YR5 Knowledge Organiser - Geometry

Key Concepts

- Identify, 3D shapes, including cubes and other cuboids, from 2D representations

- Know angles are measured in degrees; estimate and compare acute, obtuse and reflex angles

- Draw given angles, and measure them in degrees (°)

- Identify:
  - angles at a point and one whole turn (total 360°)
  - angles at a point on a straight line and a turn (total 180°)
  - other multiples of 90°

- Use the properties of squares and rectangles to deduce related facts and find missing lengths and angles

- Distinguish between regular and irregular polygons based on reasoning about equal sides and angles

Key Vocabulary

- 2D / 3D / regular / irregular
- acute / obtuse / reflex angles
- degrees
- protractor
- inside /outside scales

Measuring Angles

Angles have different names depending on their size (measured in degrees).

Type of Angle	Size of Angle
acute	< 90°
right	90°
obtuse	> 90° but < 180°
reflex	> 180° but < 360°

We can also describe angles as fractions of a turn.

> 90° is a quarter turn, 180° is a half turn, 270° is a three-quarter turn and 360° is a full turn.
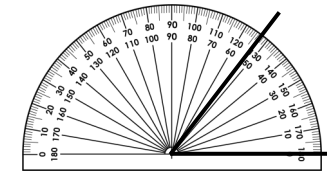
We can use our knowledge of the types of angles to estimate the size of angles.

> This angle is a reflex angle and looks a bit bigger than a half turn therefore a good estimate for its size is 190° .
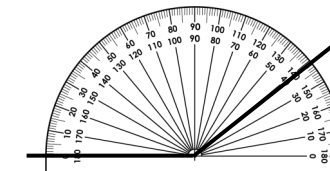
We can measure the size of angles accurately using a protractor. Protractors have 2 scales - an inside scale and an outside scale.

We use the inside scale when the angle opens to the right of the protractor.

> This acute angle is 53° .

We use the outside scale when the angle opens to the left of the protractor.

> This obtuse angle is 141° .

Now, we can compare the measurements.

53˚ < 141˚

Drawing Accurately

We can use our knowledge of measuring angles with protractors to draw angles ourselves.

> One of the 'arms' of the angle must line up with 0°. The point where the lines meet should line up with the mid point of the protractor too.

We can also draw lines accurately to the nearest mm using a ruler. We can combine both skills to create more specific drawings. E.g.
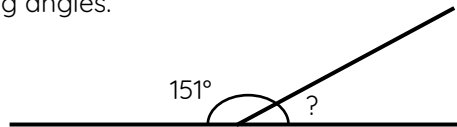
> Draw an obtuse angle that measures 127° with the arms of the angle 3cm and 6mm long."

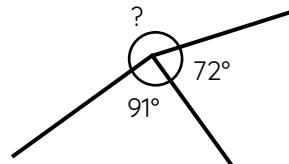# YR5 Knowledge Organiser - Geometry

Angles on a Straight Line

Angles on a straight line have a sum of 180°. We can use this knowledge to help us calculate missing angles.

151° ?

180° - 151° = 29° so the missing angle is 29°.
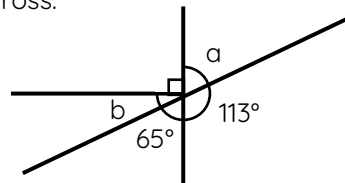
Angles around a Point

Angles around a point have a sum of 360°. We can use this knowledge to help us calculate missing angles.

? 72° 91°

360° - 91° - 72° = 197° so the missing angle is 197°.

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

a b 113° 65°

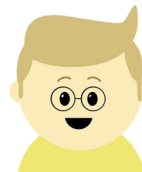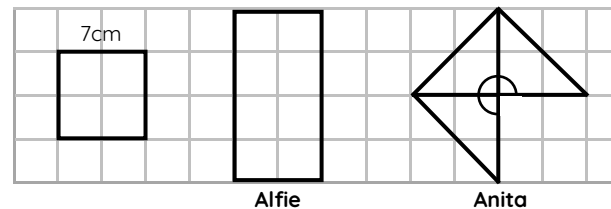$a = 180° - 113° = 67°$

$b = 180° - 90° - 65° = 25°$

Lengths and Angles in Shapes

We can use our knowledge of the properties of squares and rectangles to work out missing lengths or angles in shapes.

7cm

Alfie   **Anita**

"The rectangle must be 7cm wide and 14cm tall because it is the same width as the square but double its length."

"The missing angle is made up of 3 right angles. 90 + 90 + 45 = 225°"
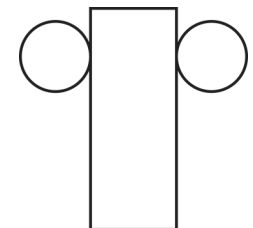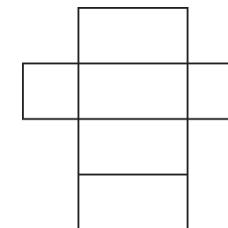
Regular and Irregular Polygons

A shape is regular if its sides and angles are all equal. We can use this knowledge to decide whether shapes are regular or irregular.
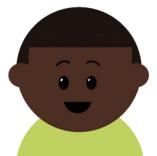
Regular	Irregular

3D Shapes

We can identify 3D shapes from 2D shapes using our understanding of the properties of 3D shapes.

"Net 1 will make a cuboid because its faces are made up of 4 rectangles and 2 squares."

"Net 2 will make a cylinder because it is made up of 1 rectangle which will create a curved surface and 2 circles which will create the flat faces."