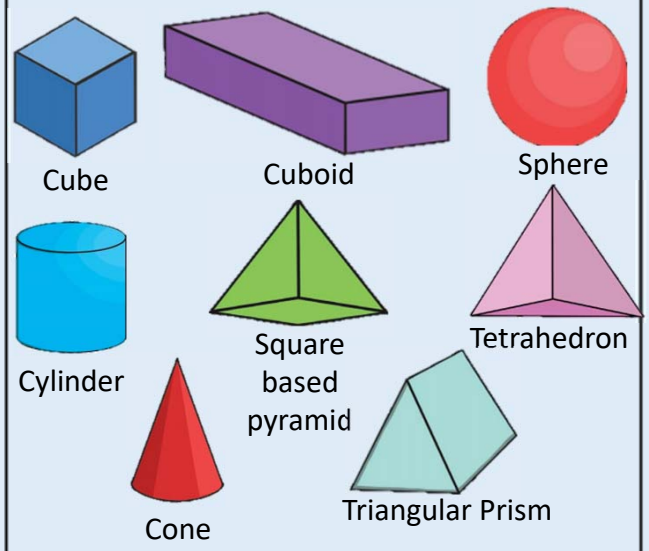
Mathematics	Constructing in 2 and 3 Dimensions	Year 9	Term 2

1. Cube Numbers

$1^3 = 1$	$7^3 = 343$
$2^3 = 8$	$8^3 = 512$
$3^3 = 27$	$9^3 = 729$
$4^3 = 64$	$10^3 = 1000$
$5^3 = 125$	$11^3 = 1331$
$6^3 = 216$	$12^3 = 1728$

2. 3D Shapes



3. Geometric Language

Faces - the flat surfaces on a solid 3D shape.

Vertex - a corner where two or more line segments meet. A vertex can be on a 2D or 3D shape.
The plural of a vertex is **vertices**

Edge - a line segment that joins two vertices together

Prism - a 3D shape that has identical end faces, flat faces and the same cross section all along its length
e.g. a cube is a prism, but a tetrahedron is not

The **cross section** of a prism is the shape revealed by a straight cut through it
e.g. the cross section on a cube is a square

Polygons - 2D shapes made up only of straight sides

Plan view - the view of an object from above it

Side elevation - looking at an object from a side

Front elevation - looking at an object from the front

4. Volume and Surface Area

Volume - the amount of space that a 3 dimensional object takes up
To find the **volume** of a **prism** you multiply the area of the **cross section** by the depth

Volume is measured in **cubic** units e.g. cm^3

Surface area - the total area of all faces of a 3 dimensional shape.

Surface area is measured in square units e.g. m^2

Net - a pattern made up of polygons that you can cut and fold to make a model of a solid shape.

A net can be used to calculate the surface area of a 3D shape.

5. Congruency

Congruent - shapes that are exactly the same size. They have equal sides and angles but may have a different orientation.

We mostly look at congruent triangles.
To prove that two triangles are congruent you must use one of the four reasons:

SSS (Side Side Side) – All the sides are the same size.

ASA (Angle Side Angle) – An angle, a side, and another angle are the same size

SAS (Side Angle Side) – A side, an angle and another side are the same size

RHS (Right angle Hypotenuse Side) – There is a right angle and the hypotenuse and another side are the same size.

6. Constructions

Locus - a path of points that follow a rule
e.g. are a set distance from a point

Loci - the plural of locus

Equidistant - points are the same distance from a point

Bisecting - an angle or a line is to cut it into two equal parts

Perpendicular – lines that intersect at a right angle

Some examples of constructions are:
- An angle bisector
- A perpendicular bisector
- Perpendicular line from a point
- Constructing different types of triangles