

Triangles and quadrilaterals

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.

INTERACTIVES 2D Shape Inspector · display, explore

WHAT THIS LESSON TEACHES

Any closed shape with three straight sides is a triangle. Any closed shape with four straight sides is a quadrilateral.

→ A tall thin shape with three sides is a triangle.

→ A wide flat shape with four sides is a quadrilateral.

MODEL THIS ON THE BOARD

COUNT THE SIDES TO NAME THE SHAPE

- 1 Look at the shape and count each straight side.
- 2 If there are exactly three sides, it is a triangle.
- 3 If there are exactly four sides, it is a quadrilateral.

DISCUSSION STARTER

REFLECT

What stays the same about every triangle, even when they look very different?

LESSON ARC

Open with three differently stretched triangles and fish for 'three sides' without naming the rule. Run the shape-inspector interactive counting sides on a triangle, square and rectangle — four sides makes a quadrilateral whatever it looks like. Pupils sort four more shapes by side-count, then draw two varied triangles and two varied quadrilaterals in their copy. Finish with straw builds at the visualiser, including the four-straws-won't-make-a-triangle trap, before the square-vs-quadrilateral maths talk.

TEACHING MOVES

1. **Getting Started.** Take three hands-up answers only — fish for 'they all have three sides'. Accept and revoice close answers ('three corners', 'three lines') but do not name the triangle rule yet; Watch and Notice does that.
2. **Watch and Notice.** Count sides aloud as the interactive lights each one. On the square, say 'quadrilateral' slowly and have the class repeat once. On the rectangle ask 'is this a square?' then 'how many sides?' — land that four sides is the test, not how it looks.
3. **Try It Together.** One shape at a time: a pupil reveals the sides, class counts aloud, then a quick verdict. Revoice every correct answer as 'three straight sides, so triangle' or 'four, so quadrilateral'. Keep each shape brisk — the five-sided one is the 'neither' check.
4. **Draw Them in Your Copy.** Walk the room glancing for two genuinely different shapes in each pair — not two near-identical squares — and the correct group name underneath. Give enough time for careful ruler drawing; this is practice, not assessment.
5. **Class Challenge.** A few pupils build at the visualiser; the watching class counts sides aloud and thumbs-up to agree. Give the last task real time: let a pupil try four straws for a triangle, fail, then revoice — four

straws close a quadrilateral, not a triangle. Accept any closed four-sided shape for the non-square quadrilateral.

6. **What Did We Notice?** Listen for pupils separating 'has four sides' from 'has four equal sides and square corners'. Revoice: every square is a quadrilateral, but a quadrilateral need not be a square. Point back to the long thin straw build if they stall.

COMMON MISCONCEPTIONS

⚠ Pupils say the tall thin triangle 'isn't a proper triangle' because it doesn't look like the equilateral ones they usually see.

Hold the tall thin and the wide flat shapes side by side and count the sides of each aloud with the class. 'Same number of straight sides — both triangles. How it looks doesn't change the name.'

⚠ Pupils treat 'quadrilateral' as another word for square, so they reject the stretched four-sided shape. Build or draw the long thin four-sider under the visualiser and count: four sides. 'Quadrilateral means four sides — a square is one kind, this stretched one is another.'

⚠ Pupils try to force four straws into a triangle and claim it works by overlapping ends or leaving a gap. Let the attempt fail in full view. Revoice: 'a triangle needs exactly three straight sides that close. Four straws make a four-sided shape — a quadrilateral.'

DIFFERENTIATION

EMERGING

- Pre-count the sides on the IWB shape before asking for the name, so the pupil only matches '3 → triangle' or '4 → quadrilateral'.
- On the copybook page, ask for one triangle and one quadrilateral only, still drawn carefully with a ruler.

DEVELOPING

- After the copybook pair, ask: can you draw a quadrilateral with no square corners at all? Check by counting the sides.
- On the five-sided 'neither' shape, ask what name it would need if we kept counting past four.

PROFICIENT

- During Class Challenge, after the straw builds, pose: 'a shape has three sides but one is curved — is it a triangle? Prove it from today's rule.'
- In the maths-talk, push for two different quadrilaterals that are not squares or rectangles, sketched in the copy.

✂ **Cross-curricular:** Tie to Visual Art — pupils cut varied triangles and quadrilaterals from scrap paper to build a simple stained-glass collage.

ANSWER KEY

a) 3 sides, All sides equal

b) 4 sides, All sides equal

c) 4 sides, Sides not all equal

Q1: 3

Q2: quadrilateral

Q3: any 2 different-looking triangles

a) **Always** : The rule says exactly three sides makes a triangle.

b) **Always** : A square has four straight sides so it is always a quadrilateral.

c) **Never** : Quadrilaterals can be rectangles or other four-sided shapes, not always squares.

d) **Never** : Triangles must have exactly three sides.

EXTENSION SHEET · STRETCH ANSWERS

S1: a quadrilateral

S2: 18

S3: Yes. It has 4 straight sides, and the lengths do not matter.

S4: a rectangle (accept any 4-sided shape that is not a square)

S5:

Neither. A triangle has 3 sides and a quadrilateral has 4.

Investigation: How many sides can you find? — open-ended; scan pupils' working for valid solution paths rather than a single answer.