Knowledge Rich Curriculum Plan

Year 11 Higher+ Geometry 1

Lesson/Learning Sequence	Intended Knowledge: *Students will know that...*	Tiered Vocabulary	Steps to Success	Prior Knowledge: *In order to know this...*	Feedback
To learn how to solve problems using Pythagoras' theorem in 3D	• Students will know how to calculate missing lengths in 3D shapes using Pythagoras' theorem	**Hypotenuse** – the longest side in a right-angled triangle. It can always be found opposite the right angle **Theorem** – a statement that has been proved, or can be proved	•	• Students will need to be confident using Pythagoras' theorem to find missing lengths in right angled triangles	
To learn how to solve problems using SOHCAHTOA in 3D	• Students will know how to calculate missing lengths and angles in 3D shapes using Pythagoras' theorem and SOHCAHTOA	**Trigonometry –** Relationships between side lengths and angles of triangles **Hypotenuse** – the longest side in a right-angled triangle. It can always be found opposite the right angle **Adjacent** – next to, in maths the adjacent side in a right-angled triangle is the side that is adjacent to the angle, forming the angle with the hypotenuse **Opposite** – for right angled triangles the opposite is the side opposite the angle that we know or are trying to find.	•	• Students need to be able to calculate missing lengths and angles in right angled triangles using SOHCAHTOA	
To learn how to use the Sine rule	• Students will know that the sine rule for missing sides is $$\frac{a}{SinA} = \frac{b}{SinB} = \frac{c}{SinC}$$ • Students will know that the sine rule for missing angles is $$\frac{SinA}{a} = \frac{SinB}{b} = \frac{SinC}{c}$$ • Students will know that we use the Sine rule with non-right-angled triangles where we know or can find a complete pair of opposites where we know both a side and the opposite angle • Students will know how to find missing lengths using the Sine rule • Students will know how to find missing angles using the Sine rule • Students will know how to solve more complex problems using the Sine rule		•	• Students need to know how to solve equations involving fractions • Students need to know how to find missing lengths and angles using SOHCAHTOA	
To learn how to use the Cosine rule	• Students will know that the cosine rule for missing sides is $$a^2 = b^2 + c^2 - 2bcCosA$$ • Students will know that the cosine rule for missing angles is $$CosA = \frac{b^2 + c^2 - a^2}{2bc}$$ • Students will know that we use the Cosine rule with non-right-angled triangles when		•	• Students need to know how to use the sine rule to find missing sides and angles • Students need to know how to substitute numbers into formulae	

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	we do not have or cannot find a complete pair of opposites and instead we know two sides and the included angle (and are asked to find the third side) or we know all three sides (and are asked to find an angle) • Students will know how to use the cosine rule to find missing sides and angles • Students will know how to solve multi-step problems using the cosine rule and also the sine rule where necessary				
To learn how to calculate the area of a triangle using sine	• Students will know that we use the formula below to calculate the area of a triangle when we do not know the base and perpendicular height but instead know or can find two sides and the included angle in a non-right-angled triangle $$Area\ of\ a\ triangle = \frac{1}{2}abSinC$$ • Students will know how to calculate the area of a triangle using the formula • Students will know how to work backwards to find missing lengths given the area of a triangle, a length and an angle • Students will know how to work backwards to find a missing angle given the area of a triangle and two lengths • Students will know how to solve multi-step problems involving the sine and cosine rules and area of a triangle formulae • Students will know how to calculate the area of a segment		•	• Students need to know how to calculate the area of a triangle without sine	
To learn and use the exact trig values	• Students will know the exact trig values for sin(0), cos(0), tan(0), sin(30), cos(30), tan(30), sin(45), cos(45), tan(45), sin(60), cos(60), tan(60), sin(90), cos(90) • Students will know that tan(90) has no value • Students will know how to use the exact trig values to solve problems involving trigonometry		•	• Students will need to know how to rationalise denominators • Students will need to know how to solve SOHCAHTOA problems and use Pythagoras' Theorem	