serving it and eating with the students. This will open opportunities for them to observe students' eating habits, and have a dialogue with them afterwards to positively impact them. Good hygiene standards have to be maintained, and groups of students and teachers can take up the responsibility of washing their own plates and checking for the cleanliness of utensils.

1.3.3.4 Distribution of work

Students and teachers are engaged in the work of the school in other ways too. For example, arranging the Mid-day Meal, cleaning the school, preparing for the school day. All such work must be allocated and managed very thoughtfully. It must be inclusive and non-discriminatory from every perspective. It must not feed into some standard prejudices or stereotypes, such as, 'Only girls should do food-related work' or 'Working involving physical labour is better done by children from specific communities'.

Distribution and management of schoolwork is wonderful opportunity to build multiple values and capacities, including a value for work and discipline, importance of teamwork and collaboration, a sense of equity and fairness, the sense of responsibility, and good work ethic among others.

1.3.3.5 Sports Activities

Regular sports activities (for class groups and the whole school) in the weekly timetable are extremely important to ensure physical and psychological fitness and cheer in students. The setting of the playground and the group dynamics among students during sports are usually very different from the classroom context. Many students may be far more skilled on the field than they are in the classroom, and these students can be encouraged to support teachers in conducting a particular sport for other student groups. This will not only enable these students to feel appreciated and gain confidence, but also inculcate a participatory culture in sports. Schools must not let go of the opportunity a playground offers for building student-student and student-teacher relationships and teaching cooperation, teamwork, courage, and resilience. Students of all genders should be encouraged to play all sports. There could be specially designed games or modified

rules for regular games to allow the inclusion, and equal participation of students with disabilities. Students can be motivated to keep trying, even if things get hard, to improve their skills, such as, speed and accuracy on the field based on their previous performances. Students can set their own goals to work towards, and teachers can also guide them to set the next level of goals to challenge themselves and grow.

1.3.3.6 Engaging with Parents, Family, and the Community

The culture of a school is reflected in the way it welcomes and engages with parents or family, the community, and other visitors. Irrespective of the parents' or family backgrounds, attitudes, and dispositions, schools need to make them feel welcome and comfortable. There should be clear communication with parents or family about when they can visit the school. They should be warmly treated and attended to. Parents or families want to know what their children are learning, so the sharing from the teachers' side cannot be just about the academic challenges and struggles, but a much more holistic report about students' overall education at school. The reception area or the school premises should have displays that reflect the kind of work happening in the school. Educational and fun activities and games designed for the active engagement of parents will ensure they have a memorable time visiting the school. They can also be invited to share their experience and knowledge with students as part of the curricular plan. Regular home visits by teachers would go a long way in building this parent-teacher relationship.

Schools cannot limit themselves to engaging with the parents of their students only. The larger community from which students come needs to be engaged through invitations to the annual day, and other school functions. Members of the school must also participate in the local events of the neighbouring community as much as possible.

Box 1.1i

Inclusion and Participation

The principle of inclusion and participation for all has to be the core consideration across all elements of school culture. School processes must be designed for the participation and benefit of all members of the school from all walks of life. These processes have the potential to help every student and staff member experience a sense of belonging and a feeling of togetherness. Teachers must be alerted to see if any student is being or feeling excluded (in the classroom or in informal settings during breaks, playtime, or mealtimes). Teachers also need to ensure that students belonging to different genders, socio-economic groups, and with differential abilities interact with one another without resistance or hesitation and develop meaningful bonds.

Acts of discrimination and exclusion, either consciously or inadvertently practised by teachers, could take many forms. These often stem from the belief that some students cannot learn because of their background or ability and are labelled discriminatorily. There need to be forums for discussion and other such processes that help the teachers become aware of their own biases and stereotypes and how these get reinforced in their classroom practices.

School teams need to assess and not merely assume if their approaches and methods are inclusive. This can be done by frequently holding discussions with students after the learning activities about how they felt while participating and if they felt comfortable and experienced fairness. Such discussions can provide a space for all students to express the difficulties they experience and draw support from others. This also generates love, empathy, and care for all.

Chapter 2

School Processes

Every school has processes to ensure two things, the smooth functioning of day-to-day activities and enabling progress towards the achievement of the Curricular Goals.

Be it relatively simple tasks, such as, ensuring the cleanliness of school premises or more complex ones, such as, monitoring and improving the quality of Teaching and Learning, both need well thought out processes. Another example is an annual calendar, as well as a daily timetable, which is central to organising the school's functioning. There must also be processes that allow for incorporating changes in both instruments of time allocation.

Processes that are set in place will clarify what needs to be done, the procedures for decision making, and the spirit with which one must act and respond.

Another important aspect of school processes is that they reflect the values and beliefs of school culture, and in turn, reinforce them. Part D, Chapter 1 has discussed this matter. School processes can be broadly divided into the following categories:

a. **Curricular Processes:** These are processes that have a direct effect on learning. For example, the school timetable, school assembly, library, student committees, celebrations and events, and the use of technology in schools.

b. **Curriculum-associated Processes:** These are processes that have a significant but mediating effect on learning. For example, processes for teacher professional development (TPD), engagement with parents and the community, the Mid-day Meal, and other such processes.

c. **Organisational Processes:** These are processes that enable the planning for and smooth functioning of the above two processes. For example, the school development plan, an annual calendar, a plan for mobilising and allocating resources, data management and reporting, forums for the resolution of conflicts and disciplinary issues, and processes for safety-related issues.

Section 2.1
Curricular Processes

These are processes that have a direct effect on learning. For schools, an important focus is making the best use of the time, and resources available for student learning. Within this, there are two considerations: how to allocate time for the learning of various subjects and how to create learning spaces beyond subject classrooms (such as, school assemblies, library). This section talks about how effective use of daily time, spaces, and opportunities beyond the subject classrooms could be made for learning. Subject teaching processes are covered in chapters dealing with specific subjects.

2.1.1 School Timetable

A timetable provides structure to the daily routines and activities carried out in the school. It must be decided imaginatively so that it allows for different engagements without compromising the requisite time for different curricular subjects, and whole or mixed group activities. A good timetable allocates time according to the needs of different Curricular Areas and provides scope for incorporating multiple activities (many of them may be weekly, fortnightly, or monthly) without disturbing the larger structure too much. For example:

a. School assembly, the last period of the day, and Saturdays could be used to serve multiple purposes. On alternate days, instead of a school assembly, a common sport or activity period for the entire school can be planned. Similarly, the last period of the day could be dedicated to club activities (e.g., music, theatre, art, literature, and sports) where students can participate or even lead various creative engagements. This slot can also be used for preparing for various events without disturbing the continuity that is required for learning improvement.

b. The idea of a block period allowing extra time for certain kinds of curricular activities would be ideal. For example, laboratory activities or project work require more time. So, teachers can plan to use block periods as required.

c. Saturdays can provide greater flexibility and scope for engaging students in a variety of ways that are educationally valuable, such as, going on short field trips, planning for interaction with the local community, and having dialogues around adolescent issues.

There should not be too many changes in the daily timetable, as it would disturb the rhythm of the school. It should be thought through carefully and designed stage-wise,

keeping the curricular demands of each stage in mind. Depending on the time of the year, considerations can be built into the timetable for processes, such as, admissions, examinations, and events, such as, festivals.

This section should be read with the chapter on time allocation (Part A, Chapter 4).

2.1.2 School Assembly

Assemblies bring the whole school community together, and facilitate collective learning and appreciation for work that goes beyond the confines of subject domains. School assembly is an ideal way to start or end the day with positive feelings of togetherness. Instead of making assemblies ritualistic and mechanical exercises, schools should think of creative ways to make assemblies meaningful. A variety of arrangements can be explored, and the sequence and format of presentations could change from time to time so that all students get the opportunity to participate in the events. Schools must ensure that the assembly does not impose undue pressure to perform or deliver only perfected presentations. Instead, assemblies should be seen as a process of sharing and learning, accepting limitations in the presentations, and getting over stage fright by creating a setting that allows students to feel comfortable presenting and not fear judgment or ridicule.

Assembly in the Foundational Stage can be mostly held in the classroom with a weekly gathering of two or more grades in larger groups. From the Preparatory Stage, students could participate in multigrade and whole-school assemblies.

Assemblies are typically done at the beginning of the day, and depending upon the school size, it could be one or many small group assemblies happening simultaneously. An assembly of least twenty minutes of gathering allows for some meaningful engagement. For larger weekly assemblies, more time can be provided. Presentations could include singing the national anthem, and a variety of songs in different languages, a few minutes of meditation or quiet time, storytelling, skits, mime, reporting local news (based on students' gathering of information and interactions with the local community), book or movie reviews, presentations of artwork, magic tricks, puppetry, and sharing relevant instructions (or information) related to other school processes and school administration. Learning to sing songs together in groups is in itself a valuable exercise in group cohesion and belongingness. Similarly, some physical activities, such as, dance and movement, can be performed by the whole group if there is sufficient space. Schools could also plan activities based on certain themes so that students can explore ideas and expressions in a variety of modes. All activities must aim to actively engage the audience and invite their responses whenever appropriate.

2.1.3 Library

The role of books in education is central to students' growth, and this value addition can begin even before one has gained literacy skills. The library opens the scope for self-driven and guided acquisition of knowledge beyond textbooks. With access to a variety of good books and other digital resources from around the globe, the doors to a world of rich experiences become open to students. Therefore, a rich collection of books and resources in a school library and reading corners in each classroom are a necessity.

A library could be housed in a dedicated room, hall, or a corner in each classroom, but the critical point is the availability of relevant books in good numbers and an easy accessibility mechanism. Efforts must be made to include content that represents various genres. Books on India's rich heritage and the lives and imaginations of people from various regions and diverse backgrounds, including those who belong to socio-economically disadvantaged groups, must find a place in the collection. Bilingual books and books in other Indian languages would be a must have section in the library. The library should also have appropriate assistive devices, audiobooks, books in braille, and other such resources for people with disabilities.

Teachers have an important role to play in identifying what books need to be purchased, and how to make use of them to enhance student learning. They need to provide students with ideas about what else they may study and research beyond what is given in the textbooks and should, in general, talk about books keeping in mind the interest areas of students. Giving students small assignments that require them to read and write about people, issues, and general life matters from the library will encourage them to access books in a more focussed manner.

A vibrant library requires a variety of activities to develop a culture around reading and sharing. The simplest of these activities are read-aloud sessions, oral storytelling, and book reviews. Making a pop-up or big book, 'meet the author' events, creative activities, such as, writing workshops and making bookmarks, and restoration activities, such as, book repairs can be thought of. Additionally, designing illustrations, posters, book covers, and bookbinding are often very exciting for students. Book purchases and book donation drives can also be planned. A library committee that consists of teachers, students, and community members could manage the various activities and arrangements of the library.

The purchase of new books and other resources can be decided by a library committee in consultation with the School Principal and could include a process of reading book reviews, visiting book fairs, and bookstores, and taking suggestions from students, teachers, and other community members. A 'wishlist' of books may be collected from all these sources.

In most schools, library responsibility is shared by a teacher and possibly some students. The processes of cataloguing, organising, keeping a record of borrowed and returned books, promoting careful and gentle handling of books, monitoring damage, wear and tear, and restoring books all need to be a collective endeavour. When libraries have very strict rules or keep their books under lock and key worrying about students using them, it defeats the whole purpose of having a library.

2.1.4 Student Committees and Forums

Every school must encourage the formation of student committees and forums *(Bal Sabha, Bal Panchayat,* and other student forums) to involve students in school activities and create a sense of ownership and responsibility among them. By participating in the activities of different committees, students develop a sense of responsibility, accountability, cooperation, taking initiative, leadership, and conflict resolution. There can be multiple committees in which students can participate for short periods, and then change over to another committee. This would ensure that all students become familiar with the management and functioning of various school processes.

