

**Key Stage 4 Foundation Curriculum Overview**

Year 10							
Autumn Term 1A		Autumn Term 1A		Autumn Term 1A		Autumn Term 1B	
TOPIC TITLE: Numbers and the number system		TOPIC TITLE: Algebra		TOPIC TITLE: Graphs, tables and charts		TOPIC TITLE: Fractions and percentages	
<b>Topics</b> <ul style="list-style-type: none"> <li>Solve problems involving prime numbers</li> <li>Use highest common factors to solve problems</li> <li>Use lowest common multiples to solve problems</li> <li>Explore powers and roots</li> <li>Investigate number patterns</li> </ul>	<b>Domains (Core knowledge and skills)</b> <ul style="list-style-type: none"> <li>use the concepts and vocabulary of prime numbers, factors (divisors), multiples, common factors, common multiples, highest common factor and lowest common multiple</li> <li>use positive integer powers and associated real roots (square, cube and higher), recognise powers of 2, 3, 4, 5</li> <li>recognise and use sequences of triangular, square and cube numbers, simple arithmetic progressions</li> </ul>	<b>Topics</b> <ul style="list-style-type: none"> <li>Understand the vocabulary and notation of algebra</li> <li>Manipulate algebraic expressions</li> <li>Explore functions</li> <li>Evaluate algebraic statements</li> </ul>	<b>Domains (Core knowledge and skills)</b> <ul style="list-style-type: none"> <li>understand and use the concepts and vocabulary of expressions, equations, formulae and terms</li> <li>use and interpret algebraic notation, including: <math>ab</math> in place of <math>a \times b</math>, <math>3y</math> in place of <math>y + y + y</math> and <math>3 \times y</math>, <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/b</math> in place of <math>a \div b</math>, brackets</li> <li>simplify and manipulate algebraic expressions by collecting like terms and multiplying a single term over a bracket</li> <li>where appropriate, interpret simple expressions as functions with inputs and outputs</li> <li>substitute numerical values into formulae and expressions</li> <li>use conventional notation for priority of operations, including brackets</li> </ul>	<b>Topics</b> <ul style="list-style-type: none"> <li>Explore types of data</li> <li>Construct and interpret graphs</li> <li>Select appropriate graphs and charts</li> <li>Understand Time series</li> </ul>	<b>Domains (Core knowledge and skills)</b> <p>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 and know their appropriate use. Know what a time series is and how to represent and analyse this.</p>	<b>Topics</b> <ul style="list-style-type: none"> <li>Calculate with fractions</li> <li>Calculate with percentages</li> </ul>	<b>Domains (Core knowledge and skills)</b> <ul style="list-style-type: none"> <li>apply the four operations, including formal written methods, to simple fractions (proper and improper), and mixed numbers</li> <li>interpret percentages and percentage changes as a fraction or a decimal, and interpret these multiplicatively</li> <li>compare two quantities using percentages</li> <li>solve problems involving percentage change, including percentage increase/decrease</li> </ul>
<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Know how to find common multiples of two given numbers</li> <li>Know how to find common factors of two given numbers</li> </ul> Recall multiplication facts to $12 \times 12$ and associated division facts		<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Use symbols (including letters) to represent missing numbers</li> <li>Substitute numbers into worded formulae</li> <li>Substitute numbers into simple algebraic formulae</li> <li>Know the order of operations</li> </ul>		<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Construct and interpret a pictogram</li> <li>Construct and interpret a bar chart</li> <li>Construct and interpret a line graph</li> <li>Understand that pie charts are used to show proportions</li> <li>Use a template to construct a pie chart by scaling frequencies</li> </ul>		<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Add and subtract fractions with different denominators</li> <li>Add and subtract mixed numbers with different denominators</li> <li>Multiply a proper fraction by a proper fraction</li> <li>Divide a proper fraction by a whole number</li> <li>Simplify the answer to a calculation when appropriate</li> <li>Use non-calculator methods to find a percentage of an amount</li> </ul> Convert between fractions, decimals and percentages	

