Lesson 73 SHAPE & SPACE

Naming and sorting 2D and 3D shapes

CURRICULUM ALIGNMENT

SHA.SHP.4a construct 3-D and 2-D models or structures given defined measurements and/or specific conditions.

INTERACTIVES 2D Shape Inspector · display | 3D Shape Inspector · display, explore | Drag Sort · challenge

LESSON ARC

Open with three flat shapes and three solids on the board and ask what could sort them all. Reveal one 2D property at a time — sides, then corners, then fold-lines — then count faces, edges and vertices on the solids, landing the cylinder as the rule-breaker. Pupils sketch a square and a cube side by side in their copy with full counts. The Class Challenge sorts a mixed set and hunts the twice-as-many-edges-as-faces solid; Student Activity Book follows.

TEACHING MOVES

1. **Getting Started.** Take three hands-up answers, not open call-outs — you want 'by sides', 'by corners' and 'flat versus solid' on the table. If you've a cereal box, a tin and a triangular packet, hold them up beside the board, but the on-screen shapes carry the beat.
2. **Watch and Notice.** Reveal one property at a time. On the square, number the four sides, dot the corners, then make the class predict the four fold-lines before you draw them. On the cube, tap and say 'six faces, twelve edges, eight vertices', then pause: 'twelve edges is exactly twice six faces' — that comparison feeds the stretch task. Save the cylinder for last as the lock-in contrast: the curved part is a surface, not a face, and there are no corners at all.
3. **Try It Together.** Run shape-inspector-2d in explore mode — a pupil reveals each property and the class predicts the count first, out loud, before it shows. Switch to shape-inspector-3d and have a pupil rotate each solid to count. Watch for anyone counting the cylinder's curved surface as a flat face — that's the error to catch here.
4. **Sketch the Counts in Your Copy.** Pupils sketch a square and a cube side by side with full counts — sides/vertices/parallel pairs/symmetry lines for the square, faces/edges/vertices for the cube. Walk the room glancing the labels and the side-by-side layout; no marking.
5. **Class Challenge.** Run three challenges live, brisk, pupils checking each answer before the class confirms. On the side-count sort, point out the cylinder has its own 'curved surface' group — revoice that it bends the rules. For the twice-as-many-edges-as-faces hunt, slow down and recall the cube comparison: count edges, count faces, check for double. Cube and cuboid fit; prism and cylinder don't.
6. **What Did We Notice?.** Ask which property separates a square, rhombus and trapezium — they all have four sides. Listen for 'lines of symmetry' or 'parallel sides' and revoice: counting sides alone doesn't name the shape, we need a second property. On the second question, draw out that a cylinder and sphere have no vertices, so vertex count alone tells you little.

COMMON MISCONCEPTIONS

⚠ Pupils count the cylinder's curved surface as a flat face and report 'three faces' as if it were a box.
Rotate the cylinder on the shape-inspector-3d and run a finger along the curve — it doesn't lie flat like the two circles. Name it a surface, not a face, and contrast straight against the cube's six flat faces so the room sees why the cylinder breaks the pattern.

⚠ Pupils say a square, a rhombus and a trapezium are 'the same shape because they all have four sides'.
On the shape-inspector-2d, draw the fold-lines for each: the square has four, the rhombus two, the trapezium often none. Make the point out loud — side-count alone doesn't name a shape, the symmetry lines and parallel sides tell them apart.

⚠ Pupils force a cylinder or sphere into a vertex group, often guessing 'one' or 'two' vertices.
Ask them to point to a single corner on the screen shape — they can't. A cylinder and sphere have zero vertices, so they sit in the zero group. Revoice that 'no vertices' is itself a sorting property, not a missing answer.

DIFFERENTIATION

EMERGING

- Stay on 2D only for these pupils during Try It Together — count sides and corners on the shape-inspector-2d before symmetry lines are added.
- In the copybook moment, ask only for the square's sides and vertices, sketched with the corners already dotted, so the count is a tally not a from-scratch labelling job.

DEVELOPING

- After the cube, ask: does a cuboid have the same counts as a cube? Have them predict before rotating it on the inspector.
- Pose the missing-property puzzle: 'I have four sides and exactly two lines of symmetry — which shape am I?' (a rectangle or rhombus) using the on-screen shapes.

PROFICIENT

- Route fast finishers to the extension challenges — the banked parallel-sides task and the extra-solids sort — on a device while you circulate.
- Ask: which solids have edges exactly double their faces, and can you say why the cylinder and prism don't? Have them justify the cube–cuboid pattern in their copy without being told the rule.

↗ **Cross-curricular:** Tie to Geography — pupils name the 3D solids in everyday packaging (a tin, a Toblerone-style triangular packet, a cereal box) and sort them by faces.

ANSWER KEY

a) Octagon (8 sides).
b) Triangle = 3 sides.
c) Pentagon = 5 sides.
d) Hexagon = 6 sides.

Q1: an isosceles triangle
Q2: a square-based pyramid
Q3: a regular hexagon
Q4: a square-based pyramid

EXTENSION SHEET · STRETCH ANSWERS

S1: a cone
S2: a square-based pyramid
S3: an isosceles trapezium
S4: a regular hexagon
S5: a tetrahedron