Some of these committees take care of school-related tasks, such as, ensuring cleanliness, managing Mid-day Meals, or organising cultural events, while some schools also have committees that work at the community level. Health committees, Sports committees, Eco club, Music club, Heritage club and other such forums take up engagement at the community level under a teacher's guidance. Through these forums, students get to participate in various tasks, and develop expertise as well as respect for different fields of meaningful work.

2.1.5 Events and Celebrations

All school celebrations and events must be both enjoyable and meaningful exercises integral to the learning process. Through a well-planned annual calendar, events and, celebrations can be integrated with various aspects of the academic plan.

Schools can plan small and large celebrations imaginatively. Apart from the usual annual day and national festivals, there could be periodic celebrations of student learning and achievements, welcoming a new teacher or a new group of students, farewell for outgoing students, achievements of school alumni and the school's contribution to the community's welfare, activity or games and interaction with parents and community members, local food festivals, and so on. The school team may decide to cook and eat together, play together, or take up some school-level or community-level work collectively at least once a month, and this event itself could be a celebration of unity and collective enjoyment. For the annual day, national festivals, and sports day, the school would need more elaborate planning and preparation as this is the time when the larger community is also involved.

a. **Preparation:** All events require adequate preparation and arrangements. The process of planning, selection of programmes, preparation of invitation material, posters, decorations, rehearsal, anchoring, and interaction with guests should involve students' participation. Rehearsals and preparation for events should be a part of the overall Teaching-Learning process where students get opportunities to present as an extension of their classroom activities and learning. This implies that classroom activities include art integration and are multi-disciplinary.

b. **Presentations:** The presentation of programmes does not require the pomp and show of elaborate costumes, stage props, and makeup in the younger age groups. Students need to wear comfortable clothes for activities that involve physical movement and dance. They could adopt other strategies, such as, masks, headgear, and symbolic paper costumes. Students, teachers, and the local community could be encouraged to provide live acoustic music support rather than using recorded music.

c. **Judicious use of resources:** Schools should be conscious of the use of resources and time and plan the events with sensitivity and careful thought. Schools should consciously use eco-friendly materials, ensure cleanliness and order throughout the event, and avoid generating noise pollution caused by powerful sound systems and amplifiers. Participation by all can be ensured by organising more frequent small-scale events where different groups of students get a chance to present and participate. Those who have presented at one event can participate as the audience in the others.

Section 2.2
Curriculum-Associated Processes

For effective Teaching and Learning to happen, some processes are required for teachers to collectively reflect on and improve the quality of teaching. Similarly, engaging parents so they also provide requisite support, and maintaining the good health of students have a significant mediating effect on learning.

2.2.1 Teacher Collaboration and Professional Development

Teachers' professional competence and collaborative efforts are the most critical factors directly impacting student learning. Every school needs effective processes that enable this, and the School Principal can make this happen in effective ways. Trusting and respecting teachers is the foundation and principals can do it in multiple ways: by listening to them, providing them with the facilities and resources to work, arranging academic and other support, and involving them as equal partners in school-related decision making. A basic connection among Teachers and the School Principal is necessary for the success of initiatives towards school improvement.

Schools require mechanisms that facilitate sharing, reflection, and working together among teachers. Teachers need to realise that teaching in a school context is a collective responsibility, so they need to rise above the notion of teaching as an individual act limited to a subject domain centred around a prescribed syllabus and textbook. Having subject-based groups at the school or school cluster or complex level will help teachers get a sharing and learning platform, new ideas and resources, as well as appreciation, and critical feedback. Wherever possible, teachers of different Curricular Areas could collaborate to create integrated plans that are implemented together. Monthly forums of mixed groups of teachers can take up common concerns (e.g., how to address adolescence-related issues) for which teachers come adequately prepared. A culture of peer review of each other's work, observing classes of other teachers, and documenting one's experiences will go a long way towards teacher learning. Without teacher collaboration for learning, it is difficult to imagine a vibrant school culture and effective school processes.

Senior teachers can be identified and groomed to become mentor teachers for the new teachers. There could be a well thought out school-based induction for the new teachers in which they get to learn about the vision, and practices of the school and the expectations from them, as well as the nature of support available. Journal writing, documenting one's teaching experiences, and writing articles for various educational periodicals are yet another way for teacher development, as writing helps one systematise one's thoughts and experiences. This also enables teachers to reach beyond the school audience and connect to the wider community of education professionals.

2.2.2 Engaging with Parents, Families and Communities

Schools need to build quality relationships with parents or families, and the community to not only assist student learning, but also fulfil the larger role a school is expected to play in the life of the community it serves. Here are some possible ways schools can make parents and community members real partners:

a. At the very beginning, when parents or families come for admission for their children, an orientation on what the school stands for, its Teaching-Learning processes, and expectations from parents or amilies must happen. This could be done in several forms, such as, one-on-one meetings where individual queries can be responded to making a presentation about the school to parents or families, and sharing a written document about what parents or families should know. A tour of the school premises led by students would be a creative and effective way of introducing the school to new parents or families. By interacting with students this way, parents or families would get a direct sense of the culture of learning fostered by the school.

b. Parents or families must get regular updates on student progress. It is a limited interaction when PTMs become primarily about telling parents or families what issues and challenges are being faced by their children. It will be a more meaningful conversation when the discussion in PTMs is about all the learning opportunities students are engaging with, and the efforts made by the school to ensure this. Maintaining an updated student progress portfolio will be a useful aid in sharing with parents or families, and they will be happy to see how the school is keeping a proper record of student progress. On PTM days, schools could organise activities for them that they would love to participate in and enjoy. This will help build camaraderie among the parents or families. Students could also perform in varied ways what they have learnt at school. Different students across the school can get a chance to share if the school organises such events.

c. Parents or families must be invited to school events and celebrations. Schools must find ways to engage them actively in such events rather than keep them as mere audiences or spectators. So, the design of such events and celebrations should aim for the active engagement of parents or families. They could also be asked to visit the school on any working day according to their convenience to observe regular school functioning. On such days, they can participate in the assembly, spend some time in the classes, and interact with students and teachers during intervals. This will give them a first-hand experience of what goes on in a school on a normal day. Some parents or family members could also be seen as important resource persons who, under a well thought out plan, and can contribute academically too. The 'bagless day' is one such window where parental engagement can be planned.

d. Teachers should also visit parents or families as and when relevant and possible as knowing the home environment and the larger socio-cultural context of students is a prerequisite for providing more individualised support to students.

e. The school's relationship should not be limited to the current group of parents or families. The larger community from which students come should also be involved systematically in school processes. One simple way to reach out to them is to invite them to events and celebrations where it is easier to accommodate larger groups. Exhibitions of work by students, *Baal Mela*, book fairs, film festivals, health camps, cleanliness drives, and campaigning for other social awareness causes are opportunities to engage with the larger community. If the school publishes a newsletter or magazine, it can also be distributed to a larger audience. Community-based events and services by student clubs (e.g., sports clubs, art and culture clubs, and health and wellness clubs) can be organised. Schools with an active alumni group could build and sustain such connections in the long term.

2.2.3 Mealtime, Health, and Hygiene

As pointed out in NEP 2020, nutrition plays a very significant role in learning, particularly in the early years. However, too many students in the country are malnourished as they simply do not receive a balanced diet for proper physical growth. Hunger and malnutrition are significant causes that prevent many students from actively participating in school processes. For such students, the Mid-day Meal provided in school is the only proper meal that they eat.

So, paying attention to the Mid-day Meal goes a long way in ensuring the good health of students, and thereby improving their participation in school. Where food is cooked in school, there is a greater opportunity to ensure good quality and variety. Good hygienic practices are required for cooking and serving. Groups of teachers and students can take turns in serving. Efforts are needed to avoid wastage of food or proper use of the leftovers. It could also be used for compost generation.

Mealtime is also about observing the food habits of students. A few students tend to eat unhealthily and avoid certain vegetables or healthy food preparations. They also consume processed food directly bought from shops. Therefore, schools need to consciously create spaces for dialogue around food, habits, health, culture, and modern and traditional wisdom around these. Another possibility is to discuss food choices, what influences them, and how discrimination occurs based on food and eating habits. Dialogue around such questions helps students understand the social-cultural aspect of food. This would also be a way of educating local communities the students are part of too as students will take home with them these values.

Schools need to organise regular medical camps at the school and cluster levels. This could be done with support from the government health department. The height and weight of all students in the school could also be monitored regularly and recorded systematically. In the case of students who are found to have any specific medical conditions that could range from poor eyesight, skin allergies, or any symptoms of vitamin deficiencies, discussions with their parents or families have to be initiated, and necessary care and treatment followed up regularly. For any serious health conditions, and the schools could ask the parents or families to seek proper medical attention.

Due to various circumstances, many students struggle with hygiene issues. As a teacher, it is important to ensure that hygiene issues among students are handled with sensitivity. Here are some points to keep in mind when such issues arise in school:

a. Empathise with the student's situation, find out the causes, and help the student address their hygiene difficulties.

b. Where students lack resources at home to ensure basic hygiene, the school could provide them (e.g., soaps, nail clippers, sanitary pads).

c. Make hygiene a class practice routine for everyone.

d. Opportunities could be found in subject teaching, in assembly, and by involving local community members or NGOs to educate the students in the classroom on good health and hygiene practices.

e. Proper hygiene practices must be followed in residential schools and schools with kitchen facilities. Food and other edible items must be stored carefully and hygienically. Dining areas and other spaces where students eat their meals must also be clean and hygienic.

Section 2.3
Organisational Processes

Schools required planned and organised collective efforts that enable the smooth functioning of the above curriculum and curriculum-associated processes. While this requires planning, resource allocation, and information management like in any other organisation, schools need to address particular concerns about student safety and appropriate responses to conflicts, and disciplinary issues. This section articulates some of the considerations relevant to these matters.

2.3.1 School Development Plan

The most important among organisational processes is to prepare a school development plan that covers all aspects of school functioning [NEP 2020, 7.9]. It sets yearly priorities and enables initiative and decision making for addressing challenges and, achieving goals within a timeframe.

School improvement is at the core of all planning and review exercises, and it requires the whole school team to have a vision about where they want to ultimately reach. It also paves the way for improvement in shorter timespans with a clear understanding of where the school stands at that moment.

It is the responsibility of School Principals to constantly work towards aligning the entire team's vision for the school in every aspect with the Aims of Education. Simultaneously, they also need to regularly build consensus over how to respond to local and contextual issues that may arise in the life of a school. A few important dimensions of school planning are briefly described below.

Each school needs to do institution-level planning covering all aspects of its functioning with clear goals to be achieved during a set timeframe. There may be given formats and processes to be followed as prescribed by the education department. The participation of the community, and SMC is also crucial in this endeavour. Senior students can also be involved, along with identified local people, who could bring in both ideas and support in some form.

A good school development plan should set clear academic and administrative goals along with clarity about implementation (who will do what and how, and where resources be mobilised from if more is required). One major part of it will be curricular planning for the year, a detailing of the way forward planned in monthly and quarterly timeframes. A good understanding of the previous year's progress and current challenges is required, both at the subject and student levels to do strategic and detailed planning. As planning at the stage and subject levels is necessary, teachers need to collaborate to develop these plans.

Other aspects to be covered in this plan are for the overall enablement of the school. This will include a plan for teacher support and development, resources that need to be procured or created, major repairs and maintenance tasks, and how to engage parents and the community.

Processes for communicating decisions, expectations, and feedback must be well planned. Most of the communication should be through formal meetings and properly documented. Deciding on modes of communication is equally important.

