

# Subject: Maths

# KS3 Curriculum Mapping

	Year 7	Year 8	Year 9
HT1	<p><b>Calculations</b></p> <ul style="list-style-type: none"> <li>- Order decimals and integers. Round a number to 1, 2, and 3 decimal places. Add and subtract decimals. Calculate quotients as decimals using short multiplication</li> <li>- Use and apply the hierarchy of operations to complete multistage calculations. Identify square and cube numbers. Calculate powers and cube/square roots</li> <li>- Find LCM and HCF of two numbers by listing. Apply basic index laws for numerical bases. Express a number as a product of its primes</li> </ul> <p><b>The number system</b></p> <ul style="list-style-type: none"> <li>- Apply knowledge of fractions equivalent to 1 to generate equivalent fractions. Convert between percentages, fractions and decimals. Use inequality symbols and fraction equivalence to compare fractions</li> <li>- Add and subtract fractions with different denominators. Add and subtract mixed numbers. Multiply fractions (without cancelling).</li> <li>- Calculate percentages of amounts using decimal equivalents on a calculator.</li> <li>- Calculate using addition and subtraction operations with negative integers. Calculate using multiply and divide operations with negative numbers</li> </ul>	<p><b>Calculations</b></p> <ul style="list-style-type: none"> <li>- Determine a multiplier to enable a given increase or decrease by a percentage.</li> <li>- Identify the reciprocal of an integer, decimal or fraction. Divide fractions by multiplying the first fraction by the reciprocal of the second. Divide decimals by converting to equivalent fractions and simplifying.</li> </ul> <p><b>The number system</b></p> <ul style="list-style-type: none"> <li>- Use the equivalence of <math>\times 0.1</math> and <math>\div 10</math>, <math>\times 0.01</math> and <math>\div 100</math> etc. to multiply and divide by powers of 10. Use a given calculation to find the answer to a related calculation</li> <li>- Use rounding and approximation to estimate the answer to decimal calculations.</li> </ul>	<p><b>Calculations</b></p> <ul style="list-style-type: none"> <li>- Use multipliers to solve problems involving repeated percentage change, compound interest and reverse percentages.</li> <li>- Convert between fractions, decimals and percentages to find the most appropriate method to use in a calculation.</li> </ul> <p><b>The number system</b></p> <ul style="list-style-type: none"> <li>- Solve problems involving numbers expressed in standard index form with and without a calculator.</li> <li>- Recognise that measurements given to the nearest whole unit may be inaccurate by up to half a unit in either direction.</li> </ul>
HT2	<p><b>Equations and formulae –</b></p> <ul style="list-style-type: none"> <li>- Simplify an algebraic expression by collecting <b>like terms</b>. Simplify an algebraic expression by multiplying terms. Use algebra to generalise number operations using function machines</li> <li>- Expand brackets containing single brackets and a linear power of <math>x</math>. Expand single brackets and simplify the resulting expression.</li> </ul>	<p><b>Indices</b></p> <ul style="list-style-type: none"> <li>- Use prime factors to find the HCF and LCM of larger numbers. To reason about the properties about the prime factorisations of squares and cubes. To find the prime factorisation of products and powers</li> <li>- Substitute into a function expressed as <math>f(x)</math>. Form expressions from function machines, including powers and roots. Change the subject of a <b>multistep</b> formula. Distinguish between formulae, expressions, and equations</li> </ul> <p><b>Equations and formulae</b></p> <ul style="list-style-type: none"> <li>- Expand and simplify the sum of two pairs of brackets. Expand 2 brackets containing linear terms and simplify the resulting expression. Expand 2 brackets in the form of a perfect square.</li> <li>- Find the HCF of two numbers, where one or more may be algebraic.</li> </ul>	<p><b>Indices</b></p> <ul style="list-style-type: none"> <li>- Understand that even powers and roots are always positive but odd can be positive or negative. - Substitute values into complex expressions and formulae involving powers and roots - Simplify algebraic expressions using multiplication and division of integer powers.</li> <li>- Use algebraic manipulation skills to prove simple identities (using <math>2n</math> and <math>2n+1</math> to represent odd and even numbers) and multiples.</li> </ul> <p><b>Equations and formulae -</b></p> <ul style="list-style-type: none"> <li>- Factorise quadratic expressions including the difference of two squares. - Solve pairs of linear simultaneous equations through elimination and substitution.</li> </ul>

