

Perimeter of rectangles and simple shapes

CURRICULUM ALIGNMENT

SHA.SHP.3b

represent shapes with drawings and models, and calculate dimensions of shapes.

NUM.OPS.3

understand and apply flexibly the four operations; and the relationships between operations.

INTERACTIVES Shape Measurer · challenge, display

WHAT THIS LESSON TEACHES

The perimeter is the total distance all the way around the edge of a flat shape. You find it by adding the length of every side once.

→ A 6 cm by 3 cm rectangle has a perimeter of $6 + 3 + 6 + 3 = 18$ cm.

→ A 4 cm by 4 cm square has a perimeter of $4 + 4 + 4 + 4 = 16$ cm.

MODEL THIS ON THE BOARD

YARD RECTANGLE PERIMETER

- ① The plan shows a school-yard rectangle 5 cm long and 3 cm wide.
- ② Opposite sides match, so the four sides are **5 cm**, **3 cm**, **5 cm** and **3 cm**.
- ③ Write the addition: **$5 + 3 + 5 + 3$** .
- ④ Add step by step: $5 + 3 = 8$, $8 + 5 = 13$, $13 + 3 = 16$. The perimeter is 16 cm.

DISCUSSION STARTER

REFLECT Did knowing opposite sides are equal make finding the perimeter faster? How?

LESSON ARC

Put the part-labelled rectangle on the board — top 6 cm, one side 3 cm, two blanks — and hold out for why pupils are certain of the missing sides before any adding. Watch and Notice works four shapes live, pivoting on 'top matches bottom, one end matches the other', ending on a six-sided L-shape. Pupils draw and fully label a 5 cm by 3 cm rectangle in their copy, then take turns at the board through the Class Challenge bank.

TEACHING MOVES

1. **Getting Started.** Take three hands-up answers, not open call-outs, and push past 'the bottom is 6' to 'how are you so sure without measuring?' You want a pupil to name the matching opposite sides — that's the whole lesson in one sentence.
2. **Watch and Notice.** Work each of the four shapes live with the readouts on. On the 5 by 5, say the line 'a square is the special rectangle where all four sides match' out loud. On the L-shape, count the six sides together first, then touch each once as you add — the mis-count is the risk here, not the arithmetic.
3. **Try It Together.** Keep the perimeter hidden until the class has agreed an answer aloud — pupils work it out, then the pupil at the board types it in. For every rectangle, ask for the two matching opposite sides BEFORE anyone adds, and point at each of the four sides in turn so nobody adds just the two given numbers.

4. **Draw the Rectangle in Your Copy.** Walk the room glancing for four numbers on the rectangle, not two — the common slip is labelling only the sides drawn first. Nudge anyone with two lengths to fill in the matching opposite pair, then check the perimeter sentence is written underneath.
5. **Class Challenge.** Keep the board work brisk — pupils take turns, check each answer, class confirms, move on. Before the L-shape, sketch and label it on the board with all six sides (5, 2, 3, 4, 2, 2) so pupils have a real figure to trace; count the six aloud together, then add one at a time.
6. **What Did We Notice?.** Listen for pupils naming the two pairs of equal sides as the reason. Revoice a strong answer: 'so two numbers really tell you all four.' Then head off over-reach — ask whether this shortcut worked for the L-shape, and draw out that it doesn't, because those sides don't all match.

COMMON MISCONCEPTIONS

⚠ Pupils add only the two numbers they were given — for the 6 by 3 rectangle they say $6 + 3 = 9$ cm and stop, forgetting the matching pair.

Point at each of the four sides in turn as the class adds, saying the hidden numbers aloud as you reach the blank sides. Better still, have a pupil trace a finger all the way around the edge — every side gets touched once, so the two forgotten sides announce themselves.

⚠ On the L-shape, pupils treat it like a rectangle and add only four sides, or count one corner twice. Sketch and label the L-shape on the board and count the six sides aloud as a class before adding anything. Then add them one at a time, crossing off or dotting each side as it goes in, so none is missed or double-counted.

⚠ Pupils believe the 'two numbers tell you all four' shortcut works for any shape, and try to apply it to the L-shape.

In the maths-talk, ask directly: did the L-shape only need two numbers? Draw out that the shortcut holds because a rectangle's opposite sides match — the L-shape has sides that don't pair up, so every one had to be checked.

DIFFERENTIATION

EMERGING

- Give the pupil a cut-out paper rectangle to write on — they fold it so top lands on bottom and see the two pairs match before working with abstract labels.
- Stay with rectangles only for these pupils; leave the L-shape as watch-and-listen while the class tackles it, then revisit with a drawn-and-labelled figure.

DEVELOPING

- After the copybook rectangle, ask: 'if the perimeter is 16 cm and one side is 5 cm, what are the other three sides?' — working the rule backwards.
- On squared paper, ask them to draw a different rectangle with the same perimeter as the 6 by 3 one, and check it round the edge.

PROFICIENT

- Pose: 'draw two different-looking rectangles that both have a perimeter of 20 cm — how many can you find?' Pupils record each in their copy with its perimeter sentence.
- While the class finishes the Class Challenge, ask a fast finisher to invent an L-shape of their own on squared paper, label all six sides, and be ready to explain to a younger pupil how they made sure they counted every side once.

✂ **Cross-curricular:** Tie to Geography — pupils find the perimeter of a rectangular field or the school yard by pacing two sides and using the matching-pair rule for the other two.

ANSWER KEY

c) $6 + 3 + 6 + 3 = 18$ cm

Q1: 28 cm

Q2: 16 cm

Q3: 16 cm

Q4: 18 cm

Q5: 18 cm

Q6: 13 cm

Spot: Emma only added one length and one width. A rectangle has **two** lengths and **two** widths: $6 + 3 + 6 + 3 = 18$ cm.

S1: 77 m

Investigation: Same perimeter, different area — open-ended; scan pupils' working for valid solution paths rather than a single answer.