Chapter 5

Far and Near



We have learnt about measuring length and some standard units we use to measure length. In this chapter we will learn some more units of measuring distances and the relationships between different units.

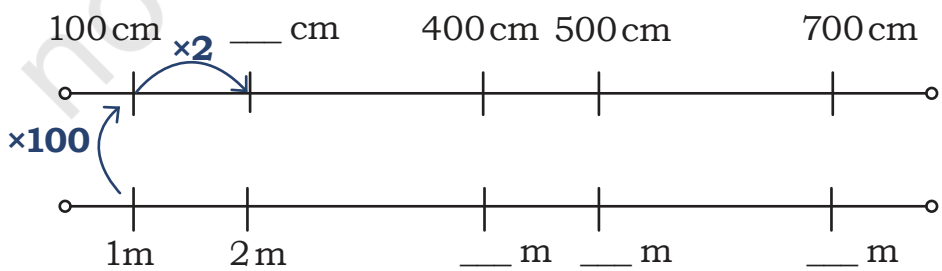
Let Us Find

Identify the appropriate units for measuring each of the following.

Quantity	Unit of measurement Metre (m) or centimetre (cm)
Height of India Gate	42
Length of a handkerchief	40
Depth of a well	50
Length of a mobile phone	13
Length of an elephant's trunk	2
Distance between two buttons on a shirt	5

Different Units but Same Measure

Shikha and Sonu are measuring the lengths of saris and stoles in the village weaving centre. Find which measures represent the same sari or stole. You can take help of the double number line below.



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204 cm	5 metre 40 cm
540 cm	2 metre 204 cm
750 cm	2 metre 4 cm
240 cm	2 metre 40 cm
404 cm	6 metre 150 cm

Let Us Compare

1. Ritika is comparing the lengths of different rods. Compare them using <, =, > signs.
   (a) 456 cm ____ 5 m
   (b) 55 cm + 200 cm ____ 200 cm + 54 cm
   (c) 6 m 5 cm ___ 6 m 50 cm
   (d) 2 m 150 cm ___ 3 m 50 cm
   (e) 238 cm ____ 138 cm + 1 m

2. World's tallest statue
   (a) What is the difference between the height of the tallest statue in the world and the Statue of Liberty?
   (b) Identify the statues whose heights have the least difference.
   (c) Identify the statues whose heights have the largest difference.
   (d) The height of which statue will be equal to the height of the Statue of Unity, if it is doubled?



Some of World's Tallest Statues

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Measuring Long Distances

Here are some ways in which you can measure long distances.

Long Tape





Rodometer—measuring wheel



Rangefinder



Laser Distance Meter

Let Us Do

Measure 100 m and 200 m on your school playground, or any other place in and around your school, using a Long Tape. Mark these points and draw a straight line. Walk on the lines and count the number of steps. Use this relationship between the number of steps taken and distance walked to find distances around you for at least 3 locations. Wherever possible, walk and find the number of steps. Otherwise, find the distance and estimate the number of steps.

(a) Identify and write the locations that are the nearest and the farthest from your home.

Nearest location _____.

Farthest location _____.

(b) Write the distances obtained above in increasing order.

_____, _____, _____, _____.

(c) Name a location that is equal to or more than 1,000 m from your home.

Let Us Explore

When we walk 1,000 m, we say we have walked 1 km.

1,000 m = 1 km

Kilo stands for thousand. This unit is used to measure long distances.

Length of rope	Number of ropes needed to make 1 km
1,000 m	1
100 m	
10 m	
200 m	
500 m	
250 m	

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Kilometre Race

Sheena and Jennifer are helping to organise a 3-km race. Help them with the arrangements for the race.

1. Water stations are to be arranged after every 500 m. How many water stations must be set up? At what positions from the starting point will these water stations be placed?
2. Children need to stand at an interval of 300 m to direct the runners. How many children are needed? At what positions from the starting point will the children be standing?
3. Red and blue flags are to be placed alternately at every 50 m. How many red and blue flags are needed till the finish line?

