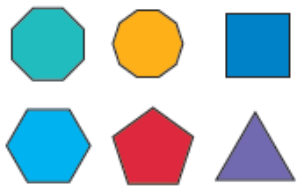
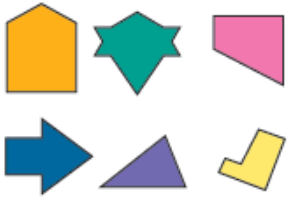
Properties of Shape

Knowledge Organiser

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
- curved edge
- vertex
- apex

Regular and Irregular Polygons

Regular	Irregular
	

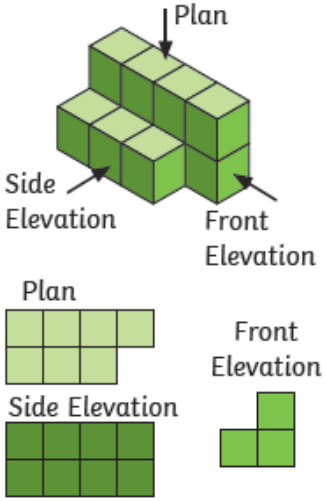
A polygon is any two-dimensional shape formed with straight lines.

In a regular polygon, all the sides and angles are equal.

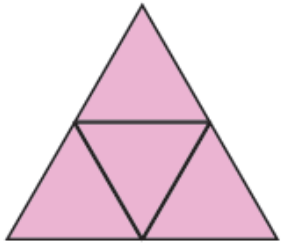
In an irregular polygon, the sides and angles are not equal.

Representations

Cube models can be drawn as 2D representations using different elevations.



A shape net is a 2D drawing of an unfolded 3D shape. When you are drawing or reasoning about shape nets, think carefully about where the edges of the faces meet.



Shape net of a tetrahedron.

Properties of 3D Shapes

Name	Surfaces		Edges		Vertices	Picture
	Flat	Curved	Flat	Curved		
cube	6	0	12	0	8	
cuboid	6	0	12	0	8	
square-based pyramid	5	0	8	0	5	
tetrahedron	4	0	6	0	4	
triangular prism	5	0	9	0	6	
pentagonal prism	7	0	15	0	10	
hexagonal prism	8	0	18	0	12	
octagonal prism	10	0	24	0	16	
octahedron	8	0	12	0	6	

A cone has an apex. This is because a vertex is the point where two straight edges meet and a cone has no straight edges.

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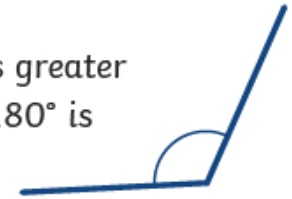
Identifying Angles

Acute Angles

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

Obtuse Angles

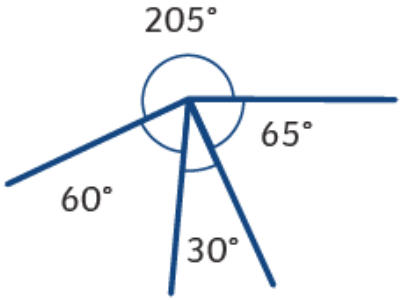
Any angle that measures greater than 90° and less than 180° is called an **obtuse** angle.



Reflex Angles

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

Angles on a straight line always total 180°.



Angles around a point always total 360°.

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

$\frac{1}{4}$ turn – 90°

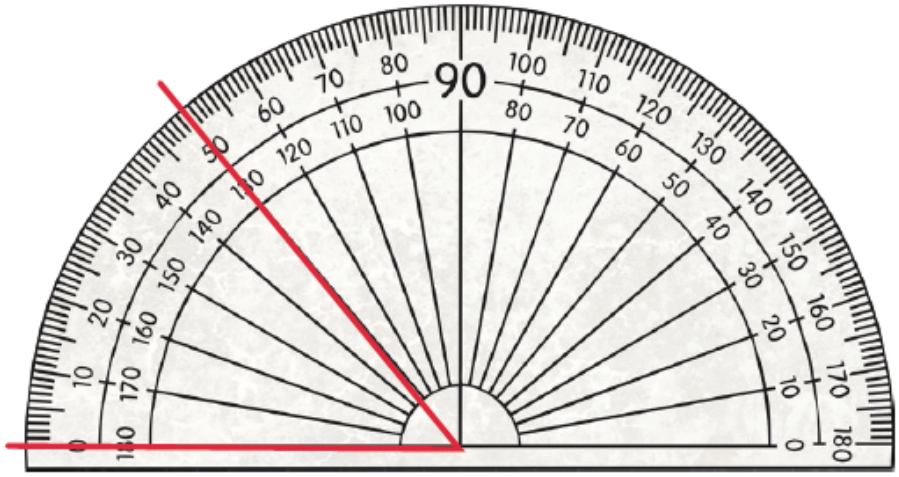
$\frac{1}{2}$ turn – 180°

$\frac{3}{4}$ turn – 270°

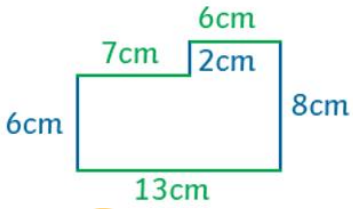
1 turn – 360°

Measuring and Drawing Angles

To measure angles, we use a protractor. Look carefully at how the numbers on the scale count from 0° to 180° in both directions.



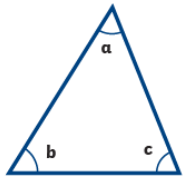
Using Properties of Rectangles



6cm + 2cm = 8cm

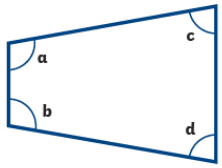
7cm + 6cm = 13cm

Angles in a triangle



a + b + c = 180°

Angles in a quadrilateral



a + b + c + d = 360°