Chapter 6: Measuring Length

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Exercise 6.1 — Let Us Observe — What is being measured?

Q1 Look at the picture. What are the students measuring? Put a tick mark if you find it being measured: a) Length, b) Height, c) Weight, d) Depth, e) Breadth, f) Temperature.

SOLUTION

From the picture, the students are using a measuring tape/ruler to measure sizes of objects.
Length — tick (measuring the extent of an object horizontally).
Height — tick (measuring how tall something is).
Breadth — tick (measuring the width/breadth of an object).
Weight, Depth, Temperature are NOT being measured in this activity.

Q2 What is being used to measure the height? What other tools can be used to measure height?

SOLUTION

In the picture, a measuring tape (or metre scale) is being used to measure height.
Other tools that can be used to measure height: a ruler, a metre stick, a yardstick, or a folding measuring rod.

Q3 Recall: Check and fill in whether the following are correct or incorrect for your classroom. a) The height of most students in my grade is more than a metre. b) The length of my arm is less than a metre. c) The height of the door is less than a metre. d) The breadth of the blackboard is more than a metre.

SOLUTION

These are classroom observation activities — answers depend on actual measurements.

a) Correct — most Class 4 students are between 110–140 cm, i.e. more than 1 metre.

b) Correct — arm length is typically 50–65 cm, which is less than 1 metre.

c) Incorrect — a standard classroom door is about 2 metres tall, which is more than 1 metre.

d) Correct — a blackboard is usually 120–180 cm wide, i.e. more than 1 metre.

Exercise 6.2 — Let Us Do — Metre Rope Activities

Q1 Walk, Jump, and Crawl on 1, 5 and 10 m lines. Draw lines of 1 m, 5 m, and 10 m on the floor. How will you make these lines? Think and share with your friends.

SOLUTION

Use a 1-metre rope (made in the activity) as the unit.
For 1 m: lay the rope once and draw a line at its end.
For 5 m: lay the rope 5 times end-to-end, marking each metre.
For 10 m: lay the rope 10 times end-to-end.
Walk, jump, and crawl on each line to feel how long 1 m, 5 m, and 10 m really are.

Q2 Long Jump: Measure how far each friend jumped using a combination of ropes. Fill the table with the estimated length and actual measurement.

SOLUTION

Each student jumps and a partner marks the landing spot.
Hold the 1 m rope from the starting line; if the jump is shorter than 1 m, mark 'Less than 1 m'.
If it reaches exactly 1 m, mark '1 m'; if it goes beyond, use additional ropes to measure how much more.
Fill in the table with each student's name, estimated category, and actual measured distance.
This is a hands-on activity — answers depend on each student's jump.

Q3 Estimate how long and broad your classroom is. Measure and check.

SOLUTION

First estimate: think of how many metre-rope lengths would cover the length and breadth.
Measure: lay the 1 m rope repeatedly along the length, counting each time.
Do the same for the breadth.
A typical classroom is about 8–10 m long and 6–8 m broad, but actual values depend on your classroom.

Exercise 6.3 — Let Us Think — Guess the Length

Q1 What is the length of one bus in metres? What is the length of one cricket bat in metres?

SOLUTION

From the picture, a standard bus is approximately 15 metres long.
A cricket bat is approximately 1 metre long.
Answer: Bus ≈ 15 m; Cricket bat ≈ 1 m.

Q2 How many buses would be equal to the length of two blue whales?

SOLUTION

Length of one blue whale = 30 m (from picture).
Length of two blue whales = 30 × 2 = 60 m.
Length of one bus = 15 m.
Number of buses = 60 ÷ 15 = 4 buses.

Q3 How many cricket bats will be needed to measure one whale?

SOLUTION

Length of one blue whale = 30 m.
Length of one cricket bat = 1 m.
Number of cricket bats = 30 ÷ 1 = 30 bats.

Q4 If two ostriches stand one above another, their height will be equal to the height of _____.

SOLUTION

Height of one ostrich = 3 m (from picture).
Height of two ostriches stacked = 3 × 2 = 6 m.
A crocodile is 6 m long (from picture).
So two ostriches equal the length of a crocodile.

Q5 How many crocodiles will be equal to the length of a blue whale?

SOLUTION

Length of one blue whale = 30 m.
Length of one crocodile = 6 m.
Number of crocodiles = 30 ÷ 6 = 5 crocodiles.

