Curriculum map - Mathematics

YEAR 8	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
TOPIC(s)	**Unit 1** Plotting Coordinates **Unit 2** Solving Linear Equations **Unit 3** Transformations	**Unit 4** Understanding Multiplicative Relationships: Percentages and Proportionality	**Unit 5** Sequences **Unit 6** Graphical Representations of Linear Relationships	**Unit 7** Standard Form **Unit 8** Statistical Representations, Measures and Analysis	**Unit 9** Constructions and Nets **Unit 10** Perimeter, Area and Volume	**Unit 11** Angle Reasoning **Unit 12** Basic Probability
What students will know	**Unit 1** All the points which satisfy a relationship can be represented graphically. The x-axis is represented by the equation $y = 0$. The y-axis is represented by the equation $x = 0$. **Unit 2** A linear equation has one solution. **Unit 3** Reflection, rotation, translation and enlargement are all transformations. If an object is transformed, the resulting shape is called the image. Reflection, rotation and translation preserve angle size and side length, resulting in an image congruent to the object. Enlargement does not guarantee a congruent shape.	**Unit 4** Percent relates to 'number of parts per hundred'. If two quantities are directly proportional then as one quantity increases, the other increases. If two quantities are inversely proportional then as one quantity increases, the other decreases.	**Unit 5** Special sequences (odd, even, square numbers, cube numbers, triangular numbers, Fibonacci sequence). Understand what is meant by an arithmetic sequence. **Unit 6** Gradient is a measure of steepness – the larger the gradient, the steeper the graph.	**Unit 7** Standard form notation takes the form A x 10^n, where $1 \leq A < 10$ and *n* is an integer. **Unit 8** Bar charts and pictograms are frequency-based diagrams. A pie chart is a proportion-based diagram. Scatter graphs are used to display bivariate data.	**Unit 9** Drawing a circle creates an infinite set of points, equidistant from the centre. **Unit 10** There is a constant multiplicative relationship (π) between the diameter and circumference of a circle. The formula for the circumference of a circle. The formula for the area of a circle. The formula for the volume of a prism.	**Unit 11** Angles which meet at a point sum to 360°. Angles which are on a straight line sum to 180°. Vertically opposite angles are equal. Angles in a triangle sum to 180°. How to prove that angles in a triangle sum to 180°. Angles in a quadrilateral sum to 360°. Alternate angles are equal. Corresponding angles are equal. Co-interior angles sum to 180°. **Unit 12** Some outcomes of an event are equally likely, some are not. Probability is a measure of the likelihood of an event happening. Probability is measured on a scale, from 0 to 1. The probabilities of all possible outcomes sum to one.