Let Us Do

Longest Train Journey

The longest train journey in India is by The Vivek Express which runs from Dibrugarh in Assam to Kanniyakumari in Tamil Nadu. Look at the stations on the route shown in the table below and answer the questions.

Station number	Name of the station	Distance from Dibrugarh
9	Dimapur	306 km
14	Guwahati	556 km
22	Jalpaiguri Road	983 km
34	Bhubaneswar	2,007 km
40	Visakhapatnam	2,450 km
45	Vijayawada JN	2,800 km
55	Coimbatore JN	3,675 km
65	Kanniyakumari	4,187 km

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1. The total length of the route from Dibrugarh to Kanniyakumari is _____ km.
2. The distance between Vijayawada and Jalpaiguri road is _____.
3. Distance between Vijayawada and Visakhapatnam is _____.
4. Which two stations are farther apart—Guwahati and Dimapur or Bhubaneswar and Jalpaiguri Road?
5. What is the distance between Guwahati and Coimbatore JN?

Let Us Explore

The World of Small Things

How can we measure small things like the ones shown here?


sprout


small screws

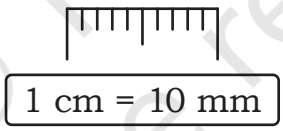

nail

Let us look at the scale. Do you notice the small marks between 1 cm and 2 cm? Count how many marks are there between 1 cm and 2 cm?



One centimetre is divided into ten equal parts. Each part is called 1 millimetre (mm).

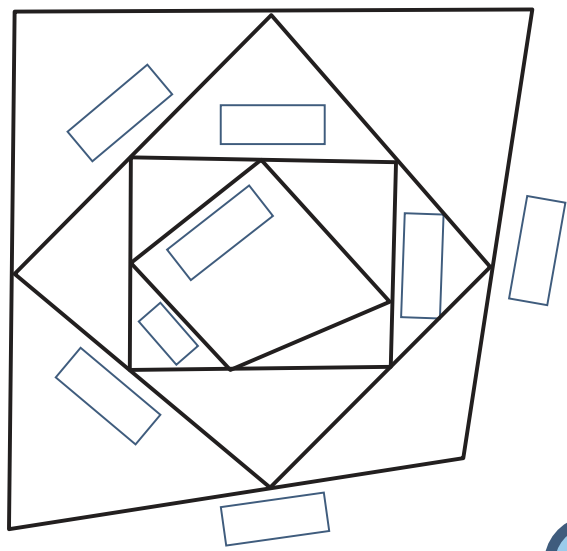
1 cm = 10 mm



These small marks between any two centimetre marks help us measure the smaller lengths. Thus, it adds to the precision in measurement.

Let Us Measure

Measure the lines in the design and write their measurements in cm and mm.



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Let Us Do

Soak some seeds of whole moong or black or white chana overnight. Next morning, take them out and wrap them in a moist cloth to sprout them. Over the next 4 days, take out one seed each day and measure the length of sprout. For ease of measurement, you can either place the seed on a paper and mark the length of the sprout, or use a thread to find its length.

Number of days	Length of the sprout (in mm)
Day 1	
Day 2	
Day 3	
Day 4	

Let Us Draw

Draw lines of the following lengths in your notebook using a scale.

1. 5 cm 5 mm
2. 3 cm 6 mm
3. 8 cm 3 mm
4. 36 mm
5. 67 mm

How did you draw lines of lengths 36 mm and 67 mm? Share your thoughts in class.

