







CURRICULUM MAP FOR MATHEMATICS





YEAR 8

<p>HALF TERM 1: Organising Data and the Language of Algebra</p> <p>Organising Data</p> <ul style="list-style-type: none"> - Read and interpret two-way tables. - Read and interpret Venn diagrams. - Enumerate two-way tables and Venn diagrams. - Read and use the notation for probability. - Express a probability of success as a fraction of total trials. - Understand set notation for Venn diagrams (including listing elements of a set, the union of sets, the intersection of sets and the empty set). - Be aware of the concept of degrees of freedom when enumerating two-way tables. <p>The Language of Algebra</p> <ul style="list-style-type: none"> - Understand the meaning of key vocabulary. - Identify examples of the key vocabulary. - Use and interpret algebraic notation (including $a+a+a = 3a$, $3 \times a = 3a$, $a \times b = ab$, $a \times a = a^2$, $a \div b = \frac{a}{b}$) - Substitute numerical values into formulae and expressions following the correct order of operations. - Substitute numerical values into scientific formulae in order to make a comparison or problem solve (including speed, distance and time and mass, density and volume) - Collect like terms in an expression or equation. - Simplify expressions or equations involving multiplication/division of terms 		<p>Students will read worded problems – with pronunciation corrected when necessary.</p> <p>Frequency Probability Element Set <i>Intersection</i> <i>Union</i> <i>Empty set</i> Term Expression Inequality Formula Coefficient Substitute Collect like terms Simplify</p>
		<p>Students will complete a 'What a bad one looks like' known as WABOLL; an incorrectly answered question. Students are required to identify the misconceptions and provide a written explanation in their own words.</p>
		<p>Students will need to verbally explain key words and concepts. e.g. the difference between $2a$ and a^2 is that $2a$ means $2 \times a$ and a^2 means $a \times a$.</p>
		<p>Homework – (Extended Do Now Topics)</p> <ol style="list-style-type: none"> 1. Probability and two way tables 2. Venn diagrams 3. BIDMAS 4. Substitution 5. Speed, distance, time 6. Density, mass, volume 7. Simplifying expressions



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<p>HALF TERM 2: Algebraic Manipulation and Linear Equations</p> <p><i>Taught prerequisites:</i></p> <ul style="list-style-type: none"> - Understand the laws of indices for multiplication, division and use of brackets to terms with the same base. - Interpret and compare numbers in standard form. - Multiply and divide numbers in standard form. <p>Algebraic Manipulation</p> <ul style="list-style-type: none"> - Understand the laws of indices for multiplication, division and use of brackets to terms with the same base. - Simplify terms involving indices. - Multiply a single term over a bracket. - Multiply out brackets in expressions and simplify by collecting like terms. - Factorise expressions (into one bracket) by taking out the highest common factor. - Understand that every operation as an inverse operation. - Rearrange equations/formulae/identities, using inverse operations, to maintain equivalence. - <i>Change the subject of an equation/formula/identity by rearranging.</i> <p>Linear Equations</p> <ul style="list-style-type: none"> - Solve linear equations (one step, two step and including brackets) by maintaining equivalence through balancing. - Understand what the solution to an equation represents (and how it can be checked). - <i>Solve linear equations with an unknown on both sides.</i> - <i>Solve inequalities with an unknown on one side.</i> - <i>Understand that an equation with have a solution but an inequality will have a solution set.</i> 		<p>Students will read worded problems – with pronunciation corrected when necessary.</p> <p>Base Index/power Expand Factorise Inverse operation Balance Rearrange Solve Solution <i>(Change) the subject</i></p>
		<p>Students will complete a ‘What a bad one looks like’ known as WABOLL; an incorrectly answered question. Students are required to identify the misconceptions and provide a written explanation in their own words.</p>
		<p>Students will need to verbally explain key words and concepts. e.g. the inverse operation of multiplying by 5 is dividing by 5.</p>
		<p>Homework – (Extended Do Now Topics Including HT1, topics to include a variety from)</p> <ol style="list-style-type: none"> 1. Laws of indices 2. Standard form 3. Simplifying expressions 4. Expanding brackets 5. Factorising expressions 6. Solving equations 7. Rearranging equations



