Knowledge Rich Curriculum Plan

Year 8 Core – Measures, 2D Shapes and Angles

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
To learn how to convert metric units for measures.	• 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 10, 100 and 1,000. • Students need to be aware of the basic unit measurements of length and distance. • Students need to be aware of the basic unit measurements of mass and volume.	Mini-Assessment 8
To learn how to recognise and identify 2D shapes.	• Students will know the properties of different 2D shapes and will be able to identify them • Students will be able to identify regular and irregular 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 that to accurately tessellate a polygon the shapes must create a pattern of identical shapes which must fit together with no gaps. • Students will know how to identify and label lines of symmetry in 2D shapes. • Students will know that a shape is symmetric if it can be divided into two or more identical pieces that are arranged in an organized fashion. • 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 **Tesselate** – fit together without gaps or overlapping.	• Students need to be able to name simple 2D shapes.	Mini-Assessment 8

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
To learn how to measure and draw angles.	• Students will know how to accurately estimate angles based on their knowledge of the types of angles. • Students will know how to use a protractor to measure an angle. • Students will know how to draw an angle. • 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.	**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 need to know how to identify different types of angles.	Mini-Assessment 8
To learn how to find missing angles on straight lines and around a point.	• Students will know that angles in a right-angle add upto 90°. • Students will know that angles on a straight line add upto 180°. • Students will know that vertically opposite angles are equal. • Students will know that angles at a point add upto 360°. • Students will know how to use angle facts to find missing angles on straight lines. • Students will know how to use angle facts to find missing angles at a point.		• Students need to know that angles are measured in degrees. • Students need to know how to recognise a 90° angle. • Students need to know how to recognise a straight line. • Students need to know how to recognise a full turn.	Mini-Assessment 8
To learn how to find missing angles in triangles and quadrilaterals.	• Students will know that angles in a triangle add upto 180°. • Students will know that angles in an equilateral triangle are equal - 60°. • Students will know that two angles in an isosceles triangle are equal. • Students will know how to use angle facts to find the missing angles in triangles. • Students will know how to use angle facts to find missing angles in special triangles. • Students will know that angles in a quadrilateral add upto 360°. • Students will know how to use angle facts to find the missing angles in quadrilaterals	**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	• Students need to know how to recognise a 90° angle. • Students need to know how to find missing angles in a straight line, at a point and when they are vertically opposite.	Mini-Assessment 8
To learn how to calculate interior and exterior angles in polygons.	• Students will know how to use angles in a triangle add up to 180° to find the angle sums of any polygon. • Students will know that the interior angles of a polygon are the angles inside the polygon. • Students will know how to use the formula $(n-2) \times 180$ to find the sum of interiors angles of any polygon. • Students will know how to find one interior angle of a regular polygon using the formula $(n-2) \times 180$ and dividing by the number of angles of the polygon. • Students will know an exterior angle is the angle between a side of a polygon and an extended adjacent side. • Students will know that the sum of the exterior angles for every polygon is 360°. • Students will know that to dividing 360° by the number of sides will find one exterior angle.	**Interior –** Inside **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 **Exterior –** Outside **Exterior angle –** is the angle between a side of a polygon and an extended adjacent side.	• Students need to know that angles in a triangle add up to 180°. • Students need to recognise different types of polygons. • Students need to know that a regular polygon is a polygon where all angles are the same size and all sides are the same length • Students need to know that an irregular polygon is a polygon that does not have all sides equal and all angles equal.	Mini-Assessment 8

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
	• Students will know that interior and exterior angles add up to 180° as they sit on a straight line. **Opportunity for challenge:** • Students will know how to solve basic problems with interior and exterior angles.			
To learn how to find missing angles in parallel lines.	• Students will know that alternate angles are angles that occur on opposite sides of the transversal line and are the same size. • Students will know that alternate angles are equal. • Students will know how to identify alternate angles. • Students will know that corresponding angles occur on the same side of the transversal line and are the same size. • Students will know that corresponding angles are equal. • Students will know how to identify corresponding angles. **Opportunity for challenge:** • Students will know how to use a combination of rules to find an angle.	**Parallel –** parallel lines are two lines that are side by side and have the same distance continuously between them **Isosceles Triangle –** a triangle with two equal sides and two equal angles **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 parallel lines are a set of lines that are always the same distance apart and never meet. • Students need to use basic angle rules.	Mini-Assessment 8
To learn how to construct triangles.	• Students will know how to use a pair of compasses to accurately draw a circle when given the radius. • Students will know how to draw 2D polygons accurately using a protractor and ruler. • Students will know how to construct SAS triangles using a ruler and protractor. • Students will know how to construct ASA triangles using a ruler and protractor. • Students will know how to construct SSS triangles using a ruler and compass.	**Construct –** Build or make. In maths, construct means to draw a shape, line or angle accurately using a compass and rule	• Students need to know how to draw straight lines of a certain length using a ruler. • Students need to know how to measure angles using a protractor. • Students need to know the radius is measured from the centre of a circle to the circumference.	Mini-Assessment 8
To learn how to perpendicular bisectors and angle bisectors.	• Students will know that perpendicular lines are at a 90° to each other. • Students will know that to bisect means to cut into two equal pieces • Students will know how to construct a perpendicular bisector of a line. • Students will know how to construct an angle bisector. • Students will know that the line of an angle bisector is equidistant to the two lines of the angle. • Students will know that the perpendicular distance from a point to a line is the shortest distance to the line. • Students will know how to construct a perpendicular line from a point to a line.	**Perpendicular –** at a right angle to **Bisect –** cut into two equal parts **Bisector –** A line that splits an angle or line into two equal parts	• Students need to know how to use a compass to draw circles. • Students need to know how to draw lines accurately with a ruler. • Students need to know how to measure a straight line.	Mini-Assessment 8