Relationships between Different Units

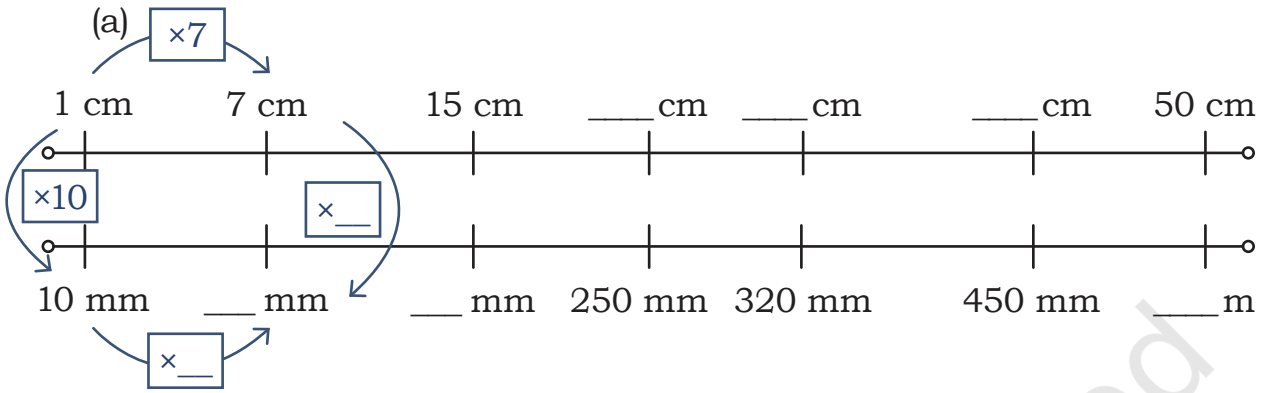
10 mm = 1 cm
100 cm = 1 m
1,000 m = 1 km

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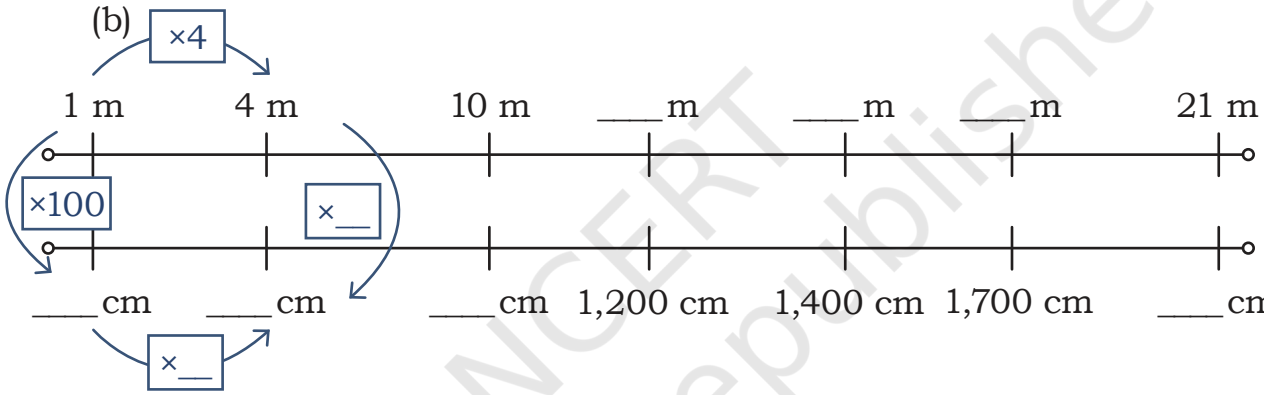
Let Us Do

