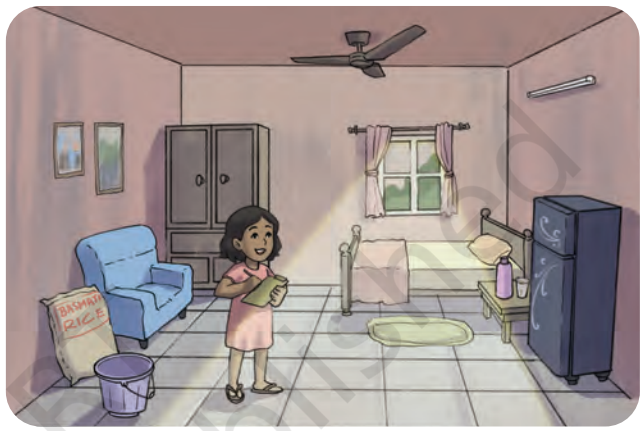
Chapter 8

Weight and Capacity

Check! Check!

Anu has recorded the weights of the items in her house. Check if she has recorded them correctly by putting a tick against them if they look correct.

1. Iron Almirah – 40 g
2. Bed – 60 kg
3. Rice Bag – 5 kg
4. Sofa – 30 g
5. Bucket – 1 kg 800 g
6. Water Bottle – 650 g
7. Refrigerator – 50 g

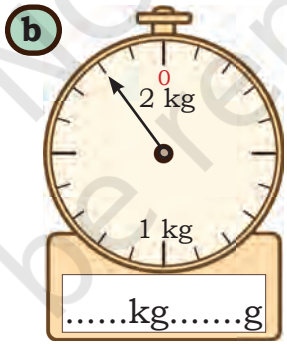


Let Us Do

Read the scales. Write the correct weight in the space given below.

a

b



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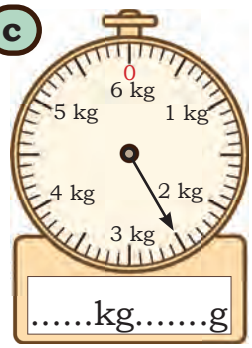

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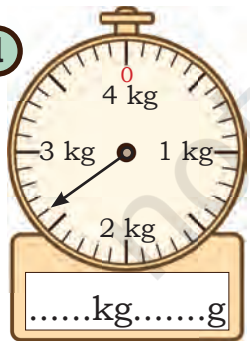

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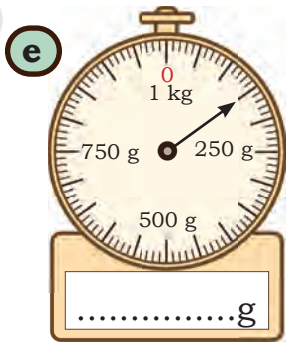


f

Note for Teachers: The learners should be capable of reading various types of weighing scales in different settings for measuring weights of different objects. Help learners to make sense of each of the scales and make them understand how the '0' works in each scale.

