



**Curriculum Map: Year: 10 Foundation Subject: Maths**

Topic	Key Knowledge <i>What will all students KNOW by the end of the topic?</i>	Key Skills <i>What key skills will be learnt/developed by the end of the topic? What will all students be able to DO by the end of the topic?</i>	Assessment Opportunities <i>What are the key pieces of assessment? How will students be assessed?</i>
<b>Half Term 1</b>	<p>All students will develop their fluency, reasoning and problem-solving skills in:</p> <ul style="list-style-type: none"> <li>• Integers and place value</li> <li>• Decimals</li> <li>• Indices, powers and roots</li> <li>• Factors, multiples and primes</li> <li>• Algebra: the basics</li> <li>• Expressions and substitution into formulae</li> </ul>	<p>N1 order positive and negative integers, decimals and fractions; use the symbols =, ≠, &lt;, &gt;, ≤, ≥</p> <p>N2 apply the four operations, including formal written methods, to integers, decimals and simple fractions (proper and improper), and mixed numbers – all both positive and negative; understand and use place value (e.g. when working with very large or very small numbers, and when calculating with decimals)</p> <p>N3 recognise and use relationships between operations, including inverse operations (e.g. cancellation to simplify calculations and expressions); use conventional notation for priority of operations, including brackets, powers, roots and reciprocals</p> <p>N4 use the concepts and vocabulary of prime numbers, factors (divisors), multiples, common factors, common multiples, highest common factor, lowest common multiple, prime factorisation, including using product notation and the unique factorisation theorem</p> <p>N5 apply systematic listing strategies</p> <p>N6 use positive integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5</p> <p>N7 calculate with roots and with integer and with integer indices</p> <p>N13 use standard units of mass, length, time, money and other measures (including standard compound measures) using decimal quantities where appropriate</p> <p>N14 estimate answers; check calculations using approximation and estimation, including answers obtained using technology</p> <p>N15 round numbers and measures to an appropriate degree of accuracy (e.g. to a specified number of decimal places or significant figures);</p> <p>A1 use and interpret algebraic notation, including:</p> <ul style="list-style-type: none"> <li>• ab in place of <math>a \times b</math></li> <li>• 3y in place of <math>y + y + y</math> and <math>3 \times y</math></li> </ul>	<p>All students will:</p> <p>Complete a self-assessed topic-based test in class.</p>

**Curriculum Map: Year: 10 Foundation Subject: Maths**

		<ul style="list-style-type: none"> <li>• <math>a^2</math> in place of <math>a \times a</math>, <math>a^3</math> in place of <math>a \times a \times a</math>, <math>a^2b</math> in place of <math>a \times a \times b</math></li> <li>• in place of <math>a \div b</math></li> <li>• coefficients written as fractions rather than as decimals</li> <li>• brackets</li> </ul> <p>A2 substitute numerical values into formulae and expressions, including scientific formulae</p> <p>A3 understand and use the concepts and vocabulary of expressions, equations, formulae, identities, inequalities, terms and factors</p> <p>A4 simplify and manipulate algebraic expressions ... by:</p> <ul style="list-style-type: none"> <li>• collecting like terms</li> <li>• multiplying a single term over a bracket</li> <li>• taking out common factors ...</li> <li>• simplifying expressions involving sums, products and powers, including the laws of indices</li> </ul> <p>A5 understand and use standard mathematical formulae; rearrange formulae to change the subject</p> <p>A6 know the difference between an equation and an identity; argue mathematically to show algebraic expressions are equivalent, and use algebra to support and construct arguments</p> <p>A7 where appropriate, interpret simple expressions as functions with inputs and outputs</p> <p>A21 translate simple situations or procedures into algebraic expressions or formulae; derive an equation, solve the equation and interpret the solution</p>	
<p><b>Half Term 2</b></p>	<p>All students will develop their fluency, reasoning and problem-solving skills in:</p> <ul style="list-style-type: none"> <li>• Tables, charts and graphs</li> <li>• Pie charts</li> <li>• Scatter graphs</li> <li>• Fractions, decimals and percentages</li> </ul>	<p>G2 use the standard ruler and compass constructions (perpendicular bisector of a line segment, constructing a perpendicular to a given line from/at a given point, bisecting a given angle); use these to construct given figures and solve loci problems; know that the perpendicular distance from a point to a line is the shortest distance to the line</p> <p>G14 use standard units of measure and related concepts (length, area, volume/capacity, mass, time, money, etc.)</p> <p>G15 measure line segments and angles in geometric figures ...</p> <p>S2 interpret and construct tables, charts and diagrams, including frequency tables, bar charts, pie charts and pictograms for categorical data, vertical line charts for ungrouped discrete numerical data, tables and line graphs for time series data and know their appropriate use</p> <p>S4 interpret, analyse and compare the distributions of data sets from univariate empirical distributions through:</p> <ul style="list-style-type: none"> <li>• appropriate graphical representation involving discrete, continuous and grouped data</li> <li>• appropriate measures of central tendency (... mode and modal class) and spread (range, including consideration of outliers)</li> </ul> <p>S5 apply statistics to describe a population</p>	<p>All students will: Complete and end of term assessment on the skills from this term.</p>