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<p>HALF TERM 3: Sequences, Linear Graphs and Transformations</p> <p><u>Sequences</u></p> <ul style="list-style-type: none"> - Continue numerical and non-numerical sequences by spotting patterns. - Recognise arithmetic (<i>and geometric</i>) sequences. - Continue an arithmetic sequence by finding the term-to-term rule. - Appreciate the nth term is a unique way of describing a sequence, unlike the term-to-term rule. - Find the nth term of an arithmetic sequence. - <i>Recognise a Fibonacci sequence.</i> - <i>Use the nth term of an arithmetic sequence to generate a sequence or find a particular term.</i> 		<p>Students will read worded problems – with pronunciation corrected when necessary.</p> <p>Sequence Term Arithmetic <i>Geometric</i> <i>Fibonacci sequence</i> Term-to-term rule nth term Quadrant Horizontal Vertical Linear Symmetry Reflect Translate</p>
<p><u>Linear Graphs</u></p> <ul style="list-style-type: none"> - Plot and read coordinates in all four quadrants. - Draw horizontal and vertical graphs from their equation. - Recognise horizontal and vertical graphs and be able to give their equation. - Draw graphs of linear functions in terms of x and y in the Cartesian plane. - <i>Recognise graphs of linear functions in terms of x and y in the Cartesian plane.</i> 		<p>Students will complete a 'What a bad one looks like' known as WABOLL; an incorrectly answered question. Students are required to identify the misconceptions and provide a written explanation in their own words.</p> <p>Mathematical descriptions need to be completed using the correct language key words.</p>
<p><u>Transformations</u></p> <ul style="list-style-type: none"> - Identify lines of symmetry in a 2D shape. - Reflect an image in a mirror line (including when given on a coordinate grid). - Describe a reflection mathematically. - Rotate an image (including when given on a coordinate grid). - <i>Describe a rotation mathematically.</i> - Translate an image (including on a coordinate grid). - Describe a translation by describing its movement. - <i>Describe a translation mathematically (use of column vectors)</i> 		<p>Students will need to verbally explain key words and concepts. e.g. the sequence is arithmetic because the term-to-term rule is +3.</p>
		<p>Homework – (Extended Do Now Topics Including Term 1, topics to include a variety from)</p> <ol style="list-style-type: none"> 1. Sequences 2. Plotting linear graphs 3. Transformations



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<p>HALF TERM 4: 2 Dimensional Shapes (2) and 3 Dimensional Shapes</p> <p><u>2 Dimensional Shapes</u></p> <ul style="list-style-type: none"> - Enlarge an image by a positive integer scale factor (including on a coordinate grid). - Enlarge an image by a positive fractional scale factor (including on a coordinate grid). - Calculate the scale factor of an enlargement. - Fully describe an enlargement mathematically. - Understand that mathematically similar shapes are created through enlargements. - Find missing lengths of the larger shape in mathematically similar shapes. - Find missing lengths of either shape in mathematically similar shapes. - Label parts of a circle (radius, diameter, chord, tangent, sector, <i>segment</i>) - Calculate the perimeter of a circle. - Calculate the area of a trapezium. - Calculate the area of a circle. - Calculate the perimeter and area of compound shapes including sectors. 		<p>Students will read worded problems – with pronunciation corrected when necessary.</p> <p>Enlarge Scale factor (Mathematically) similar Radius Diameter Chord Tangent <i>Sector</i> <i>Segment</i> Face Edge Vertex/vertices Plan view Front elevation Side elevation Net</p>
<p><u>3 Dimensional Shapes</u></p> <ul style="list-style-type: none"> - Recognise 3D shapes and describe them mathematically (using key words). - Identify the plan view and elevations of a 3D shape. - Draw 3D shapes using isometric paper. - Identify the net of cubes (and cuboids). 		<p>Students will complete a 'What a bad one looks like' known as WABOLL; an incorrectly answered question. Students are required to identify the misconceptions and provide a written explanation in their own words.</p> <p>Mathematical descriptions need to be completed using the correct language key words.</p>
		<p>Students will need to verbally describe 3D shapes by using their mathematical properties e.g. A cube has 6 identical faces, 12 edges and 8 vertices. A cuboid is similar but...</p>
		<p>Homework – (Extended Do Now Topics Including HT3, topics to include a variety from)</p> <ol style="list-style-type: none"> 1. Similar shapes 2. Circumference of a circle 3. Area of a trapezium 4. Area of a circle 5. 3d shapes