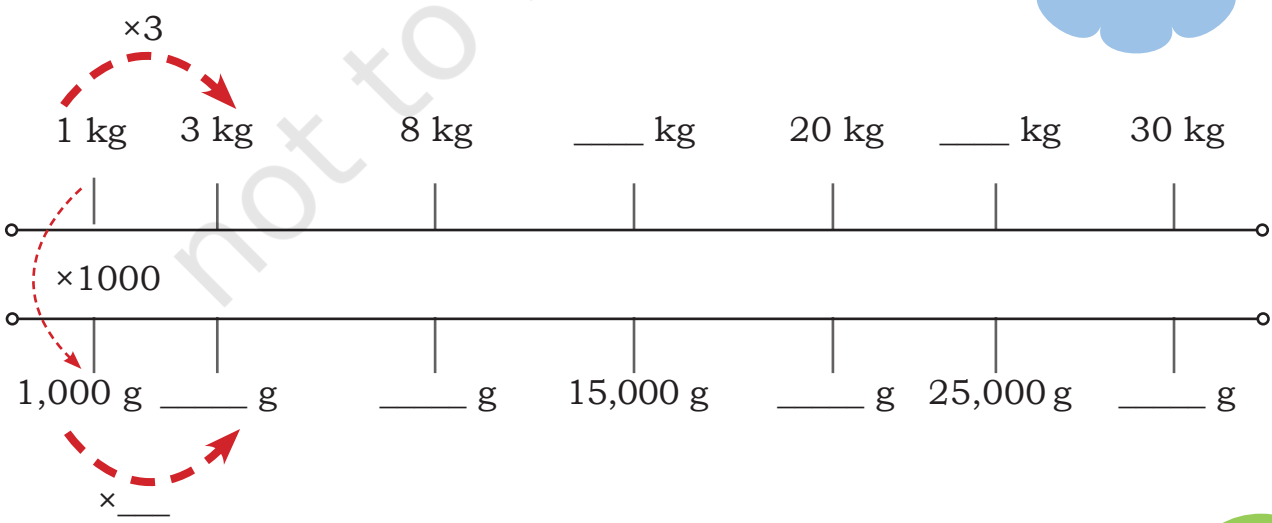
Different Units but Same Measure

Bags are weighed on two different weighing balances. One weighing balance displays weight in kilograms and other displays weight in grams.

Match the bags that have the same weights. You can use the double number line given below.

Weighing Balance 1	*Weighing Balance 2*
5 kg	3,000 g
10 kg	6,000 g
3 kg	10,000 g
6 kg	30,000 g
25 kg	5,000 g
30 kg	25,000 g

Notice the relationship between kg and g.



Let Us Find

Shrenu is baking cakes for her shop. She needs 3 kg 500 g flour. Her kitchen scale measures only in grams. What should her kitchen scale show for 3 kg 500 g of flour?

3 kg = 3,000 g
3 kg 500 g = 3,500 g

What would be 2 kg 250 g flour in grams?

2 kg = 2,000 g
2 kg 250 g = 2,250 g

Let Us Find

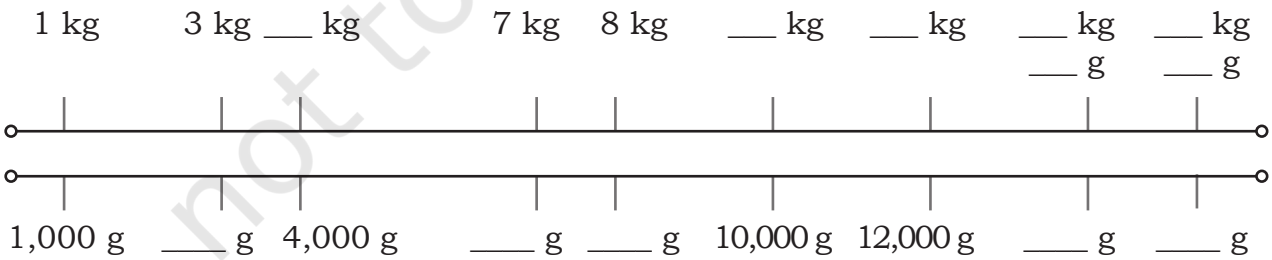
1. Shamim and Rehan observed someone buying sugar weighing 5 kg 50 g. They thought of the quantity in grams. How much is it?

5,050 g

No, it is 5,500 g

Who do you think is right and why?

2. Complete the conversions by filling in the blanks. You can use the double number line given below on which some numbers have been marked.



(a) 7 kg 67 g = _____ g

(b) 3 kg 300 g = _____ g

(c) 8 kg 69 g = _____ g

(d) 10,760 g = _____ kg _____ g

(e) 4,080 g = _____ kg _____ g

(f) 12,042 g = _____ kg _____ g

Comparison between Different Weights

1. Harpreet's family planned a picnic over the weekend. Her mother and father packed different food items to take along. The following is the list of fruits they carried.