Year 10							
Autumn Term 1B		Spring Term 2A		Spring Term 2A		Spring Term 2A	
TOPIC TITLE: Equations, Inequalities and sequences		TOPIC TITLE: Angles		TOPIC TITLE: Averages and range		TOPIC TITLE: Perimeter, area and volume	
<b>Topics</b> <ul style="list-style-type: none"> <li>Explore way of solving equations</li> <li>Solve two-step equations</li> <li>Solve three-step equations</li> </ul>	<b>Domains (Core knowledge and skills)</b> <ul style="list-style-type: none"> <li>recognise and use relationships between operations, including inverse operations (e.g. cancellation to simplify calculations and expressions)</li> <li>solve linear equations in one unknown algebraically</li> </ul>	<b>Topics</b> <p>Investigate angles</p>	<b>Domains (Core knowledge and skills)</b> <ul style="list-style-type: none"> <li>apply the properties of angles at a point, angles at a point on a straight line, vertically opposite angles</li> <li>Investigate angles in parallel lines, triangles and Interior and exterior angles.</li> </ul>	<b>Topics</b> <ul style="list-style-type: none"> <li>Investigate averages</li> <li>Explore ways of summarising data</li> <li>Analyse and compare sets of data</li> </ul>	<b>Domains (Core knowledge and skills)</b> <p>Interpret, analyse and compare the distributions of data sets from univariate empirical distributions through appropriate measures of central tendency (median, mean and mode) and spread (range)</p>	<b>Topics</b> <ul style="list-style-type: none"> <li>Develop knowledge of area</li> <li>Investigate surface area</li> <li>Explore volume</li> </ul>	<b>Domains (Core knowledge and skills)</b> <ul style="list-style-type: none"> <li>use standard units of measure and related concepts (length, area, volume/capacity)</li> <li>calculate perimeters of 2D shapes</li> <li>know and apply formulae to calculate area of triangles, parallelograms, trapezia</li> <li>calculate surface area of cuboids</li> <li>know and apply formulae to calculate volume of cuboids</li> <li>understand and use standard mathematical formulae</li> </ul>
<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Know the basic rules of algebraic notation</li> <li>Express missing number problems algebraically</li> <li>Solve missing number problems expressed algebraically</li> </ul>		<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Identify angles that meet at a point</li> <li>Identify angles that meet at a point on a line</li> <li>Identify vertically opposite angles</li> </ul> Know that vertically opposite angles are equal		<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Understand the meaning of 'average' as a typicality (or location)</li> <li>Calculate the mean of a set of data</li> </ul>		<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Understand the meaning of area, perimeter, volume and capacity</li> <li>Know how to calculate areas of rectangles, parallelograms and triangles using the standard formulae</li> <li>Know that the area of a triangle is given by the formula <math>\text{area} = \frac{1}{2} \times \text{base} \times \text{height}</math></li> </ul>	

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Spring Term 2B		Spring Term 2B		Summer Term 3A		Summer Term 3A	
<b>TOPIC TITLE: Graphs</b>		<b>TOPIC TITLE: Transformations</b>		<b>TOPIC TITLE: Ratio and proportion</b>		<b>TOPIC TITLE: Right-angled triangles</b>	
<b>Topics</b> <ul style="list-style-type: none"> <li>Plot and interpret linear graphs</li> <li>Plot and quadratic graphs</li> <li>Model real situations using linear graphs</li> </ul>	<b>Domains (Core knowledge and skills)</b> <ul style="list-style-type: none"> <li>plot graphs of equations that correspond to straight-line graphs in the coordinate plane</li> <li>identify and interpret gradients and intercepts of linear functions graphically</li> <li>recognise, sketch and interpret graphs of linear functions and simple quadratic functions</li> <li>plot and interpret graphs and graphs of non-standard (<i>piece-wise linear</i>) functions in real contexts, to find approximate solutions to problems