		<p>Factorise an expression where the HCF is algebraic</p> <ul style="list-style-type: none"> <li>- Solve fractional equations.</li> </ul> <p>Solve linear equations where the unknown appears on both sides using balancing.</p> <ul style="list-style-type: none"> <li>- Solve inequalities where the variable appears a single time. Solve inequalities where the variable is negative</li> </ul>	
HT3	<p><b>Equations and formulae –</b></p> <ul style="list-style-type: none"> <li>- Substitute symbols for variables. Substitute variables, positive and negative, into algebraic expressions. Substitute variables into formulae for triangles and trapezium.</li> <li>- Solve linear one step equations using balancing. Solve linear two step equations involving multiplication using balancing. Use substitution to check answers.</li> </ul> <p><b>Proportion</b></p> <ul style="list-style-type: none"> <li>- Solve 'best value' problems. Use scale factors to find missing lengths in similar shapes or scale drawings.</li> <li>- Write a ratio in the form 1:n. Share an amount into a ratio. Share an amount ratio where the difference is given</li> <li>- Find multiples of simple percentages of an amount, without a calculator (30%, 75%). Express one number as a percentage of another</li> </ul>	<p><b>Proportion</b></p> <ul style="list-style-type: none"> <li>- Use ratio in the form 1: n to write an equation in the form <math>y = kx</math>, where <math>k</math> is constant. Use conversion graphs and understand how they link to a common ratio</li> <li>- Use proportional relationships to calculate any percentage given the original</li> </ul> <p><b>Mensuration</b></p> <ul style="list-style-type: none"> <li>- Use proportional reasoning to find missing values in models of speed, density, and pressure. Use formulae to find missing values in models of speed, density, and pressure.</li> <li>- Calculate the area or circumference of a circle, leaving your answer in terms of <math>\pi</math>. Calculate the radius or circumference of a circle, given its area or circumference. Calculate the number of revolutions required for a circular object to travel a given distance</li> </ul>	<p><b>Proportion</b></p> <ul style="list-style-type: none"> <li>- For problems involving direct and inverse proportion, write relationships and recognise graphs.</li> </ul> <p><b>Mensuration</b></p> <ul style="list-style-type: none"> <li>- Know and use formulae for volume and surface area of all prisms, pyramids, spheres and cones, including frustums. – Pythagoras' theorem - Identify the hypotenuse in a right angles triangle. Use the formula <math>a^2 + b^2 = c^2</math>, to calculate a missing side</li> <li>- Solve problems involving compound measures such as density or speed using proportional reasoning.</li> </ul>