Watermelon	– 3 kg
Pineapple	– 1 kg 750 g
Apples	– 1 kg 250 g
Mangoes	– 2 kg

Among the fruits they carried, which one has the

(a) highest weight? _____

(b) least weight? _____

(c) Arrange the items in descending order of their weight.

_____ _____ _____ _____

2. Compare the weights using <, =, > signs.

(a) 1 kg 600 g	_____	1,700 g
(b) 1 kg 600 g	_____	1 kg 60 g
(c) 10 kg 35 g	_____	10035 g
(d) 1 kg 600 g	_____	2 kg 500 g
(e) 5 kg 50 g	_____	4 kg 500 g
(f) 900 g + 7,000 g	_____	7 kg + 900 g

Milligram

How much weight can an ant carry?

How much does an ant weigh?

Ants weigh between 1 milligram and 5 milligrams. They can carry a lot more weight than their own weight.

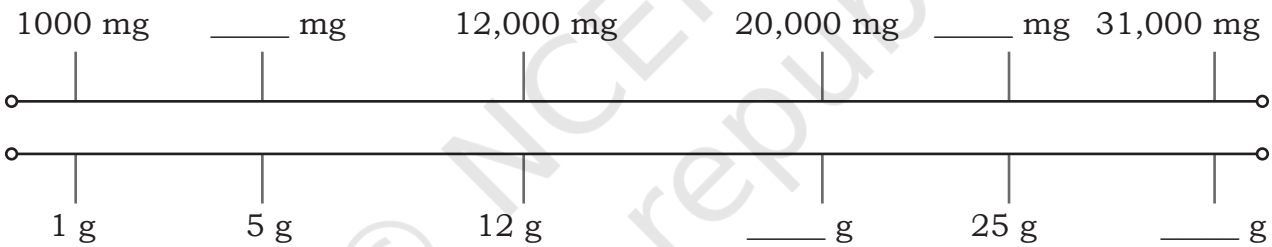
What is a milligram?

1 g = 1,000 milligram (mg)

Let Us Find

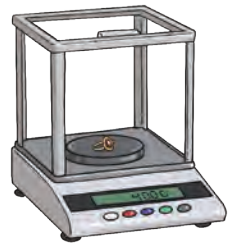
1. If a sugar sachet weighs 5g, how much will it be in milligrams?

2. Complete the double number line below appropriately.



3. An ornament weighs 4 g 100 mg. What will be the weight in milligrams?

Converting **g** to **mg** is similar to converting kg to g.
4 g = 4,000 mg
4 g 100 mg = 4,100 mg



4. A goldsmith has made an ornament weighing 10 g 500 mg. What will its weight be in milligrams? _____

Note for Teachers: Discuss objects that are light and measured in milligrams (mg), like ingredients in medicine, gold ornaments, etc. Encourage the learners to explore and find similar objects around them.

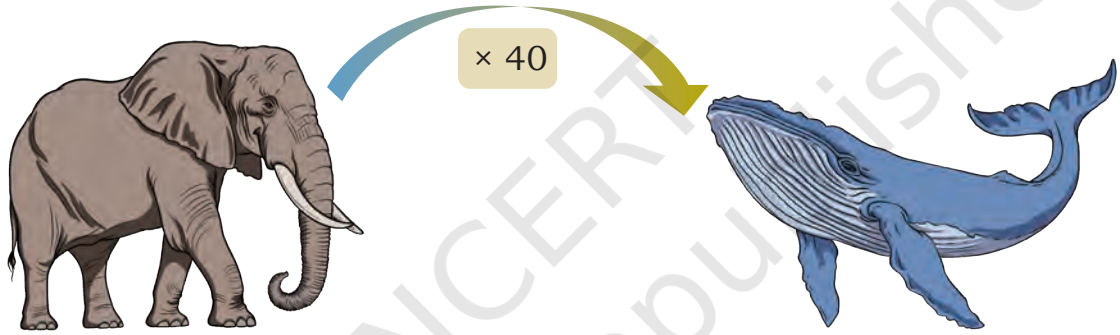
5. Compare the weights using <, =, > signs.

