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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** |
| --- | --- | --- | --- | --- |
| **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 |  |
| **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 |  |
| **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 |  |
| **To learn how to calculate the area of a trapezium** | * Students will know that the formula for the area of a trapezium is  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 |  |
| **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 |  |
| **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 |  |
| **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 |  |
| **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 |  |
| **To learn how to calculate missing sides and angles in right angled triangles using trigonometry** | * Students will know that * Students will know that * Students will know that * 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 |  |
| **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 |  |