# Y10 Maths Knowledge Organiser Foundation Tier: Measures and Scale Drawings

| What must I be able to do? | Key vocabulary | |
|---|---|---|
| **New content:** | Length | The <u>distance</u> from one point to another. |
| ☐ Convert from one metric unit to another | Mass | A measurement of how <u>heavy</u> an object is. |
| ➤ Mathswatch 112 (GCSE) | | |
| ☐ Read and draw scale drawings | Volume | The <u>amount of space</u> that an object occupies. |
| ➤ Mathswatch R6 (KS3) | | |
| ☐ Draw and use nets of 3D shapes | Elevation | A <u>view</u> of a 3D shape when looked at from the <u>side or front</u>. |
| ➤ Mathswatch 44 (GCSE) | | |
| ☐ Draw and read plans and elevations | Plan | A <u>view</u> of a 3D shape when looked at from <u>above.</u> |
| ➤ Mathswatch 51 (GCSE) | | |

## Metric unit conversions

**Mass:** 1000 mg = 1 g

1000 g = 1 kg

1000 kg = 1 tonne

**Volume:** 10ml = 1 cl

1000ml = 1 litre

1000cm$^3$ = 1 litre  (1 cm$^3$ = 1 ml)

1000 litres = 1 m$^3$

1 litre is the amount of water equal to the weight of 1kg ← You don't need to know this fact for your exam!

**Length:** 10 mm = 1 cm

100 cm = 1 m

1000 m = 1 km

If you need to convert between imperial units you will be given the conversion e.g. miles to yards, pounds to ounces.

These are conversions for metric to imperial units which you will sometimes use but they are given in an exam if needed.

5 miles ≈ 8 km          4.5 litres ≈ 1 gallon          2.2 pounds (lb) ≈ 1 kg          1 inch ≈ 2.5 cm

## Map Scales

A map scale is usually given as a ratio e.g. 1 : 100000

This would mean that for each cm on the map, it represents 100,000 cm (or 1km) in real life.

If you knew the distance in real life you would divide by 100,000 to find the distance on the map.

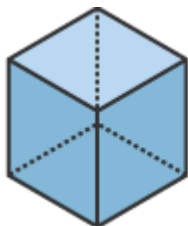If you measured a distance on the map, you would multiply it by 100,000 to find the distance in real life.

Other examples: 1 : 50000   1 cm on the map is 50,000 cm in real life (or 0.5 km)

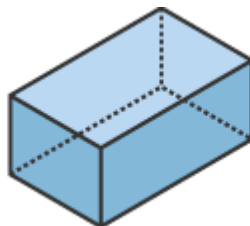1 : 100      1 cm on the map is 100cm in real life (or 1 m)
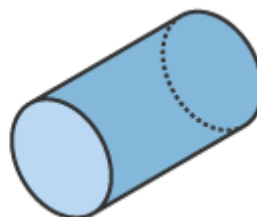
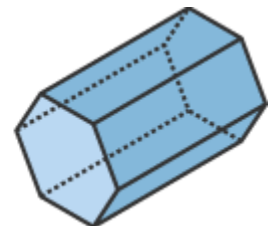## Names of 3D Shapes

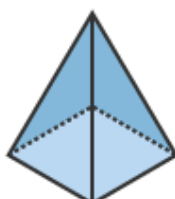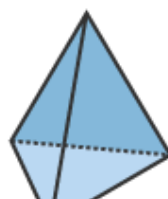Sphere          Cube          Cuboid          Cylinder          Hexagonal Prism
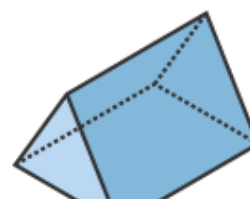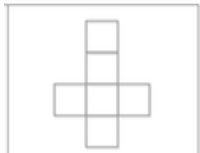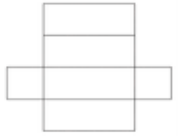
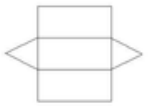Cone     Square Based Pyramid          Tetrahedron          Triangular Prism
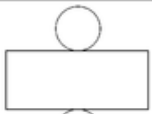
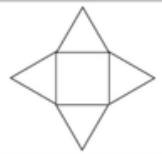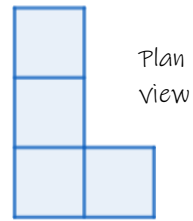Cubes and cuboids are also examples of prisms
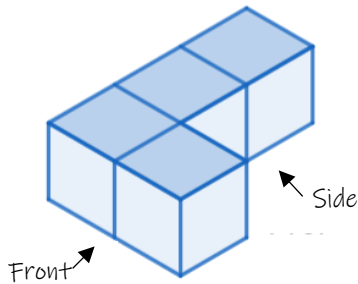
Cube

Cuboid

Triangular Prism

Cylinder

Square Based Pyramid

## Plans and Elevations

Plan view

Side

Front
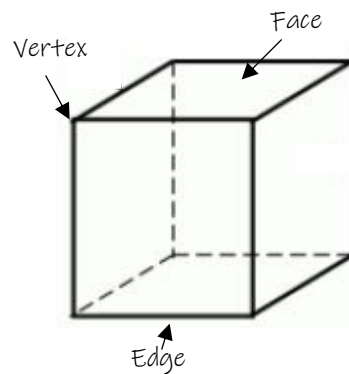
Front elevation

Side elevation

## Properties of 3D Shapes

Vertex

Face

Edge

A cube has:

6 faces        12 edges        8 vertices

There is a famous formula known as Euler's formula (pronounced Oy-ler).

It states that for all 3D shapes which have flat faces and straight edges:

Faces + Vertices = Edges + 2

So for the cube,   6 + 8 = 12 + 2

# GLUE

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