Identifying 3-D shapes

National Curriculum attainment target

• Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces

Lesson objective

• Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces

Previous related lessons

Unit 1, Week 3, Lesson 1; Unit 1, Week 3, Lesson 2;
Unit 1, Week 3, Lesson 3; Unit 1, Week 3, Lesson 4

Prerequisites for learning

Pupils need to:

• use everyday language to describe 3-D shapes

• relate simple, physical 3-D shapes to drawings of the same shapes

**Vocabulary**

shape, 3-D, cube, cuboid, sphere, cone, cylinder, pyramid,
edge, vertex, vertices, face, surface

Future related lessons

Unit 5, Week 3, Lesson 2; Unit 5, Week 3, Lesson 3;
Unit 5, Week 3, Lesson 4

Success criteria

Pupils can:

• name and describe properties of a cube, cuboid, sphere, cone, cylinder, pyramid

• count the faces, edges and vertices of a 3-D shape

• read and write names for shapes



Getting Started

• Choose an activity from Geometry – Properties of shapes.

**Year 2, Unit 5, Week 3**

Display: the Nets tool. This tool

has simulated versions of cube, cuboid, square- and triangle-based pyramids and triangular, pentagonal and hexagonal prisms. These can be rotated and tilted to give children an enlarged and alternate view of these shapes.

Teach

Resources

mini whiteboard, pen and eraser (per child); set of 3-D shapes (cube, cuboid, cylinder, cone,
sphere, pyramid) (per pair/group), set of large 3-D shapes (cube, cuboid, cylinder, cone, sphere,
pyramid) (per class); chalk (per pair/group, optional)

• Say**: Today we will be looking at three dimensional shapes. They are called three-dimensional shapes because they spread out in three dimensions. They have height, length and depth. An easier name for these shapes is 3-D.**

• Display: Slide 1 and say: **Tell your partner what this shape is called.** (cube)

• Say**: The properties of this shape tell us it is a cube. These are: the number of vertices (or corners), the number of edges and the shape and number of faces. Now let’s see if we can identify these properties and count them.**

• Say**: Talk to your partner about where you think the labels should go.** Invite children to suggest where labels should go and explain each term. Encourage children to touch and count the relevant property on their own cube.

Click on the ‘face’

label to reveal the

answer.

Say: **It is easy to lose track of**

**which faces you have already counted with
3-D shapes. Try to go around a shape first and then look at the top and bottom. You can mark each part you have counted with chalk.**

• Say: **The face is the flat part of the shape. You can remember it by thinking that the faces ‘look out’ from the shape. It is important to look at how many faces there are on a shape and what shape they are themselves.** Ask**: What shape are these faces?** (square) **Let’s look at a real cube to help us count them.** Model counting the six faces, touching each one as you count.

****• Say**: The edge is where two faces meet, like the edge of a table.
Let’s look at the real cube to help us count them.** Model counting
the 12 edges, touching each one as you count.

Click on the ‘edge’ label
to reveal the answer. answer.

• Say: **The vertex is where the edges meet. Look at the
real cube to help us count them.** Model counting the
eight vertices.

Click on the ‘vertex’ label to reveal the answer.

• Remind children that when we are talking about more than one vertex we say ‘vertices’. Some children will remember that we called the ‘corners’ of 2-D shapes vertices too.

• Display: Slide 2 and say: **Let’s look at this shape and count the faces, edges and vertices.**

• Say: **Match this shape to one in your set. Decide on the name of the shape and have a go at counting its properties. Write your answers on your whiteboards.**

• Establish that it is a cylinder and use real shapes to count the properties. Click on the labels to reveal the answers. Remember to highlight that one of the cylinder’s faces is curved and so the two edges are also curved.

• Ask: **Why are there no vertices on the cylinder?** (because the edges are curved, they go round and round rather than ‘meeting’)

• Display: Slides 3–5. Repeat the process with the pyramid, sphere and cone. Ensure children have the opportunity to count the faces, edges and vertices.

When discussing pyramids, tell children there are square- and triangular-based pyramids and that this impacts on the numbers of the different features. Challenge children to predict which will have

more edges, vertices and faces.

Individualised Learning

**Activity Book 2B:** – Page 10: Count it!

Resources: 3-D shapes: cube, cuboid, cylinder,

cone, sphere, pyramid (per group); chalk (per

child) (optional)

**Progress Guide 2:** – Support, Year 2, Unit 5, Week 3, Lesson 1:

Shape riddles

Resources: set of 3-D shapes (cone, pyramid,

cylinder, sphere, cube, cuboid) (per pair);

scissors (per pair)

Refer to Activity 1 from the
Learning activities on page 246.



Display:

the Nets

tool. This tool has simulated versions of cube, cuboid, square- and triangle-based pyramids and triangular, pentagonal and hexagonal prisms. These can be rotated and tilted to give children an enlarged and alternate view of these shapes.

Plenary

• Say: **Tell your partner any difficulties you had today with the 3-D shapes. For example, are there any particular shape names you find difficult to remember? Did you have any problems with counting parts of shapes?**

• Discuss strategies as a class to help with this. For example, children who struggle to remember ‘cylinder’ can picture the word written along the side of a long cylindrical biscuit packet. Children struggling with ‘sphere’ can picture someone playing football and shouting ‘pass it over sphere’.

• Similarly, discuss children’s strategies for accurately counting shape properties.

• Say**: Close your eyes. Now I want you to picture a cylinder and a cube. They are sitting on a slope.** Ask: **Which one will roll and which one will slide? How do you know?** (curved face will roll – cylinder)

• Say: **Close your eyes. I want you to picture a cuboid. I have painted three of the faces red, and the rest are white.** Ask: **How many faces are white? How do you know?** (three because a cuboid has six faces)

• Say: **Close your eyes. I want you to picture a square-based pyramid. I have painted two of the faces purple, and the rest are green.** Ask: **How many are green? How do you know?** (three because a square-based pyramid has five faces)

**Homework Guide 2**

Year 2, Unit 5, Week 3, Lesson 1:

3-D shape line up

• Say: **I want you to think of a similar problem for your partner. Take turns to test out your problem.**

• Share some pairs’ problems with the class. Congratulate children for using accurate vocabulary.

Overcoming Barriers

• Some children may struggle with the physical task of counting vertices, edges and faces of 3-D shapes. Teach them how to mark off what they have already counted with chalk and how to be systematic when doing this, going round the shape first and then looking at the ends.