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**Knowledge Rich Curriculum Plan**

Year 10 Higher – Geometry 2

| **Lesson/Learning Sequence**  | **Intended Knowledge:***Students will know that…* | **Tiered Vocabulary**  | **Prior Knowledge:***In order to know this, students need to already know that…* | **Assessment**  |
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| **To learn how to solve problems involving perimeter and area** | * Students will know how to solve problems involving perimeter and area of compound shapes (not including trapezia)
 | **Perimeter –** the distance around the outside of a shape**Compound -** a thing that is composed of two or more separate elements.**Area –** the amount of space inside a 2D shape**Quadrilateral –** a four-sided shape | * Students should already know how to calculate the perimeter of a compound shape
* Students should already know how to calculate the area of rectangles, squares, parallelograms and triangles
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| **To learn how to calculate the area of a trapezium** | * Students will know how to calculate the area of a compound shapes, by separating and calculating the areas of the more basic shapes.
* Students will know how to use inverse operations to find the missing lengths of shapes when given the area. Students will know that to calculate the a missing side when given the area, you do the opposite operation (divide).
* Students will know how to solve real life problems involving area
* Students will know that the formula for the area of a trapezium is $\frac{1}{2}\left(a+b\right)h$where a and b are the parallel sides and h is the height of the trapezium
* Students will know how to calculate the area of a trapezium
* Students will know how to calculate the area of compound shapes involving trapezia
* Students will know how to solve worded problems involving the area of a trapezium
* Students will know how to work backwards to find missing lengths given the area of a trapezium
 | **Trapezium –** a quadrilateral with one pair of sides parallel. | * Students should already know how to calculate the area of rectangles, squares, parallelograms and triangles
* Students should already know how to calculate the area of compound shapes involving rectangles, squares, parallelograms and triangles
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| **To learn how to solve problems using the circumference and area of a circle** | * Students will know that the circumference is the distance around the circle.
* Students will know how to calculate the perimeter of semi circles and understand why they have to add the diameter.
* Students will know how to use inverse operations to find the missing radius or diameter when given the circumference.
* Students will know how to calculate the area of a circle using the formula π x radius², leaving answers rounded to a given degree of accuracy
* Students will know how to calculate the area of semi circles
* Students will know how to use inverse operations to find the missing radius or diameter when given the area or circumference.
* Students will know how to solve problems involving area of circles.
 | **Circumference –** the perimeter of a circle**Radius –** a straight line from the centre to the circumference of a circle or sphere**Diameter –** a straight line passing from side to side through the centre of a body or figure, especially a circle or sphere | * Students will need to be able to name all of the parts of a circle
* Students will need to know how to substitute values into a formulae.
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| **To learn how to calculate the length of an arc.**  | * Students will know how to calculate the perimeter of the sector using the formula angle/360 x π x diameter + 2r
 | **Arc –** a part of a curve, a part of the circumference of a circle. | * Students will know how to find the circumference of a circle
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| **To learn how to calculate the area of a sector** | * Students will know how to calculate the arc length of the sector using the formula angle/360 x π x diameter
* Students will know how to calculate the area of a sector where the angle is not 90, 180 or 270 using the formula, angle/360 x πr², students will also be able to recall this formula.
 | **Sector –**  a part of a circle made of the arc of the circle along with its two radii. | * Students will know how to find the area of a circle.
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| **To learn how to solve problems in 2D shapes using Pythagoras' Theorem** | * Students will know how to find missing lengths in a right-angled triangle using Pythagoras' theorem
* Students will know that to prove a triangle is right angled using Pythagoras' theorem they will substitute the values into the formula.
* Students will know how to solve worded problems using Pythagoras' theorem
* Students will know how to solve problems involving multiple right-angled triangles 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 should already know how to calculate missing lengths using Pythagoras’ theorem
* Students will need to know how to rearrange formulae
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| **To learn how to calculate missing sides and angles using SOHCAHTOA** | * Students will know that $Sin=\frac{Opposite}{Hypotenuse}$
* Students will know that $Cos=\frac{Adjacent}{Hypotenuse}$
* Students will know that $Tan=\frac{Opposite}{Adjacent}$
* Students will know how to use the formula triangles for SOHCAHTOA to find missing sides.
* Students will know how to calculate missing sides in right angled triangles using SOHCAHTOA
* Students will know how to calculate missing angles in right angled triangles using SOHCAHTOA
* Students will know how to solve worded problems involving SOHCAHTOA
* Students will know how to solve multi-step problems involving more than one right-angled triangle using SOHCAHTOA.
 | **Trigonometry –** a branch of mathematics that studies 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 know how to rearrange formulae
* Students need to know how to substitute numbers into formulae
* Students need to know how to use a calculator
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