

S1 – Objectives and Key Facts

- a) Describe 2-d and 3-d figures
- b) Construct 2-d and 3-d figures from verbal descriptions
- c) Use the terms: 2-dimensional, 3-dimensional, line, straight, curve, parallel, perpendicular, horizontal, vertical, oblique, clockwise, anti-clockwise, triangle, quadrilateral, rectangle, square, polygon, regular, diagonal, circle, semicircle, arc, diameter, radius, prism, cylinder, pyramid, cone, sphere

2-dimensional: Having length and width but not height. A plane or flat shape with area but not volume, one that will lie on a desk without sticking up off the desk. Example – a square.



3-dimensional: Having length, width and height. A solid shape with volume. If laid on a desk, it will stick up off the desk. Example – a cube.



Line: this word is used in mathematics to indicate a straight line. Technically, a line should be infinitely long – a shorter line is called a line segment.



Straight: Used to describe a line that keeps going in the same direction right along its length. Not curved or bent.



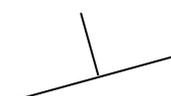
Curve: A 'line' which is not straight. Technically, mathematicians call a straight line a curve too, but you do not need to worry about this.



Parallel: Used to describe two lines which point in the same direction, and therefore remain the same distance apart right along their length. Parallel lines never meet.



Perpendicular: Used to describe two lines at right angles (90°) to each other.



Horizontal: Level. Parallel to level ground or to the bottom of the page.



Vertical: Straight up and down. Perpendicular to level ground. Perpendicular to the bottom of the page ie. parallel to the side of the page.



Oblique: Used to describe a line which is not horizontal or vertical. To be more specific, it is necessary to state the angle between the line and the horizontal or vertical.



Clockwise: Moving round in the direction that the hands of a clock travel.



Anticlockwise: Moving round in the direction opposite to that in which the hands of a clock travel.



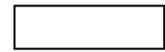
Triangle: A figure with three straight sides.



Quadrilateral: A figure with four straight sides.



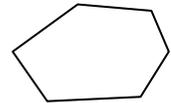
Rectangle: A quadrilateral with all its corners right angles.



Square: A rectangle with all its sides the same length.



Polygon: A figure with any number of straight sides. Triangles and squares are polygons. So are hexagons, octagons etc. [Nothing to do with escaped parrots.]



Regular: Used to describe a polygon in which all the sides are the same length and all the internal angles are equal.



Diagonal: A line which joins two corners (vertices) of a polygon (but not too adjacent corners, because that is a side)



Circle: A round 2-dimensional shape.



Semi circle: Half a circle.



Arc: Part of the edge of a circle.



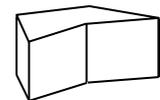
Diameter: A line across a circle through its centre **or** the length of that line, ie. the width of the circle.



Radius: A line from the centre of a circle to its edge, ie. half a diameter **or** the length of such a line, ie. the distance from the centre to the edge.



Prism: A 3-dimensional shape which remains the same size and shape as you move from one end to the other. In other words, a shape which, if you sliced it crosswise, all the slices would be the same.



Cylinder: A round prism. The shape of a tin of beans.



Pyramid: A 3-dimensional shape with a flat base and whose sides meet at a point at the top. Like the Pyramids of Egypt, but the base does not have to be square.



Cone: A pyramid with a circular base



Sphere: A round 3-dimensional shape. The shape of a ball or the earth.



TEACHER NOTES

The following three activities will help students develop skills in describing and understanding descriptions of 3-d and 2-d shapes. In conjunction with teacher input, they will also help them to gain the geometrical vocabulary required.

Activity 1

Sit 2 students back to back. Give one of them a structure made of about 6 Multilink blocks (or, better, Duplo squares). Give the other one the blocks to make the structure. The students with the loose blocks then has to reproduce the structure. The students may talk to each other but may not look at each other's blocks.

Once they have the hang of it, divide the class into 3's. Person 1 designs a structure, gives it to person 2 and gives the loose blocks to person 3. 2 and 3 then cooperate to enable person 3 to reproduce it.

Activity 2

As for Activity 1 except that instead of a structure made of blocks, a simple arrangement of lines on paper is used. Some arrangements are given on subsequent pages of this Teachers' Booklet: these can be photocopied, cut up and used with the students working in pairs. Students can also make some of their own working in threes.

Ask students to describe and draw shapes when the opportunity arises while doing other topics.

Activity 3

Give students geometric figures like the ones used in Activity 2 and, if possible, 3-dimensional shapes or pictures of 3-dimensional shapes, and ask them to write descriptions of them. Unused figures from the next two pages and shapes made from Multilink blocks can be used for this.

Learning Terms

Students will know many of the terms already and they will pick up others as they work through the activities, particularly if the teacher offers descriptions of the shapes after the students have described them. It might be necessary, however, for students to check that they know the meanings of the words in the list before the test. A list of definitions is included in the Students' Booklet.

ASSESSMENT

10-minute written test in which students write a description of an arrangement of lines on paper, then draw a figure given a verbal description. Rating depends upon the extent to which the description is clear and accurate and makes use of appropriate geometric vocabulary.

- M: the description is accurate and makes use of appropriate vocabulary; the drawing is accurate.
- C: the description is mostly accurate and makes use of some geometric vocabulary, the drawing is mostly accurate.

