

Mission Statement: Maths - To create capable and resilient mathematicians with a deep understanding of the concepts, so that they can apply their knowledge to unfamiliar problems.

Further Maths - To create capable and resilient mathematicians with a deep understanding of the concepts, so that they can apply their knowledge to unfamiliar problems.

KS3	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
7	<p>Topic: Number</p> <p>Assessment: Class based assessment in Term 1 and a single 40 minute paper used as a Reported Assessment in Term 2.</p> <p>Knowledge:</p> <p>Number Basics, Directed Numbers Using a Calculator, Types of Number, Powers and Roots, Order of Operations, Laws of Numbers Different Base Systems, Decimals, Fractions, Rounding, Prime Factorisation, Percentages, FDP, Ratio</p> <p>Skills Content:</p> <p>Manipulation of number, calculator work, problem solving</p>	<p>Topic: Algebraic Thinking</p> <p>Assessment: Class-based assessment with a test towards the end of the term covering a mixture of content so far.</p> <p>Knowledge:</p> <p>Basic Algebra, Index Laws, Imperial and Metric Units, Coordinates, Conversion Graphs, Linear Equations, Sequences, Equations of Lines</p> <p>Skills Content:</p> <p>Introduction to formulae, proof and reasoning, pattern spotting</p>	<p>Topic: Shapes</p> <p>Assessment: Class-based assessment with a test towards the end of the term covering a mixture of content so far.</p> <p>Knowledge:</p> <p>Angle Basics, 2D and 3D Shapes, Symmetry, Area and Perimeter, Nets, Volume and Surface Area, Circles and Cylinders</p> <p>Skills Content:</p> <p>Understanding shape and space, calculator work, working with formulae</p>	<p>Topic: Probability and Data</p> <p>Assessment: The end of year exam will take place towards the end of term where we intend to test all content taught up to this point.</p> <p>Knowledge:</p> <p>Probability Averages Graphs and Charts</p> <p>Skills Content:</p> <p>Real life concepts, idea of scale, evaluation of data, communication and reasoning in mathematics, reasoning.</p>	<p>Topic: Transformations and Algebra 2</p> <p>Assessment: Class-based assessment</p> <p>Knowledge:</p> <p>Transformations Factorising and Expanding Solving Equations 2</p> <p>Skills Content:</p> <p>Communication and description in mathematics, drawing and pencil skills, Creation (algebraic), Visual reasoning</p>	
	<p>Rationale:</p> <p>These are the key skills that help build the foundations required for further study. Working in different base systems allows students to practise the basic arithmetic skills that they have whilst also appreciating different ways of counting.</p>	<p>Rationale:</p> <p>Once students have a strong foundation in number, algebra allows us to generalise these concepts further.</p>	<p>Rationale:</p> <p>The concepts of angles and shapes and patterns are familiar to students, but this unit helps them to formalise the things they know more precisely and allows students to develop a love of the patterns that appear in the world.</p>	<p>Rationale:</p> <p>Instruction of averages can vary from primary schools and hence we save this topic until students are proficient with other areas of numerical reasoning and communication.</p>	<p>Rationale:</p> <p>From earlier work, students are starting to develop their algebraic skills and now need to learn how to create their own equations and link the abstract concept with real life situations. Transformations is a lighter, complimentary subject that many students enjoy and tests other skills such as drawing and visual reasoning</p>	

