# Knowledge Rich Curriculum Plan

Year 10 Foundation+ Geometry 1

| 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<br>• Students will know how to convert units for mass including mg, g, kg, tonnes<br>• Students will know how to convert units for volume including ml, cl, l | **Convert** – change/ swap to<br>**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)<br>**Capacity** – the maximum amount that something can contain.<br>**Volume** – the amount of space inside a 3D object<br>**Mass** – the weight of an object | • Students need to know how to multiply and divide by powers of 10 | |
| <mark>To learn how to measure, draw and estimate angles</mark> | • Students will know how to use a protractor to measure and draw an angle, ensuring that they start at 0 when measuring.<br>• Students will know how to measure reflex angles. Either by measuring the other angle(s) on the point and subtracting from 360° or by splitting the reflex angle into two angles and adding both measured angles together.<br>• Students will know how to draw reflex angles. Either by subtracting the angle from 360°, drawing that angle then mark the reflex angle or by subtracting the reflex angle from 180°, drawing that angle on a straight line and then mark the reflex angle.<br>• Students will know how to estimate angles | | • Students should be able to recognise acute angles, reflex angles, right angles and obtuse angles | |
| To learn how to calculate missing angles in triangles and quadrilaterals | • Students will know that the angles in a triangle add to 180°<br>• Students will know that the angles in a quadrilateral add to 360°<br>• Students will know how to find missing angles in special triangles using the rules; in isosceles triangles the base angles are equal and equilateral triangle all angles are the same size.<br>• Students will know how to solve multi-step problems involving angles in triangles<br>• Students will know how to find missing angles in quadrilaterals<br>• Students will know how to solve multi-step problems involving angles in quadrilaterals | **Estimate** – roughly calculate or judge the value, number, quantity, or extent of.<br>**Acute angle** – An angle that is less than 90°<br>**Obtuse angle** – An angle that is more than 90° but less than 180°<br>**Reflex angle** – An angle that is more than 180° but less than 360°<br>**Right angle** – An angle that is exactly 90°<br>**Isosceles Triangle** – a triangle with two equal sides and two equal angles<br>**Equilateral Triangle** – a triangle with three equal sides and three equal, 60° angles<br>**Scalene Triangle** – a triangle with no equal sides or angles<br>**Quadrilateral** – a four-sided polygon, having four edges and four corners | • Students should already know the basic angle facts: angles on a straight line add to 180°, angles around a point add to 360°, angles in a triangle add to 180°<br>• Students should already know the properties of special triangles | |
| To learn how to calculate interior angles in polygons | • Students will know how to use the fact that angles in a triangle sum to 180 to find the angle sums of any polygon.<br>• Students will know how to use the formula (n-2) x 180 to find the sum of interiors angles of any polygons.<br>• Students will know how to find one interior angle of a polygon using the formula (n-2) x 180 and dividing by the number of sides of the polygon. | **Interior** – Inside<br>**Polygon** – a closed shape with straight sides<br>**Regular Polygon** – A polygon where all sides are the same length and all angles are equal | • Students need to know that the angles in a triangle add to 180<br>• Students need to know the difference between regular and irregular polygons | |

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| | • Students will know how to apply the rules for finding interior and exterior angles to solve multi-step problems involving both regular and irregular polygons | **Irregular Polygon** – A polygon where all sides are the same length and all angles are not equal<br>**Tesselate** – fit together without gaps or overlapping. | | |
| To learn how to calculate exterior angles in polygons | • Students will know how to calculate the size of an exterior angle of a polygon using the calculation 360/number of sides. Students will know that exterior angles are the angles on the outside of a polygon.<br>• Students will know to calculate the size of an interior angle from subtracting the exterior angle from 180°.<br>• Students will know that the interior and exterior angle add to 180<br>• Students will know how to determine the number of sides for a polygon using the exterior angle | **Exterior** – Outside<br>**Exterior angle** – is the angle between a side of a polygon and an extended adjacent side. | • Students need to know that angles on a straight line add to 180° | |
| To learn how to find missing angles in parallel lines | • Students will know how to identify alternate, corresponding and co-interior angles<br>• Students will know that vertically opposite angles are equal<br>• Students will know that corresponding angles are equal<br>• Students will know that alternate angles are equal<br>• Students will know that co-interior angles add to 180<br>• Students will know how to find missing angles in parallel lines and give clear reasons for their answers | **Parallel** – parallel lines are two lines that are side by side and have the same distance continuously between them<br>**Corresponding** – matching<br>**Co-interior Angles** – angles that lie between two lines and on the same side of a transversal<br>**Transversal** – a line that crosses at least two other lines | • Students need to know that angles on a straight line add to 180°<br>• Students need to know that angles around a point add to 360° | |
| To learn how to combine angle rules to find missing angles in parallel lines | • Students will know how to apply the rules of angles in parallel lines and other angle facts to solve multi-step problems involving angles in parallel lines<br>• Students will know how to give clear, accurate reasons for their answers. | | • Students need to be able to find missing angles in triangles<br>• Students need to be able to identify alternate, corresponding and co-interior angles | |
| To learn how to draw and measure bearings. | • Students will know the rules for bearings;<br>1) Always measure from North<br>2) Bearings must be written as 3 digits.<br>3) Always measure in a clockwise direction.<br>• Students will know how to use a protractor to accurately draw bearings from A to B and B to A.<br>• Students will know how to use a protractor and ruler to accurately measure bearings on a map, including measuring from A to B and B to A.<br>• Students will know how to accurately draw and measuring bearings using a protractor to solve problems | **Bearing** – angles, measured clockwise from north | • Students should already know how to measure and draw angles<br>• Students should know how to calculate angles in parallel lines using the fact that co-interior angles add to 180 | |

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| To learn how to accurately construct triangles | • Students will know how to accurately construct a triangle using a protractor and ruler given SAS or ASA for the triangle<br>• Students will know how to accurately construct a triangle from three sides using a pair of compasses | **Construct –** In maths, construct means to draw a shape, line or angle accurately using a compass and rule | • Students should already know how to accurately draw angles using a protractor | |
| To learn how to construct angles and bisectors | • Students will know how to construct a perpendicular bisector of any given line<br>• Students will know how to construct a perpendicular from a point to a line.<br>• Students will know how to construct a bisector of any given angle.<br>• Students will know how to accurately construct angles including 45° and 90°.<br>• Students will know that the perpendicular distance from a point to a line, is the shortest distance to the line. | **Perpendicular –** at a right angle to<br>**Bisect –** cut into two equal parts<br>**Bisector –** A line that splits an angle or line into two equal parts | • Students should already know how to measure the length of a line using a ruler | |
| To learn how to construct loci | • Students will know how to construct a region bounded by a circle and an intersecting line.<br>• Students will know how to construct a given distance from a point and given distance from a line.<br>• Students will know how to construct equal distances from two points or two line segments.<br>• Students will know how to construct regions which may define by 'nearer to' or 'greater than'<br>• Students will know how to use the rules of loci to solve 2D loci problems.<br>• Students will know how to solve loci problems involving the use of constructions; angle bisectors, perpendicular bisectors etc. | **Locus (Loci is the plural) –** the set of all points (usually forming a curve or surface) satisfying some condition<br>**Equidistant –** an equal distance | • Students need to know how to construct a perpendicular bisector of any given line<br>• Students need to know how to construct a bisector of any given angle. | |