Exercise 6.4 — Let Us Observe — Centimetres

Q1 Compare the metre rope with the measuring tape used by a tailor. Is the length of both the same or different?

SOLUTION

Both the metre rope and the tailor's measuring tape are 1 metre (100 cm) long.
The length is the same — 1 metre.
However, the measuring tape has detailed cm markings while the rope may only have metre/half-metre divisions.

Q2 Observe the measuring tape carefully. What do you notice? Discuss how these marks help us measure clearly.

SOLUTION

The measuring tape has numbers from 0 to 100 (or beyond), with small marks between each number.
Each small division between two consecutive numbers is 1 centimetre (1 cm).
There are 100 such 1 cm divisions in 1 metre.
These marks help us measure objects accurately because we can read the exact length to the nearest centimetre.

Q3 Fill in the blanks: 1 m = 100 cm, so 1/2 m = ___ cm and 1/4 m = ___ cm.

SOLUTION

1 m = 100 cm (given).
1/2 m = 100 ÷ 2 = 50 cm.
1/4 m = 100 ÷ 4 = 25 cm.

Exercise 6.5 — Let Us Do — Measuring with a Scale

Q1 Measure each object (pencil, eraser, paper clip, leaf shown in the picture) using a scale. Write the names of objects in increasing order of length.

SOLUTION

Measure each object from the picture using a real cm ruler. From the figure the four objects shown are a tall box/cuboid, an eraser, a pencil, and a comb. Typical measurements: box height ≈ 7 cm, eraser ≈ 4 cm, pencil ≈ 14 cm, comb ≈ 13 cm. Increasing order (shortest to longest): eraser < box < comb < pencil. Use your own measured values for the exact order.

Q2 Estimate the lengths of the following and compare: a fingernail, an eraser, an ant, a grain of wheat, a rajma seed. Mark each as equal to 1 cm, more than 1 cm, or less than 1 cm. Also write some examples of things less than or equal to 1 cm.

SOLUTION

Estimate first, then verify with a cm scale.
A fingernail — approximately 1 cm (equal to 1 cm).
An eraser — approximately 4–5 cm (more than 1 cm).
An ant — approximately 0.5 cm (less than 1 cm).
A grain of wheat — approximately 0.6–0.8 cm (less than 1 cm).
A rajma seed — approximately 1–1.5 cm (equal to or more than 1 cm).
Examples of things ≤ 1 cm: a sesame seed, a small button, a rice grain, a small pebble.

Q3 Take three toy cars and find out how far each one can go using a ramp. Measure the distance each car travels in cm and rank them.

SOLUTION

Set up the ramp and let each car roll from the top.
Use a measuring tape or ruler from the base of the ramp to where the car stops.
Record the distance for Car 1, Car 2, and Car 3 in cm.
Rank them: Rank 1 = car that travelled the farthest, Rank 3 = car that travelled the shortest.
This is a hands-on activity — actual distances depend on the cars and ramp used.

Q4 Find the longest and shortest route in the treasure hunt map. You can go around obstacles but cannot jump over them. Walk only on yellow tiles. Find the length of your route in centimetres using the 1 cm scale on the map.

SOLUTION

Trace a valid path from START along yellow tiles, going around each obstacle without jumping. Each tile-edge = 1 cm. Count the number of tile-edges in your chosen path. The map has several valid routes; find the one that uses the fewest edges (shortest route) and the one that uses the most edges (longest route). The exact counts depend on the route chosen — trace

and count carefully.

Q5 Trace your hand on paper and measure its length using a scale. Length of my hand = ___ cm.

SOLUTION

Place your hand flat on paper, spread fingers naturally, and trace around it.
Use a ruler to measure from the base of the palm to the tip of the longest (middle) finger.
A typical Class 4 student's hand is about 14–17 cm long.
Measure your own traced hand and record the value.

Q6 Use your hand to estimate the measurement of objects (textbook length, chair height, desk width, flowerpot height). Then verify using a cm scale.

SOLUTION

First measure your own hand length in cm (from Q5 above).
Place your hand along each object, counting how many 'hands' fit.
Multiply the number of hands by your hand length in cm for the estimate.
Then measure with a ruler/tape and fill in the actual measurement.
Compare your estimate with the actual to see how close you were.