School Principals need to closely monitor and provide support to teaching and non-teaching staff when they struggle. A plan for regular reviews is equally important. Thinking through steps towards achieving the set goals helps the school progress, and monthly and quarterly reviews help in making mid-course corrections.

2.3.2 Time and Resource Allocation

A critical part of planning is to make the best use of available time and other resources, as well as generate the required resources.

2.3.2.1 Annual Calendar

Schools need to plan their academic year from the beginning through an annual school calendar. This should include the academic session start and end dates, admission-related schedule, examinations, national festivals (Republic Day, holidays, Independence Day), dates of different functions and day-long celebrations, such as, sports day, Science Day, Children's Day, field trips, PTMs, holidays for students and teachers, alumni meetings, and summer camps. Aligning with important dates as shared by the education department and local community engagements is also necessary. This list should be made through a collective exercise with teachers and parents and shared with all stakeholders, including students. Any strategic decision regarding the daily timetable is also made at the time of preparing the school development plan.

2.3.2.2 Mobilising and Allocating Resources

Schools have some fixed resources, and some that get consumed in the Teaching-Learning process. As the year begins, proper planning needs to be done around what resources will be needed, how to procure and/or mobilise them, and who will be making use of them. Certain resources, such as, computers and printers, are often required in the staff room, and the policy on printing material, and keeping track of printing can be decided collectively. Similarly, stationery for teachers' use could be placed in common storage in the staff room. If a computer lab for students is available, then one teacher should oversee its use and upkeep. For mobilising resources from the community, and systematic efforts would be needed under the leadership of the School Principal or a committee in which selected parents and students could also be members.

2.3.3 Data Management and Reporting

All schools must develop efficient systems for recording, storing, and utilising various kinds of data. Progress review, planning, and reporting, all depend on authentic data and its interpretation, so proper sourcing and upkeep of data (if possible, in computerised form) will be of great help.

The most critical set of data for schools is regarding student learning. Keeping track of student progress in both qualitative and quantitative ways is needed at the level of Teachers and School Principals. Simple things like how students' reading and writing skills are improving over months or Grades inform teachers about the impact of their teaching. Similarly, tracking student attendance helps us see how it impacts student learning. School Principals and Teachers need to regularly study the student learning data to understand the status, and take requisite steps in a timely manner.

While proper data management is unavoidable and indispensable for a school, it should aid student learning efforts rather than becoming an undue burden for teachers. Intelligent use of technology has a lot of potential to ease things on this front. The responsibility of recording and managing data will be distributed for Grade level, but it should also be collated by one person (school admin, Principal, or Teacher) to see the overall picture.

All requisite protocols must be followed, and measures must be taken for ensuring data privacy, such that any data is used only for legitimate purposes, by authorised bodies, and after informed consent.

2.3.4 Ensuring Student Safety

Schools need to ensure that all students are protected from any kind of injury or harm. Students are not only vulnerable to physical injury, but are also exposed to various forms of discrimination, harassment, and abuse that cause emotional and physical harm and can even scar them for a long time if support is not provided at the right time. The safety and well-being of everyone on the school campus must always be given the utmost priority. This can be achieved by promoting and practising safety in all school processes regularly. Safety within the school premises is the collective responsibility of the whole school community.

2.3.4.1 Physical Safety

a. Road safety around schools is an important aspect that needs to be given due attention. School authorities and SMCs could work with local administrators to ensure that appropriate road signage that mark school zones is installed.

b. Periodic inspections of buildings and equipment, including play and laboratory equipment and furniture, must be conducted. All indoor infrastructure must be free of sharp edges, splinters, and objects that could potentially cause physical injury to anyone. Potentially hazardous equipment, laboratory chemicals, and sharp tools must be stored carefully and accessible only to responsible adults. The age of students should be considered if they are to use these objects and must always be done under the supervision of teachers or adults. Clear communication procedures could be followed to instruct students on how to use laboratory equipment, as well as other guidelines for using play equipment and rules for field trips or excursions.

c. Safety and first-aid kits must be easily accessible, and available for use.

d. It is suggested that a responsible adult supervise students during breaks at playtime in the corridor or at the playground, and staircase, and any other open area.

e. Teachers and adults in the school must ensure that students of all ages and genders are protected from physical offences, violence, and sexual offences. School administrations should have stringent measures to check and stop all forms of corporal punishment meted out to students. This will require building the capacity of all stakeholders, and having appropriate policies in place.

f. Schools could conduct regular fire drills involving all members of the school to orient students, teachers, and other staff on how to evacuate the building safely and help those in need. Open spaces that could serve as safe assembly areas during natural disasters also need to be demarcated and clearly communicated.

g. In the event of an accident or a medical emergency, the supervising adult must inform parents immediately. If a student feels unwell in school but it is not a medical emergency, the teacher must contact the parents and ask them to pick up their child, or if possible, any responsible adult from school may take the student home after ascertaining that there will be somebody responsible to receive the student at home. Alternatively, if there is a place to rest, the student may rest and return home at the usual time.

2.3.4.2 Emotional Safety

A school is a place where all children must be treated equally and feel safe and secure. All schools must orient their staff and teachers on the possibility of emotional trauma caused by verbal and physical abuse of children. It is also important for schools to be aware of the home environment of students, and whether they may be facing or witnessing any form of physical or emotional abuse and discrimination. Initiating dialogue and showing concern for the well-being of all students develops mutual trust between students and teachers and creates a space for authentic sharing. Students could use such opportunities to openly express their discomfort, fears, and anxieties about any spaces, objects, people, animals, and other beings that could be the cause, and resolve these issues without delay. The school environment and culture must always strive to practise the values of love, kindness, compassion, empathy, *Ahimsa*, and *Seva* as mentioned in NEP 2020. Teachers should be encouraged to always use caring and positive language with students and provide encouragement that reinforces affirmative behaviour, and actions in the classroom and otherwise.

It is equally important to pay attention to the emotional safety of teachers and other adults on the school premises. Feeling emotionally secure plays a critical role in all adults' lives and positively impacts their ability to make responsible decisions about all tasks. Students constantly observe the behaviour and actions of adults and often mimic what they see. It is therefore important for all teachers and adults to model emotional regulation, compassion, and affirmative speech in their daily routines.

2.3.4.3 Intellectual Safety

Learning requires sustained intellectual engagement, so students need to feel safe to take risks while expanding their thinking capacities. This implies that mistakes will occur and committing errors is not only accepted as part of a healthy learning process, but also needs to be viewed as a necessary aspect of learning. It is important that all students freely express their opinions without the anxiety of being ridiculed, reprimanded, or punished.

The classroom environment should encourage the participation of all students to respond questions and contribute to discussions with the confidence that what they say has a place in the group's learning process, even if it may be incorrect. Student participation provides insights into how each of them perceives the world, and how each may have a unique way of learning and understanding. Using demeaning language, labelling, or personally criticising students is hurtful and could result in poor participation in learning activities. Teachers often assign specific responsibilities to certain students with the assumption (spoken or unspoken) that others are not capable of carrying out the same task. This causes the excluded students to feel like they are not 'good enough'

and prevents them from developing their capacities or confidence. Care must be taken to rotate all responsibilities among all students and include teachers and adult staff in working along with students to provide timely encouragement, and support to those who may face difficulties.

2.3.4.4 Prevention of Bullying

Bullying is any intentional and repeated aggression towards another. It is unprovoked and may be individual or group behaviour towards others, and aimed at causing discomfort and injury.

The experience of bullying among students is often humiliating causing lasting negative psychological consequences. It creates an atmosphere of inequality, threat, and anxiety. Schools must ensure all students are protected against the violence of bullying by creating a strong culture of care and compassion.

Some common examples of bullying are targeted and repeated insulting and offensive language; negative comments on physical appearance or family or socio-cultural background, lifestyle, or race; aggressive yelling or shouting, teasing, and pranking. These can happen in person or virtually.

In response to instances of bullying, schools must take immediate action to stop the bullying. The intervention must be strongly visible with zero tolerance. Adults in the school must be vigilant and students too can be educated to be alert and report such instances. Strong conversations across the board about bullying and repeated reminders to avoid any such transgression should help in creating a safe learning atmosphere.

2.3.4.5 Preventing Sexual Harassment or Sexual Abuse

All schools must be aware of, and stringently adhere to, the laws of POSH (Prevention of Sexual Harassment) for adults and POCSO (Protection of Children from Sexual Offenses). All adults at the school must behave in a manner that reflects the values of being an educator and a responsible adult and protect their colleagues and students from sexual transgressions, and violations. Schools must show zero tolerance for violations in this regard.

Some examples of sexual harassment include passing unsavoury remarks, gender-based insults or sexist remarks, making obscene jokes, innuendoes and taunts, displaying pornographic or other offensive or derogatory pictures, cartoons, pamphlets or sayings, making unwelcome sexual overtures in any manner over any medium or in person, touching or brushing against the bodies of others, body gestures and manners that could be offensive or frightening to the other gender, forcible physical touch or molestation, physical confinement against one's will, and any other act likely to violate one's privacy.

2.3.4.6 Cyber Safety

It is important to establish clear norms for the use of computers and the internet. Students must be taught cyber safety, the appropriate use of technology and the internet, and be educated about the function of and disruption caused by screens and handheld gadgets. Students using computers as part of their school curriculum must always access the internet under teacher, supervision. This will enable the appropriate learning of the medium and help with monitoring student activity, safeguarding them from potential cyber risks (e.g., online impersonation, unregulated inappropriate adult content,

cyberbullying, and stalking). Another crucial step in protecting students is to prepare the computers for students' use by blocking non-educational and inappropriate sites so that they become inaccessible. Web cameras may be used for school projects and other organised class activities only under teacher supervision and under no other circumstances.

Students must develop an understanding of how to identify unsafe online situations, and whom to report to; this will also make it necessary to inform teachers how to take timely action.

It will be educationally valuable and relevant for students to be taught both the usefulness and the problems of social media platforms. The pandemic enforced the widespread use of smartphones and tablets for participating in online classes. However, this seems to have brought along with it a screen dependence in students across the age groups, affecting their capacity for focussed attention and 'deep reading'.

2.3.4.7 General Safety Measures

a. The addresses and phone numbers of parents must be regularly updated and kept accessible. Emergency contact numbers must be available for all students or adults.

b. Information about any medical condition and the associated medication or preventive measures must be obtained at the time of recruitment or admission, updated regularly, and made available to all concerned.

c. Information about any emotional upheaval or trauma that the student may be going through temporarily must be made available to only the concerned persons. These would include teachers and persons the student is close to who can support them to understand and respond to their experience.

d. Telephone numbers of the closest medical centre, hospital, doctor, ambulance, fire station, and police station should be easily accessible and put up in a central place for all to see.

e. Private transportation facilities that are being used by students need to be checked regularly for safety standards. For example, in the case of using private transport, the vehicle condition must be to ensure that it is in proper order, and a background check of the drivers must be carried out to ensure that they have a valid driver's licence and are of sound health.

f. Digital devices should have child-protection features that must be frequently updated to ensure the online safety of all students.

