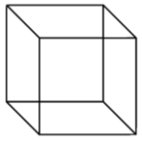
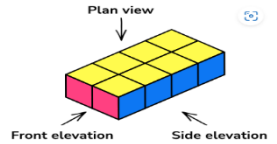
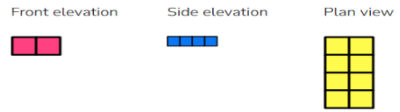
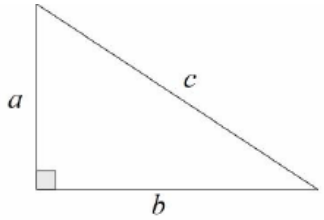
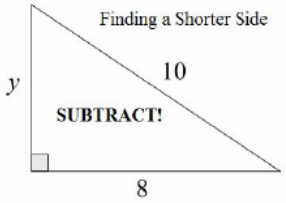
Knowledge Organiser - Mathematics 3D shapes, Pythagoras' Theorem, Ratio

	Topic	Information	Examples	Sparx clip
1	**Representations of 3D shapes**	**Faces = flat surfaces** **Edges = sides/lengths** **Vertices = corners** **Plans and elevations** are a way of representing a 33-dimensional object. We have three views of the 33D shape: • From the **front** of the shape, called the **front elevation** • From the **side** of the shape, called **side elevation** • From above **looking down** on the shape, called the **plan view.**	 A cube has 6 faces, 12 edges and 8 vertices.  	U719, U743.
2	**Pythagoras' Theorem in 2D**	For any **right angled triangle**  Used to find **missing lengths.** **a** and **b** are the shorter sides, **c** is the **hypotenuse** (**longest side**). $a^2 + b^2 = c^2$	 $a = y,\ b = 8,\ c = 10$ $a^2 = c^2 - b^2$ $y^2 = 100 - 64$ $y^2 = 36$ $y = 6$	U851, U385, U325.
3	**Ratio**	**Simplifying ratios** is a way of using **common factors** to divide all the numbers in a ratio until they cannot be divided further. **Dividing ratios** is a way of sharing a quantity in given **parts** of a ratio.	Simplify 45 : 75 HCF of (45, 75) = 15 45 : 75 = 45 ÷ 15 : 75 ÷ 15 = 3 : 5 . Share the amount £120£120 in the ratio 1:4.1:4. **Add the parts of the ratio together.** 1+4=5 **Divide the quantity by the sum of the parts.** 120÷5=24 **Multiply the share value by each part in the ratio.** 24×1=£2424×4=£96 Answer, £24:£96	U529, U687, U577.
4	**Ratio word problems**	**Ratio problem solving** is a collection of **word problems** that link together aspects of **ratio and proportion** into more **real life** questions. This requires you to be able to take key information from a question and use your knowledge of ratios (and other areas of the curriculum) to solve the problem.	For example A bag of sweets is shared between boys and girls in the ratio of 5 : 6. Each person receives the same number of sweets. If there are 15 boys, how many girls are there? (18)	U926, U721, U357, U610