

Area, perimeter and volume review

CURRICULUM ALIGNMENT

MEA.MSR.3a

compare, estimate and measure length, weight, capacity, area and volume using appropriate instruments and record and communicate appropriately.

SHA.SHP.3b

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

INTERACTIVES

Shape Measurer · display

Volume Builder · display

Word Problem · challenge

WHAT THIS LESSON TEACHES

Perimeter is the distance all the way around a shape by adding every side once. Area is the space inside counted in squares. Volume is how many cubes fill a solid. Decide each time if the question wants around, inside or cubes.

→ A 5 cm by 3 cm rectangle has a perimeter of $5 + 3 + 5 + 3 = 16$ cm.

→ A 4 by 3 rectangle covers 12 squares so its area is 12 square units.

MODEL THIS ON THE BOARD

EDGING A 5 BY 3 BUILDING SIGN

- 1 The sign is a rectangle 5 cm long and 3 cm wide.
- 2 Perimeter means add every side once: $5 + 3 + 5 + 3$.
- 3 The edging tape needed is 16 cm all the way round.

DISCUSSION STARTER

REFLECT

Which feels clearest now — area, perimeter or volume? Which still needs practice?

LESSON ARC

Open on the IWB picture — labelled rectangle beside a cube stack — and take three hands-up answers for 'around', 'inside' and 'cubes' before naming any method. In Watch and Notice, work each shape live. The key moment is the 4×4 square, where perimeter and area both give 16. Pupils draw one 4 cm by 2 cm rectangle in copy and label perimeter and area separately. The Class Challenge is four building jobs where pupils name the method first, then compute.

TEACHING MOVES

1. **Getting Started.** Five seconds of quiet think-time, then take three hands. Push pupils to feel the three different questions — 'around', 'inside', 'cubes' — about the same picture. Don't resolve which method wins yet; that's for Watch and Notice.
2. **Watch and Notice.** Work the 5×3 rectangle twice — add four sides for perimeter (16 cm), then count rows and columns for area (15 squares) — pointing at each number as it lands so two different numbers reads as two ideas, not a mistake. Then hit the trap: on the 4×4 square both give 16, so ask 'is 16 the perimeter or the area?' and let the class untangle it. For the cube stack, count bottom 4, top 4, and stress you count the 8 including hidden cubes.
3. **Try It Together.** Drag the corners to build each shape, starting from the 6×2 rectangle already set, and switch to 3D for the stack. Make the pupil at the board name the method — 'around', 'inside' or 'cubes' — before working it. Watch for adding sides when the question wants squares, or counting squares when it wants distance around.

4. **Draw and Label in Your Copy.** Pupils draw one 4 cm by 2 cm rectangle and write perimeter and area on separate labelled lines. Walk the room glancing for anyone whose perimeter and area numbers are swapped — this is practice, not marking.
5. **Class Challenge.** Before each job, get the class to call the method: tape is perimeter, slabs and 'more space' are area, packing cubes is volume. Keep the board brisk — pupils take turns, check each answer, class confirms, move on. Let them predict the method before they compute.
6. **What Did We Notice?** Listen for signal words — around/edging/border for perimeter, cover/slabs for area, fill/packed/layers for volume. Revoice a strong answer: 'so the words in the question tell you which one to count.' Remind them the square's matching numbers were coincidence, not a rule.

COMMON MISCONCEPTIONS

⚠ On the 4×4 square a pupil says '16 is the answer' as if perimeter and area are the same thing — they've taken the matching numbers as a rule.

Freeze on that square. Ask 'is 16 the distance around or the squares inside?' and trace the border with your finger for perimeter, then sweep the inside for area. Name it out loud: same number here is a coincidence, not a rule.

⚠ For the 3 m by 2 m sign a pupil multiplies to get 6 m of edging tape instead of adding the four sides for 10 m.

Trace the four edges of the sign on the board one at a time, counting $3 + 2 + 3 + 2$ aloud. 'Tape goes all the way round — we add every edge, we don't multiply.' Multiplying is what you'd do for slabs, not tape.

⚠ Counting the cube stack, a pupil says 4 — they've counted only the visible front cubes and forgotten the hidden ones behind or below.

On the 3D stack, count the bottom layer of 4, then lift focus to the top layer of 4, saying 'these are here even though we can't see them all — 4 and 4 is 8.' If cubes are to hand, rebuild the two layers physically so the hidden ones become real.

DIFFERENTIATION

EMERGING

- Keep this pupil on 'around versus inside' with the rectangle only; hold the cube stack until they're secure with two ideas rather than three.
- Give them the shape on squared paper with the border already highlighted, so they count squares inside without having to find the edge first.

DEVELOPING

- After the copybook rectangle, ask them to find a different rectangle with the same perimeter but a different area, and check it on squared paper.
- During the mats problem, ask them to justify aloud why more squares means more space covered before the class confirms.

PROFICIENT

- Pose: can you draw a shape where the area is bigger than the perimeter, and another where the perimeter is bigger? Explain what makes the difference — pair this with a copybook moment.
- Pull them ahead into the Student Activity Book page while the class finishes the Class Challenge board work.

✚ **Cross-curricular:** Tie to Geography — pupils find the perimeter of the school yard or a county on a grid map and say why edging (perimeter) differs from covering it (area).

ANSWER KEY

a) 32 cm

b) 8 cm²

Q1: 12

Q2: 8

Q3: 16 units

a) Always : That is exactly how perimeter is found.

b) Never : The space inside a flat shape is area; volume fills a solid with cubes.

c) Always : Edging goes all the way around the edge.

d) Always : Multiplying the two sides counts the squares inside.

EXTENSION SHEET · STRETCH ANSWERS

S1: No. The card needs 24 cm of ribbon, so she is 4 cm short.

S2: 25 mats

S3: 4 cubes

S4: Fence: around. Tiles: inside. Blocks: cubes.

S5: Perimeter 18 cm and area 18 squares. The number is the same, but one is the distance around and one is the space inside.