

## Perimeter – adding sides up

### CURRICULUM ALIGNMENT

MEA.MSR.4a

determine and calculate units of measurement in fractional and/or decimal form to solve practical problems.

INTERACTIVES [Shape Measurer · 2d, explore](#)

### WHAT THIS LESSON TEACHES

**Perimeter** is the total distance all the way around the outside of a shape. Add the length of every side.

→ Rectangle 6 cm by 4 cm:  $6 + 4 + 6 + 4 = 20$  cm.

→ Square with side 5 m:  $5 \times 4 = 20$  m.

### LESSON ARC

Open with a sketched pentagon paddock on the board, sides 3, 5, 4, 6, 7 m, and ask how much fencing it needs. Walk the boundary of three rectangles on the shape-measurer interactive, adding each side aloud, then trace round a pentagon and an L-shape. Three pupils measure the Maths book, an A4 page and a copybook with the tape; the class predicts each perimeter before the readout confirms. Pupils sketch and sum in copybook, then the Class Challenge pivots on a missing-side problem before the maths-talk asks what doubling every side does to the perimeter.

### TEACHING MOVES

- Getting Started.** Sketch the irregular pentagon as the class settles — sides 3, 5, 4, 6, 7 m labelled. Take three hands-up answers only, no open call-outs. Accept any reasoning and don't grade — just acknowledge 'add them up' as the move we'll formalise next.
- Watch and Notice.** Trace each rectangle's edge with your finger and say the running total aloud: 'six, ten, sixteen, twenty.' Pause hard on the  $6 \times 4$  and the  $5 \times 5$  sharing a perimeter of 20 m — don't move on until the class can tell you that walking the edge and adding every side gives the perimeter, no matter the shape.
- Try It Together.** Send three pupils up in turn with the tape — one measures the Maths book, one the A4 page, one the copybook. After each pupil reads the dimensions aloud, freeze before tapping the readout and ask 'what's the perimeter?' Take a couple of answers, then reveal. Watch for pupils calling each side once instead of twice — every side on a rectangle has a partner.
- Sketch and Sum in Your Copy.** Walk the row glancing for two things: every side labelled, and every side appearing in the sum. If a sketch shows only three sides, point at the missing one without saying anything else and move on. If a pupil's still on the first sketch when time's up, let them finish that one rather than rushing the rest.
- Class Challenge.** Keep board work brisk — pupils come up one per problem, class confirms each answer before the next. Slow right down on the missing-side problem; that's the pivot. Say it explicitly: 'we usually add sides to find the perimeter, but if we already know the perimeter and one side is missing, we subtract.' Direct fast finishers to the extension bank on a device while you circulate.
- What Did We Notice?.** Give five seconds of quiet think-time before hands go up. Listen for pupils predicting the new perimeter is four times the old — that's the area-confusion trap. Revoice the correct version: 'every side doubled means every part of the addition doubled, so the total doubles too.' Don't write anything down; this is talk-only.

## COMMON MISCONCEPTIONS

⚠ Pupils add the long side once and the short side once on a rectangle: '6 m by 4 m, so the perimeter is 10 m.' They've treated the two labels as the whole shape.

Trace the rectangle's outline with your finger slowly on the IWB, calling each of the four sides aloud as you pass it. 'Long, short, long again, short again — every side has a partner.' Have the pupil say the four-part sum with you before they try the next one.

⚠ On the L-shape, pupils skip the side that turns inward — they trace the outside corners and miss the indent. The perimeter comes out short by two sides.

Put your finger on the L-shape and say 'one side per turn — even when the corner turns the wrong way.' Re-trace the outline slowly, counting all six segments aloud. The rule is the boundary; the boundary doesn't skip anything.

⚠ On the missing-side problem, pupils add the perimeter to the three known sides ( $24 + 18 = 42$ ) instead of subtracting.

Rebuild the problem on the board: write ' $? + 18 = 24$ ' below the sketch. Ask 'what plus eighteen gives twenty-four?' Once a pupil says six, draw the arrow from addition to subtraction explicitly:  $24 - 18 = 6$ . The subtraction reverses the addition rule.

## DIFFERENTIATION

### EMERGING

- Stay with rectangles only — when the class moves to the pentagon and L-shape on the board, give these pupils a second rectangle to sketch in copybook (e.g.  $5\text{ m} \times 3\text{ m}$ ) and label all four sides.
- Pre-draw the L-shape outline in their copy with all six sides already labelled, so they only need to add — they're learning the 'one side per turn' rule, not the sketching.

### DEVELOPING

- After the L-shape, ask: can you draw a different L-shape with the same perimeter of 24 m? Sketch it in copybook with all sides labelled.
- Pose a missing-side variant: a pentagon has perimeter 30 m and four sides totalling 22 m — what's the fifth side?

### PROFICIENT

- Direct fast finishers to the extension bank on their device while you circulate the room.
- Pose: 'Two rectangles have the same perimeter of 20 m but different dimensions. Find three possible pairs.' This previews the perimeter-vs-area distinction coming next lesson.

• **Cross-curricular:** Tie to Geography — pupils sketch the outline of the school yard, measure each straight edge in metres, and find the perimeter for an imaginary fence.

## ANSWER KEY

a)  $8 \times 5$  perimeter = **26 cm**.

**Q1:** 84 m

b)  $12 \times 4$  perimeter = **32 cm**.

**Q2:** 156 m

c)  $6 \times 6$  perimeter = **24 cm**.

**Q3:** 25.2 m

d)  $15 \times 3$  perimeter = **36 cm**.

**Q4:** 25.6 m

## EXTENSION SHEET · STRETCH ANSWERS

**S1:** 21.2 m

**S3:** 112 m

**S2:** 106 m