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**Knowledge Rich Curriculum Plan**

Year 10 Intermediate – Geometry 2



| **Lesson Objective**  | **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 convert units for measure** | * Students will know how to convert units for length including mm, cm, m, km
* Students will know how to convert units for mass including mg, g, kg, tonnes
* Students will know how to convert units for volume including ml, cl, l
 | **Convert** –change/ swap to**Metric** – The metric system is a system of measurement that uses the meter, litre, and gram as base units of length (distance), capacity (volume), and weight (mass)**Capacity –** the maximum amount that something can contain.**Volume** – the amount of space inside a 3D object**Mass** – the weight of an object | * Students need to know how to multiply and divide by powers of 10
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| **To learn how to calculate perimeter** | * Students will know how to calculate the perimeter of compound shapes.
* Students will know how to use inverse operations to find the missing lengths of shapes when given the perimeter.
* Students will know how to solve real life problems involving perimeter.
* Students will know how to solve more complex problems involving perimeter
 | **Perimeter –** the distance around the outside of a shape | * Students should already know how to name different 2D shapes
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| **To learn how to calculate area** | * Students will know how to calculate the area of rectangles, squares, parallelograms and triangles
* Students will know how to calculate the area of compound shapes involving rectangles, squares, parallelograms and triangles
 | **Area –** the amount of space inside a 2D shape**Quadrilateral –** a four-sided shape**Compound -** a thing that is composed of two or more separate elements. | * Students need to know how to recognise different quadrilaterals
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| **To learn how to calculate the area of a trapezium** | * 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 need to know how to calculate the area of squares, rectangles, triangles and parallelograms
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| **To learn how to calculate circumference** | * Students will know how to calculate the circumference of a circle using the formula - πd, giving their answer to a suitable degree of accuracy
* Students will know how to calculate the arc length and perimeter of a semi-circle
* Students will know how to calculate the arc length and perimeter of quarter circles or three quarters of a circle
* Students will know how to use inverse operations to find the missing radius or diameter when given the circumference.
* Students will know how to solve problems involving area and circumference of circles.
 | **Circumference –** the perimeter of a circle**Arc –** a part of a curve, a part of the circumference 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 need to know how to identify the different parts of a circle
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| **To learn how to calculate the area of a circle** | * Students will know how to calculate the area of a circle using the formula πr²
* Students will know how to calculate the area of a circle using the formula πr², without a calculator leaving answers in terms of π.
* Students will know how to calculate the area of semi circles, quarter circles or three-quarters of a circle
* Students will know how to use inverse operations to find the missing radius or diameter when given the area.
* Students will know how to solve problems involving the area of circles.
* Students will know how to calculate the area of compound shapes involving circles or parts of circles
 |  | * Students need to know how to identify the different parts of a circle
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| **To learn how to calculate missing sides 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
 | **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 know how to square numbers
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| **To learn how to solve problems using Pythagoras' Theorem** | * 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
 |  | * Students will need to know how to find missing sides using Pythagoras’ theorem
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| **To learn how to calculate missing sides and angles in right angled triangles using trigonometry** | * 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
 | **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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| **To learn how to calculate missing sides and angles in right angled triangles using trigonometry** | * 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.
 | **Inverse** - Opposite | * Students need to know how to calculate missing sides and angles using SOHCAHTOA
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