1. Fill in the blanks appropriately in the double number lines given below.

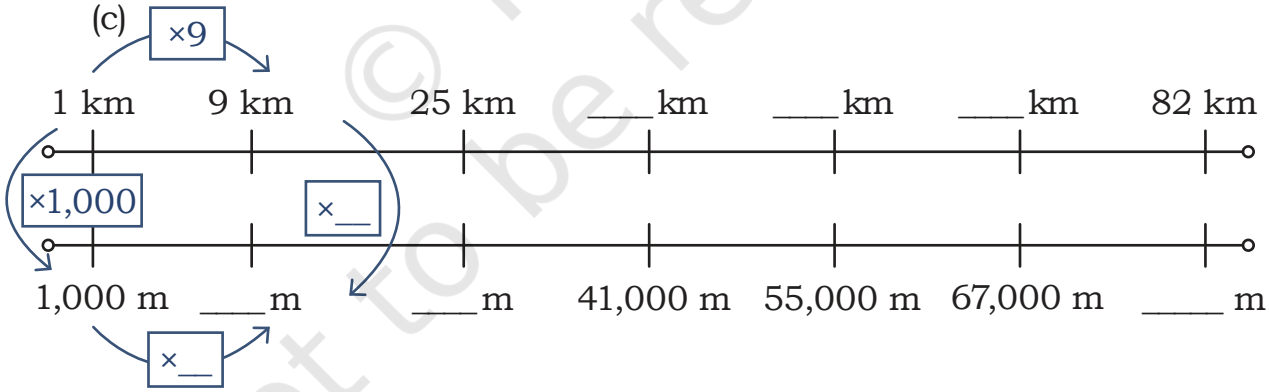
(a)



(b)



(c)



2. Use your understanding from above to fill in the blanks appropriately.
   (a) 4 cm 5 mm = _____ mm
   (b) 89 mm = ___ cm ___ mm
   (c) 234 cm = ___ mm
   (d) 514 mm = ___ cm ___ mm
   (e) 6 m 34 cm = ___ cm
   (f) 20 m 12 cm = ___ cm
   (g) 397 m = _____ cm

89 mm = 80 mm + 9 mm
= 8 cm 9 mm

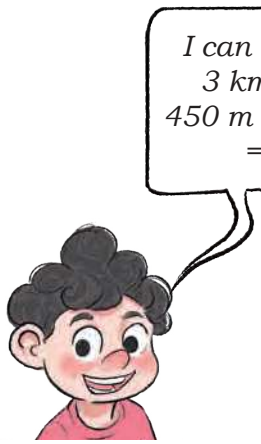
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(h) 5,792 cm = _____m _____ cm
(i) 9,108 cm = _____ m _____ cm
(j) 34 km = _____ m
(k) 6,870 m = ____ km ____ m
(l) 10,552 m = ____ km ___ m
(m) 29 km 30 m = ____ m
(n) 32 km 359 m = ____ m

5,792 cm = 5,700 cm + 92 cm
= 57 m 92 cm

Adding and Subtracting Lengths

Saji saw on his smartphone that he walked 3 km 450 m in the morning and another 4 km 650 m in the evening. How much did he walk in the whole day? How would you solve this problem? Share your thoughts in class.

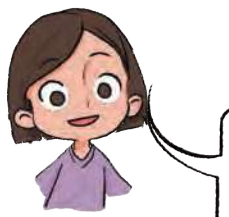


I can add similar units.
3 km + 4 km = 7 km.
450 m + 650 m = 1,100 m
= 1 km 100 m.

	km	m		
		1		
	3	4	5	0
+	4	6	5	0
	7	1 1	1	0 0

1,000 m = 1 km

7 km + 1,100 m = 8 km + 100 m = 8 km 100 m



I can convert everything into metres and add, that is 3,450 m + 4,650 m

	m			
	1	1		
	3	4	5	0
+	4	6	5	0
	8	1 1	1	0 0

8,100 m = 8,000 m + 100 m
= 8 km 100 m

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Electricians are changing the cables in a house. They need 63 m of cable for this purpose. They used 16 m 75 cm cable in the first room.
What is the length of the cable left?

Convert 1 m = 100 cm

Convert the quantities in cm.
6,300 cm – 1,675 cm



	cm			
	5	12	9	10
	~~6~~	~~3~~	~~0~~	~~0~~
–	1	6	7	5
	4	6	2	5

4625 cm = 4600 cm + 25 cm = 46 m 25 cm.

We can also subtract like units, as above.

	m		cm			m		cm		
		2				5	12	0	9	10
	6	~~3~~	1	0	0	~~6~~	~~3~~	~~1~~	~~0~~	~~0~~
–	1	6		7	5	– 1	6		7	5
						4	6		2	5

Therefore, 46 m 25 cm cable is left.

