Year 6 Shape Knowledge Organiser

Lesson sequence:

Learning focus: To measure and calculate angles
Learning focus: To find vertically opposite angles
Learning focus: To find angles in a triangle
Learning focus: To find angles in quadrilaterals and polygons
Learning focus: To identify the circumference, radius and diameter of a circle
Learning focus: To draw shapes accurately
Learning focus: To make and draw nets of 3D shapes

Vocabulary revision (vocabulary I have been taught before)

- Obtuse
- Acute
- Reflex
- protractor
- right angle
- Interior/exterior angles

Surfaces
Vertices
Faces
Edges

Sticky Learning

New knowledge

- To know that a net is an 'opened out' 3D shape
- To know that the radius is the distance from the centre of a circle to the circumference
- To know that the diameter is the straight line passing through the center of a circle meeting the circumference at the other side
- To know that the diameter is twice the radius
- To know that the circumference is the distance all the way round the circle

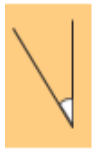
New Skills

- To recognise, describe and build simple 3-D shapes, including making nets
- To illustrate and name parts of circles, including radius, diameter and circumference
- To draw 2-D shapes using given dimensions and angles
- To compare and classify geometric shapes based on their properties and sizes
- To find unknown angles in any triangles, quadrilaterals, and regular polygons
- To recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles

New vocabulary

Radius
Diameter
Circumference
Intersecting
Plane
Arc

Pictorial representations

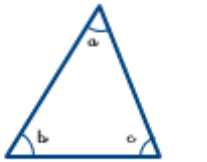


Acute Angles Any angle that measures less than 90° is called an acute angle.

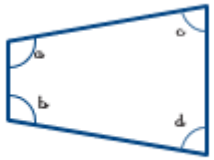
Obtuse Angles Any angle that measures greater than 90° and less than 180° is called an obtuse angle.

Reflex Angles Any angle that measures greater than 180° is called a reflex angle.

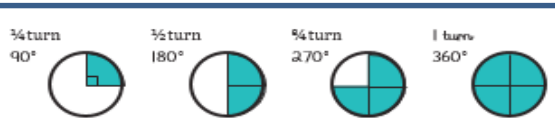
Pictorial representations



$a + b + c = 180°$



$a + b + c + d = 360°$



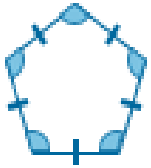
Multiples of 90° can be used as descriptions of a turn.

Angles in Regular Polygons

As the number of sides of a polygon increases by one the total of the interior angles increases by 180°. When n = number of sides this formula can be used to find the size of each angle in a regular polygon:

Sum of Interior Angles = $(n - 2) \times 180°$

Each Angle = $\frac{(n - 2) \times 180°}{n}$

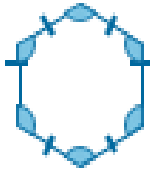


Pentagon

n = 5

$(5 - 2) \times 180° = 540°$

$540° \div 5 = 108°$



Hexagon

n = 6

$(6 - 2) \times 180° = 720°$

$720° \div 6 = 120°$

Properties of 3D Shapes

3D shapes have three dimensions – length, width and depth.

A polyhedron is a 3D shape with flat faces. Spheres, cylinders and cones are not polyhedrons as they have curved surfaces.

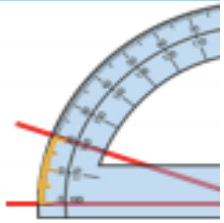
Cube 6 square faces 12 edges 8 vertices	Tetrahedron 4 triangular faces 6 edges 4 vertices	Sphere 1 curved surface 0 edges 0 vertices
Cuboid 6 faces 12 edges 8 vertices	Octahedron 8 faces 12 edges 6 vertices	Triangular prism 5 faces 9 edges 6 vertices
Square-based pyramid faces 8 edges 5 vertices	Cone 1 curved surface 1 curved edge 1 apex	Cylinder 2 circular faces (c 1 curved surface 2 curved edges 0 vertices

Using a Protractor

Place the cross or circle at the point of the angle you are measuring.

Read from the zero on the outer scale of your protractor.

Count the degree lines carefully.

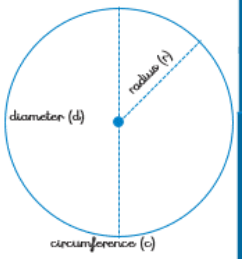


Parts of Circles

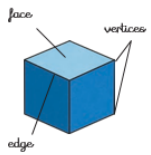
A circle is a 2D shape. The perimeter of a circle is called the **circumference** (c). The distance across the circle, passing through the centre, is called the **diameter** (d).

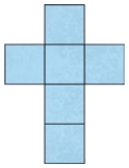
The distance from the centre of the circle to the circumference is called the **radius** (r).

$r \times 2 = d$ $\qquad \frac{d}{2} = r$



Nets of 3D Shapes





A shape net shows which 2D shapes can be folded and joined to make a 3D shape. When you are drawing a net, or solving a problem involving a shape net, think carefully about where the