such as simple kinematic problems involving distance and speed</li> </ul>	<b>Topics</b> <ul style="list-style-type: none"> <li>Explore lines on the coordinate grid</li> <li>Use transformations to move shapes</li> <li>Describe transformations</li> </ul>	<b>Domains (Core knowledge and skills)</b> <ul style="list-style-type: none"> <li>work with coordinates in all four quadrants</li> <li><i>understand and use lines parallel to the axes, <math>y = x</math> and <math>y = -x</math></i></li> <li>solve geometrical problems on coordinate axes</li> <li>identify, describe and construct congruent shapes including on coordinate axes, by considering rotation, reflection and translation</li> <li>describe translations as 2D vectors</li> </ul>	<b>Topics</b> <ul style="list-style-type: none"> <li>Understand and use ratio notation</li> <li>Solve problems that involve dividing in a ratio</li> </ul>	<b>Domains (Core knowledge and skills)</b> <ul style="list-style-type: none"> <li>use ratio notation, including reduction to simplest form</li> <li>divide a given quantity into two parts in a given part:part or part:whole ratio</li> </ul>	<b>Topics</b> <ul style="list-style-type: none"> <li>Investigate right-angled triangles</li> <li>Solve problems involving Pythagoras' theorem</li> <li>know the trigonometric ratios, <math>\sin\theta = \text{opposite/hypotenuse}</math>, <math>\cos\theta = \text{adjacent/hypotenuse}</math>, <math>\tan\theta = \text{opposite/adjacent}</math></li> <li>apply it to find angles and lengths in right-angled triangles in two dimensional figures</li> </ul>	<b>Domains (Core knowledge and skills)</b> <p>know the formulae for: Pythagoras' theorem, <math>a^2 + b^2 = c^2</math>, and apply it to find lengths in right-angled triangles in two dimensional figures</p> <ul style="list-style-type: none"> <li>Investigate similar triangles</li> <li>Explore trigonometry in right-angled triangles</li> <li>Set up and solve trigonometric equations</li> <li>Use trigonometry to solve practical problems</li> </ul>
<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Use coordinates in all four quadrants</li> <li>Write the equation of a line parallel to the x-axis or the y-axis</li> <li>Draw a line parallel to the x-axis or the y-axis given its equation</li> <li>Identify the lines <math>y = x</math> and <math>y = -x</math></li> <li>Draw the lines <math>y = x</math> and <math>y = -x</math></li> <li>Substitute positive and negative numbers into formulae</li> </ul>		<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Work with coordinates in all four quadrants</li> <li>Carry out a reflection in a given vertical or horizontal mirror line</li> <li>Carry out a translation</li> </ul>		<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Find common factors of pairs of numbers</li> <li>Convert between standard metric units of measurement</li> <li>Convert between units of time</li> <li>Recall multiplication facts for multiplication tables up to <math>12 \times 12</math></li> <li>Recall division facts for multiplication tables up to <math>12 \times 12</math></li> <li>Solve comparison problems</li> </ul>		<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Know how to use formulae to find the area of rectangles, parallelograms, triangles and trapezia</li> <li>Know how to find the area of compound shapes</li> <li>Understand and work with similar shapes</li> <li>Solve linear equations, including those with the unknown in the denominator of a fraction</li> </ul>	

Year 10					
Summer Term 3A		Summer Term 3B		Summer Term 3B	
<b>TOPIC TITLE: Probability</b>		<b>TOPIC TITLE: Multiplicative reasoning</b>		<b>TOPIC TITLE: Constructions, loci and bearings</b>	