**Curriculum Map: Year: 10 Foundation Subject: Maths**

		<p>S6 use and interpret scatter graphs of bivariate data; recognise correlation and know that it does not indicate causation; draw estimated lines of best fit; make predictions; interpolate and extrapolate apparent trends whilst knowing the dangers of so doing</p> <p>N8 calculate exactly with fractions ...</p> <p>N10 work interchangeably with terminating decimals and their corresponding fractions (such as 3.5 and 0.375 and )</p>	
<p><b>Half Term 3</b></p>	<p>All students will develop their fluency, reasoning and problem-solving skills in:</p> <ul style="list-style-type: none"> <li>• Percentages</li> <li>• Equations and inequalities</li> <li>• Sequences</li> </ul>	<p>All students will be able to:</p> <p>N12 interpret fractions and percentages as operators</p> <p>N13 use standard units of mass, length, time, money and other measures (including standard compound measures) using decimal quantities where appropriate</p> <p>R9 define percentage as ‘number of parts per hundred’; interpret percentages and percentage changes as a fraction or a decimal, and interpret these multiplicatively; express one quantity as a percentage of another; compare two quantities using percentages; work with percentages greater than 100%; solve problems involving percentage change, including percentage increase/decrease, and original value problems and simple interest including in financial mathematics</p> <p>N1 order positive and negative integers, decimals and fractions; use the symbols =, ≠, &lt;, &gt;, ≤, ≥</p> <p>N15 round numbers and measures to an appropriate degree of accuracy (e.g. to a specified number of decimal places or significant figures); use inequality notation to specify simple error intervals due to truncation or rounding</p> <p>N16 apply and interpret limits of accuracy</p> <p>A2 substitute numerical values into formulae and expressions, including scientific formulae</p> <p>A3 understand and use the concepts and vocabulary of expressions, equations, formulae, identities, inequalities, terms and factors</p> <p>A5 understand and use standard mathematical formulae; rearrange formulae to change the subject</p> <p>A7 where appropriate, interpret simple expressions as functions with inputs and outputs</p> <p>A17 solve linear equations in one unknown algebraically (including those with the unknown on both sides of the equation); find approximate solutions using a graph</p> <p>A21 translate simple situations or procedures into algebraic expressions or formulae; derive an equation, solve the equation and interpret the solution</p> <p>A22 solve linear inequalities in one variable; represent the solution set on a number line</p> <p>A23 generate terms of a sequence from either a term-to-term or a position-to-term rule</p> <p>A24 recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions; Fibonacci type sequences and simple geometric progressions (<math>rn</math> where <math>n</math> is an integer, and <math>r</math> is a rational number <math>&gt; 0</math>)</p> <p>A25 deduce expressions to calculate the <math>n</math>th term of linear sequences.</p>	<p>All students will:</p> <p>Complete a self-assessed topic-based test in class.</p>

**Curriculum Map: Year: 10 Foundation Subject: Maths**

<p><b>Half Term 4</b></p>	<p>All students will develop their fluency, reasoning and problem-solving skills in:</p> <ul style="list-style-type: none"> <li>• Properties of shapes, parallel lines and angle facts</li> <li>• Interior and exterior angles of polygons</li> <li>• Statistics, sampling and the averages</li> </ul>	<p>All students will be able to:</p> <p>A8 work with coordinates in all four quadrants</p> <p>G1 use conventional terms and notation: points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons, regular polygons and polygons with reflection and/or rotation symmetries; use the standard conventions for labelling and referring to the sides and angles of triangles; draw diagrams from written description</p> <p>G3 apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles; understand and use alternate and corresponding angles on parallel lines; derive and use the sum of angles in a triangle (e.g. to deduce and use the angle sum in any polygon, and to derive properties of regular polygons)</p> <p>G4 derive and apply the properties and definitions of special types of quadrilaterals, including square, rectangle, parallelogram, trapezium, kite and rhombus; and triangles and other plane figures using appropriate language</p> <p>G7 identify and describe congruent and similar shapes</p> <p>G6 apply angle facts, triangle congruence, similarity and properties of quadrilaterals to conjecture and derive results about angles and sides, including ... the fact that the base angles of an isosceles triangle are equal, and use known results to obtain simple proofs</p> <p>G11 solve geometrical problems on coordinate axes</p> <p>G15 measure line segments and angles in geometric figures</p> <p>S1 infer properties of populations or distributions from a sample, while knowing the limitations of sampling</p> <p>S2 interpret and construct tables, charts and diagrams, including frequency tables, bar charts, pie charts and pictograms for categorical data, vertical line charts for ungrouped discrete numerical data, tables and line graphs for time-series data and know their appropriate use</p> <p>S4 interpret, analyse and compare the distributions of data sets from univariate empirical distributions through: ...</p> <ul style="list-style-type: none"> <li>• appropriate measures of central tendency (median, mean, mode and modal class) and spread (range, including consideration of outliers)</li> </ul>	<p>All students will:</p> <p>Complete and end of term assessment on the skills from this term.</p>
<p><b>Half Term 5</b></p>	<p>All students will develop their fluency, reasoning and problem-solving skills in:</p> <ul style="list-style-type: none"> <li>• Perimeter, area and volume</li> <li>• Real-life graphs</li> <li>• Straight-line graphs</li> </ul>	<p>All students will be able to:</p> <p>N14 estimate answers; check calculations using approximation and estimation, including answers obtained using technology</p> <p>A5 understand and use standard mathematical formulae; ...</p> <p>R1 change freely between related standard units (e.g. time, length, area, volume/capacity, mass) and compound units (e.g. speed, rates of pay, prices, density, pressure) in numerical and algebraic contexts</p> <p>G11 solve geometrical problems on coordinate axes</p> <p>G12 identify properties of the faces, surfaces, edges and vertices of: cubes, cuboids, prisms, cylinders, pyramids, cones and spheres</p> <p>G14 use standard units of measure and related concepts (length, area, volume/capacity, mass, time, money, etc.)</p>	<p>All students will:</p> <p>Complete a self-assessed topic-based test in class. Complete a mock exam paper.</p>