(a) 20 g	_____	200 mg
(b) 16 g 50 mg	_____	50 g 16 mg
(c) 2,010 mg	_____	2 g 100 mg
(d) 9,000 mg	_____	90 g
(e) 5,000 g	_____	7,500 g
(f) 800 mg + 88 mg	_____	880 mg + 8 mg

Did you know?

100 kg = 1 quintal
10 quintals = 1 tonne → 1,000 kg = 1 tonne

6. Observe the pictures given below and fill in the blanks.



5,000 kg

..... kg

7. Answer the following questions.

(a) 5,000 kg = _____ quintals = _____ tonne
(b) 9,000 kg = _____ quintals
(c) _____ kg = 8 tonnes

King's Weight

In a kingdom, the king donates wheat grains equal to 10 times his weight on his birthday.

(a) If he donates 800 kg of wheat grain this birthday, what is his current weight? _____ kg.

(b) If he had donated 780 kg of wheat grain on his last birthday, what was his weight last year? _____ kg.

(c) How much weight did he gain in a year until this birthday?_____ kg.

From Tiny to Big

1,000 mg = 1 g
1,000 g = 1 kg
100 kg = 1 quintal
10 quintals = 1 tonne

The Grocery Store

Rathna went to the local grocery store and bought several items.

She bought 2 kg 500 g rice for daily use and 1 kg 750 g additional rice for the upcoming Pongal festival. How much total rice did she buy?

I can think like this
2 kg 500 g + 1 kg 750 g
= 3 kg + 500 g + 750 g.
500 g + 750 g
= 500 g + 500 g + 250 g
= 1 kg + 250 g
So, total rice bought is 4 kg 250.

kg		g	
(1)			
2		5	0 0
+ 1		7	5 0
4	(1) 2	5	0

We can add and subtract like quantities.

1,000 g = 1 kg

We can also convert the quantities into grams.
2,500 g + 1,750 g

Grams				
(1)				
2	5	0	0	
+ 1	7	5	0	
4	(1) 2	5	0	= 4 kg 250 g

How much extra rice did she buy for household use than for the Pongal festival?

Note for Teachers: Note that three different ways have been suggested above for adding and subtracting weights. The need for these different strategies arises depending on the numbers used. If the numbers are 250, 500, 750 or even 200, 400, 500, etc., we can add and subtract numbers orally. In fact, we should encourage these mental strategies to be able to use mathematics for daily life problem-solving. When numbers are not amenable to such oral calculations, the learners can choose one of the column strategies provided here, based on their comfort. Help learners observe the similarity between subtraction of numbers and subtraction of quantities like weights.

I can also think like this.
We have to do
2 kg 500 g – 1 kg 750 g.
Take away 500 g from
2 kg 500g.
We get 2 kg.
Take away 1 kg from
2 kg. We get 1 kg.
Now, take away 250 g.
We get 750 g.

kg		g			kg		g		
(1)					(1)	(0)(14)(10)			
~~2~~	1	5	0	0	~~2~~	~~1~~	~~5~~	~~0~~	0
– 1		7	5	0	– 1		7	5	0
					0		7	5	0

Convert
1 kg = 1000 g

Grams

(1)	(14)	(10)	( )		
~~2~~	~~5~~	~~0~~	0		
– 1	7	5	0		
0	7	5	0	=	750 g

Convert the
quantities into grams.
We get 2500 g and 1750 g.
Now subtract as before.

Let Us Do

1. A restaurant owner uses 5 kg 200 g, 8 kg 900 g, and 12 kg 600 g of onions over 3 days. What is the total weight of onions used by the restaurant owner in 3 days?
2. Aarav is helping his grandfather at the fruit stall. He lifts two baskets of apples weighing 2 kg 100 g and 3 kg 950 g. What is the total weight of apples he lifted?
3. 4 kg 500 g of sand is used from a sack weighing 10 kg. How much sand is left in the sack?
4. A rice sack weighs 9 kg 750 g. After some rice is used, it weighs 3 kg 700 g. How much rice was used?
5. A delivery truck delivered 17 kg 900 g of supplies in the morning and 12 kg 700g in the afternoon. How much total supplies did it deliver?
6. A box of books weighs 14 kg 750 g. After removing some books, the weight of the box is 10 kg 500 g. What is the weight of the books removed?
7. In a community kitchen of a Gurdwara, 65 kg of flour was purchased on one day. Out of this, 42 kg 275 g flour was used for preparing langar. The next day, an additional 52 kg 500 g of flour was bought. What is the total quantity of flour now available in the kitchen store?

