

# Progression of skills 



Geometry
Properties of shape

At Portswood Primary Academy Trust, we strive for achievement for all our pupils and believe that all pupils should develop a passion for maths.

We want pupils to be confident in their use of maths; being able to identify where the maths is in the problems they are faced with, to prepare them for its use in the real world, and to ensure that they are ready for the next stage of their mathematics education.

Our aims for maths, reflect the aims of the National Curriculum. Pupils should:

- Become fluent in the fundamentals of Maths
- Reason mathematically
-Solve problems

Pupils, at Portswood Primary School, should have a secure knowledge of mathematical facts and be able to recall them rapidly. Ensuring that pupils retain a knowledge of number, other mathematical facts or the processes of calculation, will mean they are not a barrier to use in wider mathematics.

Maths teaching should be supported by using a concrete, pictorial, abstract approach.


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2+1=3
$$

ABSTRACT
This allows for secure retention of key mathematical concepts.
Manipulative resources should be available until a pupil is confident working with abstract concepts. They may be returned to at any time.

# Early years 

By the end of the year I can...

- explore everyday objects and talk about them
- make a pattern
- describe a pattern
- explore shapes and talk about them


## 2D shapes

square, rectangle, triangle, circle

## 3D shapes

cube, cuboid, cone, sphere, cylinder


Identifying shapes and their properties
Circles and triangles
Learn circles have one curved side and triangles have three straight sides.

Begin to recognise these shapes on everyday items in the classroom and outside.

Start to build their own circles and triangles.

# Early years 

Identifying shapes and their properties

## Shapes with 4 sides

Learn squares and rectangles have four straight sides and four corners.

Begin to recognise these shapes on everyday items in the classroom and outside.

Start to build their own squares and rectangles.

## 3D Shape

Children will:
naturally explore and manipulate 3D shapes through their block play and modelling.
begin to consider which shapes roll and why that is.
be given opportunities to build using a variety of shapes and to construct their own 3D shapes in different ways.
be introduced to the names of shapes and be given opportunities to explore similarities and differences between them as they play.

By the end of the year I can...

- recognise and name 2D shapes
- recognise and name 3D shapes


## Position and direction

- I can talk about position
- I can talk about movement
- I can talk about direction
- I can use the words; half turn, quarter turn and three quarter turn


## Year 1

## 2D shapes

square, rectangle, triangle, circle, hexagon, octagon

3D shapes
cube, cuboid, cone, sphere, cylinder, square based pyramid, triangular prism

## Vocabulary

## sides corners faces

## Identifying shapes and their properties

Recognise and name common 2-D and 3-D shapes, including:

- 2-D shapes including rectangles, squares, circles and triangles.
- 3-D shapes including cuboids, cubes, pyramids and spheres.


## Year 2

## By the end of the year I can...

- recognise and name 2D shapes
- describe the properties of 2 D shapes
- say how many sides a 2 D shape has
- say how many lines of symmetry a 2 D shape has
- recognise 3D shapes
- describe the properties of 3D shapes
- say how many edges a 3D shape has
- say how many vertices a 3D shape has
- say how many faces a 3D shape has
- know there are 2D shapes on the surface of 3D shapes
- compare 2D,3D shapes and everyday objects
- sort 2D, 3D shapes and everyday objects


## Position and direction

- I can order and arrange objects into patterns
- I can order and arrange objects into sequences
- I can use mathematical words to describe position, direction and movement
- I know what a right angle is
- I can describe a quarter turn
- I can describe a half turn
- I can describe a three - quarter turn
- I can show anti - clock wise
- I can show clockwise

Identifying shapes and their properties

## 2D shapes

circle, triangle, square, rectangle, pentagon, hexagon, octagon

3D shapes
sphere, cube, cylinder, cone, rectangular prism, square-based pyramid

## Vocabulary

## sides corners edges vertices faces

## Comparing and classifying

Children can compare and sort common 2D and 3D shapes and everyday objects.

## Symmetry

Children can identify and describe vertical lines of symmetry on 2D shapes.