Note for the Teachers: Lengths can be added and subtracted in different ways. We can orally calculate whenever the numbers are convenient, like 200, 250, 400, 500, or 750, etc. In fact, we should encourage the use of mental strategies so that students can use mathematics for solving daily-life problems. When numbers are not suitable for oral calculations, the learners can choose one of the column strategies provided here based on their comfort. Help learners notice the similarity between operations on numbers and on quantities like length.

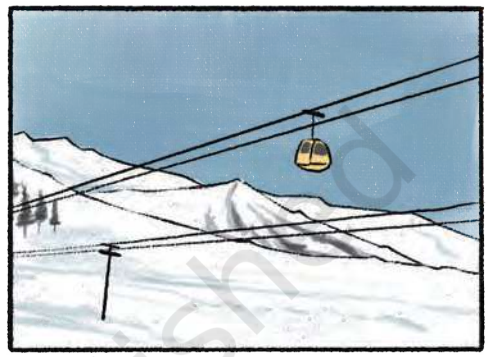
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Let Us Do

1. Rani has two red-coloured ribbon rolls, one of length 3 m 75 cm and another 2 m 25 cm long. How much ribbon does she have?

2. The distance from Bhopal to Sanchi is 48 km 700 m. Bhadbhada Ghat waterfall is on the way, and 17 km 900 m away from Bhopal. How far is Sanchi from the waterfall?

3. Gulmarg Gondola in Gulmarg, Kashmir is the second longest and second highest cable car in the world. It is divided into two sections. The first section covers 2 km 300 m and the second section covers 2 km 650 m. What is the total distance covered by the cable car?



4. Circle the bigger length and find the difference.

(a) 11 mm and 1 cm — Difference — _____
(b) 26 mm and 2 cm — Difference — _____
(c) 20 cm and 201 mm — Difference — _____
(d) 1,020 mm and 1m — Difference — _____
(e) 2 m and 245 cm — Difference — _____
(f) 5,678 m and 6 km — Difference — _____
(g) 6 km 1,480m and 7 km 479m — Difference — _____

Multiplying and Dividing Lengths

1. We need a 1 m 80 cm cloth to make a shirt for a 10-year old child. How much cloth will be needed to make shirts for 20 such children?

20 × 1 m 80 cm = 20 × 1 m and 20 × 80 cm
= 20 m + 1600 cm
= 20 m + 16 m
= 36 m.

Break the quantity into m and cm and multiply. You can also convert it into cm and multiply.

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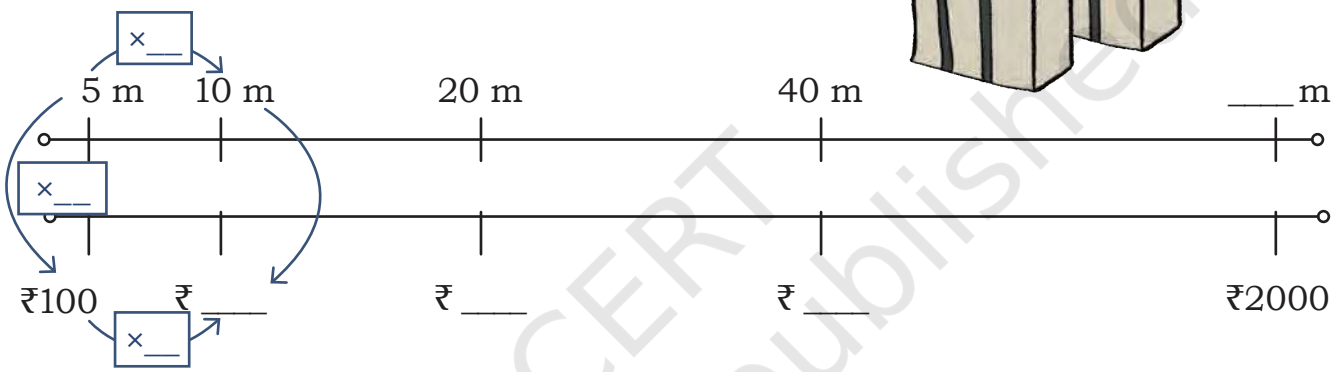
2. A shop sells cloth for making bags at ₹100 for 5 m. How much money is needed to buy a 1 m cloth?



