The Sutton Academy

# Knowledge Rich Curriculum Plan

Year 7 Core – Measures, 2D Shapes and Angles

| Lesson/Learning Sequence | Intended Knowledge:<br>*Students will know that…* | Tiered Vocabulary | Prior Knowledge:<br>*In order to know this, students need to already know that…* | Assessment |
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| **To learn how to convert metric units for measures.** | • 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 10, 100 and 1,000.<br>• Students need to be aware of the basic unit measurements of length and distance.<br>• 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<br>• Students will be able to identify regular and irregular shapes<br>• Students will know how to recognise and draw the different types of triangle: isosceles, scalene, right-angled, equilateral<br>• Students will know how to name and sketch all types of quadrilaterals and their properties including; square, rectangle, parallelogram, rhombus, kite, trapezium. | **Polygon** – a closed shape with straight sides<br>**Regular Polygon** – A polygon where all sides are the same length and all angles are equal<br>**Irregular Polygon** – A polygon where all sides are the same length and all angles are not equal<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<br>**Perpendicular –** at a right angle to<br>**Parallel –** parallel lines are two lines that are side by side and have the same distance continuously between them | • Students should already be able to name simple 2D shapes | Mini-Assessment 8 |
| **To learn how to identify lines of symmetry and rotational symmetry.** | • Students will know how to identify and label lines of symmetry in 2D shapes.<br>• 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.<br>• 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). | **Symmetry –** the quality of being made up of exactly similar parts facing each other or around an axis.<br>**Rotational symmetry –** A shape has rotational symmetry when it can be rotated and it still looks the same<br>**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 need to know how to identify regular polygons and irregular polygons. | Mini-Assessment 8 |
| **To learn how to recognise different types of angles and estimate angles.** | • Students will know that acute angles are angles that measure between 0 and 90°.<br>• Students will know that obtuse angles are angles that measure between 90° and 180°.<br>• Students will know that reflex angles are angles that measure between 180° and 360°.<br>• Students will know that a right-angle is 90° and is represented by a square within the angle.<br>• Students will know that angles on a straight line add up to 180°.<br>• Students will know that angles in a full turn add up to 360°.<br>• Students will know how to identify each type of angle by sight. | **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° | • Students need to know that angles are measured in degrees.<br>• Students need to know that an angle is the measure of a turn. | Mini-Assessment 8 |

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| | • Students will know how to accurately estimate angles based on their knowledge of the types of angles.<br>• Students will know why angles are measured in degrees up to 360° - they will know that ancient Babylonian and Persian calendars were both based upon 360-day years and that that this observation is the reason a circle contains 360 degrees. (Cultural Capital) | | | |
| **To learn how to measure and draw angles.** | • Students will know how to use a protractor to measure an angle.<br>• Students will know how to draw an angle.<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. | **Protractor** – an instrument used for measuring angles | • Students should already know how to use a ruler to measure and draw accurately | 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°.<br>• Students will know that angles on a straight line add upto 180°.<br>• Students will know that vertically opposite angles are equal.<br>• Students will know that angles at a point add upto 360°.<br>• Students will know how to use angle facts to find missing angles on straight lines.<br>• Students will know how to use angle facts to find missing angles at a point. | | • Students need to know how to identify different types of angles.<br>• Students need to know how to recognise a straight line.<br>• Students need to know how to recognise a full turn. | Mini-Assessment 8 |
| **To learn how to find missing angles in triangles.** | • Students will know that angles in a triangle add upto 180°.<br>• Students will know that angles in an equilateral triangle are equal - 60°.<br>• Students will know that two angles in an isosceles triangle are equal.<br>• Students will know how to use angle facts to find the missing angles in triangles.<br>• Students will know how to use angle facts to find missing angles in special triangles. | **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 | • Students need to know how to add and subtract using the column method. | Mini-Assessment 8 |
| **To learn how to find missing angles in quadrilaterals.** | • Students will know that angles in a quadrilateral add up to 360°.<br>• Students will know why the angles in a quadrilateral add to 360°.<br>• Students will know how to use angle facts to find the missing angles in quadrilaterals<br>• Students will know how to solve multi-step problems involving angles in quadrilaterals and other basic angle rules (straight lines, around a point etc.) | **Quadrilateral –** a four-sided polygon, having four edges and four corners | • Students need to know how to find missing angles in a triangle | Mini-Assessment 8 |

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| **To learn how to identify parts of a circle and draw circles and other 2D shapes accurately.** | • Students will know how to label the radius, diameter, circumference, tangent, chord, segment, sector and centre of a circle.<br>• Students will know how to draw the radius, diameter, circumference, tangent, chord, segment, sector and centre of a circle<br>• Students will know that the diameter is double the size of the radius or the radius is half the size of the diameter.<br>• Students will know that the circumference is the distance around the circle and is a measure of length.<br>• Students will know how to use a pair of compasses to accurately draw a circle when given the radius or diameter.<br>• Students will know how to draw rectangles accurately using a ruler and protractor.<br>• Students will know how to draw squares accurately using a ruler and protractor.<br>• Students will know how to draw parallelograms accurately using a ruler and protractor.<br>• Students will know how to draw trapezia accurately using a ruler and protractor. | **Circumference –** the perimeter of a circle<br>**Perimeter –** the distance around the outside of a shape<br>**Arc –** a part of a curve, a part of the circumference of a circle<br>**Radius –** a straight line from the centre to the circumference of a circle or sphere<br>**Diameter –** a straight line passing from side to side through the centre of a body or figure, especially a circle or sphere<br>**Tangent –** a line touching a circle or curve at only one point<br>**Segment –** a region bounded by a chord and a corresponding arc lying between the chord's endpoints<br>**Chord –** the line segment joining two points on a curve<br>**Trapezium –** a quadrilateral with one pair of sides parallel.<br>**Parallelogram** – a four-sided shape with two pairs of parallel opposite sides.<br>**Construct –** Build or make. In maths, construct means to draw a shape, line or angle accurately using a compass and rule | • Students need to recognise and name 2D shapes | Mini-Assessment 8 |
| **To learn how to construct triangles.** | • Students will know how to construct SAS triangles using a ruler and protractor.<br>• Students will know how to construct ASA triangles using a ruler and protractor.<br>• Students will know how to construct SSS triangles using a pair of compasses. | **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.<br>• Students need to know how to measure and draw angles using a protractor. | Mini-Assessment 8 |