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<p>HALF TERM 5: Measures of 3D Shapes and Angle Properties</p> <p>Measures of 3D Shapes</p> <ul style="list-style-type: none">- Understand what is meant by the surface area of a 3D shape.- Calculate the surface area of cubes (and cuboids) by first considering their nets.- Calculate the surface area of triangular prisms and cylinders (when all dimensions are given)- Calculate the volume of cubes and cuboids.- Calculate the volume of triangular prisms and cylinders.		<p>Students will read worded problems – with pronunciation corrected when necessary.</p> <p>Surface area Alternate (angle) Corresponding (angle) Interior (angle) Exterior (angle) Adjacent Regular Irregular</p>
<p>Angle Properties</p> <ul style="list-style-type: none">- Recall the angle properties of a straight line and vertically opposite angles.- Identify alternate and corresponding angles in parallel lines.- Calculate missing angles in parallel lines.- Identify interior and exterior angles in polygons.- Understand and use the relationship between adjacent interior and exterior angles.- Understand and use the relationship between all exterior angles of any polygon.- Understand the impact of being a regular polygon has on its angles and use this to calculate an exterior (and then interior) angle.- Be able to calculate the number of sides a regular polygon has when given an exterior or interior angle.		<p>Students will complete a 'What a bad one looks like' known as WABOLL; an incorrectly answered question. Students are required to identify the misconceptions and provide a written explanation in their own words.</p>
		<p>Students will need to verbally explain key words and concepts. e.g. these two angles are equal because they are alternate angles in parallel lines.</p>
		<p>Homework – (Extended Do Now Topics Including Term 2, topics to include)</p> <ol style="list-style-type: none">1. Surface area2. Volume3. Angles



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<p>HALF TERM 6: Constructions</p> <p>Constructions</p> <ul style="list-style-type: none"> - Recall the use of a protractor to measure angles. - Use a pair of compasses to draw a circle given the radius (or diameter). - Understand that to draw a triangle three details need to be given (SAS; side-angle-side, ASA; angle-side-angle or SSS; side-side-side). - Understand that when given AAA (angle-angle-angle) several triangles could be constructed. All of which would be mathematically similar. - Accurately construct triangles (as described above) using the correct mathematical equipment. - Understand what is meant by congruence and be able to identify congruent shapes. - Understand that triangles constructed by SAS, ASA or SSS are congruent triangles. - Understand that any rotation or reflection of the same triangle are congruent. - Draw the locus of all points a given distance from a point using the correct mathematical equipment. - Draw the locus of all points a given distance from a line using the correct mathematical equipment. - Construct an angle bisector using the correct mathematical equipment. - Construct a perpendicular bisector using the correct mathematical equipment. - Use constructions and loci to identify a point or region equidistant from two points or lines. 		<p>Students will read worded problems – with pronunciation corrected when necessary.</p> <p>Construct <i>Congruent</i> Locus/loci Bisect(or) <i>Perpendicular</i> <i>Equidistant</i></p>
		<p>Students will complete a 'What a bad one looks like' known as WABOLL; an incorrectly answered question. Students are required to identify the misconceptions and provide a written explanation in their own words.</p>
		<p>Students will need to verbally explain key words and concepts. e.g. This line bisects the angle because it cuts it exactly in half..</p>
		<p>Homework – (Extended Do Now Topics Including HT5, topics to include)</p> <ol style="list-style-type: none"> 1. Angles in polygons 2. Congruent shapes