

Helping Your Child with 2D & 3D Shapes

Space · Prep to Year 6 · Australian Curriculum Mathematics

2D shapes are flat shapes with length and width. **3D objects** are solid shapes with length, width and height. From Prep, children sort and name shapes. By Year 3 they classify 3D objects. By Year 5 they build 3D objects from their **nets** (flat unfolded versions). By Year 6 they explore cross-sections and prisms. Learning shape names and properties helps your child in maths, science, art and everyday life.

Year level	What your child learns	What this looks like
Prep	Sorting and naming familiar shapes Your child sorts and names shapes found in the environment. 2D shapes (flat): circle, square, triangle, rectangle 3D objects (solid): ball (sphere), box (rectangular prism), tin (cylinder), cone vertex (corner): the point where sides meet side / edge — a straight line forming part of the boundary They match shapes to objects in the real world: door = rectangle coin = circle dice = cube	Sort household objects by shape. "Find 3 things shaped like a rectangle." "How is a square the same as a rectangle? How is it different?" Build a picture from shape cut-outs.
Year 1	Comparing and classifying by properties Your child compares shapes by their properties: sides — how many straight edges does the shape have? vertices — how many corners (plural of vertex)? Triangle: 3 sides, 3 vertices Square: 4 equal sides, 4 vertices Pentagon: 5 sides, 5 vertices Hexagon: 6 sides, 6 vertices They also spot shapes in the environment and describe similarities and differences.	"How many sides does a stop sign have? What shape is it?" "How is a rectangle different from a square?" Sort these shapes by number of sides. "Find a shape with exactly 5 sides."
Year 2	Properties of 2D shapes — sides, angles and parallel lines Your child uses more precise language: parallel — lines that never meet (opposite sides of a rectangle are parallel) curved — a rounded edge (circles have curved sides) straight — a non-curved edge opposite sides — sides directly across from each other They sort shapes: 'This shape has 2 pairs of opposite parallel sides.' They identify shapes in composite designs (e.g. a rectangle made of two squares).	"Are opposite sides of a rectangle parallel?" "Does a circle have any straight sides?" Look at a building or bridge. "What shapes can you spot? Are any sides parallel?"
Year 3	3D objects — features and uses Your child classifies 3D objects by their features: face — a flat surface of a 3D object edge — a straight line where two faces meet vertex — a point where edges meet (corner) Cube: 6 faces, 12 edges, 8 vertices Triangular prism: 5 faces, 9 edges, 6 vertices They explain why shapes suit their purpose: a cylinder (tin can) rolls and stacks easily	Count the faces, edges and vertices of a tissue box. "Why is a ball round? Why is a brick shaped like a prism?" "What shape is the base of a pyramid?" Build a prism from toothpicks and blu-tak.
Year 4	Composite shapes and symmetry Your child combines shapes to make composite shapes — shapes made from two or more simpler shapes. e.g. a house outline = triangle (roof) + rectangle (walls) They also identify and create patterns using line symmetry : A shape has line symmetry if one half mirrors the other. Letters with symmetry: A, H, M, O, T, V, W, X, Y rotational symmetry — a shape looks the same after being rotated: A square looks the same after rotating 90°.	Cut out a shape and fold it in half. "Does one half match the other exactly? How many lines of symmetry?" Draw a house outline using triangles and rectangles. "What basic shapes did you use?"

Year 5	Nets of 3D objects A net is the flat shape you get when you unfold a 3D object. Unfold a cereal box carefully — that is its net! Your child matches 3D objects to their nets and builds objects from nets. Cube net: 6 squares arranged in a cross or T shape Triangular prism net: 2 triangles + 3 rectangles Square pyramid net: 1 square + 4 triangles They use spatial reasoning — the ability to mentally fold and unfold shapes.	Carefully unfold a cereal box. "How many faces did the box have? How many edges?" "Could you fold it back into the box?" Draw a net for a cube on grid paper and cut it out.
Year 6	Cross-sections and prisms A cross-section is the shape you see when you cut straight through a 3D object. Cut a banana across → circle cross-section Cut a banana lengthways → oval cross-section prism — a 3D object with the same cross-section all the way through: rectangular prism (box): rectangle cross-section triangular prism: triangle cross-section cylinder: circle cross-section right prism — the cross-section is at right angles to the length	Slice a carrot, banana, or block of cheese. "What shape is the cross-section?" "Would the cross-section be the same at every point along the carrot?" "Is this object a prism? Why or why not?"