More Operations on Weight

1. A farmer weighs a sack of potatoes and finds it to be 10 kg 500 g. If the farmer has 4 such potato sacks, what is the total weight of all the sacks?

   4 × 10 kg 500 g
   = 4 ×10 kg and 4 × 500 g
   = 40 kg + 2000 g
   = 40 kg + 2 kg = 42 kg.

You can find the product by multiplying the kg and g separately and adding the two. You can also convert the quantity into grams and then multiply.

2. A box of nuts weighing 4 kg 800 g is equally distributed into 4 smaller boxes. What is the weight of each small box in grams?

   4 kg ÷ 4 = 1 kg
   800 g ÷ 4 = 200 g
   So, 4 kg 800 g ÷ 4 = 1 kg 200 g

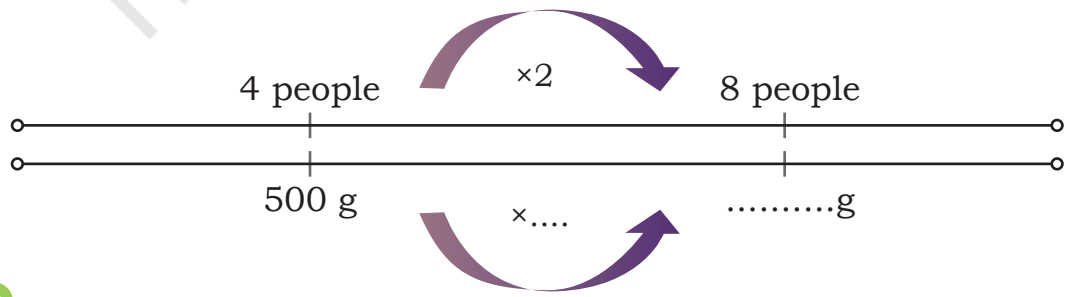
We can also convert the quantity into grams and divide
4800 ÷ 4 = ?

Let Us Do

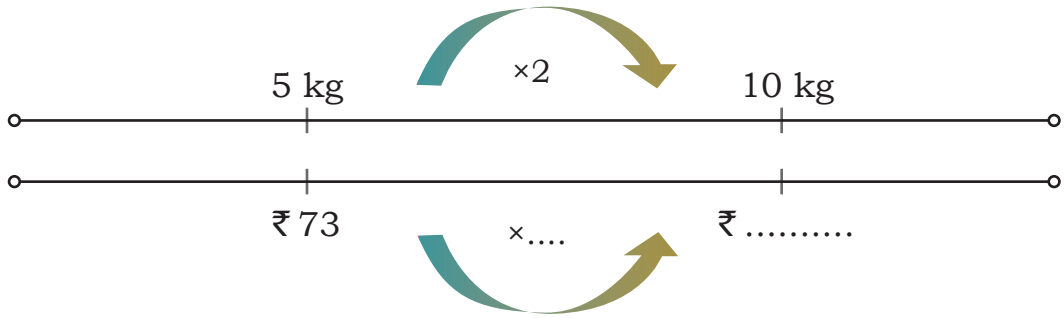
1. The cost of some grocery items is given in the following table. Find the total cost of each item.

Item	Weight	Cost of 1 kg	Total cost
Rice	12 kg 500 g	₹ 60	
Flour	7 kg 250 g	₹ 40	
Sugar	5 kg	₹ 45	
Chana dal	3 kg 600 g	₹ 70	
Besan	4 kg	₹ 60	
Jaggery	1 kg 400 g	₹ 50	

2. 4 people need 500 g rice for a meal. How much rice will be needed for 8 people if they eat similar quantity of rice?



