YR6 Knowledge Organiser - Geometry

Key Concepts

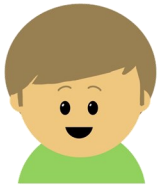
- Recognise, describe and build simple 3D shapes, including making nets
- Compare and classify geometric shapes based on their properties and sizes
- Find unknown angles in any triangles, quadrilaterals and regular polygons
- Recognise angles where they meet at a point, are on a straight line, or are vertically opposite and find missing angles

Key Vocabulary

- 2D / 3D shapes
- nets
- acute / right / obtuse / reflex angle
- vertically opposite angle
- protractor
- compass
- triangle
- quadrilateral
- polygon

3D Shapes

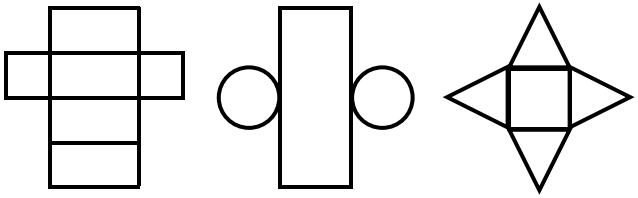
We can apply our knowledge of 3D shapes to recognise and describe their properties, including with everyday objects.



"The cereal box is a cuboid as it has 6 rectangular faces, 12 edges and 8 vertices. The tin of beans is a cylinder as it has 2 flat faces and 1 curved surface."

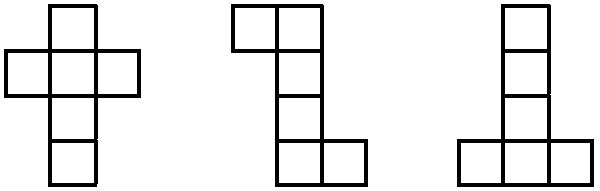
Making Nets

Nets are 2D figures that can be folded to make 3D shapes.



cuboid | cylinder | square-based pyramid

There can be several possible nets for one 3D shape. For example, all of the nets below could be folded to make a cube.



Comparing and Classifying Shapes

We can compare and classify geometric shapes based on their properties, such as:

- regular / irregular
- number of parallel or perpendicular sides
- size of angles

Find Unknown Angles in Triangles

The interior angles of a triangle total 180°. We can use this fact to calculate missing angles.

180° - (78° + 66°) = 36°

a = 36°

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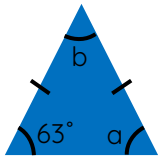
We use hatch marks to show equal side lengths. Recognising the equal lengths helps us to identify the equal angles in isosceles triangles.

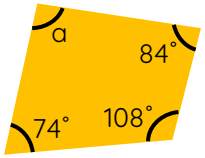


a = 63°

b = 180° - (63° + 63°) = 54°

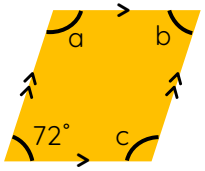
Find Unknown Angles in Quadrilaterals

The interior angles of a triangle total 360°. We can use this fact to calculate missing angles.



a = 360° - (108° + 84° + 74°) = 94°

As with triangles, we can use our knowledge of the properties of shapes, such as parallel lines, to identify the equal angles in quadrilaterals.



b = 72°

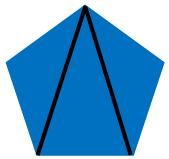
360° - (72° + 72°) = 216°

a = c = 216° ÷ 2 = 108°

Find Interior Angles in Regular Polygons

We can use our knowledge of the interior angles in a triangle to calculate the sum of the interior angles of a regular polygon.

We can partition shapes into triangles from a single vertex, then multiply the number of triangles by 180° to find the sum of their interior angles.

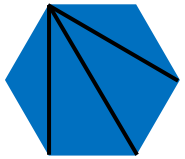


180° × 3 = 540°

The interior angles of a pentagon total 540°.

180° × 4 = 720°

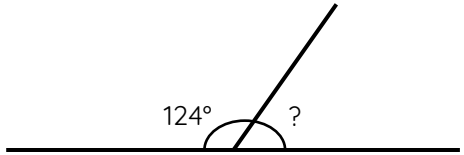
The interior angles of a hexagon total 720°.



"The number of triangles increases by 1 for each extra side. This means a heptagon can be split into 5 triangles. The sum of its interior angles is 180° × 5 = 900°"

Angles on a Straight Line

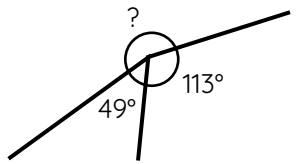
Angles on a straight line have a sum of 180°.



The missing angle = 180° - 124° = 56°

Angles around a Point

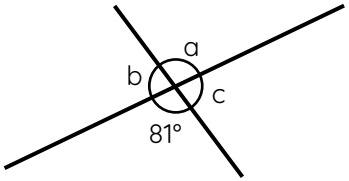
Angles around a point have a sum of 360°.



The missing angle = 360° - (113° + 49°) = 198°

Vertically Opposite Angles

Angles on straight lines must have a sum of 180° and opposite angles are equal on two straight lines that cross.



a = 81°

b = 180° - 81° = 99°

c = 99°