



The Sutton Academy

Knowledge Rich Curriculum Plan

Year 9 Core – Measures, 2D Shapes and Angles

Lesson/Learning Sequence	Intended Knowledge: <i>Students will know that...</i>	Tiered Vocabulary	Prior Knowledge: <i>In order to know this students, need to already know that...</i>	Assessment
To learn how to convert metric units for measures.	<ul style="list-style-type: none"> • 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 	<p>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</p>	<ul style="list-style-type: none"> • Students need to know how to multiply and divide by powers of 10 	Mini-Assessment 8
To learn how to measure, draw and estimate angles.	<ul style="list-style-type: none"> • Students will know that acute angles are angles that measure between 0 and 90°. • Students will know that obtuse angles are angles that measure between 90° and 180°. • Students will know that reflex angles are angles that measure between 180° and 360°. • Students will know that a right-angle is 90° and is represented by a square within the angle. • Students will know that angles on a straight line add upto 180°. • Students will know that angles in a full turn add upto 360°. • Students will know how to identify each type of angle by sight. • 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 or by drawing a straight line of 180°, then using this as a base line to draw the remainder of the angle. 	<p>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°</p>	<ul style="list-style-type: none"> • Students need to know that angles are measured in degrees. • Students need to know that an angle is the measure of a turn. • Students need to know how to identify different types of angles. 	Mini-Assessment 8
To learn how to find missing angles on straight lines, around a point, in triangles and quadrilaterals.	<ul style="list-style-type: none"> • 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 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°. 	<p>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</p>	<ul style="list-style-type: none"> • 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. • Students need to know how to recognise different types of triangles. 	Mini-Assessment 8

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	<ul style="list-style-type: none"> Students will know how to use angle facts to find the missing angles in quadrilaterals 			
To learn how to calculate interior and exterior angles in polygons.	<ul style="list-style-type: none"> 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 interior 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 dividing 360° by the number of sides will find one exterior angle. Students will know that interior and exterior angles add up to 180° as they sit on a straight line. 	<p>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 Tessellate – fit together without gaps or overlapping. Exterior – Outside Exterior angle – is the angle between a side of a polygon and an extended adjacent side.</p>	<ul style="list-style-type: none"> 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
To learn how to solve problems involving angles in polygons.	<ul style="list-style-type: none"> Students will know how to find missing angles in irregular polygons by finding the sum of the interior angles and subtracting all known angles. Students will know how to apply the rules for finding interior and exterior angles to solve problems. 		<ul style="list-style-type: none"> Students need to know how to find interior and exterior angles of regular polygons. 	Mini-Assessment 8
To learn how to find missing angles in parallel lines.	<ul style="list-style-type: none"> 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. Students will know that co-interior angles occur on the same side on the transversal line and are trapped within the parallel lines. Students will know that co-interior angles add up to 180°. Students will know how to identify co-interior angles. 	<p>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</p>	<ul style="list-style-type: none"> 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 find missing angles in parallel lines using a combination of rules.	<ul style="list-style-type: none"> Students will know how to use a mixture of parallel line rules to find missing angles. 		<ul style="list-style-type: none"> Students need to know how to use basic angle rules. Students need to know how to find angles on parallel lines. 	Mini-Assessment 8

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To learn how to draw and measure bearings.	<ul style="list-style-type: none"> • Students will know that a bearing is always measured from North. • Students will know that a bearing is always measured in a clockwise direction. • Students will know that bearings must be written as 3 digits. • 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 measure reflex bearings. Either by measuring the other angle(s) on the point in an anti-clockwise direction and subtracting from 360° or by splitting the reflex bearing into two bearings and adding both measured angles together. • Students will know how to draw reflex bearings. Either by subtracting the bearing from 360°, drawing that bearing in the anti-clockwise or by drawing a straight line of 180°, then using this as a base line to draw the remainder of the bearing. 	Bearing – angles, measured clockwise from north	<ul style="list-style-type: none"> • Students need to know how to draw angles. • Students need to know how to measure angles. • Students need to know how to draw lines accurately. • Students need to know how to measure lines accurately. 	Mini-Assessment 8
To learn how to construct triangles.	<ul style="list-style-type: none"> • 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 – In maths, construct means to draw a shape, line or angle accurately using a compass and rule	<ul style="list-style-type: none"> • 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. • Student need to know that angles in a triangle add upto 180°. • Students need to recognise and know the properties of different 2D shapes. • 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.	<ul style="list-style-type: none"> • 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	<ul style="list-style-type: none"> • 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 straight line. 	Mini-Assessment 8
To learn how to construct loci.	<ul style="list-style-type: none"> • Students will know how to construct a region bounded by a circle. • Students will know how to construct a region bounded by two circles. • Students will know how to construct a given distance from a point. • Students will know how to construct a given distance from a line. • Students will know how to construct equal distances from two points. • Students will know how to construct equal distances from two-line segments. • Students will know how to construct regions defined by 'less than', 'nearer to' or 'greater than'. • Students will know how to use constructions to solve loci problems. 	Locus (Loci is the plural) – the set of all points (usually forming a curve or surface) satisfying some condition Equidistant – an equal distance	<ul style="list-style-type: none"> • Students need to know how to draw circles using a known radius. • Students need to know how to find the perpendicular bisector of a line. • Students need to know how to find the perpendicular bisector of two point. • Students need to know how to bisect an angle. • Students need to know how to construct a perpendicular line from a point to a line. • Students need to know how to measure lines accurately. 	Mini-Assessment 8

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			<ul style="list-style-type: none"> • Students need to know how to draw lines accurately. 	