9. Posting Shapes

Objectives

- Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line
- Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces
- Identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid]

I can

- Identify 3-D shapes
- Name the 2-D faces on a 3-D shape
- Describe the properties of 3-D and 2-D shapes

Resources

- A collection of 3-D shapes per group: spheres, cones, cylinders, cubes, cuboids, square-based pyramids and triangular prisms
- Card, scissors, sticky tape

Introduction

- Ask the children to tell you what they can see in the picture and to discuss with a partner what the problem is. Agree that the picture shows a selection of 3-D shapes and a posting box and that Emily is having trouble posting the shapes through the holes. Ask the children what mathematics would help. Agree 3-D and 2-D shapes.
- Ask the children to identify the 3-D shapes in the picture (sphere, cone, cylinder, cube, cuboid, square-based pyramid, triangular prism) and the holes in the posting box (circle, triangle, rectangle, square). Recap the properties of each shape in terms of number of faces, edges, vertices, shape of faces for the 3-D shapes, and number of sides, corners, any right angles and lines of symmetry for the 2-D shapes. Focus on squares and rectangles. Discuss what is the same and what is different. Establish that a rectangle has four sides and four right angles. This means that a square is also a rectangle. It is known as a regular rectangle because all the sides are the same length. Explain that a cube is a special cuboid just as a square is a special rectangle.

During the activity

1. Give small groups of the children a selection of 3-D shapes. Ask them to match each one to those in the picture. They explore how the shapes could be posted, e.g. the triangular prism could be posted through both the triangular and rectangular holes; the pyramid through the square and triangular holes.
2. Ask the children to make a Carroll diagram to sort the shapes. They should make up their own criteria, e.g. 'flat faces'/'not flat faces'.

If you have time...

1. Give pairs of the children a cube or cuboid, some card, scissors and sticky tape. They look carefully at their shape and make it. They might draw around the faces of their shape on the card, cut them out and stick them together. Some of the children might draw around the faces so that they are linked, thereby making the beginnings of a net.

Maths words

sphere, cone, cylinder, cube, cuboid, square-based pyramid, triangular prism, circle, triangle, square, rectangle, sides, line symmetry

Solutions

1.14, **2.** 2, 5, 9, 6, **3.** 4, 6, 12, 8, **4.** Sphere, cone, cylinder, cube, cuboid, square-based pyramid, triangular prism, **5.** Triangular hole: square-based pyramid, triangular prism, Circular hole: sphere, cone, cylinder, **6.** Rectangular hole: cuboid, triangular prism, Square hole: cuboid, cube, square-based pyramid, **7.** Triangles, squares, rectangles and circles, **8.** Squares, 4, 4, **9.** 4, 3 sides, 3 lines of symmetry, **10.** Ensure each shape in the picture is sketched and properties written about include number of faces, edges and vertices, shapes of faces and their properties in terms of sides and lines of symmetry.

Posting Shapes

1. How many 3-D shapes can you see in the picture?

2. How many triangular prisms can you see? How many faces does each one have? How many edges? How many vertices?

3. How many cuboids can you see? How many faces does each one have? How many edges? How many vertices?

4. List the names of the 3-D shapes you can see in the picture.

5. Which 3-D shapes can Emily post in the triangle-shaped hole? Which can she post in the circle-shaped hole?

6. Which 3-D shapes can Emily post in the rectangle-shaped hole? Which can she post in the square-shaped hole?

7. Look at the faces of the 3-D shapes. What 2-D shapes can you see?

8. What shapes are the faces of the cube? How many sides have they got? How many lines of symmetry?

9. How many triangle-shaped faces does each square-based pyramid have? Draw and describe a triangle. Make sure you write about the number of sides and lines of symmetry.

10. Make up a 3-D shape poster. Draw each shape and write its properties beside each one.

© Rising Stars UK Ltd 2014 You may photocopy this page