

Lesson 73 SHAPE & SPACE

Classifying quadrilaterals: square, rectangle, rhombus, parallelogram and trapezium

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 2D Shape Inspector · display, explore

WHAT THIS LESSON TEACHES

A quadrilateral is a flat shape with exactly four straight sides and four corners. We sort them by looking at their sides and corners: how many sides are equal, how many pairs of sides are parallel, and whether the corners are right angles.

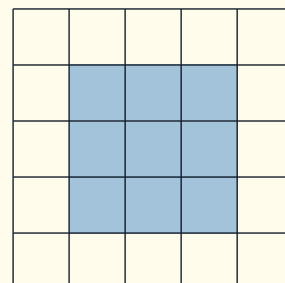
→ A square has 4 equal sides and 4 right-angle corners; it is also a special rectangle.

→ A parallelogram is a leaned-over rectangle: opposite sides stay parallel but its corners are not right angles.

MODEL THIS ON THE BOARD

NAMING A SQUARE

- ① The shaded shape has **4** straight sides and **4** corners, so it is a quadrilateral.
- ② All **4** corners are right angles (square corners).
- ③ All **4** sides are the same length (**3** units each).
- ④ A shape with 4 right angles and 4 equal sides is a **square**.



DISCUSSION STARTER

REFLECT

Which property helped you most when sorting — equal sides, parallel sides or right angles?

LESSON ARC

Open with three real four-sided objects (window, kite, cake slice) and pull out the two deciding questions: equal sides and square corners. Reveal square, rectangle, rhombus, trapezium and parallelogram one at a time on the shape-inspector-2d interactive, asking the same three questions each time. Pupils then name unseen shapes from the revealed evidence, draw square-rectangle-rhombus in copybook, and build-then-lean the shapes with straws. Student Activity Book page follows for individual practice.

TEACHING MOVES

1. **Getting Started.** Take three hands-up answers on window-versus-kite, not open call-outs. Steer every answer toward the two things that decide a name: are the sides equal, are the corners square? Resist naming any shape yet — that's the next step.
2. **Watch and Notice.** Run the same three questions (equal sides? parallel sides? right angles?) on every shape so pupils learn the routine, not five loose facts. Ask for the corners before you reveal them. Pause hard on the rhombus — say its properties aloud twice before moving on, or it blurs into the parallelogram.
3. **Try It Together.** Put an unnamed quadrilateral up and have a pupil tap to reveal equal sides and parallel pairs before anyone names it. Hold out for the class to name from the evidence, not on sight. Revoice one pupil's reasoning per shape: 'Aoife said rhombus because all four sides are equal but the corners aren't square.'
4. **Draw Three in Your Copy.** Walk the room glancing for one true, distinguishing property per shape. Catch anyone writing 'four sides' for all three — that's true of every quadrilateral, so it names nothing. Nudge toward 'all four sides equal' (square), 'four right angles' (rectangle), 'equal sides but slanted, no right angles' (rhombus).
5. **Class Challenge.** Groups build a square, lean it into a rhombus, build a rectangle, lean it into a parallelogram. At each stage ask 'what stayed the same, what changed?' — side lengths stay, right angles open out. Keep it brisk; have groups hold up each stage rather than re-explaining every build.
6. **What Did We Notice?.** Pose the 'a square is just a special rectangle' claim and listen for pupils reasoning from the rules, not the look. Revoice a strong answer: 'so every square is a rectangle, but not every rectangle is a square.' Head off 'they're two totally different shapes.'

COMMON MISCONCEPTIONS

⚠ Pupils see the rhombus and call it a square — 'all four sides are the same, so it's a square' — ignoring that the corners aren't square.

Rebuild it on the straws in front of them: hold up the square, then lean it over. Same four equal straws, but the corners have opened out. 'Equal sides yes, but a square needs square corners too.'

⚠ Pupils write 'four sides' as the special property beside every shape in their copybook.

Stop and ask: 'if the kite, the square and the rhombus ALL have four sides, does that tell us which is which?' Push them to a property that only that shape has — the deciding feature, not the family feature.

⚠ Pupils insist a square and a rectangle are 'two completely different shapes' and reject that a square is a rectangle.

Run both through the rectangle test aloud on the interactive: opposite sides equal? tick. Four right angles? tick. The square passes every rectangle rule and adds equal sides — it's inside the rectangle family, not outside it.

DIFFERENTIATION

EMERGING

- Give these pupils only two questions to check at first — equal sides and square corners — and add parallel sides once those two are secure.
- In the copybook step, let them trace the square and rectangle from the board and write just one word beside each ('equal', 'square corners') rather than a full property.

DEVELOPING

- After they name a shape from the evidence, ask them to predict what the shape becomes if you lean it over, then check on the straws.
- Give a shape with only equal-side clues revealed and ask what it could still be — could be a square or a rhombus, so what would settle it?

PROFICIENT

- During the Class Challenge, have them build a trapezium with the straws and prove it has exactly one pair of parallel sides by sliding two straws to check the gap stays constant.
- Ask them to explain to the teacher why 'every square is a rectangle but not every rectangle is a square' — is-a in one direction only — using the rectangle test, not the pictures.

✂ **Cross-curricular:** Tie to visual art — pupils spot quadrilaterals in a photo of a Georgian Dublin doorway or a Celtic knotwork tile and name each by its properties.

ANSWER KEY

- a) square
- b) rectangle
- c) rhombus

Q1: 8 sides and 8 corners

Spot: A square needs 4 right angles as well as 4 equal sides. A rhombus has 4 equal sides but its angles are not always right angles, so not every rhombus is a square.

EXTENSION SHEET · STRETCH ANSWERS

S1: a regular hexagon

S2: a kite

S3: a regular octagon

S4: a rhombus

S5: a parallelogram

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