

2D shapes: sides, vertices and naming

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.TRN.3

model and explain the effects of transformations on shapes and line segments.

INTERACTIVES 2D Shape Inspector · challenge, display, explore

WHAT THIS LESSON TEACHES

A side is a straight line that makes up part of the edge of a flat shape. A vertex is a corner where two sides meet, and we name a 2D shape by how many straight sides it has.

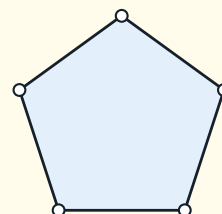
→ A square has 4 straight sides and 4 vertices.

→ A triangle has 3 straight sides and 3 vertices; a pentagon has 5 sides and 5 vertices.

MODEL THIS ON THE BOARD

NAMING BY SIDES AND VERTICES

- 1 Count the straight sides on the shape: **5**.
- 2 Count the vertices (corners) where the sides meet: **5**.
- 3 A flat shape with **5** sides and **5** vertices is called a pentagon.



pentagon

LESSON ARC

Open with three Irish road signs — yield triangle, window panes, warning hexagon — and take hands-up counts of sides and corners. On the IWB, reveal four shapes one at a time, counting sides then vertices aloud, holding out on the pentagon where counts drift past four. Pupils mark up shapes at the board, including a hexagon turned on its side. They draw and label four shapes in their copy before the Class Challenge practice round.

TEACHING MOVES

1. **Getting Started.** Take three hands-up answers per object, not open call-outs, so the count stays honest. Let pupils offer 'side' and 'corner' in their own words — don't correct to 'vertex' yet, that comes in Watch and Notice.
2. **Watch and Notice.** Reveal shapes one at a time. On the pentagon, slow right down and point at each side as the class counts — this is where pupils lose track past four. After the hexagon, ask 'what stays the same if I turn it on its side?' before moving on, planting the turned-shape idea early.
3. **Try It Together.** Rotate four pupils to the board to number sides and dot corners; the class agrees or corrects out loud before checking. On the turned hexagon hold out for 'still six — turning it did not add or lose a side'. Slow the tapping on the eight-sided shape where counts wander round the middle.

4. **Draw and Label in Your Copy.** Walk the room glancing for straight edges and a matching sides-and-corners number beside each shape. Watch for a pentagon drawn with a rounded top or a count of six on a five-sided shape — flag it quietly, this is practice not marking.
5. **Class Challenge.** Keep the board work brisk — pupils predict, tap Check, class confirms, move on. Don't re-teach each shape. The eight-sided shape is the one to slow on: count the sides, not the way it's turned. Use the ✓ in your narration — 'yes, that's it'.
6. **What Did We Notice?.** Ask how they'd prove a turned shape is still the same shape. Revoice a strong answer: 'so turning it moves it, but it does not add or take away a side.' Head off any pupil calling the turned hexagon a new shape.

COMMON MISCONCEPTIONS

⚠ A pupil looks at the hexagon turned on its side and says 'that's a different shape now' — they read orientation as identity.

Take the same shape card, count the sides in its usual position, then physically rotate the card and count again out loud. Six either way. 'Turning it moved it — it didn't add or lose a side.'

⚠ Counting round the pentagon or eight-sided shape, pupils lose their place and double-count a side or skip the last corner near where they started.

Have the pupil at the board tap and number each side as they go, starting from a marked corner. The written number stops the recount drifting — the class checks the last side meets the first.

⚠ Pupils count sides and corners as if they're different totals for the same shape (e.g. 'five sides but four corners on a pentagon').

Point out that each corner is where two sides meet, so the counts always match. Dot the corners on the board and count them against the numbered sides — five and five.

DIFFERENTIATION

EMERGING

- Hand these pupils a printed shape cut-out to trace a finger along each side while the class counts — the physical edge stops the eye drifting.
- Keep them on triangle, square and pentagon in the copybook; the hexagon is teacher-supported at your table.

DEVELOPING

- After the copybook shapes, ask: draw a shape with exactly seven sides — what would we call a seven-sided shape? Let them reason from the naming pattern.
- Give a shape card face-down and have the pupil predict sides and corners from a one-line clue ('I have one more side than a pentagon') before turning it over.

PROFICIENT

- Pose: is there a flat shape where the number of corners does NOT equal the number of sides? Let them hunt with the shape cards and explain what they find to you.
- Ask them to write a rule a younger pupil could follow to name any shape just by counting — then test it on the eight-sided shape.

✂ **Cross-curricular:** Tie to Geography and road safety — pupils spot the shapes of real Irish road signs on the walk home and count sides on each.

ANSWER KEY

Scaffold: visual check on the page

Q1: 3 vertices, triangle

Q2: 6 vertices, hexagon

a) Always : The lesson states a triangle has 3 straight sides and 3 vertices.

b) Sometimes : Only a shape with exactly 3 straight sides is a triangle; one with 4 is a quadrilateral and one with 5 is a pentagon.

c) Always : The lesson teaches that the number of sides matches the number of vertices.

d) Never : A shape with 3 straight sides has 3 vertices, not 5.

EXTENSION SHEET · STRETCH ANSWERS

S1: a regular hexagon

S2: an isosceles trapezium

S3: a kite

S4: a regular octagon

S5: a regular pentagon