3. 5 kg of tomatoes cost ₹ 73. How much will 10 kg of tomatoes cost?



4. Nitesh is a scrap dealer. How much would he have paid for
   (a) 16 kg of old newspaper, if he paid ₹ 8 for every 1 kg of newspaper?
   (b) 20 kg iron, if he paid ₹ 200 for every 10 kg of iron?
   (c) 10 kg plastic, if he paid ₹ 30 for 5 kg of plastic?

   Make double number lines for answering (b) and (c).

Measuring Capacity

1. You must have seen tea being prepared at your home. How much water and milk do we need to make 2 cups of tea?

   Do we need 1 *l* of water to make 2 cups of tea?

   Is 500 *ml* of water enough for 2 cups of tea?

2. A bucket can hold a maximum of 20 *ml* of water. Is this statement correct? Which unit should be used in such a situation?

Big to Small, Small to Big

1. Ramiz brings a 500 ml water bottle to school. He drinks two bottles at school. How much water does he drink at school?

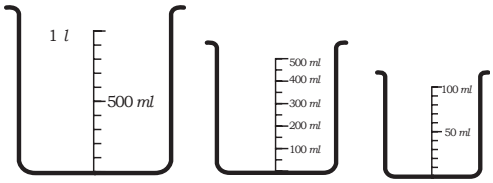
   Ramiz drinks _____ *ml* + _____ *ml* = _____ *ml.*

   Ramiz drinks ____ *l* of water in a day.

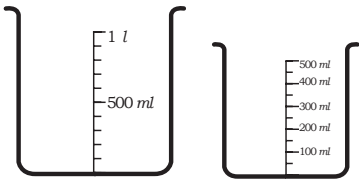
2. Muskaan drinks 3 *l* of water in a day. How many times would she need to refill a 500 *ml* water bottle? _____.

   Muskaan drinks _____ *ml* of water in a day.

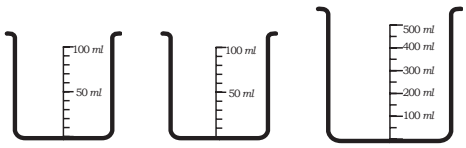
3. Write the total capacity of the following containers in each blank.



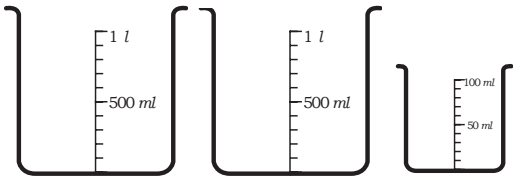
_____ *l* _____ *ml*



_____ *l* _____ *ml*



_____ *l* _____ *ml*



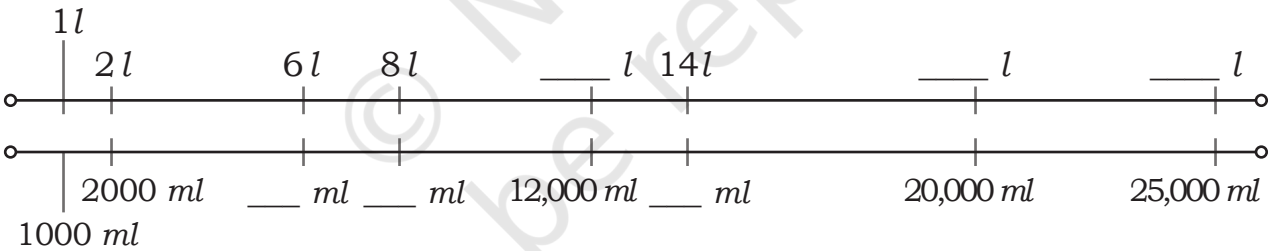
_____ *l* _____ *ml*

Different Units but Same Measure

The Milkman's Delivery

Khayal *chacha* delivers fresh cow milk to homes. Bhalerao's family orders 2*l* of milk everyday.

This family has a vessel marked in *ml* only. What mark will you see in the vessel corresponding to 2*l*?