**Curriculum Map: Year: 10 Foundation Subject: Maths**

		<p>G15 measure line segments and angles in geometric figures ...</p> <p>G16 know and apply formulae to calculate: area of triangles, parallelograms, trapezia; volume of cuboids and other right prisms (including cylinders)</p> <p>G17 ... calculate: perimeters of 2D shapes, including ... composite shapes</p> <p>N13 use standard units of mass, length, time, money and other measures (including standard compound measures) using decimal quantities where appropriate</p> <p>A7 where appropriate, interpret simple expressions as functions with inputs and outputs</p> <p>A8 work with coordinates in all four quadrants</p> <p>A9 plot graphs of equations that correspond to straight-line graphs in the coordinate plane; ...</p> <p>A10 identify and interpret gradients and intercepts of linear functions graphically and algebraically</p> <p>A12 Recognise, sketch and interpret graphs of linear functions ...</p> <p>A14 plot and interpret ... graphs of non-standard functions in real contexts, to find approximate solutions to problems such as simple kinematic problems involving distance, speed and acceleration</p> <p>A17 solve linear equations in one unknown algebraically (including those with the unknown on both sides of the equation); find approximate solutions using a graph</p> <p>R1 change freely between related standard units (e.g. time, length, area, volume/capacity, mass) and compound units (e.g. speed, rates of pay, prices, density, pressure) in numerical and algebraic contexts</p> <p>R11 use compound units such as speed, ... unit pricing, ...</p> <p>R14 interpret the gradient of a straight line graph as a rate of change; recognise and interpret graphs that illustrate direct and inverse proportion</p>	
<p><b>Half Term 6</b></p>	<p>All students will develop their fluency, reasoning and problem-solving skills in:</p> <ul style="list-style-type: none"> <li>• Transformations</li> <li>• Ratio</li> <li>• Proportion</li> </ul>	<p>All students will be able to:</p> <p>G1 use conventional terms and notations: points, lines, vertices, edges, planes, parallel lines, perpendicular lines, right angles, polygons, regular polygons and polygons with reflection and/or rotation symmetries; ...</p> <p>G7 identify, describe and construct congruent and similar shapes, including on coordinate axes, by considering rotation, reflection, translation and enlargement (including fractional scale factors)</p> <p>G24 describe translations as 2D vectors</p> <p>N11 identify and work with fractions in ratio problems</p> <p>N13 use standard units of mass, length, time, money and other measures (including standard compound measures) using decimal quantities where appropriate</p> <p>R1 change freely between related standard units (e.g. time, length, area, volume/capacity, mass) and compound units (e.g. speed, rates of pay, prices, density, pressure) in numerical and algebraic contexts</p> <p>R2 use scale factors, scale diagrams and maps</p> <p>R3 express one quantity as a fraction of another</p>	<p>All students will: Complete and end of term assessment on the skills from this term.</p>

**Curriculum Map: Year: 10 Foundation Subject: Maths**

		<p>R4 use ratio notation, including reduction to simplest form</p> <p>R5 divide a given quantity into two parts in a given part : part or part : whole ratio; express the division of a quantity into two parts as a ratio; apply ratio to real contexts and problems (such as those involving conversion, comparison, scaling, mixing, concentrations)</p> <p>R6 express a multiplicative relationship between two quantities as a ratio or a fraction</p> <p>R7 understand and use proportion as equality of ratios</p> <p>R8 relate ratios to fractions and to linear functions</p> <p>R10 solve problems involving direct and inverse proportion, including graphical and algebraic representations</p> <p>R12 compare lengths, areas and volumes using ratio notation; make links to similarity (including trigonometric ratios) and scale factors</p> <p>R13 understand that X is inversely proportional to Y is equivalent to X is proportional to ; interpret equations that describe direct and inverse proportion</p> <p>R14 interpret the gradient of a straight line graph as a rate of change; recognise and interpret graphs that illustrate direct and inverse proportion</p>	
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