Year 6 **Properties of Shape**

Key Vocabulary
right angle
acute angle
obtuse angle
reflex angle
degrees
angles on straight line
angles around a point
vertically opposite
missing angles
horizontal
vertical
perpendicular
parallel lines
regular polygon
irregular polygon
radius
circumference
diameter
dimensions

3D Shapes and their Properties

Cube	6 faces 8 vertices 12 edges
Cylinder	3 faces 0 vertices 2 edges
Cone	2 faces 0 vertices 1 edge
Triangular Prism	5 faces 6 vertices 9 edges
Tetrahedron	4 faces 4 vertices 6 edges
Hexagonal Prism	8 faces 12 vertices 18 edges
Octahedron	8 faces 6 vertices 12 edges
Cuboid	6 faces 8 vertices 12 edges
Square-based Pyramid	5 faces 5 vertices 8 edges
Sphere	1 face 0 vertices 0 edges
Octagonal Prism	10 faces 16 vertices 24 edges
Pentagonal Prism	7 faces 10 vertices 15 edges

Angles

Acute Angle

An angle measuring more than 0 degrees, but less than 90 degrees.

Obtuse Angle

An angle measuring more than 90 degrees, but less than 180 degrees.

Reflex Angle

An angle measuring more than 180 degrees, but less than 360 degrees.

Angles on a Straight Line

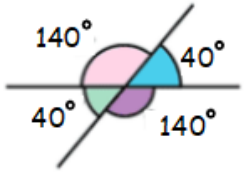
Angles on a straight line always total 180°.

To find the missing angle on a straight line, you have to subtract the angle you have from 180°.

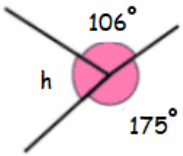
$180° - 74° = 106°$

$c = 106°$

Angles Around a Point



Angles around a point always total 360°.



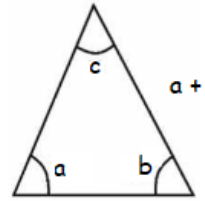
To find the missing angle around a point, you have to subtract the angles you have from 360°.

$175° + 106° = 281°$

$360° - 281° = 79°$

$h = 79°$

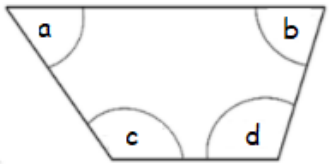
Angles in a Triangle



$a + b + c = 180°$

The internal angles of a triangle always add up to 180°.

Angles in a Quadrilateral



$a + b + c + d = 360°$

The internal angles in a quadrilateral always add up to 360°.

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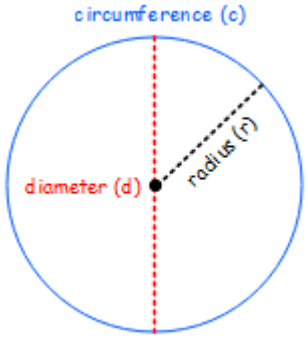
Circles



Circumference (c) : The perimeter of a circle.
Diameter (d) : The distance across the circle, passing thorugh the centre.
Radius (r) : The distance from the centre of a circle to the circumference.

The radius is half the diameter $\frac{d}{2} = r$

The diameter is double the radius $r \times 2 = d$

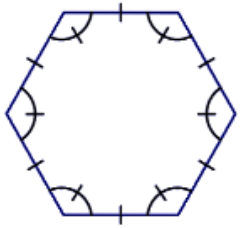
Angles in Regular Polygons

To work out the sum of the internal angles in regular polygons you can subtract two from the number of sides (n) and multiply it by 180°.

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

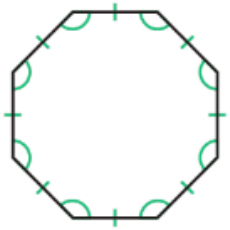
To then work out individual angles you divide the total by the number of sides.

Each Individual Angle = $\frac{(n - 2) \times 180^\circ}{2}$



Hexagon

n = 6
$(6-2) \times 180^\circ = 720^\circ$
$720 \div 6 - 120^\circ$

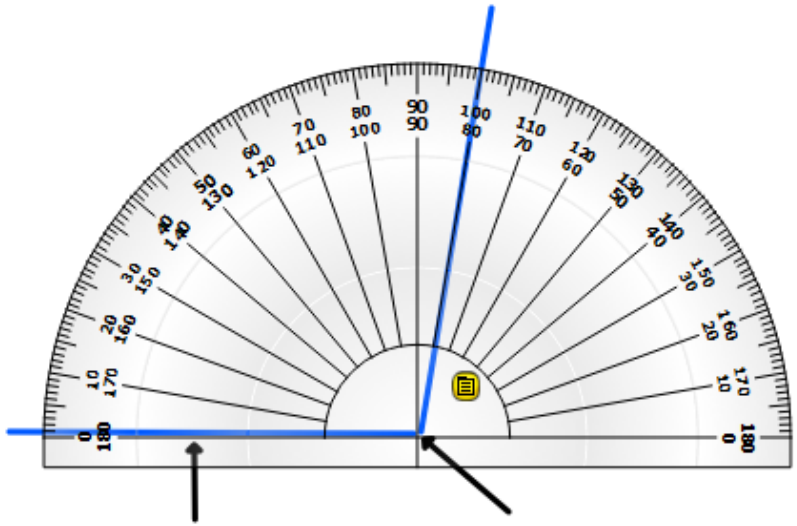


Octagon

n = 8
$(8-2) \times 180^\circ = 1080^\circ$
$720 \div 8 - 135^\circ$

Drawing and Measuring Angles

We use a protractor to draw and measure angles. The numbers on the scale are from 0 - 180° on both sides so look carefully at whether the angle is acute or obtuse to work out which number you need to use.



Make sure the baseline of your protractor lines up with the baseline of the angle.

Place the midpoint of the protractor on the vertex of the angle.