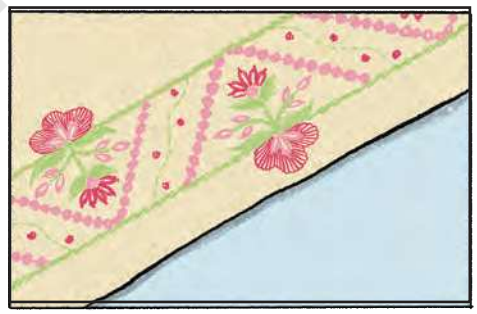
If 5 m cloth costs ₹100, then a 1 m cloth costs 100 ÷ 5 = ₹20.

Now, use the double number line to find the cost of the cloth or the length of cloth that we can buy at a particular cost.





3. Anita is making an embroidery on the border of a sari. She needs a 1 m long thread to embroider a 50 cm sari. How much thread would she need for a 5 m sari border?



A 1 m long thread costs ₹50. How much money will be needed to buy the thread?

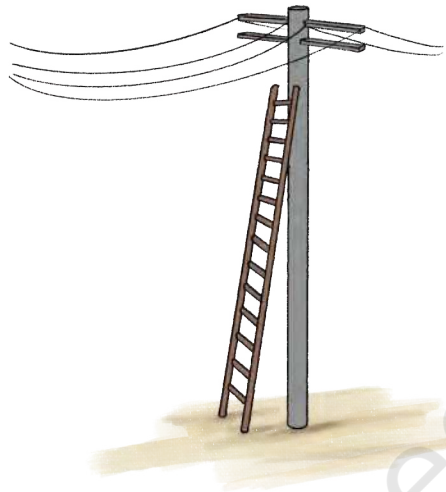
4. A road 12 km 600 m long is being laid in a town. The workers lay an equal length of road each day, and complete the work in 6 days. How much road-laying work is done on each day?

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Let Us Estimate



Height of a single-storeyed house



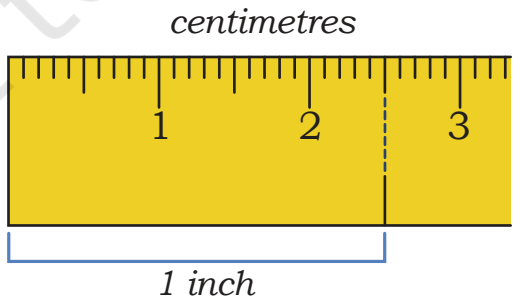
Height of an electric pole

Estimate the following. Share your reasoning in class.

1. The height of the tallest building in your neighbourhood. What did you use as a reference to estimate the height?
2. The height of the tallest tree in your neighbourhood. What did you use as a reference?
3. The depth of a well or swimming pool in your neighbourhood. How did you find out?

Let Us Explore

In daily life, we use other units of measuring length as well. Height is usually measured in feet and inches. Look at your ruler to see if inches are also marked on it. Find out how many cm and mm equal 1 inch.



1 inch = 2 cm 5 mm

1 foot = 12 inches or 30 cm.

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Measure Your Height



Stand against a wall and mark your height. Measure the distance between the floor and the marked point in feet and inches.

Similarly, other students in the class can also measure their heights.

Find out who is the tallest student in your class. What is his or her height in feet and inches?

Try This

Put appropriate operation sign (+, –, ×, ÷) such that each row and column and each 4 × 4 box should not repeat the sign.

÷			+
	×		
		+	
			–

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