Khayal *chacha* delivers the following amounts of milk each week to different families.

Family	Milk Delivered in a Week in *l*	Quantity in *ml*
Arora's	8	
Nair's	14	
Shrivastava's		12,000
Das's		20,000
Rao's		25,000

Dev's family needs 1 *l* milk every day. On Sunday, they need 500 *ml* more.

Quantity of milk they need on Sunday = 1 *l* + 500 *ml*

= 1,000 *ml* + 500 *ml* = 1,500 *ml*.

Let Us Think

1. Mary and Daisy filled their bottle with 1*l* 400 *ml* of water. They wondered about the capacity of the bottle in *ml*. How much is it?

Who do you think is correct and why?

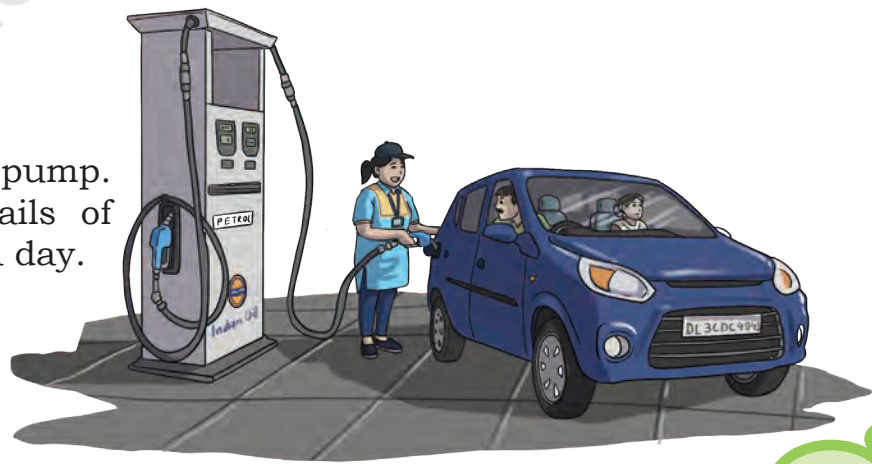
2. Convert and fill in the blanks appropriately. You can use the double number line given earlier.

(a) 3 *l* 8 *ml* = _____*ml* (b) 9 *l* 90 *ml* = _____ *ml* (c) 14,075 *ml* = ____*l* ____*ml*

(d) 8 *l* 86 *ml* = ____ *ml* (e) 12,200 ml = ____*l* _____*ml* (f) 18,350 ml = ____*l* ____*ml*

Let Us Compare

1. Kiran owns a petrol pump. She records the details of the sales of petrol in a day.



2.

Vehicle	No. of Vehicles	Quantity of Fuel in Each Vehicle (in litres)	Total Quantity of Fuel (in litres)
Truck	3	500	
Bus	6	300	
Car	10	50	
Auto Rickshaw	12	8	
Two-wheeler	25	5	

(a) How much more fuel is bought for buses than for trucks?

(b) What is the total quantity of fuel filled from the petrol pump on that day?

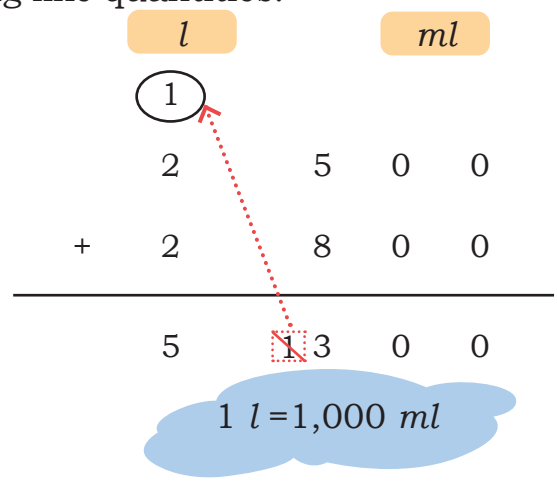
3. Compare the following quantities using the signs <, =, >.