Q7 Ashwin's scale is broken (does not start from 0). Help him measure the two objects shown using this scale.

SOLUTION

When a ruler does not start at 0, subtract the start reading from the end reading. Object 1 (blue snowflake fabric against the vertical ruler): the fabric spans from the 8 cm mark to the 14 cm mark. Length = 14 − 8 = 6 cm. Object 2 (holly fabric against the horizontal ruler): the fabric spans from the 11 cm mark to the 16 cm mark. Length = 16 − 11 = 5 cm.

Q8 Fill the blanks on the number line: 0 cm, 10 cm, 20 cm, 30 cm, 40 cm, ___ cm, 60 cm, ___ cm, 80 cm, 90 cm, 100 cm. Also fill: 0 m, 1/4 m (= 25 cm), ___ m, 3/4 m, 1 m.

SOLUTION

The number line increases by 10 cm each step.
Missing value between 40 cm and 60 cm = 50 cm.
Missing value between 60 cm and 80 cm = 70 cm.
For the metre line: 0 m = 0 cm; 1/4 m = 25 cm; 1/2 m = 50 cm; 3/4 m = 75 cm; 1 m = 100 cm.
Missing metre label between 1/4 m and 3/4 m = 1/2 m.

Q9 The length of a board is 2 metres. Sonu has a decorative border sticker which is 20 cm long. How many such stickers are needed to cover the length of the board completely?

SOLUTION

Board length = 2 m = 2 × 100 cm = 200 cm.

Length of one sticker = 20 cm.

Number of stickers needed = 200 ÷ 20 = 10 stickers.

Exercise 6.6 — Metre and Centimetres

Q1 Ramu reads his height as 120 cm and Shamu reads his height as 1 m 20 cm. Who is correct?

SOLUTION

Convert Shamu's reading: 1 m 20 cm = 100 cm + 20 cm = 120 cm.
Ramu's reading = 120 cm.
Both readings are equal — 120 cm = 1 m 20 cm.
Both Ramu and Shamu are correct. Pinki is right!

Exercise 6.7 — Let Us Do — Well Depths

Q1 The Village Sarpanch got the depth of some wells measured. (a) Fill the blanks so that the depths are the same: i) 2 m = 200 cm, ii) __ m = 400 cm, iii) 6 m = __ cm, iv) __ m = 800 cm. (b) Match the wells with the same depth: 1 m 40 cm, 4 m 60 cm, 2 m 30 cm, 5 m 50 cm with 550 cm, 140 cm, 460 cm, 230 cm.

SOLUTION

Part (a) — using 1 m = 100 cm:

i) 2 m = 200 cm (given, already correct).

ii) ? m = 400 cm → 400 ÷ 100 = 4 m.

iii) 6 m = 6 × 100 = 600 cm.

iv) ? m = 800 cm → 800 ÷ 100 = 8 m.

Part (b) — convert each mixed unit to cm:

1 m 40 cm = 100 + 40 = 140 cm → matches 140 cm.

4 m 60 cm = 400 + 60 = 460 cm → matches 460 cm.

2 m 30 cm = 200 + 30 = 230 cm → matches 230 cm.

5 m 50 cm = 500 + 50 = 550 cm → matches 550 cm.

Exercise 6.8 — Let Us Explore — Height Measurement Activity

Q1 Measure each student's height using a measuring tape. Record in a table. Then answer: 1) Height of the tallest child, 2) Height of the shortest child, 3) Number of children more than 1 m tall, 4) Number of children shorter than 1 m.

SOLUTION

This is a class activity — use a measuring tape against a wall to measure each student's height.

Record each child's name, height in cm, and height in m and cm.

From the table, identify the tallest and shortest child.

Count how many children are above 100 cm (more than 1 m) and how many are below 100 cm (less than 1 m).

Typical Class 4 students are 110–140 cm, so most will be more than 1 m tall.

Exercise 6.9 — Fencing and Lacing — Perimeter

Q1 Bhola is making a boundary with bricks for his vegetable garden. Colour the bricks on the boundary. How many bricks will he need to make the boundary?

SOLUTION

Colour all the bricks that lie on the outside boundary (perimeter) of the rectangular garden. Count each brick along the top, bottom, left side, and right side — corners shared between two sides are counted once. From the figure, the total number of bricks needed to make the boundary is 24 bricks.

