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
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 recognise and identify 2D shapes	• Students will know how to recognise and draw the different types of triangle: isosceles, scalene, right-angled, equilateral • Students will know how to name and sketch all types of quadrilaterals and their properties including; square, rectangle, parallelogram, rhombus, kite, trapezium. • Students will know how to identify and draw lines of symmetry in 2d shapes. • Students will know how to identify the order of rotational symmetry of any 2d shape, by rotating the shape 360°, this can be done with the use of tracing paper.	**Polygon** – a closed shape with straight sides **Regular Polygon** – A polygon where all sides are the same length and all angles are equal **Irregular Polygon** – A polygon where all sides are the same length and all angles are not equal **Isosceles Triangle** – a triangle with two equal sides and two equal angles **Equilateral Triangle** – a triangle with three equal sides and three equal, 60° angles **Scalene Triangle** – a triangle with no equal sides or angles **Quadrilateral** – a four-sided polygon, having four edges and four corners **Perpendicular** – at a right angle to **Parallel** – parallel lines are two lines that are side by side and have the same distance continuously between them **Symmetry** – the quality of being made up of exactly similar parts facing each other or around an axis. **Rotational symmetry** – A shape has rotational symmetry when it can be rotated and it still looks the same **Order of Rotational Symmetry** – order of rotational symmetry of a shape is the number of times it can be rotated around a full circle and still look the same	• Students should already be able to name simple 2D shapes	
To learn how to measure, draw and estimate angles	• Students will know how to use a protractor to measure and draw an angle, ensuring that they start at 0 when measuring. • 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. • 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. • Students will know how to estimate angles	**Estimate** – roughly calculate or judge the value, number, quantity, or extent of. **Acute angle** – An angle that is less than 90° **Obtuse angle** – An angle that is more than 90° but less than 180° **Reflex angle** – An angle that is more than 180° but less than 360° **Right angle** – An angle that is exactly 90° **Protractor** – an instrument used for measuring angles	• Students should be able to recognise acute angles, reflex angles, right angles and obtuse angles	

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To learn how to calculate missing angles on straight lines, around a point and in triangles and quadrilaterals	• Students will know how to find missing angles on a straight line • Students will know how to find missing angles around a point. • Students will know that the angles in a triangle add to 180° • Students will know that the angles in a quadrilateral add to 360° • 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. • Students will know how to solve multi-step problems involving angles in triangles • Students will know how to find missing angles in quadrilaterals • Students will know how to solve multi-step problems involving angles in quadrilaterals		• 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° • 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. • Students will know how to use the formula (n-2) x 180 to find the sum of interiors angles of any polygons. • 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. • 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	**Interior** – Inside **Regular Polygon** – A polygon where all sides are the same length and all angles are equal **Irregular Polygon** – A polygon where all sides are the same length and all angles are not equal **Tesselate –** fit together without gaps or overlapping.	• Students need to know that the angles in a triangle add to 180 • Students need to know the difference between regular and irregular polygons	
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. • Students will know to calculate the size of an interior angle from subtracting the exterior angle from 180°. • Students will know that the interior and exterior angle add to 180 • Students will know how to determine the number of sides for a polygon using the exterior angle	**Exterior** – Outside **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 • Students will know that vertically opposite angles are equal • Students will know that corresponding angles are equal • Students will know that alternate angles are equal • Students will know that co-interior angles add to 180 • 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 **Corresponding –** matching **Co-interior Angles –** angles that lie between two lines and on the same side of a transversal **Transversal –** a line that crosses at least two other lines	• Students need to know that angles on a straight line add to 180° • Students need to know that angles around a point add to 360°	

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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 • Students will know how to give clear, accurate reasons for their answers.		• Students need to be able to find missing angles in triangles • 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; 1) Always measure from North 2) Bearings must be written as 3 digits. 3) Always measure in a clockwise direction. • Students will know how to use a protractor to accurately draw bearings from A to B and B to A. • 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. • 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 • Students should know how to calculate angles in parallel lines using the fact that co-interior angles add to 180	
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 • 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 • Students will know how to construct a perpendicular from a point to a line. • Students will know how to construct a bisector of any given angle. • Students will know how to accurately construct angles including 45° and 90°. • Students will know that the perpendicular distance from a point to a line, is the shortest distance to the line.	**Bisect –** cut into two equal parts **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. • Students will know how to construct a given distance from a point and given distance from a line. • Students will know how to construct equal distances from two points or two line segments. • Students will know how to construct regions which may define by 'nearer to' or 'greater than' • Students will know how to use the rules of loci to solve 2D loci problems. • 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 **Equidistant –** an equal distance	• Students need to know how to construct a perpendicular bisector of any given line • Students need to know how to construct a bisector of any given angle.	