<b>Topics</b> <ul style="list-style-type: none"> <li>Convert between fractions, decimals and percentages</li> <li>Understand the use of the 0-1 scale to measure probability</li> <li>Work out theoretical probabilities for events with equally likely outcomes</li> <li>Know how to represent a probability</li> <li>Know that the sum of probabilities for all outcomes is 1</li> </ul>	<b>Domains (Core knowledge and skills)</b> <ul style="list-style-type: none"> <li>apply systematic listing strategies</li> <li>record describe and analyse the frequency of outcomes of probability experiments using frequency trees</li> <li>enumerate sets and combinations of sets systematically, using tables, grids and Venn diagrams</li> <li>construct theoretical possibility spaces for combined experiments with equally likely outcomes and use these to calculate theoretical probabilities</li> <li>apply ideas of randomness, fairness and equally likely events to calculate expected outcomes of multiple future experiments</li> </ul>	<b>Topics</b> <ul style="list-style-type: none"> <li>Solve problems involving proportional reasoning</li> <li>Solve problems involving compound units</li> </ul>	<b>Domains (Core knowledge and skills)</b> <ul style="list-style-type: none"> <li>express a multiplicative relationship between two quantities as a ratio or a fraction</li> <li>use compound units (such as speed, rates of pay, unit pricing)</li> <li>change freely between compound units (e.g. speed, rates of pay, prices) in numerical contexts</li> <li>relate ratios to fractions and to linear functions</li> </ul>	<b>Topics</b> <ul style="list-style-type: none"> <li>Explore enlargement of 2D shapes</li> <li>Use and interpret scale drawings</li> <li>Use and interpret bearings</li> <li>Explore ways of representing 3D shapes</li> </ul>	<b>Domains (Core knowledge and skills)</b> <ul style="list-style-type: none"> <li>measure line segments and angles in geometric figures, including interpreting maps and scale drawings and use of bearings</li> <li>identify, describe and construct similar shapes, including on coordinate axes, by considering enlargement</li> <li>interpret plans and elevations of 3D shapes</li> <li>use scale factors, scale diagrams and maps</li> </ul>
<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Convert between fractions, decimals and percentages</li> <li>Understand the use of the 0-1 scale to measure probability</li> <li>Work out theoretical probabilities for events with equally likely outcomes</li> <li>Know how to represent a probability</li> <li>Know that the sum of probabilities for all outcomes is 1</li> </ul>		<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Find a relevant multiplier in a situation involving proportion</li> <li>Plot the graph of a linear function</li> <li>Understand the meaning of a compound unit</li> </ul> Convert between units of length, capacity, mass and time		<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Use a protractor to measure angles to the nearest degree</li> <li>Use a ruler to measure lengths to the nearest millimetre</li> <li>Understand coordinates in all four quadrants</li> <li>Work out a multiplier given two numbers</li> <li>Understand the concept of an enlargement (no scale factor)</li> </ul>	

Year 11									
Autumn Term 1A		Autumn Term 1A		Autumn Term 1B		Autumn Term 1B		Autumn Term 1B	
TOPIC TITLE: Quadratic equations and graphs		TOPIC TITLE: Perimeter, area and volume 2		TOPIC TITLE: Fractions, indices and standard form		TOPIC TITLE: Congruence, similarity and vectors		TOPIC TITLE: More Algebra	
<b>Topics</b> <ul style="list-style-type: none"> <li>Understand equations and identities</li> <li>Manipulate algebraic expressions</li> <li>Construct algebraic statements</li> <li>Plot and interpret linear graphs</li> <li>Plot and quadratic graphs</li> <li>Model real situations using linear graphs</li> </ul>	<b>Domains (Core knowledge and skills)</b> <ul style="list-style-type: none"> <li>understand and use the concepts and vocabulary of identities</li> <li>know the difference between an equation and an identity</li> <li>simplify and manipulate algebraic expressions by expanding products of two binomials and factorising quadratic expressions of the form <math>x^2 + bx + c</math></li> <li>argue mathematically to show algebraic expressions are equivalent, and use algebra to support and construct arguments</li> <li>translate simple situations or procedures into algebraic expressions or formulae</li> <li>recognise, sketch and interpret graphs of linear functions and simple quadratic functions</li> </ul>	<b>Topics</b> <ul style="list-style-type: none"> <li>Investigate circles</li> <li>Discover pi</li> <li>Solve problems involving circles</li> </ul> Explore prisms and cylinders	<b>Domains (Core knowledge and skills)</b> <ul style="list-style-type: none"> <li>compare lengths, areas and volumes using ratio notation</li> <li>calculate perimeters of 2D shapes, including circles</li> <li>identify and apply circle definitions and properties, including: centre, radius, chord, diameter, circumference</li> <li>know the formulae: circumference of a circle = <math>2\pi r = \pi d</math>, area of a circle = <math>\pi r^2</math></li> <li>calculate areas of circles and composite shapes</li> <li>know and apply formulae to calculate volume of right prisms (including cylinders)</li> </ul>	<b>Topics</b> <ul style="list-style-type: none"> <li>Calculate with fractions</li> <li>Calculate with powers and roots</li> <li>Explore the use of standard form</li> </ul>	<b>Domains (Core knowledge and skills)</b> <ul style="list-style-type: none"> <li>calculate exactly with fractions</li> <li>calculate with roots, and with integer indices</li> <li>calculate with standard form <math>A \times 10^n</math>, where <math>1 \leq A &lt; 10</math> and <math>n</math> is an integer</li> </ul>	<b>Topics</b> <ul style="list-style-type: none"> <li>Explore the congruence of triangles</li> <li>Investigate geometrical situations</li> <li>Form conjectures</li> </ul> Create a mathematical proof	<b>Domains (Core knowledge and skills)</b> <ul style="list-style-type: none"> <li>use the basic congruence criteria for triangles (SSS, SAS, ASA, RHS)</li> <li>apply angle facts, triangle congruence, similarity and properties of quadrilaterals to conjecture and derive results about angles and sides, including Pythagoras' Theorem and the fact that the base angles of an isosceles triangle are equal, and use known results to obtain simple proofs</li> </ul>	<b>Topics</b> <ul style="list-style-type: none"> <li>Solve simultaneous equations</li> <li>Use graphs to solve equations</li> </ul> Solve problems involving simultaneous equations	<b>Domains (Core knowledge and skills)</b> <ul style="list-style-type: none"> <li>solve, in simple cases, two linear simultaneous equations in two variables algebraically</li> <li>derive an equation (or two simultaneous equations), solve the equation(s) and interpret the solution</li> <li>find approximate solutions to simultaneous equations using a graph</li> </ul>
<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Manipulate expressions by collecting like terms</li> <li>Know that <math>x \times x = x^2</math></li> <li>Calculate with negative numbers</li> <li>Know the grid method for multiplying two two-digit numbers</li> <li>Know the difference between an expression, an equation and a formula</li> <li>Use coordinates in all four quadrants</li> <li>Write the equation of a line parallel to the x-axis or the y-axis</li> <li>Draw a line parallel to the x-axis or the y-axis given its equation</li> <li>Identify the lines <math>y = x</math> and <math>y = -x</math></li> <li>Draw the lines <math>y = x</math> and <math>y = -x</math></li> </ul>		<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Know how to use formulae to find the area of rectangles, parallelograms, triangles and trapezia</li> </ul> Know how to find the area of compound shapes		<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Know the meaning of powers</li> <li>Know the meaning of roots</li> <li>Know the multiplication and division laws of indices</li> <li>Understand and use standard form to write numbers</li> <li>Interpret a number written in standard form</li> <li>Apply the four operations to proper fractions, improper fractions and mixed numbers</li> </ul>		<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Know angle facts including angles at a point, on a line and in a triangle</li> <li>Know angle facts involving parallel lines and vertically opposite angles</li> <li>Know the properties of special quadrilaterals</li> <li>Know Pythagoras' theorem</li> </ul>		<b>Prior Domains:</b> <ul style="list-style-type: none"> <li>Solve linear equations</li> <li>Substitute numbers into formulae</li> <li>Plot graphs of functions of the form <math>y = mx + c</math>, <math>x \pm y = c</math> and <math>ax \pm by = c</math></li> </ul> Manipulate expressions by multiplying by a single term	

In Spring Term, individual class teachers will identify priority topics based on both summative and formative assessment