(a) 5 *l* 600 *ml*	_____	5,400 *ml*
(b) 10 *l* 100 *ml*	_____	1 *l* 600 *ml*
(c) 190 *ml* + 800 *ml*	_____	800 *ml* +109 *ml*
(d) 3 *l* 600 *ml*	_____	3,600 *ml*
(e) 4 *l* 50 *ml*	_____	4 *l* 500 *ml*

4. Sam and Tina fill petrol in their bikes. Tina bought 2 *l* 500 *ml* of petrol. Sam bought 2 *l* 800 *ml* more petrol than Tina. How much petrol did Sam buy?

Sam found the quantity of petrol by adding like quantities.

2 *l* 500 *ml* + 2 *l* 800 *ml*
= 2 *l* + 2 *l* and 500 *ml* + 800 *ml*
= 4 *l* and 1,300 *ml*
= 4 *l* and 1 *l* and 300 *ml*
= 5 *l* 300 *ml*.



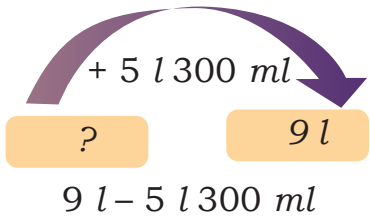
Tina converted the quantities into *ml*, that is, 2,500 *ml* and 2,800 *ml*.

	(1)		*ml*	
	2	5	0	0
+	2	8	0	0
	5	1	3	0	0

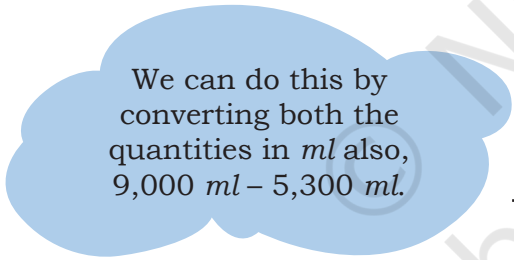
Total quantity of petrol bought by Sam = 2,500 *ml* + 2,800 *ml* = 5,300 *ml* = 5 *l* 300 *ml*.

After refueling, Sam found his fuel gauge reading 9 *l*. How much fuel did his bike have before refueling?

Quantity of fuel Sam's bike had before refueling is–



9 *l* – 5 *l* 300 *ml*



Convert 1 *l* = 1,000 *ml*.

	l		*ml*		
	(8)		(10)		
	~~9~~		0	0	0
–	5		3	0	0
	3		7	0	0

Sam's bike had 3 *l* 700 *ml* of fuel before refuelling.

Note for Teachers: Explain the addition and subtraction algorithm as was done in the case of weight. Encourage the learners to choose the strategy they are comfortable with. Teachers can create several more problems like this. To help learners master such problem-solving, choose numbers mindfully—preferably multiples of 10, 100, or 1000.

Let Us Solve

1. Riya is filling water bottles for a picnic. She fills one 2 *l* bottle and four 500 *ml* bottles. Her friend, Aarav fills three 750 *ml* bottles. Who filled more water, Riya or Aarav? How much more?

2. A bottle of milk is poured equally into 8 glasses, leaving 120 *ml* of milk in the bottle.

   (a) If each glass has a capacity of 360 *ml*, what is the total capacity of 8 glasses?

   (b) How much milk was there in the bottle initially?

   (c) If 1 *l* of milk costs ₹ 40, how much will 3 *l* milk cost?

3. A juice vendor has a 5 *l* container of orange juice. Each glass has a capacity 250 *ml*.

   (a) How many full glasses can he serve before the container becomes empty?

   (b) If he has already served 10 glasses, how much juice is left?

   (c) If 250 *ml* of juice is sold at ₹ 25, how much will he earn by selling 5 *l* juice?

4. In a factory, 8 *l* 400 *ml* of oil needs to be equally poured into 7 containers for storage. How much oil will each container hold?

5. If one container can hold 1 *l* 75 *ml* of buttermilk, how much buttermilk will be there in 8 such containers?

Use the double number line whenever needed to solve such problems.