SHAPE AND SPACE

2-D Shapes in the Environment

Learning focus

- Identify 2-D shapes in the environment
- Describe and compare 2-D shapes using appropriate vocabulary
- Use natural materials to construct 2-D shapes which have specified properties

Key vocabulary

- Shape names (isosceles triangle, quadrilateral, rhombus, etc.)
- Line properties (curved, straight, parallel, perpendicular)
- Shape properties (symmetrical, regular, irregular)
- Angle properties (acute, obtuse, reflex)

Resources

- Pencils, paper and clipboards
- Digital cameras
- Sticks of various lengths

Activity

Gather the children in an outdoor area and discuss how shapes are everywhere in the environment. Pose questions which invite children to describe what they see.

> *What 2-D shapes can you see from here?*
> *Can you see any triangles, quadrilaterals, etc.?*
> *Can you see straight/curved lines?*
> *Can you see any sets of parallel/perpendicular lines?*

Use this initial discussion to draw attention to shape properties and shape vocabulary. Encourage children to explain their thinking. Have materials to hand so that children can model shapes or shape properties. For example, they could use chalk to draw shapes or sticks to construct shapes and represent key properties.

Set the children the task of searching for 2-D shapes in the surrounding natural and built environment. Interesting shapes can be drawn and labelled or photographed if possible. The list of shape vocabulary (at the end) can be used to focus children's exploration, if necessary.

After about 15 minutes, gather the children together to discuss the shapes that they have found. They can share their drawings or digital photos as they discuss their shapes.

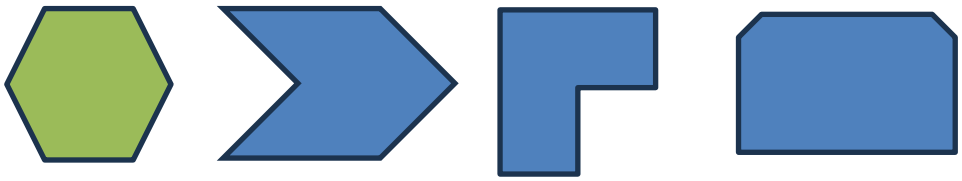
> *What did you find?*
> *Can you name this shape? What can you tell me about this shape?*
> *Where did you find the most perpendicular lines: in the natural or the built environment? Why do you think this is?*

Teaching point

Some 2-D shapes have curved edges (such as circles and semicircles) and some have only straight edges. A 2-D shape made up entirely of straight edges is called a **polygon**. The straight edges are called sides. In discussing shapes, restrict the use of the word 'side' to the straight edges of a polygon. (It is not appropriate to refer to the circumference of a circle as a 'side'.)

Polygons can be further classified according to the number of sides: triangles (3 sides), quadrilaterals (4 sides), pentagons (5 sides), hexagons (6 sides), and so on.

A **regular** polygon is one in which all sides are the same length and all the angles are the same size. The image in green below is a regular hexagon. The other shapes (blue images) are irregular hexagons.



For the next task, distribute sticks of different lengths to the children or have them gather a collection of sticks. In pairs or individually, challenge children to construct shapes with different properties and then compare these to shapes created by their peers. The level of challenge can be varied according to children's prior knowledge.

> *Construct a shape with 6 sticks.*
> *Look at your friends' shape: What is the same/different? What can you say about the lines and angles in each shape?*
> *Construct a shape with 4 sides. Can you name this shape?*
> *Construct a symmetrical shape. What do you notice about the number and length of the sticks that you used?*
> *Construct a symmetrical shape that is not regular/has a reflex angle/has at least one pair of parallel lines.*

Model correct mathematical vocabulary and encourage children to use formal terminology to discuss mathematical features of shapes: number of sides, number and size of angles, parallel lines, perpendicular lines, etc.

Taking ideas further

Have children take photos of their favourite shape creations. They can estimate the angle size and then use a digital tool to measure and check their estimation or print the photo and use a traditional protractor. They can also create property lists for their shapes and design digital or paper posters.

Assessment opportunities

Are the children able to:

- Name common 2-D shapes
- Use appropriate vocabulary to talk about shapes and their properties

Selection of 2-D shape vocabulary

Lines			
Curved	Straight	Parallel	Perpendicular
Angles			
Acute	Obtuse	Reflex	Right
2-D Shapes			
Isosceles	Equilateral	Scalene	Right
Circle	Oval	Regular	Symmetrical
Quadrilateral	Square	Rhombus	Parallelogram
Rectangle	Pentagon	Hexagon	Polygon