Y10 FOUNDATION HT3B2 Volumes and Surface Areas of Prisms & Curved Shapes and Pyramids

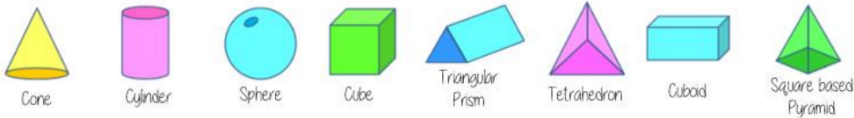## What do I need to be able to do?

By the end of this unit you should be able to:
- Name 2D & 3D shapes
- Recognise Prisms
- Sketch and recognise nets
- Draw plans and elevations
- Find areas of 2D shapes
- Find Surface area for cubes, cuboids, triangular prisms and cylinders
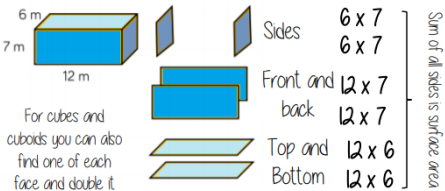- Find the volume of 3D shapes

Keywords

2D: two dimensions to the shape e.g. length and width
3D: three dimensions to the shape e.g. length, width and height
Vertex: a point where two or more line segments meet
Edge: a line on the boundary joining two vertex
Face: a flat surface on a solid object
Cross-section: a view inside a solid shape made by cutting through it
Plan: a drawing of something when drawn from above (sometimes birds eye view)
Perspective: a way to give illustration of a 3D shape when drawn on a flat surface.

Name 3D shapes

Cone   Cylinder   Sphere   Cube   Triangular Prism   Tetrahedron   Cuboid   Square based Pyramid

Surface area

Sketching nets first helps you visualise all the sides that will form the overall surface area

Sides	6×7
Sides	6×7
Front and back	12×7
Front and back	12×7
Top and	12×6
Bottom	12×6

Sum of all sides is surface area

For cubes and cuboids you can also find one of each face and double it

For other shapes = not all the sides are the same, so calculate them individually

Surface area – cylinders

The area of the circle
$\pi \times radius^2$

The width of this face is the same as the circumference
$\pi \times diameter \times height$

Circumference

$$2 \times \pi \times radius^2 + \pi \times diameter \times height$$
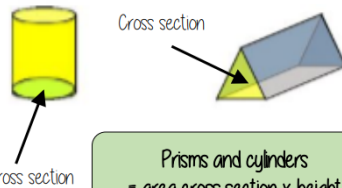
Volumes

Volume is the 3D space it takes up — also known as capacity if using liquids to fill the space

Counting cubes

Some 3D shape volumes can be calculated by counting the number of cubes that fit inside the shape.
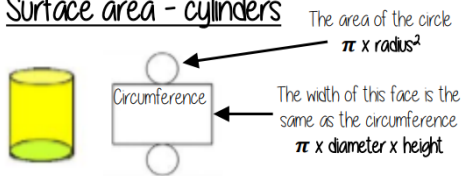
Cubes/ Cuboids = base x width x height

Remember multiplication is commutative

Cross section

Cross section

Prisms and cylinders = area cross section x height

Height can also be described as depth

Areas – square units
Volumes – cube units

Areas and volumes can be left in terms of pi π

Missing:

Sectors

Pyramids

Cones

Spheres