# Properties of Shape

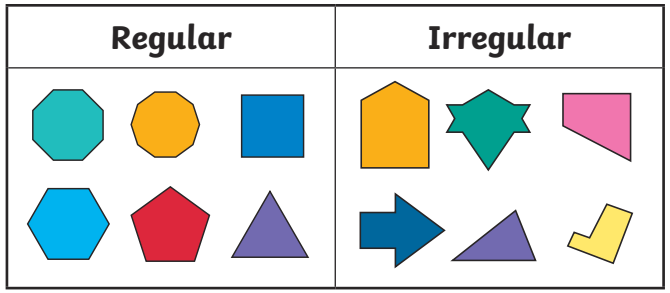
# Knowledge Organiser

## 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



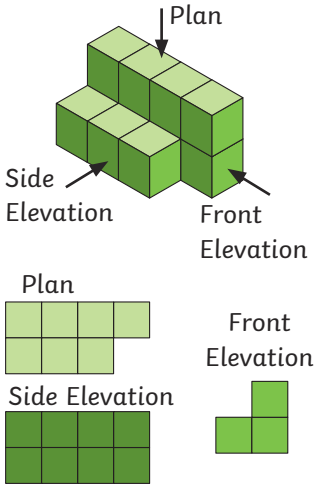

A polygon is any two-dimensional shape formed with straight lines.

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

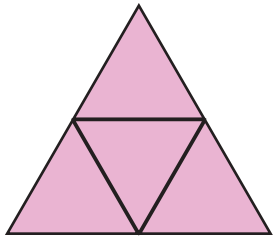
In an irregular polygon, the sides and angles are not equal.

## 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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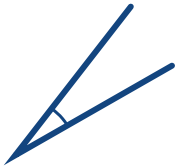
## Identifying Angles

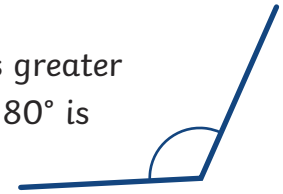
### Acute Angles

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



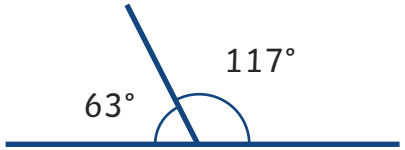
### Obtuse Angles

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

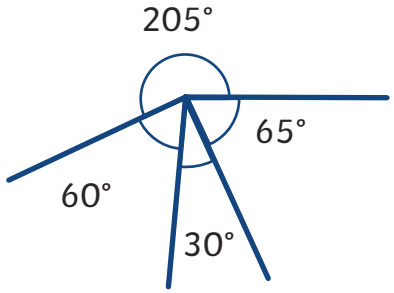


### Reflex Angles

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



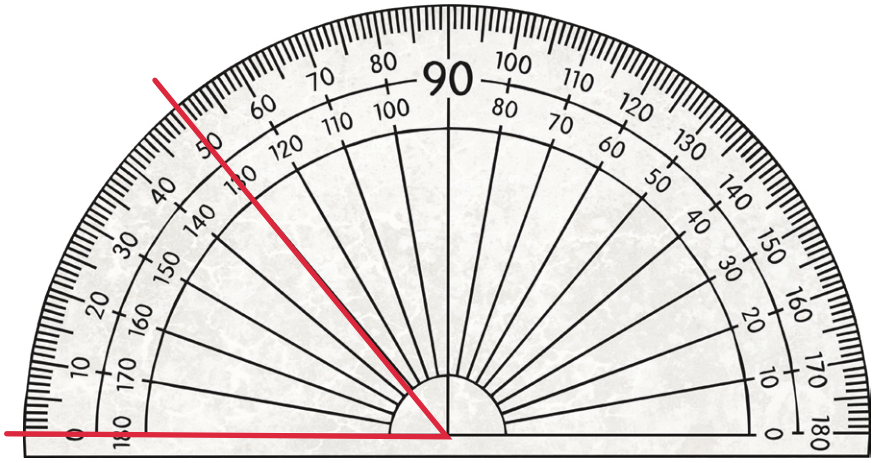

Angles on a straight line always total 180°.



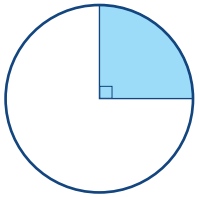

Angles around a point always total 360°.

### Measuring and Drawing Angles

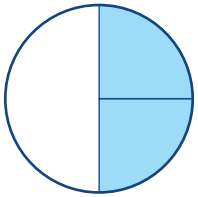
To measure angles, we use a protractor. Look carefully at how the numbers on the scale count from 0° to 180° in both directions.



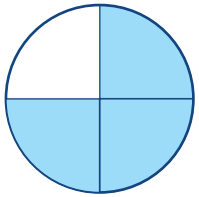
Multiples of 90° can be used as descriptions of a turn.



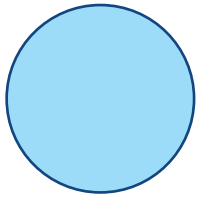
$\frac{1}{4}$ turn = 90°



$\frac{1}{2}$ turn = 180°

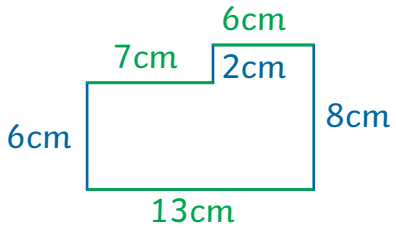


$\frac{3}{4}$ turn = 270°



1 turn = 360°

## Using Properties of Rectangles




6cm + 2cm = 8cm

7cm + 6cm = 13cm