2.3.5 Resolving Differences, Conflicts and Disciplinary Issues

This section talks about the mechanisms to deal with matters of indiscipline and conflicts encountered in school life. This could be in the form of irregularity, lack of seriousness towards classwork, homework, teasing, passing comments, rivalry, bullying, damage to school property, sexual harassment, and substance abuse. Here are some suggested steps:

a. **Clear communication on expected behavioural norms and consequences:** Behavioural expectations must be communicated in writing to students and parents at the time of admission. These should largely be defined in positive terms, and if

there is a student diary, then school rules should also find space there. The staff room, classroom, and general notice board of the school can also have this for ready reference. From time to time, in school assemblies or classroom situations, these could be discussed so that the rationale behind school rules is understood properly by all students. The consequences of not abiding by the rules should also be clear, communicated, and followed.

b. **Polite reminders and encouragement for self and peer-led correction:** There should be ways of drawing attention to any lapse in expected behaviour. This should be done politely, with the expectation that the person involved will avoid repeating it. For example, there could be a chart on the classroom wall for students in the Preparatory Stage where they rate themselves based on their participation in classroom and school activities. In the higher Grades, students themselves can speak to other erring students. When the majority follows the rules, those who do not will be easily noticed, and these students can be expected to make amends in the course of their school day as an essential part of their learning.

c. **Dialogue and counselling:** The next step is to have a discussion with those who have difficulty following the rules and, in some cases, with the whole class or school as collective efforts may be needed. Class Teachers, or in extreme cases, the School Principal, could hold this discussion, as this would demand a certain level of maturity, and expertise. These discussions need to be carried out with empathy as well as firmness. One will have to find effective and respectful ways of doing it. The intent should be to understand why a student is behaving in ways which are detrimental to their own learning and that of others. A few teachers could be identified and trained to counsel students. At the school complex level, a counsellor can be appointed to assist teachers in dealing with special cases.

d. **Other measures:** When the earlier steps do not work and there are repeated instances of rule breaking (e.g., violence or intentional damage to school property), then measures such as withdrawal from activity or classes, temporary isolation, warning, consultation with parents or families, or collection of fine may be required.

e. **Expulsion from school:** This must be the last resort response to any student misbehaviour. If no other strategy has worked and there is little to no change in the behaviour of a student, then in the interest of others' safety and the smooth functioning of group learning processes in the school, this step may be required as the final call.

If schools make their best efforts to build nurturing culture and keeping students meaningfully engaged, the instances of indiscipline will eventually get minimised. Classroom processes should not allow small incidents to hijack the learning objectives for the day. As part of classroom management skills, teachers must learn what to pay attention to and address immediately, what to ignore, and what to attend to afterwards. It has been observed that frequent disruptions and a lack of consistency in the Teaching-Learning process are important factors leading to low levels of learning. Also, incidents of undesirable behaviour have a way of lingering in the minds of others. It would be disheartening for the students who make amends if they become trapped in labels of any kind. School cultures must foster forgiveness and kindness to avoid this.

Part E

Creating a Supportive Ecosystem

The NCF for School Education is applicable to all types of schools and all modes of schooling, including open schools, distance learning, alternative schools, non-formal schools, and virtual schools.

For the NCF to be a real transformational force for Indian school education, it will need to be appropriately complemented by other elements of the education system.

This section briefly describes the kind of ecosystem needed for the implementation of the NCF. Chapter 1 discusses ***capacity building*** *for NCF implementation. Chapter 2 details the* ***infrastructure and learning resources support*** *required to implement this NCF. Chapter 3 is about the* ***empowerment of Teachers*** *on various dimensions in line with NEP 2020. Chapter 4 enumerates the importance of* ***parents and the community*** *in supporting the learning of students. These matters require significant elaboration, which would be done with associated documents.*

Chapter 1

Capacity Building for Implementation

Implementation of the NCF will have many steps. Including the development of State Curriculum Frameworks (SCFs) and other Curriculum Frameworks that may be based on the NCF, appropriate syllabi, textbooks, and other materials. Hence, hereon, Curriculum Framework (CF) will be used to denote the relevant frameworks.

Curricular literacy among all stakeholders, whether associated with public or private schools, academic support structures, or teacher education institutions, is critical for the implementation of the NCF.

Section 1.1
Curriculum Framework Literacy for All Stakeholders

a. Stakeholders Involved in the Implementation of Curriculum Frameworks

Teachers, Head Teachers, Principals, and syllabus and TLM developers are the key persons involved in the implementation of the relevant CFs. In addition, all the stakeholders in the ecosystem within which they work must be able to interpret the CFs in the context of their roles and support them. This will include personnel in academic and administrative support structures, as well as Teacher Education institutions. Parents and community members must also be CF literate; as key stakeholders in schooling, they must be able to understand changes in curriculum and processes and the expected learning.

It must be noted that the duration of the capacity development programmes, the modes, and the bodies that should conduct them, as mentioned in this chapter, are only indicative. The important matter is to ensure that high-quality and relevant capacity development of all stakeholders happens with speed and that relevant handbooks and other materials are made available. This would be relevant for all Grades.

b. Components of Curriculum Framework Literacy

The components of CF literacy are a deep understanding of:

i. The approaches and principles of the CF to achieve the aims of education

ii. Key curricular changes and transitions in pedagogy, content, and assessment in each curricular area to achieve these aims

iii. Roles and responsibilities of each stakeholder to execute the changes

iv. The importance of the above components

This understanding is necessary especially for teachers to exercise their autonomy, and to take decisions best suited to the needs and context of their students.

c. Orientation to the Relevant Curriculum Framework

An overall orientation to the relevant CF must be planned for all stakeholders at the earliest:

i. SCERT (or the relevant body) will anchor the design and module development for this programme. It will be implemented by the DIETs (and relevant bodies) using well-trained, high-capacity resource persons.

ii. A 2–3 day intensive orientation or programme must be designed separately for each set of stakeholders. This is necessary because, in addition to common areas, some aspects of the relevant CF will require a deeper focus based on specific roles and responsibilities:

   1) All stakeholders must be oriented to the broad curricular, pedagogical, and assessment approach of the CF, as well as school restructuring. They must understand the key transitions and why they are necessary. They must also understand the expectations from schools regarding culture and processes.

2) All stakeholders must also receive a broad orientation to the Learning Standards and their implications for schools and classrooms.

3) Focus areas for teachers must include, illustratively, details of the Learning Standards, Curricular Areas, experiential learning, a competency-based approach, formative assessments, and connecting to students' context.

4) Focus areas for Head Teachers and Principals must include, illustratively, expectations from them regarding school culture and processes, school restructuring, as well as approaches to curriculum, pedagogy, and assessment.

5) Focus areas for academic functionaries must include, illustratively, the key transitions they must support teachers make, particularly in pedagogy and assessment. They must also receive an orientation on maintaining an empowering culture for teachers.

6) Focus areas for administrative functionaries must include, illustratively, resourcing requirements for implementation of the relevant CF and monitoring and review informed by key transitions. They must also receive an orientation on maintaining an empowering culture for teachers.

7) Parents and community members must be oriented to the Learning Standards so that they can follow the progress of students in the family. They must be aware of the ways in which they can support schools, whether as Resource Persons or by ensuring enrolment and attendance. Online modules for NCF literacy can also be available for interested members of the community.

d. Academic functionaries identified as per their specialisation must also undergo a more intensive face-to-face programme for building capacity in Art Education, Vocational Education, Physical Education and Well-being, and Education in Interdisciplinary Areas. This programme should be conducted annually in blended mode for 2–3 years after implementation of the CF, with at least six days of face-to-face interaction followed by pre-scheduled online sessions.

Section 1.2
Capacity Building of Teachers

Capacity building of teachers to implement the CF must be comprehensively done across stages of schooling, with a focus on the following:

a. Overall Approach to Capacity Building

i. The preferred mode is face-to-face, followed by frequent interactions and continuing on-site support. The programmes must be supplemented with digital material, relevant handbooks, and other training materials. Capacity building may be organised by DIETs or other bodies, and continued support will be provided by block-level and cluster-level functionaries. Modules and materials will be collaboratively developed by relevant stakeholders brought together by the SCERT.

ii. As far as possible, private schools could be part of these processes; otherwise, they must develop their own plans.

iii. Broadly, the modules for capacity building will address CF literacy, learning standards, Competency-based approach, stage-wise pedagogy and assessment, textbooks and materials, and experiential learning. Also, teachers must be oriented on how to leverage local resources, particularly for Vocational Education, Physical Education and Well-being, and Art Education.

b. Capacity Building for Mathematics, Languages, Science, Social Science, and Other Subjects in the Secondary Stage

i. Capacity building of teachers related to these Curricular Areas is necessary for them to understand and fully utilise the empowerment from the CF.

ii. This can be in the form of intensive face-to-face programmes to be conducted for about 10 days. This must be supplemented by single-day interactions at the block and cluster levels spread over the year, preferably face-to-face, the total of these single-day interactions should add up to about 15 days over the year. This must be continued for at least 2–3 years after the implementation of the relevant CF.

iii. For secondary stage teachers, the capacity development will have to be aligned with the subjects being offered and their design.

c. Capacity Building in The World Around Us, Art Education, Vocational Education, Physical Education and Well-being, and Education in Interdisciplinary Areas

i. The capacity building of teachers related to these Curricular Areas must take into consideration the existing realities. For the first few years after the implementation of the relevant CF, teachers who are not necessarily qualified to teach these subjects will have to help students attain Curricular Goals adequately, as per the design of the curriculum. For example, a teacher of Social Science may have to teach individuals in Society in Grade 9, and a teacher of The World Around Us may have to teach Art Education in the Preparatory Stage. Teachers will undergo special orientation for these areas and will also require more intense ongoing support compared to other areas.

ii. For these teachers, intensive face-to-face programmes must be conducted for 10 days twice in the first year after implementation of the relevant CF, totalling 20 days. A calendar of five follow-up on-site visits by Resource Persons for at least one day must be prepared between the two sets of face-to-face interactions. As above, this must be supplemented by single-day interactions at the block and cluster level spread over the year, preferably face-to-face, the total of these single-day interactions should add up to about 15 days over the year.

iii. In the second year after the implementation of the CF, a single face-to-face programme of 10 days duration with single-day interactions can be planned. This must be continued for at least 2–3 years after the implementation of the relevant CF.

Chapter 2

Ensuring an Appropriate Environment for Learning

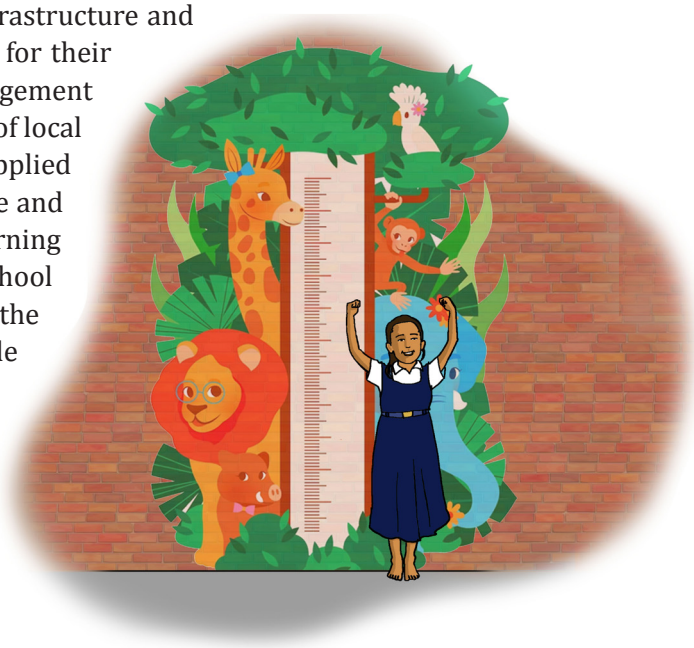
All students must look forward to coming to school every day. A safe and stimulating physical environment can help make school a positive experience for all. Studies have also shown that when physical spaces are carefully designed to address the needs of students, they can have a positive impact on their overall well-being and learning.

Since most students spend close to six hours (or more) a day in school where they are engaged in a variety of activities, it is important to design school infrastructure in a way that addresses learning requirements and allows for play, gatherings, and interaction with others and with nature. All these aspects contribute to learning and support the smooth functioning of school processes.