What students will be able to do	**Unit 1** Identify coordinates, including non-integer values, in all four quadrants. Plot coordinates, including non-integer values, in all four quadrants. Identify and plot the line of $y = a$, where a is a number. Identify and plot the line of $x = b$, where b is a number. Identify and plot the line of $y = x$. Identify and plot the line of $y = -x$ **Unit 2** Solve a one-step linear equation (unknown on one side). Solve a two-step linear equation (unknown on one side). Solve a three-step equation (unknown on one side). Solve a linear equation with the unknown on both sides. Solve a linear equation containing brackets. **Unit 3** Reflect a shape in a vertical or horizontal line, given the equation. Reflect a shape in the line y=x or y=-x. Describe a reflection in a horizontal or vertical line, using the equation of the line. Describe a reflection in the line y=x or y=-x. Rotate a shape given the angle, direction and centre of rotation. Describe a rotation, giving the angle, direction and centre of rotation. Translate a shape on a coordinate grid, given the translation described in words. Describe a translation on a coordinate grid, using words.	**Unit 4** Convert between fractions, decimals and percentages. Express one quantity as a percentage of another. Calculate a percentage of a given quantity. Calculate a quantity after a percentage increase or decrease (with and without a multiplier). Calculate the original amount after a percentage increase or decrease. Find the percentage increase or decrease. Solve problems involving direct proportion. Solve problems involving inverse proportion. Interpret direct proportion graphs. Draw direct proportion graphs. Interpret conversion graphs. Interpret scale diagrams. Draw scale diagrams.	**Unit 5** Identify the term-to-term rule of an arithmetic sequence. Use a term-to-term rule to continue an arithmetic sequence. Use a position-to-term rule (*n*th term) to calculate a term in a sequence. Derive the position-to-tem (*n*th term) rule, given an arithmetic sequence. Use properties of a sequence to determine whether a number is a term in that sequence. **Unit 6** Plot the graph of an equation in the form $y = mx + c$. Plot the graph of a linear equation given in the form $ax + by = c$. Identify the gradient and y-intercept, given the equation $y = mx + c$. Identify the gradient and y-intercept, given the equation $y = mx + c$. Identify the gradient and y-intercept, given the graph of $y = mx + c$. Identify the equation of a linear graph, in the form $y = mx + c$.	**Unit 7** Convert a large number written in standard form to an ordinary number. Express a large number in standard form notation. Convert a small number written in standard form to an ordinary number. Express a small number in standard form notation. Compare numbers written in standard form. **Unit 8** Interpret dual bar charts. Construct dual bar charts. Interpret multiple bar charts. Construct multiple bar charts. Interpret composite bar charts. Construct composite bar charts. Interpret pie charts. Construct pie charts. Interpret scatter graphs. Identify an outlier on a scatter graph. Construct scatter graphs. Choose what data should be collected and analysed to explore a statistical problem. Choose appropriate statistical measures to explore a statistical problem. Choose appropriate representations to explore a statistical problem. Compare sets of data.	**Unit 9** Construct the perpendicular bisector of a line segment. Construct the perpendicular to a given line from a given point. Construct the perpendicular to a given line at a given point. Bisect a given angle. Construct a triangle, given the length of three sides. Construct a triangle, given the length of two sides and the angle between them. Construct a triangle, given two angles and the length of the side between them. Draw accurate nets of 3D solids. **Unit 10** Calculate the circumference of a circle. Calculate the diameter of a circle, given the circumference. Calculate the area of a circle. Calculate the radius of a circle, given the area. Calculate the area of semi-circles and quarter-circles. Calculate the area of composite shapes involving whole, semi- or quarter- circles.	**Unit 11** Recognise vertically opposite angles and calculate missing angles. Solve multi-step missing angle problems, including angles that meet at a point, angles on a straight line and vertically opposite angles. Identify alternate angles. Identify corresponding angles. Identify co-interior angles. Calculate missing angles in problems involving parallel lines traversed by straight lines. Calculate the interior angle of a regular polygon. Calculate the exterior angle of a regular polygon. **Unit 12** Describe the likelihood of an event happening using words, such as, certain, likely, even chance, unlikely, impossible etc. Calculate the theoretical probability of a single event occurring (equally likely outcomes). Calculate the probability of an event not occurring, using the probability of it occurring. Systematically find all the outcomes for two or more independent events, using a list. Systematically find all the outcomes for two independent events, using a grid (sample space). Calculate the theoretical probability of a combined event occurring, using a list or sample space diagram.

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	Enlarge a shape by a positive scale factor (≥ 1), given a centre of enlargement. Describe an enlargement, giving the scale factor (positive ≥ 1) and centre of enlargement. Identify any invariant points following a transformation.				Calculate the surface area of a prism. Calculate the surface area of a cylinder. Calculate the volume of a prism. Calculate the volume of a cylinder.	
Beyond the classroom (Wider reading / Trips)	Sparx Compulsory Homework Task. Sparx XP Boost Task. Sparx Target Task. Sparx Independent Learning Tasks. Y7 End of Year Assessment Intervention. Recommended read: Maths Quest: Attack on Circuit City by Catherine Casey.	Sparx Compulsory Homework Task. Sparx XP Boost Task. Sparx Target Task. Sparx Independent Learning Tasks. Y7 End of Year Assessment Intervention. Recommended read: Maths Quest: Lost in the Fourth Dimension by Jonathan Litton.	Sparx Compulsory Homework Task. Sparx XP Boost Task. Sparx Target Task. Sparx Independent Learning Tasks. Y8 Autumn Term Assessment Intervention. Recommended read: The Boy Who Loved Math: The Improbable Life of Paul Edros by Deborah Heiligman. MEM Challenge (completed over February half-term)	Sparx Compulsory Homework Task. Sparx XP Boost Task. Sparx Target Task. Sparx Independent Learning Tasks. Y8 Autumn Term Assessment Intervention. Recommended read: 50 Mathematical Ideas You Really Need to Know by Tony Crilly.	Sparx Compulsory Homework Task. Sparx XP Boost Task. Sparx Target Task. Sparx Independent Learning Tasks. Y8 Spring Term Assessment Intervention. Recommended read: The Number Devil: A Mathematical Adventure by Hans Magnus Enzensberger.	Sparx Compulsory Homework Task. Sparx XP Boost Task. Sparx Target Task. Sparx Independent Learning Tasks. Y8 Spring Term Assessment Intervention. Recommended read: How Many Socks Make a Pair?: Surprisingly Interesting Everyday Maths by Rob Eastaway.