★ Key 2D shapes and 3D objects — learn these names and properties together

2D Shapes (flat)

Triangle	Square	Rectangle	Pentagon	Hexagon
3 sides 3 vertices	4 equal sides 4 right angles	4 sides (2 pairs of equal sides)	5 sides 5 vertices	6 sides 6 vertices

3D Objects (solid)

Cube	Rectangular Prism	Triangular Prism	Square Pyramid	Cylinder
6 faces 12 edges 8 vertices	6 faces 12 edges 8 vertices	5 faces 9 edges 6 vertices	5 faces 8 edges 5 vertices	2 faces 0 edges 0 vertices

Real-life connection: *Tin can = cylinder / Dice = cube / Ramp = triangular prism / Pyramid tent = square pyramid / Brick = rectangular prism*

Helping at Home — 2D & 3D Shapes

Worked examples and questions to ask · Prep to Year 6

How it works — worked examples

Year 2 — Sorting shapes by properties

Sort these shapes: square, rectangle, circle, rhombus, triangle, oval

Property	Shapes that have it	Shapes without it
Straight sides only	Square, Rectangle, Rhombus, Triangle	Circle, Oval
All sides equal	Square, Rhombus	Rectangle, Triangle, Circle, Oval
Parallel sides	Square, Rectangle, Rhombus	Triangle, Circle, Oval

Year 3 — Faces, edges and vertices of 3D objects

Examine a rectangular prism (cereal box) and a triangular prism

Object	Faces	Edges	Vertices
Rectangular prism (cereal box)	6	12	8
Triangular prism	5	9	6

Euler's formula (Year 6 extension): Faces + Vertices – Edges = 2 (e.g. $6 + 8 - 12 = 2$ ✓)

Year 5 — Nets of 3D objects

A cube has 6 square faces. One possible net looks like this:

Cube net (cross shape): <pre> [top] [left][front][right][back] [bottom] </pre> Fold up the 4 sides, close top and bottom → cube!	Triangular prism net: <pre> [Δ triangle] [rect][rect][rect] [Δ triangle] </pre> 2 triangles + 3 rectangles = 5 faces total
Square pyramid net: <pre> [Δ] [Δ][□][Δ] [Δ] </pre> 1 square base + 4 triangular faces	Try this at home! Carefully unfold an empty cereal box. Count the faces. Can you fold it back up?

Questions to ask your child

You do not need to know the answer. Ask and let your child explain!

P Prep

- Find 3 things in the kitchen that are rectangles.
- How is a square different from a rectangle?
- What shapes can you see in this room right now?

1 Year 1

- How many sides does a triangle have? A hexagon?
- Sort these blocks — which have curved edges?
- Find a shape in the house with exactly 4 equal sides.

2 Year 2

- Do a square and a rectangle have parallel sides?
- How is a rhombus the same as a square? How is it different?
- Find two shapes that both have 4 sides but look different.

3 Year 3

- Count the faces, edges and vertices of a tissue box.
- Why is a tin can useful for stacking? What shape is it?
- Find a triangular prism in the house. (Hint: try cheese!)

4 Year 4

- Fold a piece of paper in half. Is the fold a line of symmetry?
- What letters of the alphabet have line symmetry?
- Does a square have rotational symmetry? Try rotating it.

5 Year 5

- Unfold a cereal box. How many faces does the net show?
- Draw a net for a cube on grid paper. Cut it out and fold.
- What net would a square pyramid have? (Hint: 5 faces)

6 Year 6

- Slice a banana across — what shape is the cross-section?
- Slice it lengthways — is the cross-section different?
- Is a cylinder a prism? (Every cross-section is a circle — yes!)

Things to try at home

Any age: Shape hunt! Walk around the house. Find one of each: circle, triangle, square, rectangle, pentagon, hexagon.	Year 1–2: Play 'I spy a shape': 'I spy something with 4 equal sides and 4 right angles.' Take turns guessing.
Year 2–3: Look at food packaging — what 3D objects can you find? 'The can is a cylinder. What shape is the lid?'	Year 3: Build shapes with toothpicks and marshmallows or blu-tak. Try a cube (needs 12 toothpicks and 8 corners).
Year 4–5: Fold a piece of paper to find lines of symmetry. Try different shapes. How many lines does each shape have?	Year 5–6: Unfold a cardboard box carefully. Draw and label its net. Then fold it back. Great spatial reasoning practice!

Key words to learn together

2D shape: a flat shape with only length and width — e.g. circle, triangle, square	3D object: a solid shape with length, width and height — e.g. cube, pyramid, cylinder
vertex (vertices): a corner — the point where two sides (2D) or two edges (3D) meet	side / edge: a straight line forming part of a shape's boundary
face: a flat surface on a 3D object — a cube has 6 faces	parallel: lines or sides that are always the same distance apart and never meet
polygon: a flat closed shape with straight sides: triangle, square, pentagon etc.	composite shape: a shape made by joining two or more simple shapes together
line symmetry: a shape has line symmetry if one half is a mirror image of the other	net: the flat shape you get when you unfold a 3D object — like unfolding a box
cross-section: the shape revealed when you slice straight through a 3D object	prism: a 3D object with the same cross-section all the way through — e.g. a cube or triangular prism