

Shape and angle investigation and review

CURRICULUM ALIGNMENT

SHA.SHP.3a

investigate and analyse the properties of 3-D and 2-D shapes and identify classes of shapes based on these properties.

SHA.SAL.3b

compare and classify angles, recognising them as a property of a shape and as a description of a turn.

INTERACTIVES **Drag Sort** · challenge, display

WHAT THIS LESSON TEACHES

To name or sort a shape, ask one property question about it, such as 'how many sides?', 'how many faces?' or 'is this corner a right angle?'. The answer tells you which group it belongs in.

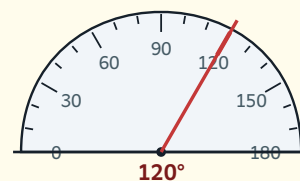
→ A cube has 6 faces; a square-based pyramid has 5 faces, so 'how many faces?' tells them apart.

→ A triangle has 3 sides; a square, rhombus and trapezium each have 4 sides.

MODEL THIS ON THE BOARD

SORTING ONE ANGLE: RIGHT OR NOT?

- 1 The protractor shows this corner measures exactly **120** degrees.
- 2 A right angle is exactly **90** degrees.
- 3 **120** is bigger than **90**, so this is not a right angle (it is obtuse).



DISCUSSION STARTER

REFLECT When you sorted the mixed shapes, which property question helped you most?

LESSON ARC

Open with the jumbled mixed-tray interactive — flat cards, solids and angle cards together — and take three property questions from hands-up. Model two live sorts on the board: flat shapes by side count, then the shift from sides to faces/edges/vertices for solids. Pupils write one true property sentence each for a flat shape, a solid and an angle in their copy. The Class Challenge runs four sorting rounds, ending with a rule-free mixed set where pupils choose the question first.

TEACHING MOVES

1. **Getting Started.** Take three hands-up answers only — not open call-outs. Listen for a maths property (how many sides? does it have a right angle?) and if a pupil sorts by colour or size, steer with 'that tells us how it looks — what tells us what it is?'
2. **Watch and Notice.** Work both sorts live — ask the property question aloud before each card lands and let the class predict the group. On the second sort, count the cube's faces, edges and vertices out loud so the shift from counting sides to counting solid properties is seen, not just said. Close by naming the pattern: one good question leads straight to the name.
3. **Try It Together.** Keep a folded-paper right-angle checker in hand as the reference. Rotate four pupils to the board and hold out for a reason each time — 'it fits the square corner exactly' — not just a group

name. The straight-edge (ruler) card is the trap: draw eyes to it as a straight angle, bigger than a right angle, so it fails the square-corner test.

4. **Write One True Thing in Your Copy.** Walk the room glancing for a real property — a count or an angle name, not a colour or size. If you see 'a square is blue', point at the folded checker and ask for a maths fact instead. This is copybook practice, not marking.
5. **Class Challenge.** Brisk practice — pupils take turns, hit Check, class confirms, move on. Read the triangle-family buckets aloud at Round 2 (all 3 sides equal / 2 equal / none equal) since it's the first meeting of those names, and at Round 4 pause before anyone drags to ask 'what should we look at first?'
6. **What Did We Notice?.** Listen for pupils choosing a question that fits every card — 'is it flat or solid?' splits the whole tray, while 'how many sides?' only works on the flat ones. Revoice a strong answer: 'so the best question is the one that works on every card in the set.'

COMMON MISCONCEPTIONS

⚠ A pupil holds the ruler's straight edge against the square-corner test and says 'yes, that's a right angle' — they read a flat straight angle as a corner.

Fold your paper right-angle checker and lay it along the straight edge — two of them fit, not one. 'A right angle is one square corner; this is two of them in a line — a straight angle.' Rebuild it on the board so the class sees it fail the test.

⚠ When the set turns solid, pupils keep counting sides — 'a cube has 4 sides' — instead of switching to faces, edges and vertices.

Put a solid from the shape tray in a pupil's hands and count faces together aloud (6), then edges, then vertices. 'On a flat card we count sides; on a solid we count faces, edges and corners.' Rerun the cube's drop on the board so the property shift is visible.

⚠ In the triangle round pupils name families by look — 'that one's pointy, so it's isosceles' — rather than by counting equal sides.

Read the bucket labels aloud again (all 3 equal / 2 equal / none equal) and have the pupil count and compare the sides before choosing. The name follows the count, not the look.

DIFFERENTIATION

EMERGING

- Give these pupils the flat-shape-by-sides round only, and let them count sides on a shape card in hand before deciding on the board.
- In the copybook moment, offer a sentence stem — 'a ____ has ____ sides' — so they supply the count, not the whole structure.

DEVELOPING

- After the angle round, ask them to find a card that would fit two different sorting questions and name both.
- Pose: 'sort these four triangles a second way — not by family. What other question works?'

PROFICIENT

- During the Round 4 mixed set, narrate a harder variant to them: 'find the one question that would leave exactly two cards in every group — is it possible?' and have them justify aloud.
- Ask them to invent a shape card that would break a classmate's chosen sorting rule, and explain why it slips through.

✂ **Cross-curricular:** Tie to Geography — pupils find right angles and other angles in the road signs and building corners around the school on a quick map walk.

ANSWER KEY

Scaffold: visual check on the page

Q1: 3

Q2: 6

Q3: 5 faces, fewer

a) Always : Any closed shape with exactly 3 straight sides is a triangle.

b) Sometimes : A square has right angles but a rhombus need not, so it depends on the shape.

c) Always : Every cube has exactly 6 square faces.

d) Never : A pentagon has 5 sides and a square has 4, so they are never equal.

EXTENSION SHEET · STRETCH ANSWERS

S1: radius, 5 cm

S2: a regular hexagon

S3: cone

S4: a square-based pyramid

S5: a cuboid