Geometrical design – Teacher notes

Activity description

The aim of this activity is for students to recognise geometrical shapes and their properties.

Suitability

Level 1 (Foundation)

Time

1–2 hours
(depending on whether or not you include one or more of the extensions)

Resources

Student information sheet/worksheet, Optional: slideshow

Equipment

Optional: pencil, compass, ruler, protractor, felt-tips/colouring pencils

Key mathematical language

Regular, parallel, perpendicular, triangle, acute-angled, right-angled, obtuse-angled, scalene, isosceles, equilateral, quadrilateral, square, rectangle, parallelogram, rhombus, trapezium, kite, pentagon, hexagon, octagon, circle, polygon.

Notes on the activity

The slideshow can be used at the start of the session to find out what students already know about the names and properties of 2D shapes, and to introduce new terms and ideas where necessary.

The information sheet provides a summary of the main points. You may want to allow students to refer to this as they try the questions on the first worksheet, or you could distribute the information sheets at the end of the session for students to keep for revision.

Students will need to have studied line and rotational symmetry before they attempt the second worksheet.

During the activity

If possible, display the slide which includes the key terms as students attempt the questions on the worksheets.

Points for discussion

The animation on the slideshow will allow you to ask questions about the names and properties of each shape before the answers are revealed.

Advise students that it is important to use the correct mathematical terms and that some other terms in common use (for example, 'oblong') are not correct.

Extensions

Students could use a camera to photograph geometrical designs around your school or college, then print the photographs and create a poster describing the design, using geometrical terms and ideas.

Find pictures of geometrical designs in magazines or the internet. They can be found in information about tiling, stained glass, textiles, buildings or a variety of other real situations. Ask students to describe the designs using geometrical terms.
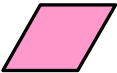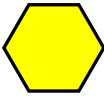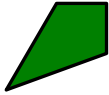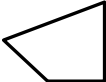
Ask students to use a pencil, ruler and compasses to create a geometrical design. They could include one or more of the constructions listed below:

- a regular hexagon inscribed in a circle

- an equilateral triangle inscribed in a circle.

- a line perpendicular to a given line, through a given point

- the mid-point of a line segment

- the perpendicular bisector of a line segment

- an angle bisector

Answers

1 Trapezium, rhombus, kite, quadrilateral, rectangle

2 Regular hexagon

3 Regular hexagon, regular octagon, rhombus, rectangle, trapezium

4 2 pentagons

5 Isosceles triangle, equilateral triangle, right-angled triangle, acute-angled triangle, obtuse-angled triangle.

6 Circle

7 Rectangle

8 2 octagons

Answers to … 'The table includes some of the shapes in the design. Fill the gaps.**'**

Shape	Name of the shape	Number of lines of symmetry	Order of rotational symmetry
	rectangle	2	2
	isosceles, right-angled triangle	1	1
	rhombus	2	2
	acute-angled, equilateral triangle	3	3
	regular hexagon	6	6
	trapezium	1	1
	regular pentagon	5	5
	kite	1	1
	regular octagon	8	8
	quadrilateral	0	1