Quality, completeness, and maintenance of infrastructure are key differentiators between a good school and a not-so-good one, especially in the eyes of parents and the community.

Safe, barrier-free, and adequate physical infrastructure must be available as per prescribed norms. Buildings and equipment must meet safety standards as per the law. Adequate budgets and utilisation for infrastructure development, infrastructure maintenance, and TLM must be available.

While the importance of safe and adequate infrastructure is well recognised, many schools across the country still struggle to meet the basic requirements for a conducive learning environment. However, many schools are taking several initiatives to improve their infrastructure and ensure a better learning environment for their students through strong School Management Committees (SMCs) and with the help of local communities. These schools have applied many creative ideas to overcome space and resource limitations to achieve learning goals. Collaboration among school administrations, local authorities, and the local community can play a critical role in finding solutions to the infrastructural challenges that many schools face. Some basic requirements that all schools should aim to address are detailed in the following sub-sections:



Section 2.1
Outdoor Infrastructure

Schools exist in varied environments across the country, from being on a busy main street with heavy traffic to being amidst an idyllic landscape bordering a forest. Setting up a school with the right infrastructure and safety measures can be a challenge in many locations across the country.

All schools must ensure that basic standards for infrastructure and safety are met to ensure learning for all students.

2.1.1 Basic Structure and Compound Wall

School buildings should be permanent structures constructed with appropriate materials that ensure structural stability and the long-term safety of all individuals who use the space. The school boundaries and grounds need to be protected from various external elements that could threaten the safe movement of students, so a compound wall and a secure gate can ensure that the entry and exit of visitors to the school are properly organised and monitored.

2.1.2 Open Space for Play and Safe Assembly

An outdoor open space in schools can be a space for students to play (outdoor games and sports) as well as a place for large gatherings, meditation, or a dedicated assembly point in the case of any emergency (e.g., fire, natural disaster). Schools could opt to install play equipment, such as, swings, climbing frames, slides, jungle gyms, and so on for young students.

2.1.3 Trees, Plants and Nature

Nature is a great teacher. The presence of trees (including local fruit-bearing trees) and plants where students can find shade, explore, invent their own games, and observe birds, small animals, insects, and butterflies has a positive impact on learning. In addition to local flora and fauna, schools could have a dedicated kitchen garden where students participate in growing and nurturing plants, and a composting pit to process organic waste from the kitchen.

2.1.4 Accessibility and Inclusion

Schools must take measures to make the physical environment accessible for people and students with disabilities. At the least, ramps must be provided for wheelchair access, and lifts can be provided in schools that need them. Both ramps and stairs should have handrails. Tactile pavers to guide people and students with disabilities must be placed judiciously, particularly in toilets and in areas near drinking water units. Appropriate signage with text and pictograms, and in Braille if possible, can help people and students with disabilities move independently (e.g., directions to the ramp, accessible toilets if available).

While the entire school could have anti-skid flooring for ease of movement (including for wheelchairs), the toilet and area around drinking water units, where there is a danger of slipping, must have slip-resistant flooring.

Devices using assistive technology can be kept in the library for students with disabilities to use whenever required, e.g., magnifiers, text-to-speech software, books with large prints, Braille books and displays, personal amplification systems, speech output software, and specialised apps.

Simpler actions must also be taken after due care and thought are given to requirements, e.g., ensuring unobstructed corridors and classrooms, moving classrooms to the ground floor from upper floors to cater to specific students, and planning laboratories and libraries on the ground floor.

Section 2.2
Indoor Infrastructure

2.2.1 Classrooms

Classrooms are where teachers and students spend most of their time in schools. Schools must have sufficient classrooms to accommodate all students comfortably and ensure that the dignity of every student and the learning process is respected.

Classrooms must be well-ventilated and well-lit spaces. Depending on the climatic conditions and school requirements, basic lights, fans, and electric power outlets with safe electrification would also need to be provided in classrooms.

The design of classrooms must take into consideration accessibility for all students and people with disabilities, the nature of different subjects and the recommended pedagogy, movement for a variety of learning activities, furniture for flexible seating arrangements, blackboards for teachers and students, and facilities for storage and display.

Classroom organisation could be flexible, giving students the opportunity to move to other rooms. For example, a room dedicated for language learning could be designed to offer an immersive, print-rich environment with easily accessible resources for different learning levels across Grades. Similarly, dedicated rooms for the art could be planned for conducting art activities, with the provision of sufficient space for movement and storage of materials, props, stationery, and instruments. Wherever possible, schools could consider making provisions for using digital technologies and equipment to support learning practices. TV or projector or interactive board, either in the classrooms or as a commonly shared multipurpose media room.

2.2.2 Libraries

Depending on the space available in the school, three types of libraries can be set up:

a. **School Library:** This is a separate room dedicated for use as a library with adequate furniture to store a wide range of books arranged and catalogued systematically, for students and teachers. Books could be categorised according to reading level, language, subject, and so on. Systematic labelling could help students navigate through the collection, and maintain entries in a library record book. Storybooks for early readers are usually light and full of colourful pictures. These can be hung on the wall at a lower level using a string to draw the attention of younger readers, provide easy access for them to choose different books to browse through or spend time reading, or help them decide which books they want to read.

Such a library could also include multimedia and audio-visual learning resources with computers, projectors, and other relevant devices.

There should be sufficient space and appropriate furniture for students to sit comfortably and spend time reading, researching, and accessing resources in the library.

b. **Classroom Library Corner:** If a school has limited space, libraries can be set up in classrooms with appropriate material available for that particular Grade. A corner library could also be set up in one part of a particular classroom. Here too, bookshelves, tables, or cupboards can be used to place the books.

c. **Community Library:** A school could also choose to make its library more open by extending it for the use of the local community after school hours. It could set up a part of the library outside the school premises, in a place that gives access not only to its students but also to students of other schools or other children and adults in the community. Such initiatives can become lively and enriching centres, especially when different people contribute books, periodicals, and magazines towards the library collection.

School alumni, youth, and adults could volunteer to help early readers by reading to them, organising storytelling activities, or managing the library's resources. A community library could also serve as a space for students to study after school hours, get together, and help one another with their homework.

2.2.3 Laboratories

Although laboratories are commonly associated only with science, schools must aim to expand the idea of a laboratory to other subjects as well. Laboratories must be kept open and accessible to students during their learning hours. They must be perceived as spaces for 'doing', extending to a variety of learning experiments across disciplines where students explore, discover, and verify knowledge.

For example, students can access instruments required for measurement and geometry alongside raw materials, such as, wood to create their own measuring instruments. A laboratory can also have a stock of natural clay that can be used for visualising and creating 3D models, seals, toys, and other resources that can aid learning. The concept of a laboratory could be extended to workshops for woodwork or carpentry, electronics, mechanics, pottery, textiles, and sewing in schools for Middle and Secondary Stages.

2.2.4 Dining Area and Drinking Water

The area for eating meals must be shaded, clean, spacious, and hygienic. It should be welcoming to all people to sit comfortably and eat together. The dining area must also have sufficient space and an adequate number of taps for washing dishes and utensils after meals. Easily accessible and hygienic drinking water facilities should be provided in all schools. Timely maintenance of these facilities must be followed.

2.2.5 Toilets

Well-lit, clean toilets with safe and well-maintained plumbing and an uninterrupted supply of water are a basic requirement. Separate toilets for different genders and people

with disabilities must be provided. Girls' toilets should stock sanitary pads and provide covered dustbins for the safe disposal of used sanitary pads.

2.2.6 Semi-open or Partially Shaded Areas

Schools could also have semi-open areas, such as, partially shaded corridors or verandas, where students can move safely, sit, play indoor games, or seek shelter from the rain. These areas could also accommodate display facilities where charts, poem cards, story cards, students' art works, and writings are presented and changed periodically. Schools could also think of creating interactive spaces in these areas where students find opportunities for sensorial exploration, e.g., interactive materials, such as, walls or surfaces with a variety of textures and objects that produce different sounds that students can play, such as, musical instruments or wind chimes.

2.2.7 Uninterrupted Supply of Water and Electricity

Regular and uninterrupted supplies of water and electricity are essential for the smooth functioning of any school. Disruption in the water supply can impact the hygiene and cleanliness of toilets and the kitchen. Electricity is essential to power many devices that are used not only for learning, but also to operate computers and other electric and electronic devices that are integrated into school routines.

Schools could work closely with the local administrative authorities to ensure that the supply of water and electricity is prioritised for the school. At the same time, steps can be taken to educate all members of the school staff and students to use water and electricity judiciously and report any misuse.

Section 2.3
Infrastructure that Ensures Safety

a. **Choice of Building Material:** Physical safety in a school begins with the choice of materials used in the construction of the school building. Schools must avoid using easily flammable materials, such as, straw and ensure that the construction quality meets all school safety regulation standards. School buildings need to be secure, permanent structures with long-term stability.

b. **Electrification and plumbing** in the building must be standardised and concealed.

c. **Doors, Windows, and Gates:** Toilets for all genders must ensure safety and privacy by installing proper doors with latches that can be used by students of all age groups comfortably. Windows must be installed in all classrooms to ensure proper ventilation and light. The main entry and exit points of the school premises should have gates that can be closed and opened smoothly and locked after school hours.

d. **Safety During Emergencies:** Multiple entry and exit points could be provided to avoid stampedes during emergency evacuations. Schools must have fire safety mechanisms and fire extinguishers in proper working condition. They could conduct regular fire drills involving all members of the school to orient students, Teachers, and other staff on how to evacuate the building safely and help those in need. Open spaces that could serve as safe assembly areas during natural disasters also need to be demarcated and clearly communicated to all members of the school. Helpline and

Emergency numbers should be displayed in multiple locations on the school premises. Safety and first-aid kits must be easily accessible and available for use.

Other aspects of safety and its operationalisation are provided in the chapter on school processes.

The Ministry of Education's Guidelines on School Safety and Security clearly define the measures that schools and other relevant stakeholders must take to create a safe and secure environment for all students. They are an excellent resource for all educational institutions and settings.

Section 2.4
Infrastructure that Ensures Inclusion

All common spaces and property on the school campus meant for students and teachers should be made accessible to all students and teachers.

This includes barrier-free access to all parts of the school for people and students with disabilities, e.g., entry, exit, corridors, classrooms, library, laboratories, dining areas, play areas, toilets, use of furniture, and use of learning material.

Particular issues related to inadequate infrastructure or inadequately maintained infrastructure can create barriers for particular groups of students. For example, one important reason why many adolescent girls have poor school attendance is the lack of proper toilet and sanitation facilities in schools suitable for all students, including those with disabilities.

Chapter 3

Enabling and Empowering Teachers

Section 3.1

Ensuring an Enabling Environment for Teachers

A culture that encourages people to learn and work together characterised by trust and respect for all, is critical to a good school, this is possible in an environment that is open and caring and where dialogue, collaboration, inquiry, and reflection are embedded practices.

NEP 2020 places teachers at the 'centre of the fundamental reforms in the education system'. It states that:

> *Education policy must help re-establish teachers, at all levels, as the most respected and essential members of our society, because they truly shape our next generation of citizens. It must do everything to empower teachers and help them to do their job as effectively as possible.*
>
> *[NEP 2020, Introduction]*

Teachers need resource-rich, motivating environments, and continuous opportunities for professional learning and interaction. Teachers must feel a sense of pride in belonging to a well-qualified, close-knit, and vibrant professional group.

This includes ensuring adequate and safe physical infrastructure, facilities, and learning resources with safe drinking water, functioning toilets with running water, and basic hand washing facilities, as well as the infrastructure and teaching materials necessary to teach students effectively.