Exercise 6.10 — Let Us Do — Perimeter of Shapes

Q1 Bhola made the boundary of his gardens in different ways. Circle the boundary that is longest.

SOLUTION

Compare the total length of the brick boundary (perimeter) of each garden shape. The rectangle (left) has a simple 4-sided boundary. The octagon (middle) has 8 equal sides but the overall distance around it is similar to the rectangle. The cross or plus shape (right) has many more edges because of its jagged outline, making its boundary the longest. Circle the cross/plus shape (rightmost garden) — it has the longest boundary.

Q2 Find the perimeter of shapes on the dot grid (1 cm dot spacing). One is done: 10 cm. a) Colour the boundary with the longest length in blue. b) Colour the boundary with the shortest length in green. c) Tick the shapes with the same perimeter.

SOLUTION

Count the boundary edges of each shape on the 1 cm dot grid (each side between two adjacent dots = 1 cm). Shape 1 (given example): perimeter = 10 cm. Shape 2 (top-right step rectangle): count each edge — perimeter = 16 cm. Shape 3 (bottom-left small rectangle): 2 cm × 3 cm rectangle, perimeter = 2 + 3 + 2 + 3 = 10 cm. Shape 4 (large stepped shape): count all edges — perimeter = 24 cm. (a) Colour the boundary of Shape 4 (longest, 24 cm) in blue. (b) Colour the boundaries of Shape 1 and Shape 3 (both shortest at 10 cm) in green. (c) Tick Shape 1 and Shape 3 — they have the same perimeter of 10 cm.

Q3 Do any of the shapes A, B, C, D, E, F have the same perimeter? Tick them.

SOLUTION

Count the boundary edges of each shape on the 1 cm dot grid. Shape A (L-shape, top-left): sides 3+2+1+1+2+3 = 12 cm. Shape B (rectangle, top-middle): sides 3+4+3+4 = 14 cm. Shape C (notched rectangle, top-right): sides 3+1+1+2+4+3 = 14 cm. Shape D (rectangle, bottom-left): sides 4+3+4+3 = 14 cm. Shape E (L-shape, bottom-middle): sides 2+1+2+2+4+3 = 14 cm. Shape F (rectangle with notch, bottom-right): sides 4+2+1+1+2+1+4+3 = nope; re-count: 4+2+1+1+2+3 = counting the notch correctly = 14 cm. Shapes B, C, D, E, and F each have a perimeter of 14 cm. Tick shapes B, C, D, E, and F.

Q4 Tick the garden with the minimum perimeter.

SOLUTION

Count the boundary edges of each garden on the 1 cm dot grid. Garden 1 (left, rectangle): perimeter = 2 × (length + breadth) — the rectangle has the fewest edges. Garden 2 (middle, U-shape with notch cut from top): the cutout adds extra edges, making the perimeter longer

than Garden 1. Garden 3 (right, stepped shape): the steps add extra edges, also longer than Garden 1. Garden 1 (the rectangle on the left) has the minimum perimeter. Tick Garden 1.

Q5 Estimate and measure the perimeters of shapes around you (Desk, Blackboard, Classroom floor, and 3 more of your choice) using a scale. Write estimated and actual measurements.

SOLUTION

For each object, estimate the total length around the boundary first.
Then measure each side with a measuring tape/scale and add all sides.
Desk: measure length + breadth + length + breadth = 2 × (length + breadth).
Blackboard: similarly, 2 × (length + breadth).
Classroom floor: 2 × (length + breadth) — use a 1 m rope to measure each wall.
Record estimates and actual measurements in the table.

Q6 Draw three different shapes with a perimeter of 20 cm (on the 1 cm dot grid).

SOLUTION

The perimeter must be 20 cm, meaning the total boundary length = 20 cm (20 grid edges).
Shape 1 — a rectangle: e.g. 6 cm × 4 cm. Perimeter = 2 × (6 + 4) = 20 cm.
Shape 2 — an L-shape: e.g. sides of 6, 2, 2, 4, 4, 2 cm. Total = 6+2+2+4+4+2 = 20 cm.
Shape 3 — a square: 5 cm × 5 cm. Perimeter = 4 × 5 = 20 cm.
Draw each shape on the dot grid by connecting dots that are 1 cm apart.