## By the end of the year I can...

- draw 2D shapes
- make 3D shapes
- recognise 3D shapes in different positions and describe these
- use angles to describe shape
- use angles to describe a turn
- identify right angles
- I know that two right angles make a half turn
- I know that three right angles make three quarters of a turn
- I know that four right angles complete a turn
- say which angles are greater than or less than a right angle
- identify horizontal lines
- identify vertical lines
- identify pairs of perpendicular lines
- identify parallel lines


## Position and direction

- I can order and arrange objects into patterns
- I can order and arrange objects into sequences
- I can use mathematical words to describe position, direction and movement
- I know what a right angle is
- I can describe a quarter turn
- I can describe a half turn
- I can describe a three - quarter turn
- I can show anti - clock wise

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## Identifying shapes and their properties

## 2D shapes

Circle, triangle, square, rectangle, pentagon, hexagon, octagon, quadrilaterals, rhombus, trapezium, parallelogram, kite

## 3D shapes

Sphere, cube, cylinder, cone, cuboid, rectangular prism, square-based pyramid, triangular based pyramid, tetrahedron

## Vocabulary



## Symmetry

Identify lines of symmetry in 2-D shapes presented in different orientations.

## Identifying shapes and their properties

## Drawing and contructing

Draw 2-D shapes and make 3-D shapes using modelling materials; recognised 3-D shapes in different orientations and describe them.

## Angles

Identify acute and obtuse angles and compare and order angles up to two right angles by size.

Recognise angles as a property of shape or a description of a turn.

Identify right angles, recognise that two right angles make a half- turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angles.

Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.

## Comparing and classifying

Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.

## Year 4

## By the end of the year I can...

- compare and sort quadrilaterals based on their properties and sizes
- compare and sort triangles based on their properties and sizes
- identify acute angles
- identify obtuse angles
- compare angles up to two right angles by size
- order angles up to two right angles by size
- say where the lines of symmetry are in 2D shapes
- complete a symmetrical figure

Position and direction

- I can know how to use co ordinates
- I can describe positions on a grid using co ordinates
- I can use translation to describe movement (left/right; up/down)
- I can plot points on a grid
- I can plot points to draw a shape


## Year 4

## Identifying shapes and their properties

## 2D shapes

Circle, oval, square, rectangle, polygon, pentagon, hexagon, heptagon, octagon, nonagon, decagon, rhombus, kite, trapezium, parallelogram, equilateral triangle, scalene triangle, isosceles triangle, right angled triangle

## 3D shapes

Cube, cuboid, sphere, cone, cylinder, triangular prism, pentagonal prism, hexagonal prism, octagonal prism, square based pyramid, triangular based pyramid

## Vocabulary

sides angles edges vertices faces quadrilaterals regular irregular polygon symmetry parallel perpendicular Angles - acute, obtuse, right angle, reflex

Identifying shapes and their properties

## Symmetry

Identify lines of symmetry in 2-D shapes presented in different orientations.

## Drawing and contructing

Complete a simple symmetric figure with respect to a specific line of symmetry.

## Angles

Identify acute and obtuse angles and compare and order angles up to two right angles by size.

## Comparing and classifying

Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.

## Year

By the end of the year I can...

- identify 3D shapes, from 2D drawings
- know angles are measured in degrees
- estimate acute, obtuse and reflex angles
- compare acute, obtuse and reflex angles
- draw angles
- measure angles in degrees
- identify angles at a point and one whole turn
- identify angles at a point on a straight line and a 1/2 turn
- identify other multiples of 90 degrees
- use the properties of rectangles to find missing lengths and angles
Position and direction
- I can identify, describe and show the position of a shape following a reflection
- I can identify, describe and show the position of a shape following a translation


## Year 5

## Identifying shapes and their properties

## 2D shapes

Circle, oval, square, rectangle, polygon, pentagon, hexagon, heptagon, octagon, nonagon, decagon, rhombus, kite, trapezium, parallelogram, equilateral triangle, scalene triangle, isosceles triangle, right angled triangle

## 3D shapes

Cube, cuboid, sphere, cone, cylinder, triangular prism, pentagonal prism, hexagonal prism, octagonal prism, square based pyramid, triangular based pyramid

## Vocabulary

sides angles edges vertices faces regular irregular quadrilateral parallel perpendicular acute obtuse reflex rightangled degrees equal opposite adjacent

## Identifying shapes and their properties

Identify 3-D shapes, including cubes and other cuboids, from 2-D representations

## Drawing and contructing

Draw given angles, and measure them in degrees ${ }^{\circ}$.

