Year 8 Unit 5
3D Geometry

PROPERTIES OF 3D SOLIDS

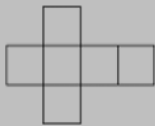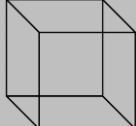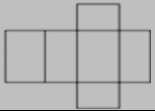|	
surface	the **outside layer** of an object, it has an **area** and **can be flat or curved**
face	any of the **individual flat surfaces** of a **solid object**
edge	for a 3D shape, the **line segment** where **two faces** meet
vertex (vertices)	for a 3D shape, the **point** where **two or more edges meet**, a **corner**
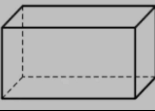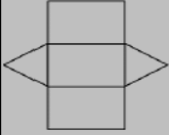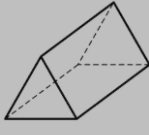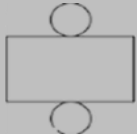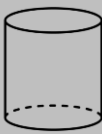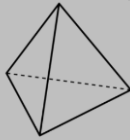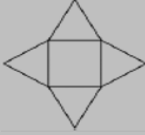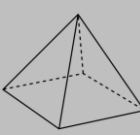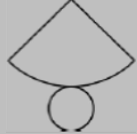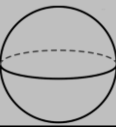
2D REPRESENTATIONS OF 3D SHAPES

plan	a **2D view** of a **3D solid** as viewed **from above**, birds-eye view
elevation	the **2D view** of a **3D solid from** the **front** or the **side**
net	a **pattern** that you can **cut** and **fold** to make a **model** of a 3D shape

VOLUME

volume	the amount of **space a 3D shape** takes up	
volume units	mm³, cm³, m³...	
prism	volume = **area of cross section x length**	
cube	volume = **one side cubed** (or, **area of square x length of prism**)	$V = l^3$
cuboid	volume = **area of rectangle x length of prism**	$V = lbh$
triangular prism	volume = **area of triangle x length of prism**	$V = \frac{lbh}{2}$
cylinder	volume = **area of circle x length of prism**	$V = \pi r^2 h$
pyramid	volume = $\frac{1}{3}$ x area of cross section x length	
square based pyramid	volume = $\frac{1}{3}$ x area of **square base x height of pyramid**	$V = \frac{lwh}{3}$
cone	volume = $\frac{1}{3}$ x area of circle **base x height of cone**	$V = \frac{\pi r^2 h}{3}$
sphere	$V = \frac{4}{3}\pi r^3$	

3D SOLIDS

prism	a **3D solid** with a **consistent cross section**	
cube	6 faces 12 edges 8 vertices	
cuboid	6 faces 12 edges 8 vertices	
triangular prism	5 faces 9 edges 6 vertices	
cylinder	3 faces 2 edges no vertices	
pyramid	a **solid three-dimensional shape** with a **polygon base**, and **triangular faces** that **meet** at the **apex** (a vertex)	
triangular based pyramid (tetrahedron)	4 faces 6 edges 4 vertices	
square based pyramid	5 faces 8 edges 5 vertices	
cone	2 faces 1 edge 1 vertex	
sphere	1 face no edges no vertices	

SURFACE AREA

surface area	the **total area** of all the **surfaces** on a **3D shape**	
surface area method	find the **area of each face** separately, then **add** them together	
surface area of a sphere	$A = 4\pi r^2$	
surface area of a cone	curved surface area = $\pi r l$ circle base area = πr^2 **add** these together	