While these enablers are critical, they are not sufficient in themselves. Teachers are best placed to know what their students need and can find creative ways of addressing these needs. Hence, giving teachers autonomy is necessary for change in our schools and classrooms.

Section 3.2
Teacher Autonomy and Accountability

Teachers are responsible for student learning and must be held accountable for it. But teacher empowerment and autonomy are preconditions for accountability. Accountability is critical, but so is autonomy, an empowering culture based on autonomy is a necessary condition for accountability.

It must also be recognised that 'accountability' is a complex matter in education; it must not mean a mechanistic linking of student test scores (or progress on those) to teachers as a measure of accountability. A simplistic understanding of accountability and actions on that basis do more harm than good to the education system. A far more nuanced understanding is required.

Competent and committed teachers are critical to improving the quality of learning. Supportive environments within schools and the ecosystem improve teacher effectiveness. Teachers are unique individuals with their own set of beliefs and personal theories about learners, learning, and education. To a creative and discerning teacher, every learning episode presents unanticipated opportunities, the opportunity to spontaneously stimulate and support the learning of what was not planned, and the opportunity to omit learning of what was originally planned for in that particular session. Competent teachers, when autonomous, make the most of these opportunities through sound educational judgments.

Teachers must have the pedagogic autonomy to plan and organise content, decide the sequence and methods of teaching students as the situation demands, along with ways of assessing their learning. All this must be based on the prescribed curricular goals, competencies, learning outcomes, and pedagogical approaches and principles.

Teacher autonomy and accountability are consequences of teacher capacity and the environment in which they work. For example, if teachers do not have a strong knowledge base, they will not be able to exercise autonomy. At the same time, if teacher practice is affected by a lack of infrastructure or Pupil-Teacher Ratio (PTR), the teacher can be held accountable only for what is within their capacity. Hence, teacher autonomy cannot be viewed as independent of the larger systemic accountability.

Section 3.3
Pupil-Teacher Ratio

It is widely understood and accepted that the right PTR enables individual attention by teachers, and therefore can increase student engagement and achievement.

It is important to look at the PTR as not just a number, but as a measure that would lead to better learning outcomes. Many crucial classroom processes can be better implemented if the teacher could operate in an environment of favourable PTR.

Pedagogy specialists argue that a lower PTR has a larger impact during the early years of schooling. It is found that students who attend schools with a lower PTR have a greater likelihood of continuing schooling for a greater number of years.

One important caveat is that reducing PTR does not imply filling schools with underqualified or temporary teachers. PTR must be improved through the appointment and professional development of appropriately qualified teachers.

Also, the PTR must account for resources available to students at home. A lower PTR may be warranted in classes where students have relatively fewer resources and support at home because of economic conditions.

Along with improved PTR, issues of infrastructure and the academic and pedagogic capability of teachers must also be taken care for taking full advantage of lower PTR. There must be a full complement of teachers for all students across all school stages.

Section 3.4
Career and Professional Development Opportunities

NEP 2020, Para 5.18 speaks of equal career growth opportunities across all stages of school education. All stages of school education are critical and will require teachers who are competent and committed.

This can happen only when pay and service conditions of teachers are improved as soon as possible to be commensurate with their professional responsibilities and must be set to attract and retain talented teachers in the profession. The long-term impact of this will be improved overall quality of the profession and people's view of growth opportunities in it.

All teachers, from foundational stage teachers to secondary stage teachers, will be recruited with standard service conditions as per their work requirements and with the same salary structure.

All teachers must have the opportunity to progress in their career (in terms of salary and promotions) while continuing to serve as teachers in the same stage of education (i.e., Foundational, Preparatory, Middle, or Secondary).

Teachers can also make a career shift to becoming teacher educators, or academic and administrative functionaries, on the fulfilment of specified criteria, including additional certification.

The approach will be to ensure that growth in one's career (salary and promotion) is available to teachers within a single school stage and that there is no career progression related incentive to move from being teachers in early stages to later stages. Though such

career moves across stages will be allowed, provided the teacher has the desire and qualifications for such a move.

Section 3.5
In-Service Teacher Education, Mentoring, and Support

Teacher professional development is a journey, and teachers progress through it at their own individual pace.

Different teachers will be at different phases of their developmental journey and will have different developmental needs. Within each phase, the learning experience needs to be holistic and complete to a point that it can help teachers bring about sustained change in their practice and move on to the next phase.

In the current context, and for at least the next 5–10 years until the pre-service programme makes the transitions outlined in NEP 2020, the role of in-service teacher education is particularly important. Teachers must be able to implement relevant CF with care and understanding. Therefore, the professional development of teachers must be such that they become competent and reflective individuals with the ability to drive educational improvement. Teachers must engage continuously with their professional development through a variety of means. Platforms for peer learning with mentoring and coaching support must be made available.

A school-based mechanism for the continuous professional development of teachers is essential. These could be in the form of institutionalised meetings of subject group members, class teachers, teachers teaching in a particular stage, and the whole school plan and review meeting. To help teachers, grow, head teachers and school principals need to observe and assist them as they go about their tasks and hold individual meetings with them as well.

A well-thought-out school-based induction for the new teachers, in which they get to learn about the vision and practices of the school, the expectations from them, and the nature of the support available, is essential. Senior teachers can also be identified and groomed to become mentor teachers for the new teachers.

Journal writing, documenting one's teaching experiences, and writing articles for various education periodicals is yet another way for teacher development, as writing helps an individual systematise their thoughts and experiences. This also enables teachers to reach beyond the school audience and connect to the wider community of education professionals.

Teachers also need to engage in wholesome learning activities for their own growth. As students are taken on excursion tours and film screenings, and sports day or club activities are organised for students, similar efforts are needed for the group of teachers.

Additionally, NCERT, SCERTs, DIETs, BITEs, BRCs, and CRCs provide academic mentoring and support to schools and teachers through the development of support material, capacity-building sessions, on-site visits, and quality monitoring and supervision. These academic resource institutions must continue to play a key part in ensuring that Teacher Professional Development opportunities are continuously available.

Section 3.6
Pre-Service Teacher Education

Pre-service teacher education must prepare teachers with a sound knowledge base and a strong professional identity. This will be best done through an interdisciplinary curriculum that reflects the NCF, and through a graded exposure to practicum over a period. The four-year programme outlined in NEP 2020, which is to be detailed in National Curriculum Framework for Teacher Education (NCF-TE), will provide sufficient opportunities for student teachers to observe and experience school and classroom practices. Opportunities for dialogue with peers, teacher educators, and practising teachers will help them connect their theoretical understanding with practice. Sufficient time and space must be given to student teachers to develop this understanding, this will be enabled through the longer duration of the four-year programme. Once they complete the teacher education programme, teachers will be able to continue their learning as practising teachers, given sufficiently enabling conditions.

To ensure that teachers are available for the restructured school stages as soon as possible, the first step must be to estimate teacher demand and supply. This must be undertaken by NCTE on priority, building on existing studies related to the demand and supply of teachers for specific stages of school education.

This will help ensure that the right number and type of universities offer the four-year Integrated Teacher Education Programme (ITEP) with specialisations in subjects and stages of education: Foundational, Preparatory, Middle, and Secondary. The curriculum for the specialisations within the ITEP must be based on the curriculum and pedagogy of NCF. It must also ensure adequate practice opportunities for student teachers in all kinds of school environments.

The Teacher Eligibility Test (TET) should also be extended to all teachers of the Foundational and Secondary Stages once the re-structuring of school stages is complete, as envisaged in NEP 2020.

This certification of suitability to teach will cover teachers across all kinds of schools. Recruitment of Teachers must be through rigorous process comprising not only a written test but also an interview and classroom demonstration, as stated in NEP 2020.

Section 3.7
Head Teachers and School Principals

The Head Teacher or School Principal must create a supportive and empowering culture for teachers so that they teach well (among other things), helping them in planning classes, providing access to appropriate resources, observing classes, providing constructive feedback, and creating an ethos where conversations centre around student's learning. Another critical role that Head Teachers and School Principals play is that of building relationships with parents and the community.

Head teachers and school principals need to constantly work towards ensuring dialogue with teachers, support staff, and other key stakeholders on larger issues as well as their individual roles through formal meetings and need-based individual engagement. The effort should be to align the entire staff to a shared vision and to create a learning community.

It follows that Head Teachers and school Principals must keep working towards improving their own capacities to enable the functioning of teachers. They must particularly work on their own biases, find time to know students and teachers personally and professionally, and ensure transparent communication.

Section 3.8
Role of Academic and Administrative Functionaries

Academic functionaries have important roles to play in leading the school education system towards improvement and transformation. They will play a key role in the implementation of this NCF as well.

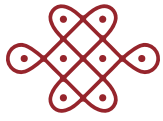
They are involved with schools, school visits and on-site support, continuous professional development at cluster-level meetings, in the development of innovative learning materials, as well as the development of a pool of academic resource persons to support teachers.

Functionaries at the cluster and block levels need to support teachers through classroom observation and demonstration of pedagogy. DIETs must develop extensive material for students and teachers in the local language. In addition, DIETs must also create plans to support teachers in the use of these materials. At the level of SCERT, the focus should be to develop the State curriculum, syllabus, textbooks, and other material. The SCERT should also take responsibility for sourcing, contextualising, and anchoring translations of materials wherever necessary.

Administrative functionaries have a critical role in ensuring appropriate budgetary allocations for all aspects of resourcing, including the availability of teachers, timely supply of TLM, with regular monitoring and review of progress. Appropriate collection and use of data would be necessary to ensure access to SEDGs. The integration of technology for this purpose would reduce effort while ensuring that data-based decision-making becomes possible very quickly.

An indicator of the quality of education will be the attainment of Competencies and Learning Outcomes. The National Achievement Survey (NAS) makes this tracking possible. In addition to NAS, States may plan State Learning Achievement Surveys (SLAS) with this focus.

Large-scale advocacy through public service messages and media campaigns, direct communication with parents, and wide-scale dissemination of simple methods and materials required for enabling parents to actively support their children's learning needs could also be designed.



Chapter 4

Community and Family Engagement

For more holistic learning and upbringing of children, parental and community participation is necessary. Children spend more time with their families and local community than at school, so schools need to engage with parents and communities to ensure a conducive learning environment for them beyond school hours.

Parents and family must be co-partners with the school in their children's learning and development. Communication with parents needs to be frequent and ongoing, with parents being treated as indispensable partners in the process of the child's education.

The local community is defined as parents, family, residents of the neighbourhood, youth groups, community leaders, and local governance institutions. The community must be involved in and support the school in as many ways as possible.

Apart from benefits at the level of individual students, the collaboration of school, family, and community results in the strengthening of not only schools but other institutions as well. It helps build local oversight and accountability in the education system.

Section 4.1
Enabling the Involvement of Parents and Families and Community

4.1.1 Inviting Parents or Families and Community to School

Parents and families must be invited to school functions and celebrations. Schools must find ways to engage them actively in such events as opposed to being mere audience or spectators. Therefore, the design of such functions and celebrations should aim for the active engagement of parents. Parents or families could also be asked to visit the school on working days to observe regular school functioning. They can, without disrupting the learning process of students, join the morning assembly and later spend some time in the classes. During intervals, they can interact with students and teachers. This will give them first-hand experience of what goes on in the school on a normal day.

The school's relationship should not be limited to the current group of parents and families. The larger community from where students come to school should also be involved systematically in school processes to whatever extent possible. For example, they could help ensure enrolment and regular attendance, mobilise funds for infrastructure and learning materials, organise ingredients for more nutritious meals locally, and so on. One simple way to reach out to them is to invite them to events, functions, and celebrations where it is easier to accommodate larger groups. Exhibitions of work by students, *Bal Mela*, book fairs, film festivals, health camps, cleanliness drives, and campaigning for other social awareness causes are opportunities to engage with the larger community. If the school publishes any newsletter or magazine, it can also be distributed to a larger audience. Community-based events and services by student clubs (e.g., sports clubs, art and culture clubs, health and wellness clubs) can be organised. Schools should have an active alumni group; with their help, building and sustaining this connection would be easier.

