Lesson - 2D and 3D shapes

Year: Year 1

Hello, I am Otto! Shapes are all around us. A clock face, a window, a ball and a tin can are all shapes. In Year 1 we learn the names of flat shapes and of solid shapes, and we learn how to describe them.

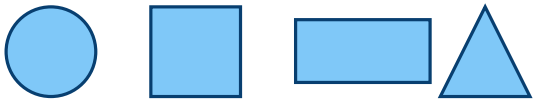
Starter activity

Go on a shape hunt in your classroom or home. Find something round, something with straight sides and something shaped like a box. Make a list. Then sort your finds into two groups: flat shapes and solid shapes you can hold.

Flat shapes (2D shapes)

Definition: 2D shape

A **2D shape** is a flat shape. It has only two dimensions: length and width. You can draw it on paper. It is also called a **flat shape**.



Definition: side and corner

A **side** is a straight line that is part of the edge of a shape. A **corner** is the point where two sides meet. A circle has no straight sides and no corners.

Shape	Sides	Corners	Looks like
Circle	0 (1 curved side)	0	a coin, a clock
Triangle	3	3	a slice of pizza
Square	4 (all the same)	4	a window pane
Rectangle	4 (opposite sides the same)	4	a door, a book

Key fact: square and rectangle

- A square has 4 sides that are all the same length.
- A rectangle has 4 sides. The two long sides are the same and the two short sides are the same.
- A square is a special kind of rectangle.

Example 1

A shape has 3 sides and 3 corners. What is it?

It is a **triangle**.

Example 2

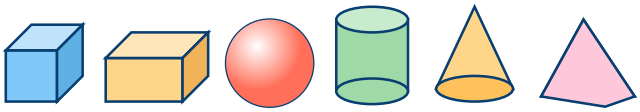
A shape has no corners and no straight sides. What is it?

It is a **circle**.

Solid shapes (3D shapes)

Definition: 3D shape

A **3D shape** is a solid shape. It has three dimensions: length, width and height. You can pick it up and hold it. It is also called a **solid shape**.



Shape	Looks like	Faces	Edges	Vertices (corners)
Cube	a dice	6 square faces	12	8
Cuboid	a cereal box	6 rectangular faces	12	8
Sphere	a ball	1 curved face	0	0
Cylinder	a tin can	3 (2 flat and 1 curved)	2 curved	0
Cone	an ice cream cone	2 (1 flat and 1 curved)	1	1
Pyramid	a pyramid in Egypt	5 (square base)	8	5

Definition: face, edge and vertex

A **face** is a flat or curved surface of a solid shape. An **edge** is where two faces meet. A **vertex** is a corner where edges meet. The plural of vertex is **vertices**.

Example 3

A solid shape can roll and has one curved face. What is it?

It is a **sphere**, like a ball.

Example 4

A solid shape has 6 faces and all the faces are squares. What is it?

It is a **cube**.

Shapes in the world around us

We can find flat shapes on the faces of solid shapes. A cube has square faces. A cuboid has rectangle faces. A cone has a circle on the bottom. A pyramid has a square base and triangle faces. When you print with a solid shape, you can see the flat shape on its face.

Example 5

Eli paints the bottom of a tin can and presses it on paper. What flat shape does he make?

The bottom of a cylinder is a circle. Eli makes a **circle**.

Sorting and patterns

Method: sorting shapes

1. Look at the shapes and choose a rule, such as "has corners".
2. Put each shape in the right group.
3. Check that no shape is in the wrong group.

Shapes can also make patterns. A pattern repeats. Look at this pattern: circle, square, circle, square, circle, ... What comes next?



Example 6

What comes next in the pattern: triangle, square, triangle, square, triangle?

The pattern is triangle, square and then it repeats. After a triangle comes a **square**.

Example 7: describing

Describe a cube using 3 facts.

A cube has 6 faces, 12 edges and 8 vertices. All of its faces are squares.

Watch out

- A triangle always has 3 sides. A shape with 4 sides is not a triangle.
- A circle is not a sphere. A circle is flat. A sphere is solid like a ball.
- A square is not a cube. A square is flat and a cube is solid.

Did you know?

Bees make honey in tiny six-sided holes. The honeycomb is a tessellation: the shapes

fit together with no gaps. Builders use triangles in bridges because triangles are very strong!

Otto's tip

Feel the shape if you can. Count the faces and the corners with your finger. Say the name out loud: sphere, cube, cone. The more you handle shapes, the better you remember them!