

Angles in shapes

CURRICULUM ALIGNMENT

SHA.SAL.3b

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

SHA.SHP.3a

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

INTERACTIVES 2D Shape Inspector · display, explore

WHAT THIS LESSON TEACHES

Every corner of a shape is an angle: it shows how much you turn from one side to the next.

→ A square has four corners, so it has four angles.

→ A pointy corner of a triangle is smaller than a right angle.

MODEL THIS ON THE BOARD

MARKING ANGLES ON A SQUARE BLOCK

- 1 Draw one square like a building block on the board.
- 2 At each corner draw a tiny square inside to show a right angle.
- 3 Check all 4 corners get the same right-angle mark.
- 4 A square therefore has 4 right angles.

DISCUSSION STARTER

REFLECT How do you decide if an angle is smaller or bigger than a right angle?

LESSON ARC

Open with a square, triangle and hexagon on the shape-inspector-2d interactive and ask which has square-corner angles. Reveal each shape's corners one at a time, adding a rectangle to compare with the square. The class then predicts every corner with a thumbs signal before each reveal. Pupils fold a paper right-angle tester and test real shape cards — square, triangle, obtuse triangle, rectangle — sorting corners as fits-exactly, too small, or too big.

TEACHING MOVES

1. **Getting Started.** Show the three shapes and give five seconds of quiet think-time before taking three hands-up answers only — no call-outs. Hold your nerve: don't confirm which shape has right angles, that reveal belongs to the next step.
2. **Watch and Notice.** Reveal corners one at a time on the interactive. On the rectangle, ask 'what's the same as the square?' to surface that both have four square corners. Say 'every corner is an angle' at least twice across the four shapes — it's the line pupils need to carry into the tester work.
3. **Try It Together.** Before each reveal, the whole class commits with thumbs: up for a square corner, sideways for sharper, down for wider. Then rotate a different pupil to the board to reveal and count while the class checks its prediction. Revoice a strong answer: 'so a square's corners are all square corners, but a hexagon's are wider.'

4. **Mark the Corners in Your Copy.** Pupils draw a square and mark all four corners with the little right-angle square, then draw a triangle and mark its sharpest corner. Walk the room glancing for four square symbols on the square and one clear mark on the triangle — glance only, don't mark.
5. **Class Challenge.** Fold the tester with the class first — in half, then half again — and check the new corner slots into the very point of each shape. Run the cards in rising order (square, sharp triangle, obtuse triangle, rectangle) and keep the pass-on brisk; the class confirms each reading aloud at the end. Check your set has a genuine obtuse triangle before the bell.
6. **What Did We Notice?.** Listen for 'the square's corners fill the tester but the triangle's are too sharp to fill it.' Head off 'a bigger shape has bigger angles' straight away — grow a shape on the interactive and show the corner is unchanged.

COMMON MISCONCEPTIONS

⚠ 'The hexagon is bigger, so its angles are bigger than the square's' — pupils link angle size to shape size.

On the interactive, scale a square up large and slot the paper tester into a corner — it still fits exactly. The corner didn't change; only the sides got longer. Say 'the size of the shape doesn't change the corner.'

⚠ Pupils lay the paper tester loosely against a corner instead of into the point, so a right angle reads as 'too big'.

Stop the pass-on and model it: push the folded corner right into the very point of the shape, both fold-edges flush along both sides. Then let the same pupil re-test and re-call the reading.

DIFFERENTIATION

EMERGING

- Stay on square and rectangle corners only in the copybook and challenge — both are all right angles, so the tester always fits and pupils build confidence before sharper corners.
- Pre-fold a tester with these pupils at the teacher table so the folding step doesn't swallow the testing step.

DEVELOPING

- During the Class Challenge, hand them the obtuse triangle and ask them to find and mark both the corner smaller than the tester and the one bigger than it.
- Ask: does every four-corner shape have four right angles? Give them a card that says no (e.g. a leaning parallelogram) to test.

PROFICIENT

- Teacher-narrated stretch at the board: 'if you add up a square's four right angles as turns, how much turning is that all the way round?' Let them reason with quarter-turns before anyone names 360° .
- Pull them ahead onto the Student Activity Book page and ask them to sort a mixed set of corners into square / smaller / bigger without the tester, then check with it.

✂ **Cross-curricular:** Tie to Geography — pupils hunt for right angles in the classroom map or building plan: door frames, window corners, wall junctions.

ANSWER KEY

Scaffold: visual check on the page

Q1: 4

Q2: 3

Q3: 4

Q4: 6

Q5: No

a) **Always** : Every corner of a square is a right angle.

b) **Always** : Every triangle has exactly three corners and so three angles.

c) **Sometimes** : Some triangles have one right angle but many have none.

d) **Sometimes** : True for the corners of a square; false for the corners of a triangle with sharp points.

EXTENSION SHEET · STRETCH ANSWERS

Investigation: Right-angle detective — open-ended;
scan pupils' working for valid solution paths rather
than a single answer.