HT4	<p><b>Mensuration</b></p> <ul style="list-style-type: none"> <li>- Understand the difference between different types of quadrilateral and triangles. Calculate the area of Trapeziums and Parallelograms. Calculate the Area and Perimeter of Compound polygons</li> <li>- Work out the volume of a cube or cuboid using its dimensions. Work out missing dimensions of a cuboid given its volume.</li> </ul>	<p><b>Graphs and sequences</b></p> <ul style="list-style-type: none"> <li>- Use term to term rules and multiples to find the nth term of a linear sequence. Use the nth term of a sequence to justify if a number belongs to the sequence.</li> <li>- Identify the gradient and y intercept of function from its graph. Identify the gradient and y intercept by rearranging into the form <math>y = mx + c</math>. Plot real life graphs and interpret the meaning of the y-intercept and gradient</li> <li>- Find the coordinates which two straight lines intersect by plotting them onto a coordinate grid.</li> </ul>	<p><b>Graphs and sequences</b></p> <ul style="list-style-type: none"> <li>- Find gradient and intercept of line given in the form <math>y = mx + c</math> and other forms such as <math>3x + 2y = 12</math>.</li> <li>- Find the equation of a line or the midpoint given two coordinates.</li> <li>- Find the equation of a line from a single coordinate and the equation of a parallel line.</li> <li>- Plot simple quadratic, cubic and reciprocal functions. Solve a quadratic by identifying its roots on a graph.</li> </ul>
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<p><b>HT5</b></p>	<p><b>Sequences</b> Describe and continue Linear and non-linear Term to term rules</p> <p><b>Rounding and Estimate</b> Rounding to significant figures Estimation Solving problems with estimation Understand and use error interval notation</p> <p><b>Graphing and Data</b> Pictograms Bar charts Dual bar charts Composite bar charts Coordinates in the first quadrant Scatter graphs Correlation</p> <p><b>Algebraic notation and substitution</b> Function machines Substitution</p> <p><b>Expressions and equations</b> Equality and equivalence Related facts Like and unlike terms Collect like terms Solve 1 and 2 step equations</p>	<p><b>Symmetry and reflection</b> Line of symmetry Rotational symmetry Reflect a shape in a horizontal or vertical line Reflect in a diagonal line Reflect a shape un a given equation of a line</p> <p><b>Standard form</b> Positive and negative powers of ten Numbers greater than 1 Numbers between 0 and 1 Using a calculator</p> <p><b>Interpret and represent data</b> Types of data Outliers and errors Averages and range Grouped frequency Discrete and continuous data Mean and mode from a grouped frequency</p>	<p><b>Ratio</b> Simplify Compare Problems with whole and part given</p> <p><b>Proportion and scale</b> Direct proportion Conversion graphs Direct proportion graphs Similar shapes Metric units Scale diagrams and maps</p> <p><b>Algebraic manipulation</b> Form algebraic expressions Identify and use formulae and expressions, identities and equations Simplify expressions Directed number with algebra Expand and factorise brackets</p>	<p><b>Similarity</b> Recognise enlargement and similarity Calculate unknown lengths and angles Problem solving</p> <p><b>Transformations</b> Enlargement – positive, fractional and negative. Describing</p> <p><b>Rates</b> Speed, distance time Distance time graphs Solve flow problems Rates of changes Converting compound units</p> <p><b>Non-linear graphs</b> Substitute into quadratic expressions Draw quadratics Interpret quadratics – including roots, intercepts and turning points. Reciprocal, exponential and cubic graphs</p>	<p><b>Percentages</b> Increase and decrease Find original Solve problems – non-calc and calc Repeated change Simple and compound interest</p> <p><b>Equations, inequalities and formulae</b> Solve equations and inequalities Substitute into formulae and equations Change of subject</p> <p><b>Fractions</b> Add, subtract, multiply and divide Fractions of amounts</p> <p><b>Standard form</b> Compare Multiply and divide Add and subtract</p>
<p><b>HT6</b></p>	<p><b>Averages</b> Mode, mean, median and range</p> <p><b>Speed, distance and time</b> Solve problems with time Calculate speed Calculate time and distance Solve problems with speed, distance and time Interpret distance-time graphs Draw distance-time graphs Calculate the speed from a distance time graph</p> <p><b>Angles and polygons</b></p>	<p><b>Angles in parallel lines and polygons</b> Alternate, corresponding and co-interior Solve problems Properties of special quadrilaterals Exterior angles Interior angles Regular polygons</p> <p><b>Coordinates and graphs</b> Lines parallel to axes</p>	<p><b>Angles in parallel lines and polygons</b> Alternate, corresponding and co-interior</p> <p><b>Coordinates and graphs</b> Lines parallel to axes Recognise <math>y = mx</math> Links to direct proportion Gradients Lines in the for <math>y = mx + c</math></p>	<p><b>Pythagoras Theorem</b> Coordinate axes Proof 3D shapes</p> <p><b>Probability Sets</b> Intersection, Unions, Complements of sets Probability of event</p>	<p><b>Rates</b> Speed, distance and time Distance time graphs Solve flow problems Rates of changes Converting compound units</p> <p>Ratio and proportion</p>

	<p>Draw and measure lines and angles  Understand and use geometric notation  Angles round a point, form a straight line, vertically opposite  Recognise and name polygons  Angles in a triangle and quadrilaterals  Solve problems with angles</p>	<p>Recognise <math>y = mx</math>  Links to direct proportion  Gradients  Lines in the form <math>y = mx + c</math></p> <p><b>Tables and probability</b>  Vocabulary  Scale  Single events  Experiments  Sample space  Two-way tables</p>	<p><b>Tables and probability</b>  Vocabulary  Scale  Single events  Experiments  Sample space  Two-way tables</p> <p><b>Circles</b>  Circle vocabulary  Pi ratio  Circumference  Perimeter  Area</p>	<p>Relative frequency  Expected outcomes  Independent events  Venn diagrams</p> <p><b>Trigonometry</b>  Tangent, sine and cosine ratios – finding unknown side lengths and angles</p>	<p>Direct and inverse proportion  Graphs  Problem solving</p> <p><b>Pythagoras Theorem</b>  Solve equations with squares and roots  Identify hypotenuse  Determine whether a triangle is right-angled  Find unknown sides</p>
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