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Maths Curriculum; Sequencing Overview



Academic Year <u>Year 9</u>	Content Unit title and brief outline of content. GCSE Syllabus	Skills taught in each unit	Assessment – what knowledge and skills will be assessed and how?
Autumn A	KS3 Maths Now Units 23, 31, 32, 33, 39	The units covered in this term provide the skills necessary to: identify the correlation and use a line of best fit to interpolate from a graphed data set, compare data sets using graphical methods, calculate changes in percentages, and calculate the side lengths of right-angled triangles using Pythagoras' theorem.	One 45-minute cumulative assessment mid-way through the half term using exam questions. One 45-minute skills test based on the work from Aut A.
Autumn B	KS3 Maths Now Units 40, 42 <i>Textbook Change</i> Unit 1: Number	The units covered at the start of this term provide the skills necessary to: manipulate and perform calculations with decimal numbers, identify the correct trigonometric ratio to use in a right angled triangle and apply this to calculating missing side lengths or angles using the correct trigonometric ratio. Unit 1 develops the skills necessary to: Write a number as a product of its prime factors, Use prime factor decomposition and Venn diagrams to find the HCF and LCM, Use powers and roots in calculations, Use index laws, Use negative indices, Calculate with numbers in standard form with positive powers, Understand the difference between rational and irrational numbers, Rationalise a denominator with one term, Simplify a surd	One 45-minute cumulative assessment mid-way through the half term using exam questions. One 45-minute skills test based on the work from Aut A and B.

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Spring A	<p>Unit 2: Algebra – Indices, Expanding/Factorising, Equations, Formulae, Linear Sequences</p> <p>Unit 3: Interpreting and Representing Data</p>	<p>Unit 2 develops the skills necessary to: Expanding the product of two brackets and simplify the expression, Solve problems involving factorising, Solve linear equations with unknowns on both sides, Solve linear equations containing fractions, Derive an algebraic formula from information given, Change the subject of a formula, Find a general formula for the nth term of an arithmetic sequence, Determine whether a particular number is a term of a given arithmetic sequence, Find the nth term of a quadratic sequence.</p> <p>Unit 3 develops the skills necessary to: Construct and interpret a Frequency Polygon, interpret bar charts, and pie charts, Solve problems including exam questions involving Time Series Graphs, Identify lines of best fit and use them in solving problems including exam questions, Use the line of best fit to predict values, Identify the modal class, the class where the median lies and to solve exam style problems, Analyse data and identify a suitable graph to display it, Analyse graphs/tables and give reasons to support particular claims about the data</p>	<p>One 45-minute cumulative assessment mid-way through the half term using exam questions. One 45-minute skills test based on the work from Aut A-Spr A.</p>
Spring B	<p>Unit 4: Fractions, Ratio and Percentages</p> <p>Unit 5: Angle properties and polygons, Pythagoras' theorem and Trigonometry</p> <p>Unit 6: Graphs</p>	<p>Unit 4 develops the skills necessary to: Multiply mixed numbers, Add and subtract mixed numbers, Write ratios in the form 1:n or n:1 and solve problems, Divide fractions (mixed and proper), Solve problems with fractions, Share a quantity in a given ratio and solve problems, Solve exam questions on direct proportion, Solve problems using reverse percentages, Convert recurring decimals into fractions</p> <p>Unit 5 develops the skills necessary to: Derive and use the sum of angles in a triangle and in a quadrilateral, Derive and use the fact that the exterior angle of a triangle is equal to the sum of the two opposite interior angles, Calculate the sum of the interior angles of a polygon, Know the sum of the exterior angles of a polygon, Solve problems using Pythagoras' theorem, Calculate the length of a shorter side in a right-angled triangle, Use trigonometric ratios to</p>	<p>One 45-minute cumulative assessment mid-way through the half term using exam questions. One 45-minute skills test based on the work from Aut A-Spr B.</p>