The unutilised capacity of school infrastructure could be used to promote social, intellectual, and volunteer activities for the community to promote social cohesion during non-teaching or schooling hours. This will help schools to function as a platform to bring the community together (e.g., *Samajik Chetna Kendras)*.

4.1.2 Orientation Meetings

At the very beginning, when parents and families come for admission of their children, an orientation on what the school stands for, its teaching-learning processes, and expectations from parents and families is necessary. This could be done in several forms, one-to-one meetings where individual queries can be taken up; meeting with a group of parents where a presentation on the school can be given; and sharing a written document about what parents should know. A tour of the school premises led by students would be a more creative and effective way of orienting parents and families. By interacting with students, they would get a good feel of what they are learning in the school.

When members from the larger community visit school, a short session, a tour, or an exhibition about school can be organised to orient them on various aspects of school functioning.

4.1.3 Parent Teachers Meetings

Parents and families must be treated as indispensable partners in the process, not as people who are availing of a service or people who need to be given only progress reports to. This must be reflected in the school's culture, in the way it welcomes and engages with parents and families, the community, and other visitors. Irrespective of the parental and familial backgrounds, attitudes, and dispositions, schools need to make them comfortable. There should be clear communication with parents and families on when they can visit schools. They should be properly welcomed and attended to.

While Parent-Teacher Meetings (PTMs) are a forum through which larger parent bodies engage with and contributes to school processes, communication with parents and families need to be frequent and ongoing.

Parents and families need regular updates on how their children are progressing in various learning domains, like in different subjects and socio-emotional aspects. At the same time, teachers also need to know the home and community context of students to provide the requisite support at school. This enables dialogue between parents and families and teachers on the kind of support students need at home. They could be invited to school regularly for discussions about their child's learning, and also be given updates by the teacher conducting home visits. Holding meetings at regular intervals is necessary to facilitate mutual sharing, trust building, and ownership. They may also solicit meetings with teachers as and when required.

These meetings should not primarily be about telling parents and families about the issues and challenges being faced with their children, but about what their children are learning, and the details of efforts being made by the school. Maintaining an updated student progress portfolio will be a huge help in this sharing, and parents and families will be happy to see how the school is keeping a proper record of student progress. On PTM days, schools could organise fun activities that parents and families could participate in. This will help build camaraderie between them and teachers.

Teachers should also visit parents and families periodically, as knowing the home environment and the larger socio-cultural context of students is a pre-requisite for providing more customised support to students.

4.1.4 Building Perspectives Among Parents, Families and Community

One important aspect of the school's dialogue with parents and families and the community would be around those aspects of education and school processes where the school needs to build their understanding and perspective. These could be issues, such as, attendance, on establishing relationships based on love and care rather than fear and punishment, home assignment, tutorial support, the inclusion of local language and context in the teaching process, health and hygiene issues, and behavioural norms where discussions with parents and families will help this partnership. For example, in early grades, a shared understanding of the importance of child development in the early years, different domains of development and learning, the need for stimulation and engagement in a conducive and safe home environment, and the importance of basic health and nutrition will go a long way in ensuring students all-round development.

Similarly, when students reach adolescence, conversations with parents and families about the changes that occur at this age are necessary. The kind of understanding and approach required for engaging with adolescent children would be integral to this dialogue.

A critical area of communication between schools and parents and families is about expected behavioural norms and consequences. Learning has to be joyful on the whole and it requires seriousness, perseverance, and a lot of hard work. In a school, all this is achieved through teamwork, so students must learn to be socially sensitive and responsible. These expectations must be communicated to and discussed with students and parents and families at the time of admission and at regular intervals. These behavioural expectations should largely be defined in positive terms, and if there is a student diary, then school rules should also find space there. They should also be displayed on the general notice board of the school. The consequences of not abiding by the rules should also be clear and well communicated.

4.1.5 Parents and Families and the Community as Resource Persons

Some parents and families, and members of the community could also be seen as important resource persons who through a well thought-out plan, can also contribute academically. Bagless Day is one such window where such engagement can be planned. Identified individuals or volunteers can help with organising and supervising small local field trips; share their knowledge and experiences when particular topics are being studied (e.g., growing plants and controling for pests, how to perform first aid for basic injuries, cooking a simple healthy meal, demonstrating basic woodwork, talking about animals or vehicles); help the teacher align aspects of school practices to the local context (e.g., local festivals, local food, local art forms); and be part of the classroom on designated days as an observer or co-teacher. They could also provide learning opportunities to students through visits to their place of work. Parents and families and community workers could also support teachers in teaching and learning in areas, such as, Art, Physical Education and Well-being, and Vocational Education, as per their expertise and the requirements of the school. Schools need to build a database of such parents and community members.

Efforts must be made to involve the community and alumni in volunteer efforts for addressing learning gaps by providing tutoring help. Databases of literate and willing individuals (retired scientists or government or semi-government employees, alumni and educators) will help achieve this purpose.

Section 4.2
School Management Committees

There was a time in the past when schools were established, owned, and run by the village and local communities. But modern schools are either run by the State or certain societies and trusts. In this scenario, the onus of initiating and sustaining the participation of parents and families and the community lies with the school staff and its governing bodies. School Management Committees (SMCs) are the official mechanism through

which community participation is ensured. Mothers, school alumni, local people with expertise in relevant areas of school functioning, and those with exemplary public spirit should be included as SMC members. This will substantially increase the engagement of the SMC with the school.

In public schools having SMCs, School Development Plans (SDPs) are prepared by this committee. It is an important document that manifests the priorities of the school in alignment with the vision of the school as well as its current status. The plan should have clear short-term and long-term goals and steps to move in that direction. The plan must also have mechanisms to review the progress of work done in the school.

SMC meetings should be held regularly to review school progress and to take necessary steps wherever required. These meetings can also be used to orient committee members on various educational matters so that they also grow in their understanding of the educational process and can play a more active and supportive role in ensuring all enabling supports for student learning.

The school-community partnership has great potential for ensuring better learning for students and community development. The relationship should not be limited to only sharing updates on student progress, resource mobilisation, or participation as an audience in school functions. Schools need to build quality relationships with parents and families and the community for enabling the learning process at the school and fulfil the larger role a school is expected to play in the life of the community they serve. A school necessarily brings different community members together for the education of their children and also has the potential for achieving greater social cohesion among these members through its educational endeavour.

Acronyms

S. No.	Acronym	Full Form
1.	AAC	Alternative Academic Calendar
2.	AEP	Additional Enrichment Period
3.	AI	Artificial Intelligence
4.	AR	Augmented Reality
5.	BITE	Block Institute of Teacher Education
6.	BRC	Block Resource Centre
7.	CCC	Control and Command Centre
8.	CG	Curricular Goals
9.	CF	Curriculum Framework
10.	CLT	Communicative Language Teaching
11.	CPU	Central Processing Unit
12.	CRC	Cluster Resource Centre
13.	CRT	Cathode Ray Tube
14.	CSR	Corporate Social Responsibility
15.	DAISY	Digitally Accessible Information System
16.	DIET	District Institute of Education and Training
17.	DIKSHA	Digital Infrastructure for Knowledge Sharing
18.	DIY	Do It Yourself
19.	DNA	Deoxyribonucleic Acid
20.	ECCE	Early Childhood Care and Education
21.	EVS	Environmental Studies
22.	FLN	Foundational Literacy and Numeracy
23.	FOSS	Free and Open Source Software
24.	GMO	Genetically Modified Organism
25.	GRR	Gradual Release of Responsibility
26.	HIIT	High Intensity Interval Training
27.	HPC	Holistic Progress Card
28.	ICDS	Integrated Child Development Services
29.	ICT	Information and Communication Technology

30.	IDA	Interdisciplinary Areas
31.	IEP	Individualised Education Plan
32.	ISL	Indian Sign Language
33.	IT	Information Technology
34.	IT Department	Income Tax Department
35.	ITEP	Integrated Teacher Education Programme
36.	KRCR 2019	Kasturirangan Committee Report 2019 (Draft National Education Policy)
37.	KTPI	Knowledge Traditions and Practices of India
38.	LiFE	Lifestyle for Environment
39.	LMS	Learning Management System
40.	LS	Learning Standards
41.	MCQ	Multiple Choice Question
42.	MeitY	Ministry of Electronics and Information Technology
43.	MIIT	Medium Intensity Interval Training
44.	MIS	Management Information System
45.	MoI	Medium of Instruction
46.	MWCD	Ministry of Women and Child Development
47.	NAB	National Association for the Blind
48.	NAS	National Achievement Survey
49.	NCDRC	National Consumer Disputes Redressal Commission
50.	NCERT	National Council of Educational Research and Training
51.	NCF	National Curriculum Framework
52.	NCF-TE	National Curriculum Framework for Teacher Education
53.	NCF-FS	National Curriculum Framework for Foundational Stage
54.	NCF-SE	National Curriculum Framework for School Education
55.	NCTE	National Council for Teacher Education
56.	NDEAR	National Digital Education Architecture
57.	NEP	National Education Policy
58.	NISHTHA	National Initiative for School Heads' and Teachers' Holistic Advancement
59.	NIVH	National Institute for the Empowerment of the Persons with Visual Disabilities (Divyangjan)

60.	NSQF	National Skills Qualifications Framework
61.	NTA	National Testing Agency
62.	OER	Open Educational Resources
63.	OTT	Over-The-Top, a consumer-subscribed internet platform for television and film content
64.	PBR	People's Biodiversity Register
65.	PCK	Pedagogical Content Knowledge
66.	PE	Physical Education
67.	PhET	Originally Physics Education Technology , now a STEM-based free online simulation tool alternative for real-world experiments
68.	POCSO	Protection of Children from Sexual Offenses Act, 2012
69.	POSH	Prevention of Sexual Harassment Act, 2013
70.	PRAGYATA	Plan-Review-Arrange-Guide-Yak (talk)-Assign-Track-Appreciate, guidelines for digital education in India published by NCERT
71.	PTM	Parent-Teacher Meeting
72.	PTR	Pupil-Teacher Ratio
73.	QR Code	Quick Response Code
74.	RERA	Real Estate Regulatory Authority
75.	RPL	Recognition of Prior Learning
76.	RPWD Act	Rights of Persons with Disabilities Act, 2016
77.	SCERT	State Council of Educational Research and Training
78.	SCF	State Curriculum Framework
79.	SDP	School Development Plan
80.	SEDG	Socio-Economically Disadvantaged Group
81.	SLAS	State Learning Achievement Survey
82.	SMC	School Management Committee
83.	SS	Social Science
84.	SWAYAM	Study Webs of Active-Learning for Young Aspiring Minds
85.	TET	Teacher Eligibility Test
86.	TLM	Teaching-Learning Material
87.	TPD	Teacher Professional Development
88.	TT	Table Tennis
89.	TWAU	The World Around Us

90.	UDL	Universal Design for Learning
91.	UNESCO	United Nations Educational, Scientific and Cultural Organization
92.	UNICEF	United Nations Children's Fund
93.	VE	Vocational Education
94.	VR	Virtual Reality
95.	YUVAi	Youth for Unnati & Vikas with AI
96.	ZPD	Zone of Proximal Development

