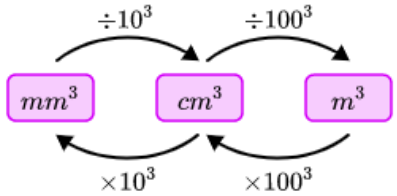
Year 10 Higher Unit 2 Knowledge Organiser – 3D Forms, Volume, Cylinders, Cones and Spheres, Accuracy and Bounds

3D Forms		
1	Prism	A solid object with identical faces at each end. The cross-section is the same all along its length.
2	Three-dimensional (3D) shape	A shape with three dimensions, width, height and length.
3	Cube	A 3D shape with 6 identical square faces.
4	Cuboid	A prism with 6 sides, all the faces are rectangles.
5	Cylinder	A prism where the cross section is a circle.
6	Pyramid	A 3D shape with sloping sides that meet in a point at the top.
7	Sphere	A round 3D shape with every point at equal distance from the centre.
8	Cone	A 3D object that has a circular base joined to a point by a curved face.
9	Hemisphere	A 3D shape that is one half of a sphere.
10	Frustum	A cone or pyramid with the top cut off.
Properties of 3D shapes		
1	Face	Any flat surface of a 3D shape.
2	Edge	Where two faces meet.
3	Vertex	A point where two or more edges meet.
4	Net	A Pattern of 2D shapes you can fold to make a 3D shape.
Volume and Surface Area		
1	Volume	The amount of space inside a shape.
2	Volume of a prism	area of the cross section x length
3	Volume of a cuboid	base x width x length
4	Volume of a cylinder	$\pi r^2 x\ length$
5	Volume of a pyramid	$\frac{1}{3} \times area\ of\ the\ base\ \times height$
6	Surface Area	The total area of all faces of a 3D shape.
7	Surface area of a cylinder	$2\pi r^2 + \pi dh$

Metric Units		
1	Convert between metric units of volume	
2	Convert between measures of volume and capacity	$1l = 1000cm^3$
		$1ml = 1cm^3$
		$1000l = 1m^3$

Limits of Accuracy			
1	Round	To make a number simpler but keep its value close to what it was.	
2	First significant figure	The first non-zero digit in a number.	
3	Significant figure	Any digit after the first significant figure.	
4	Truncate	To miss off digits of a number, past a certain point.	
5	Estimate	To make an educated guess of the value of a calculation by rounding each number to one significant figure.	
6	Lower Bound (LB)	The smallest value that would round up to a give you a rounded number.	
7	Upper Bound (UB)	The largest value that would round down to give you a rounded number.	
8	Error Interval	The range of values that round to a give you a rounded number.	LB ≤ n < UB
9	Overestimate	Where the value of the estimation is greater than the real calculation.	
10	Underestimate	Where the value of the estimation is lower than the real calculation.	

Calculating with Bounds			
1	Addition	Upper bound	$A_{UB} + B_{UB}$
		Lower bound	$A_{LB} + B_{LB}$
2	Subtraction	Upper bound	$A_{UB} - B_{LB}$

		Lower bound	$A_{LB} – B_{UB}$
3	Multiplication	Upper bound	$A_{UB} \times B_{UB}$
		Lower bound	$A_{LB} \times B_{LB}$
4	Division	Upper bound	$A_{UB} \div B_{LB}$
		Lower bound	ALB $\div B_{UB}$