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		<p>solve problems, Use trigonometric ratios to calculate an angle in a right-angled triangle, Find angles of elevation and angles of depression.</p> <p>Unit 6 develops the skills necessary to: Identify the gradient and y intercept from straight lines drawn on coordinate axes, Identify the equation of a straight line from pairs of coordinates and to identify the point where 2 lines intersect, Solve problems including exam questions on D/T graphs and other graphs, Plot scatter diagrams and identify the line of best fit and its equation, Work out the equation of parallel or perpendicular lines, Solve real life problems involving quadratic graphs and find graphical solutions, Plot a reciprocal function $y=k/x$, Plot a scatter graph and interpret it, Solve cubic graphs graphically, Interpret various graphs and to be able to draw a graph of a circle centre O with given radii</p>	
Summer A	Unit 7: Area and Volume	<p>Unit 7 develops the skills necessary to: Find the area and perimeter of compound shapes, Calculate volumes and surface areas of prisms, Calculate area and circumference of a circle, Calculate the arc lengths, angles and areas of sectors of circle, Calculate the volume and surface area of a sphere, Calculate volume and surface area of pyramids and cones</p>	<p>One 45-minute cumulative assessment mid-way through the half term using exam questions.</p> <p>One 45-minute skills test based on the work from Aut A-Sum A.</p>
Summer B		<p>Preparing for End of Year exams developing exam technique, interpreting questions and markschemes, timing, checking working, attention to detail, and approaching questions in a methodical way.</p> <p>End of Year therapy and consolidation completed following the exams.</p>	<p>End of year exams – two 90 minute papers (non-calculator and calculator) which assesses all content from Year 9.</p>



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Key Stage 2 content summary; fundamentals of the number system including addition, subtraction, multiplication and division, basic algebra, ratio and proportion and links to decimals, fractions and percentages, basic geometry including angles, shapes and measurements, time, representing data

<p>Year 7 Content <i>These units form the foundations of Maths. Without teaching these units, students would not have the basic knowledge to build upon over time.</i></p> <p>Factors and Multiples, Sequences, Perimeter and Area, Negative Numbers, Averages, Equivalent fractions, Algebraic Expressions, Angles, Decimals, Linear Graphs, Percentages, 3D shapes, Probability, Ratio, Proportion and Rate of Change, Symmetry, Solving Equations.</p>	<p>Skills taught. <i>Are the skills taught in a spiral curriculum? What is the rationale for your sequencing of skills</i></p> <p><i>Maths has a spiral curriculum for both knowledge and skills. The skills learned in KS3 are subsequently built upon as students move in to KS4. They do not exist in isolation from each other, rather each is a necessary step in order to build the complexity and understanding of the range of mathematical knowledge and understanding that is required.</i></p> <p>Year 7:</p> <ul style="list-style-type: none"> - define, list, calculate and solve problems with factors, multiples, primes as well as HCF and LCM - add, subtract, multiply and divide positive and negative integers and apply the rules of BIDMAS to calculations - square, cube, square root and cube root integers and link these skills to BIDMAS - form equations and expressions, simplifying them where necessary, solve the equations, and substitute in to formulae or expressions - expand brackets and factorise expressions - working with fractions, decimals and percentages including simplifying, adding, subtracting, multiplying and dividing, and conversion between forms. Expressing one amount as a quantity of another. - recognising, drawing and calculating with angles. Using parallel lines, triangles, quadrilaterals and other polygons. - simplifying and sharing terms in a given ratio. - calculating perimeter, area and volume of 2D and 3D shapes respectively, properties of 2D and 3D shapes - recognising and continuing sequences, finding the nth term <p>Year 8:</p>
<p>Year 8 Content <i>These units build upon the foundations of KS2 and Year 7 content and deliver the basics that can then be layered upon with more complexity in the next key stage.</i></p>	

