The Sutton Academy

Knowledge Rich Curriculum Plan

Year 10 Higher+ Geometry 3

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 apply the circle theorems	• Students will know that the angle at the centre of a circle is double the angle at the circumference • Students will know how to prove this circle theorem using isosceles triangles	**Theorem –** a statement that has been proved, or can be proved **Circumference –** the perimeter of a circle	**Steps to Success** The angle at the centre is double the angle at the circumference	• Students need to be able to label parts of a circle, e.g. radius, diameter, etc. • Students will need to know how to find missing angles in isosceles triangles	Exam Prep 6
To learn how to apply the circle theorems	• Students will know that the angle in a semi-circle is 90 degrees • Students will know how to prove this circle theorem using isosceles triangles. They will also understand how this links to the first circle theorem (the angle at the centre is double the angle at the circumference).		**Steps to Success** Students will know that the angle in a semi-circle is 90 degrees	• Students will need to know how to find missing angles in isosceles triangles	Exam Prep 6
To learn how to apply the circle theorems	• Students will know that angles in the same segment are equal • Students will know how to prove this circle theorem using the theorem that the angle at the centre is double the angle at the circumference	**Segment –** a region bounded by a chord and a corresponding arc lying between the chord's endpoints	**Steps to Success** • Students will know that angles in the same segment are equal	• Students need to know the angle sums of triangles and quadrilaterals. • Students need to be able to label parts of a circle, e.g. radius, diameter, etc. • Students need to know angle facts such as angles on a line, angels in parallel lines, etc.	Exam Prep 6
To learn how to apply circle theorems	• Students will know that the opposite angles of a cyclic quadrilateral add to 180° • Students will know how to prove this circle theorem using the theorem that the angle at the centre is double the angle at the circumference	**Cyclic Quadrilateral –** a quadrilateral whose vertices all lie on a single circle	**Steps to Success** • Students will know that the opposite angles of a cyclic quadrilateral add to 180° • Alternate segment theorem.	• Students need to know the angle sums of triangles and quadrilaterals. • Students need to be able to find missing angles within isosceles triangles. • Students need to be able to label parts of a circle, e.g. radius, diameter, etc. • Students need to know angle facts such as angles on a line, angels in parallel lines, etc.	Exam Prep 6
To learn how to calculate missing sides and angles using the sine rule	• Students will know the sine rule to find missing lengths to be $\frac{a}{SinA} = \frac{b}{SinB}$ • Students will know the sine rule to find missing angles to be $\frac{SinA}{a} = \frac{SinB}{b}$ • Students will know how to find missing sides with the sine rule • Students will know how to find missing angles with the sine rule • Students will know that we use the Sine rule for non-right angled triangles when we have a pair of opposites (side and a corresponding angle)		**Steps to Success** **Steps to Success – The Sine Rule** **Step 1:** Label the sides of the triangles with lower case a, b, and c and label the angle opposite each side with the corresponding capital letter. **Step 2:** Identify whether you are using the formula for angles or sides and write this out	• Students need to be able to substitute into and rearrange formulae. • Students need to be able to label triangles and right-angle triangles. • Students need to be able to use all four operations.	

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	• Students will know that for all of the further trig formulae we use capital letters (A, B and C) to label the angles and that the side opposite each angles is labelled as the lower case letter that corresponds with the angle (A is opposite a, B is opposite b and C is opposite c) • Students will know how to solve problems using the sine rule		**Step 3:** Substitute the sides and angles into the formula **Step 4:** Solve the resulting equation to find either the side or sin(x) where x is the angle you are trying to find **Step 5:** If you are trying to find an angle, using the inverse of sine (sin^{-1})		
To learn how to calculate missing sides and angles of a triangle using the cosine rule	• Students will know the cosine rule to find missing angles to be $a^2 = b^2 + c^2 - 2bc\ cos(A)$ • Students will know the cosine rule to find missing angles to be $CosA = \frac{b^2+c^2-a^2}{2bc}$ • Students will know that we use the Cosine rule to find a missing side for non-right-angled triangles when we know two sides and the included angle • Students will know that we use the Cosine rule to find missing angles when we know all three sides for the triangle but no angles • Students will know how to use the cosine rule to find missing sides and angles • Students will know how to solve problems using the cosine rule • Students will know how to use the sine rule and cosine rule together to solve multi-step problems		<u>Steps to Success – The Cosine Rule</u> • **Step 1:** Label the angle you know (or are trying to find) as A. Label the side opposite A lowercase a. Label the other sides b and c and the angles opposite B and C (it doesn't matter which way around). • **Step 2:** Identify whether you are using the formula for angles or sides and write this out • **Step 3:** Substitute the sides and angles into the formula • **Step 4:** Solve the resulting equation to find either the side or cos(x) where x is the angle you are trying to find • **Step 5:** If you are trying to find an angle, using the inverse of cos (cos^{-1}) •	• Students need to be able to substitute into and rearrange formulae. • Students need to be able to label triangles and right-angle triangles. • Students need to be able to use all four operations.	
To learn how to calculate the area of a triangle using Sine	• Students will know how to calculate the area of a triangle using the formula $Area = \frac{1}{2}abSinC$. • Students will know how to use the inverse of $Area = \frac{1}{2}abSinC$ to find a missing length or angle when given the area of a triangle. • Students will know how to solve multi-step problems involving the sine rule, cosine rule and area of a triangle formula.		• <u>Steps to Success – Area of a Triangle</u> • **Step 1:** Label the angle you know in the triangle as 'C' and the opposite side 'c'. Label the other sides as a and b and the angles opposite them A and B. It doesn't matter which way around you label a and b. • **Step 2:** Substitute the sides and angles into the formula • **Step 3:** Solve the resulting equation to find the area or missing side/angle you have been asked to find given the area. • (If you are trying to find an angle, using the inverse of sin (sin^{-1})) •	• Students need to know how to find the area of a triangle and understand height is the perpendicular height. • Students need to be able to substitute into and rearrange formulae.	

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To learn how to solve multi-step problems involving triangles	• Students will know which formula is appropriate to use in different scenarios • Students will know how to solve problems using the different trig formulae		•	• Students need to know how to use SOHCAHTOA, the sine rule, the cosine rule and 1/2absinC.	