Glossary of Terms

1. **Aesthetic Sensibility:** Aesthetic sensibility refers to our ability to perceive beauty, arrive at considered judgments regarding the good and beautiful, and strive towards a sense of refinement and elegance in artistic and creative processes across fields.
2. **Alternative Conceptions:** Ideas, which students use to explain various scientific concepts that do not match with the generally accepted scientific explanation of those concepts.
3. **Amrita Virtual Lab:** Online repository of science education simulations for Physical Science, Chemical Science, Mechanical Engineering, and Biotechnology set up under the National Mission on Education through Information and Communication Technology (NMEICT) initiative of MHRD.
4. **Anganwadi:** A childcare centre that provides health, education, and nutrition services to children of less than six years, mothers, and adolescents throughout the country; set up under the Integrated Child Development Services (ICDS) scheme.
5. **Balvatika:** A one-year preparatory class before Grade 1 for children aged 5–6 years; it can be in an Anganwadi, a pre-school, primary school, or any other configuration.
6. **Biodiversity Collapse:** Described as the loss of life on Earth at various levels, going from reductions in genetic diversity to the collapse of entire ecosystems.
7. **Capacity:** That we refer to in this document, is procedural knowledge, 'knowing how'.
8. **Carbon Credits:** A permit which allows a country or organisation to produce a certain amount of carbon emissions, and which can be traded if the full allowance is not used.
9. **Carbon Offsets:** A carbon offset is a credit that a person or organisation can buy to decrease its carbon footprint.
10. **Circle Time:** A period in the school day when students gather in a circle to participate in a guided discussion or group activity.
11. **Cognition:** Knowledge of students related to concepts as well as process capacities.
12. **Cognitive:** Any mental activity relating to or involving the processes of thinking and reasoning.
13. **Cognitive Development:** Any mental activity relating to or involving the processes of thinking and reasoning.
14. **Contact Comfort :** A term coined by psychologist Harry Harlow. It is the positive and soothing physical and emotional feelings that an infant experiences from being in physical contact with the mother or caregiver.
15. **Coordination Abilities:** An ability to perform difficult movements quickly and purposefully.
16. **Curricular Goal:** Statements that give direction to the curriculum development and implementation.
17. **Displacement:** The displacement of human populations refers to the relocation of the people from their homes due to environmental causes and development.
18. **Disposition:** Dispositions are the attitudes and perceptions that form the basis for behaviour.
19. **Diverse Needs:** Different students learn in different way, learning needs of students vary based on their social, emotional, and physical contexts, and current learning levels.
20. **Domains of Development:** The areas of growth and progress. The major domains of development are physical, cognitive, language, and socio-emotional.
21. **Domain:** Broad area of work that encompasses similar kinds of vocations.
22. **Dribble:** In soccer, hockey, and basketball an act of taking the ball forward with repeated slight touches or bounces.

23. **Ecology:** The study of the relationships between living organisms, including humans, and their physical environment.
24. **Ecosystem:** The physical environment where plants, animals, and other organisms, as well as, weather and landscape work together.
25. **Empirical Evidence:** Observations and data obtained using senses and extension of senses.
26. **Environmental Degradation:** Environmental degradation refers to the loss of biodiversity through the depletion and exploitation of natural resources.
27. **Environmental Literacy:** Having the knowledge, capacities, and dispositions to solve problems and resolve issues individually and collectively that sustain ecological, economic, and social stability.
28. **Ethics:** Judgments or principles informed by value systems which direct behaviour.
29. **Fine Motor Skills:** The ability to make movements using the small muscles in our hands and wrists.
30. **Foundational Stage:** The stage of schooling for children aged 3–8 years.
31. **Free Play:** Child-led, child-directed play in a stimulating environment developed by the teacher.
32. **Gross Motor Skills:** Skills involving large-muscle activities, they are key skills developed during infancy and include control of posture and walking.
33. **Home Curricular Goal:** Goal related to students' engagement in home-based tasks.
34. **Humanism:** Approach in which all beings are treated with dignity, humanity, and compassion.
35. **Hypothesis:** A statement suggesting a possible explanation for a phenomenon that is yet to be verified.
36. **Indigenous Knowledge:** The knowledge that an indigenous (local) community accumulates over generations of living in a particular environment**.**
37. **Information, Communication and Technology (ICT):** A diverse set of technological tools and resources used to create, store, transmit, share, or exchange information.
38. **Integrated Approach:** Approach to learning in which different subject areas are integrated, intertwining, and permeating each other.
39. **Jal Jeevan:** An initiative or mission led by the Department of Drinking Water and Sanitation to provide safe and adequate drinking water through individual household tap connections by 2024 to all households in rural India.
40. **Job:** The work that is done by a person regularly to earn money.
41. **Knowledge:** Descriptive knowledge, which is mentioned in this NCF-SE as, 'knowing that'.
42. **Learning Outcomes:** These are statements summarising the knowledge, skills, attitudes, and values that all children must possess and demonstrate upon the completion of a learning experience or sequence of learning experiences.
43. **Locomotor:** A physical action that propels an object or individual from one place to another.
44. **Manipulative Skills:** Movement skills that require the ability to handle an object or a part of an equipment with control.
45. **Mentor:** A person who focuses on including students in an activity, supports them in case of questions and helps them learn work-related skills.
46. **Middle Stage:** The stage of schooling for children aged 11–14 years.
47. **Mitigation of Environmental Issues:** Environmental mitigation means an action or activity intended to remedy, reduce, or counter known negative impacts on the environment.
48. **Moro Reflexes:** When the baby gets started by an unexpected sound, light, or movement.

49. **Motor Skills:** A function that involves specific movements of the body's muscles to perform a certain task.
50. **Multidisciplinary:** Combining or involving more than one discipline or field of study.
51. **Muscle Memory:** The ability to reproduce a particular movement without conscious thought, acquired because of frequent repetition of that movement.
52. **Peripheral Vision:** The ability to see things where you are not directly looking.
53. **Phenomenon:** An observable fact or event that typically is unusual or difficult to understand or explain.
54. **Predisposition:** Hold a particular attitude, or act in a particular way.
55. **Preparatory Stage:** The stage of schooling for children aged 8–11 years.
56. **Prevocational:** Prevocational education is mainly designed to introduce participants to the world of work, and to prepare them for entry into further vocational or technical programmes.
57. **Procedural Knowledge:** Knowledge to accomplish a task acquired by 'doing science'.
58. **Replicability:** Process that can be repeated and results in similar outcomes.
59. **Resource Person:** A person with expertise in a certain area who may be called upon as necessary to perform a task or provide information.
60. **Scaffolding:** Specific and structured form of support provided to help children learn a particular concept.
61. **Scepticism:** Questioning the validity of any idea or process.
62. **Science Kit:** A set of scientific tools or devices (ruler, thermometer, wire, battery, magnets, metal box, litmus paper, microscope, digital weighing machine etc.), chemicals and lab manuals put together to carry out experiments from school curriculum.
63. **Secondary Stage:** The stage of schooling for children aged 14–18 years.
64. **Skeletal Health:** Healthy framework of bones and cartilage that supports and protects the soft tissues and the internal organs of the body.
65. **Skill Lab:** Specifically equipped practice rooms functioning as training facilities offering skill-based training for the practice of skills prior to their real life application.
66. **Socio-Cultural:** It is related to the different groups of peoples in society and their habits, traditions, and beliefs.
67. **Static Exercise:** Performed by increasing tension in a muscle while keeping its length constant.
68. **Static Movement:** Movement in which you stand, sit, or lie still and hold a single position for period, up to about 45 seconds.
69. **Stimulation:** Simple activities, such as, playing, reading, and singing with children that improve young children's ability to think, communicate, and connect with others.
70. **Sustainability:** The degree to which a process or enterprise can be maintained or continued while avoiding the long-term depletion of natural resources.
71. ***Swachh Bharat Abhiyaan*:** The national-wide Clean India mission or campaign launched by Prime Minister of India, Narendra Modi in 2014 on the occasion of Mahatma Gandhi's 145th birth anniversary.
72. **Tinkering Laboratory:** A space to work with materials and instruments to design and execute ideas in a flexible environment.
73. **Triple Planetary Crisis:** The triple planetary crisis refers to the three main interlinked issues that humanity currently faces; climate change, pollution, and biodiversity loss. It is considered that each of these issues has its own causes and effects, and each issue needs to be resolved to have a viable future on this planet.

74. **Values:** Values are beliefs about what is right and what is wrong, while dispositions are the attitudes and perceptions that form the basis for behaviour.
75. **Visual Cues:** Concrete objects, pictures, symbols, or written words that provide a child with information about how to do a routine, activity, behaviour, or skill.
76. **Vocation:** A type of work or a way of life that a person believes to be especially suitable for him or her.
77. **Work:** To do something which needs physical or mental effort, in order to earn money or to achieve something.
78. **Yoga:** An ancient Indian discipline, including breath control, simple meditation, and the adoption of specific bodily postures; widely practised for health.
79. **Zone of Proximal Development (ZPD):** The Zone of Proximal Development is a concept developed by psychologist Lev Vygotsky. It is the gap between a student's current level of ability or knowledge and their potential level of development with assistance. This refers to the potential for learning a range of knowledge and skills that a student can achieve with guidance and support from a teacher.

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Wide and Inclusive Process for Development of the National Curriculum Framework

The National Steering Committee (NSC) for the NCF, along with the Ministry of Education, and the NCERT, designed a large-scale, inclusive, and iterative process for the development of the NCF-SE. This process benefited from the diverse and vibrant educational landscape of our country.

Involvement of States and UTs

The process started with the States and Union Territories (UTs) setting up State Focus Groups which together had over 4000 experts, to write Positions Papers on 25 themes relevant to the development of the NCF. More than 600 papers were submitted by 32 States and UTs.

25 National Focus Groups were also formed to develop Position Papers on these 25 themes with an integrated national outlook.

District-level consultations were conducted across the country by the States and UTs with the active participation of DIETs. More than 1550 District Consultation Reports (DCR) were submitted to provide inputs to the NCF.

A survey on MyGov platform was also conducted for seeking relevant inputs from diverse stakeholders, including Teachers, Teacher educators, and other professionals, throught the 100 questions in various categories, on ECCE, School Education, Teacher Education and Adult Education, 1,50,000 participants shared their views.

Wide Consultation with Stakeholders

Alongside, consultation meetings were organised with various Ministries of Government of India to understand their vision and how education is important to realising their vision. NGOs and other institutions working on the ground shared their experiences and suggestions. Consultations and Seminars were conducted in universities to get suggestions from scholars on their expectations from school education. Over 200 educational institutions and experts also gave detailed and careful inputs. Open consultations were organised with various groups of Teachers, parents, and students. The Digital Citizen-centric Survey for National Curriculum (DiSaNC) was launched to get inputs from citizens of India, through 10 questions in various categories; over 13,00,000 citizens, including parents and students, gave their inputs.

Public Release of Draft

A draft version of the NCF for School Education was released for public comment on 6 April 2023. This was done with the specific objective of seeking feedback from stakeholders to improve the NCF. Over 1,500 specific and detailed suggestions were received from over a 100 institutions and educators. Consultations were conducted with Boards of School Education and Higher Education Institutions. These have helped arrive at the NCF as it is being released.

Thus, this NCF is the output of a deeply inclusive process that involved Teachers, parents, relevant government departments in the States, administrators, schools, NGOs working in education and allied areas, educationists and scholars from various fields, and other citizens of India.

Note

Note

In every epoch of humankind, knowledge represents the sum of what is created by all previous generations, to which the present generation adds its own.

The motif of the Mobius strip symbolises the perpetual, developing and live nature of knowledge — that which has no beginning and that which has no end.

National Curriculum Framework for School Education 2023

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एन सी ई आर टी
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राष्ट्रीय शैक्षिक अनुसंधान और प्रशिक्षण परिषद्
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