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<p>Sequences, Percentages, Probability, Using Data, Pencil and Paper Calculations, Transformations, Working with Numbers, Percentage Change, Graphs, Congruence and Scaling, Algebraic Expressions, Working with Fractions, Circles, Finding Probabilities, Equations and Formulae, Expressions and Equations</p>	<ul style="list-style-type: none"> - to be able to identify numbers in index form and apply the laws of indices - to be able to round numbers to appropriate degrees of accuracy based on significant figures or decimal places - to be able to estimate calculations using rounding to assist with reducing the complexity - to be able to simplify expressions using the index laws and apply to problem solving - to be able to substitute values and solve equations - recognise values are in direct proportion and interpret their meaning when put in context - to be able to recognise and perform transformations - to be able to work with terminating and recurring decimals - to be able to use percentages and calculate percentage change - to be able to calculate probabilities and draw and complete probability diagrams and tree diagrams - to be able to make scale drawings, use bearings and be able to draw and recognise congruent and similar shapes. To apply this to problem solving - to be able to plot linear graphs and use the equation $y=mx+c$, including working with parallel and perpendicular lines and inverse functions.
<p>Year 9 Content <i>These units map out the start of GCSE and use all of the KS3 content to deepen the complexity and understanding of Maths. The majority of students follow the higher tier content, those studying foundation tier will not study every topic listed.</i></p> <p>Number, place value, factors, powers, standard form, surds, fundamentals of algebra (simplifying, solving, substitution, sequences), interpreting and representing data, fractions, ratio and percentages, angles and trigonometry, graphs (linear, quadratic, cubic, reciprocal, real-life), area and volume or prisms, circles, cones and</p>	<p>Year 9:</p> <ul style="list-style-type: none"> - extend calculations to those involving numbers in standard form, surds and indices (zero, negative and fractional) - use and implement the manipulation of algebra including sequences, expanding, factorising equations, expressions and formulae - summarise, infer, interpret and compare data with the use of statistical diagrams and with the calculation of averages and range - organise, outline and integrate skills of manipulation for fractions, decimals and percentages - develop the fluency to use all prior knowledge to integrate problem solving and ratio - apply the trigonometric ratios to solve problems with right angled triangles <p>Year 10:</p> <ul style="list-style-type: none"> - combine the skills of solving, completing the square, factorising, substituting in to formulae in order to solve quadratic equations - combine the skills of algebraic manipulation and substitution in order to solve simultaneous equations - represent solutions to inequalities on a number line and plot them on a graph

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pyramids, transformations and constructions.	<ul style="list-style-type: none"> - construct a frequency tree, tree diagram, Venn diagram and use it to calculate probabilities - prove geometrical identities using clear mathematical reasoning and language - plot histograms, cumulative frequency graphs, box plots and draw comparisons between data sets using the graphs to help
<p>Year 10 <i>These units are the culmination of content taught in previous years and require a firm grasp of skills and content before. They cannot be taught any earlier.</i> Quadratic equations, simultaneous equations, inequations, probability, compound measures, similarity and congruence, sine and cosine rules, further statistics, solving equations graphically.</p>	<p>Year 11:</p> <ul style="list-style-type: none"> - apply the circle theorems to problems using the angle rules, explaining reasoning clearly - balancing and rearranging equations and formulae - interpreting real-life data and graphs and calculating gradients of tangents, chords and the area under graphs - using mock exam to develop exam technique, interpreting questions and markschemes, timing, checking working, attention to detail, and approaching questions in a methodical way
<p>Year 11 Content – see above for rationale.</p> <p>Circle theorems, algebraic fractions, functions, proof, vectors, direct and inverse proportion, translating graphs of functions.</p>	
<p>Is all of the NC Ks3 content taught in Year 7 & 8? If not, where is this made up? <i>The NC KS3 content is delivered in Year 7-9 in Maths. In Year 9, students start the GCSE course with any KS3 gaps delivered then.</i></p>	