

Angles inside 2D 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.

WHAT THIS LESSON TEACHES

The corner of a flat shape is an angle, showing how much the two sides turn away from each other. A right angle is a square corner like a copybook corner; an acute angle is smaller and sharper; an obtuse angle is wider than a square corner.

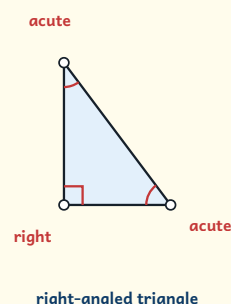
→ Every corner of a rectangle is a right angle.

→ Each corner of an equilateral triangle is acute, and the wide point of an arrowhead is obtuse.

MODEL THIS ON THE BOARD

NAMING CORNERS OF A TRIANGLE

- 1 The small square drawn in the **bottom-left** corner is the mark for a **right** angle, like the corner of a copybook.
- 2 Compare the other two corners with it: each one opens **less** than that square corner, so both are **acute**.
- 3 This triangle has **1** right angle and **2** acute angles.



DISCUSSION STARTER

REFLECT

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

LESSON ARC

Put three labelled shapes on the IWB — rectangle, right-angled triangle, arrowhead — and steer eyes to corners, not sides. Demonstrate from the front with a folded paper right-angle checker: the same question at every corner, 'does the square corner fit exactly?' Pupils then test their own paper shapes through the same five in order. They label a square and triangle in their copybooks, then work a shape-card testing round before the activity-book page.

TEACHING MOVES

1. **Getting Started.** Take three hands-up answers per question, not open call-outs, and hold a book corner against the rectangle so pupils feel 'square corner' before naming anything. Point the class at the arrowhead's outward point only — do not let them fixate on the inward notch.
2. **Watch and Notice.** This is a real front-of-class demo with the folded checker, not an interactive. Say the identical line at every corner — 'does the square corner fit exactly?' — and let the class call acute/right/obtuse before you confirm. On the arrowhead, test an outward point only; if a pupil asks about the notch, say we only test corners that point outwards today.

3. **Try It Together.** Call each of the five shapes in turn so the class stays together; pupils predict each corner aloud before pushing the checker in. Circulate for two slips: the checker pushed in crooked (a right angle then reads acute), and 'right' called on a tidy-looking corner that was never tested. Revoice: 'so a shape can have some right corners and some acute corners at once.'
4. **Label the Corners in Your Copy.** Glance at the corner labels as you walk — not marking. Watch for pupils using the copybook corner as their checker rather than eyeballing; nudge the guessers to actually test.
5. **Class Challenge.** Brisk practice round — pupils test their shape cards near-continuously, then confirm findings aloud at the end. On the count-the-right-angles task, a pupil who says 'four' should point the checker at each corner in turn, not just look. Revoice: 'you tested it, you didn't just look at it.'
6. **What Did We Notice?.** Don't settle the two-right-angles-in-a-triangle question by authority — hand them a triangle card and the checker. Listen for the reasoning that two square corners leave nothing to close the third side, and revoice: 'so if you use up a right angle at two corners, there's nothing left to make the third.'

COMMON MISCONCEPTIONS

⚠ A pupil pushes the checker in crooked and reports a genuine right angle as acute — 'there's a gap, so it's sharper.'

Stop and reseal the checker with them: line one folded edge flush along one side of the corner first, then swing the other edge in. The 'gap' vanishes. Show that a true acute corner leaves a gap even when the checker is perfectly aligned.

⚠ A pupil names a corner 'right' just because it looks neat and square, without testing it at all.

Catch it on the copybook page or the card round: 'you looked — now check it with your copybook corner.' Make testing, not appearance, the rule for a name. Revoice the pupils who test before they name.

⚠ A pupil tries to test the arrowhead's inward notch and gets a confusing reading, then decides the shape is 'broken'.

Redirect to the two outward points. Explain simply that the notch folds back into the shape so the checker can't sit in it — today we only name the corners that point outwards.

DIFFERENTIATION

EMERGING

- Stay with the square and rectangle first — corners that all fit exactly — so pupils get the 'fits' feeling before meeting acute and obtuse.
- Pre-crease the folded checker for them and mark the two folded edges with a pencil line so they know which edges to align in the corner.

DEVELOPING

- After the five shapes, hand them a pentagon or hexagon card and ask them to name every corner and say which kind appears most.
- Ask: can you find a shape card with exactly two right angles? Test to prove it, don't just point.

PROFICIENT

- During the Class Challenge, narrate a harder variant: 'find a four-sided shape with two acute and two obtuse corners — sketch it in your copy and prove each corner with the checker.'
- Pull them ahead into the Student Activity Book page while the class finishes the card round.

✂ **Cross-curricular:** Tie to Geography — pupils test the corners on a map of a county or the corners of the school building's floor plan and name which are right angles.

ANSWER KEY

Scaffold: visual check on the page

Q1: 4

a) **Always** : Lesson states a right angle is exactly a quarter turn.

b) **Always** : Acute angles open less than a square corner.

c) **Sometimes** : Only when opened a tiny bit; wider openings can be right or obtuse.

d) **Never** : Obtuse angles open more than a right angle.

EXTENSION SHEET · STRETCH ANSWERS

S1: a regular hexagon

S2: a rectangle

S3: a scalene triangle

S4: 71° is acute

S5: an equilateral triangle