## Angles

Know angles are measured in degrees: estimate and compare acute, obtuse and reflect angles.

Identify:

- Angles at a point and one whole turn (total $360^{\circ}$ ).
- Angles at a point on a straight line and $1 / 2$ a turn (total $180^{\circ}$ ).
- Other multiples of $90^{\circ}$.


## Comparing and classifying

Use the properties of rectangles to deduce related facts and find missing lengths and angles.

Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.

## Yearl

## By the end of the year I can...

- draw 2D shapes using given dimensions and angles
- recognise, describe and build simple 3D shapes, including making nets
- compare and sort shapes based on their properties and sizes
- find unknown angles in any triangle
- find unknown angles in any quadrilateral
- find unknown angles in regular polygons
- name parts of circles; radius, diameter, circumference
- I know that the diameter is twice the radius
- recognise angles where they meet a point
- recognise angles where they are on a straight line
- recognise angles that are vertically opposite
- find missing angles using mathematical reasoning


## Position and direction

- I can describe positions on four quadrants
- I can draw simple shapes on the coordinate plane
- I can translate simple shapes on the coordinate plane
- I can reflect simple shapes in the axes


## Yearl

## Identifying shapes and their properties

## 2D shapes

Circle, oval, square, rectangle, polygon, pentagon, hexagon, heptagon, octagon, nonagon, decagon, rhombus, kite, trapezium, parallelogram, equilateral triangle, scalene triangle, isosceles triangle, right angled triangle

## 3D shapes

Cube, cuboid, sphere, cone, cylinder, triangular prism, pentagonal prism, hexagonal prism, octagonal prism, square based pyramid, triangular based pyramid

## Vocabulary

sides angles edges vertices faces Equilateral right angle isosceles scalene equilateral circumference horizontal vertical diagonal perpendicular parallel opposite equal enlarge radius diameter vertices/ vertex quadrant reflect
$x$ and $y$ axis translate rotate regular/ irregular acute obtuse reflex

## Identifying shapes and their properties

Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.

## Drawing and contructing

Draw 2-D shapes using given dimensions and angles.

Recognise, describe and build simple 3-D shapes, including making nets.

## Angles

Recognise angels where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.

## Comparing and classifying

Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, and regular polygons.

## 2D shapes


circle

kite

pentagon
nonagon decagon

oval

rhombus

hexagon

right-angled triangle

equilateral triangle

heptagon
parallelogram trapezium

octagon


## 3D shapes <br> Portswood Primary School


cube


## cylinder


square based pyramid

triangular prism

pentagonal prism

hexagonal prism

octagonal prism

## Vocabulary

## horizontal

A horizontal line is a line extending from left to right.

A vertical line is a line extending up and down.
diagonal


A straight line joining two opposite corners.
perpendicular
$\stackrel{\downarrow}{\square}$ parallel
$\longleftrightarrow \quad$ Side by side and having the same distance continuously between them.
A straight line at an angle of $90^{\circ}$ to a given line.

Regular shapes have sides and angles that are all equal.

## irregular

Irregular shapes have sides and angles of different measures.

## acute

Acute angles measure less than $90^{\circ}$.

Obtuse angles measure greater than $90^{\circ}$ and less than $180^{\circ}$.

## Vo

Reflex angles measure greater than $180^{\circ}$ and less than $360^{\circ}$

## equilateral



A triangle in which all three sides are the same length.

## isosceles


scalene
An triangle which all sides are of different measure.
enlarge
Make or become larger.

A quadrant are four regions created by the intersection of the $x$-axis and $y$-axis.

## translate

A translation is a type of transformation that takes each point in a shape and slides them in the same distance and direction.

## reflect

A triangle which two sides are of equal measure.

