Key Vocabulary

- angle
- right angle
- acute
- obtuse
- reflex
- protractor
- horizontal
- vertical
- parallel
- perpendicular
- polygon
- regular
- irregular
- two-dimensional
- three-dimensional
- flat face
- curved surface
- edge
- vertex
- vertices
- apex
- radius
- diameter
- circumference

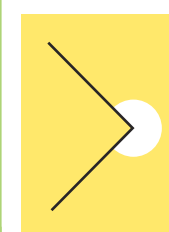## Angle Types
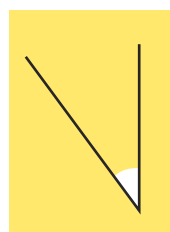
Acute Angles
Any angle that measures less than 90° is called an **acute** angle.

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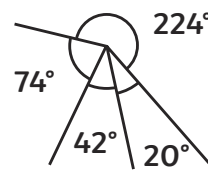Any angle that measures greater than 90° and less than 180° is called an **obtuse** angle.

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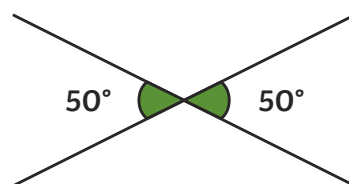Any angle that measures greater than 180° is called a **reflex** angle.

Calculating Angles

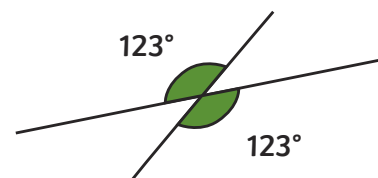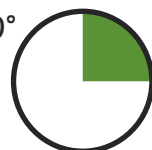117° 63°

Angles on a straight line always total 180°.

224°
74°
42° 20°

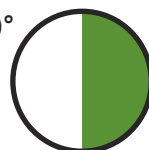**Angles around a point always total 360°.**

50° 50°

123°
123°

Vertically opposite angles are formed when two straight lines cross. Opposite angles that share a vertex are equal.
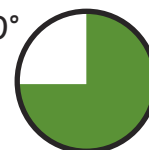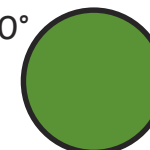
$\frac{1}{4}$ turn
90°

$\frac{1}{2}$ turn
180°

$\frac{3}{4}$ turn
270°

1 turn
360°

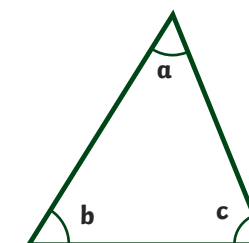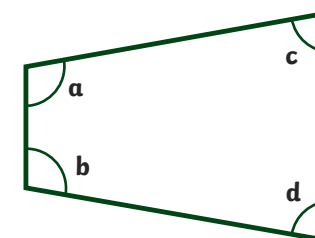**Multiples of 90° can be used as descriptions of a turn.**

Angles in a Triangle

a
b   c

$$a + b + c = 180°$$

a
b
c
d

$$a + b + c + d = 360°$$

twinkl

Properties of Shapes
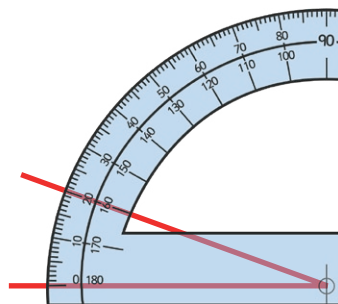
Using a Protractor

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.
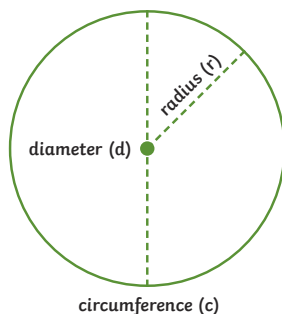
Count the degree lines carefully.

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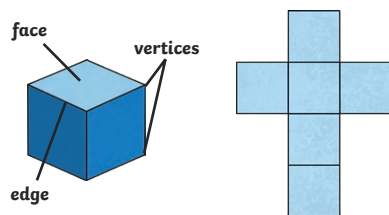
The distance from the centre of the circle to the circumference is called the **radius** (r).

r × 2 = d $\frac{d}{2}$ **= r**

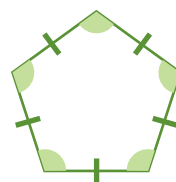## Nets of 3D Shapes

face

vertices

edge

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 edges of the faces meet.

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

Pentagon
n = 5
(5 - 2) × 180° = 540°
540° ÷ 5 = 108°
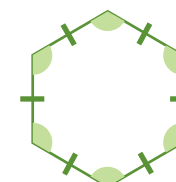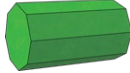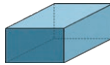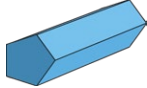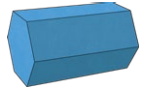
Hexagon
n = 6
(6 - 2) × 180° = 720°
720° ÷ 6 = 120°

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		Tetrahedron		Octagonal prism	
	6 square faces 12 edges 8 vertices		4 triangular faces 6 edges 4 vertices		10 faces 24 edges 16 vertices
Cuboid		Octahedron		Triangular prism	
	6 faces 12 edges 8 vertices		8 faces 12 edges 6 vertices		5 faces 9 edges 6 vertices
Square-based pyramid		Pentagonal prism		Hexagonal prism	
	5 faces 8 edges 5 vertices		7 faces 15 edges 10 vertices		8 faces 18 edges 12 vertices

twinkl