KS3	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
8	<p>Topic: Number and Shape</p> <p>Assessment: Written Assessment</p> <p>Knowledge:</p> <p>Estimation, Rounding, Index Laws, Surds, Rearranging formulae, Circles, Problem Solving</p> <p>Skills Content:</p> <p>Estimation and precision, Evaluation of techniques, use of algebra, problem solving, algebraic manipulation</p>	<p>Topic: Quadratic Algebra and Further Number</p> <p>Assessment: class-based assessments only</p> <p>Knowledge:</p> <p>Linear equations involving expanding, expanding and factorising 2 brackets, Problem solving, Multi-stage problems</p> <p>Skills Content:</p> <p>Algebraic manipulation, problem solving, multi-stage processing, layout and communication</p>	<p>Topic: Pythagorean Theorem and Proof</p> <p>Assessment: class-based assessments only</p> <p>Knowledge:</p> <p>Properties of right-angled triangles, Angle recap, Pythagoras, Simple geometric proof and reasoning</p> <p>Skills Content:</p> <p>Shape work and visual reasoning, application of a formulae, derivation of a rule, proof and reasoning, communication in mathematics.</p>	<p>Topic: Fractions, Decimals, Percentages, and Ratio</p> <p>Assessment: Written Assessment</p> <p>Knowledge:</p> <p>Converting between complex fractions, decimals and percentages, recurring decimals, repeated percentage change, reverse percentages, ratio and proportion, word problems</p> <p>Skills Content:</p> <p>Working without a calculator, concept of equivalence, real life problem, multistage problem solving, financial issues</p>	<p>Topic: Data</p> <p>Assessment: Final Assessments – all 5 terms of topics</p> <p>Knowledge:</p> <p>Questionnaires, averages from a list, averages from a table, scatter diagrams, quartiles and IQR, Comparing data, Interpreting Graphs and charts.</p> <p>Skills Content:</p> <p>Real life concepts, mathematical communication and reasoning, evaluation of techniques, comparison of sets of data, visual representation.</p>	<p>Topic: Graphs and inequalities</p> <p>Assessment: Project based assessment only.</p> <p>Knowledge:</p> <p>Recapping the co-ordinate grid, plotting lines, $y=mx+c$, drawing straight lines, plotting quadratics from a table, linear inequalities</p> <p>Skills Content:</p> <p>Algebraic reasoning, moving between visual and algebraic representations, pencil and ruler work.</p>
	<p>Rationale:</p> <p>The concept of estimation and precision will help with all upcoming units – with the skill of deciding if answers are appropriate as topics become more abstract. Equally problem solving is a skill for all topics, so this helps build the foundation.</p>	<p>Rationale:</p> <p>Students are now familiar with all elements of linear algebra and need to focus on quadratic algebra. There are a lot of avenues for extension here for those higher achievers so it's a good start to the year.</p>	<p>Rationale:</p> <p>Now students are confident with basic numeracy and algebraic reasoning, proof is a good chance to develop their communication in the subject. Trigonometry will stretch students.</p>	<p>Rationale:</p> <p>This concept develops students' earlier understanding but allows them to incorporate multistage problems and to link Mathematics to real-life issues such as finance.</p>	<p>Rationale:</p> <p>Drawing on real life concepts from the previous unit, students can start to investigate data and statistics and evaluate how these can be used. Their communication and reasoning should be stronger now and this unit provides them to create questions as well as answers.</p>	<p>Rationale:</p> <p>This topic is a challenging one and complements the unit before well. Students always find graphs challenging so we have chosen to wait until they have seen all other units. It also keeps graph work topped up before it appears in the GCSE scheme of work.</p>

We follow the EDEXCEL 9-1 GCSE for Years 9, 10 and 11 with terminal exams in year 11.

KS3	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
9	<p>Topic: Number</p> <p>Assessment: A test will be used to create the initial sets.</p> <p>Knowledge:</p> <p>Estimation, Rounding, HCF/LCM, Indices, Surds</p> <p>Skills Content:</p> <p>Working without a calculator, estimation and precision, evaluation of techniques, real life problems.</p>	<p>Topic: Algebra</p> <p>Assessment: Reported Assessment on units 1 and 2</p> <p>Knowledge:</p> <p>Algebraic indices, expanding and factorising, Equations, Formulae, Linear and nonlinear sequences</p> <p>Skills Content:</p> <p>Understanding the concept of algebra, manipulation and representation, Use of formulae, pattern spotting</p>	<p>Topic: Data</p> <p>Assessment: Unit tests only</p> <p>Knowledge:</p> <p>Statistical diagrams, Time series graphs, Scatter graphs, lines of best fit, Averages and Range</p> <p>Skills Content:</p> <p>Real life problems, evaluation of techniques, comparison and evaluation of data, communication in Maths, pencil and ruler Skills.</p>	<p>Topic: Fractions, Ratio and Percentages</p> <p>Assessment: Reported assessment on Units 1-4.</p> <p>Knowledge:</p> <p>Fractions, decimals, percentages, Ratio, Proportion</p> <p>Skills Content:</p> <p>Working without a calculator, application of number theory, real life problems, reasoning.</p>	<p>Topic: Angles and Trigonometry</p> <p>Assessment: Unit tests only</p> <p>Knowledge:</p> <p>Properties of triangles and quadrilaterals, Angles in polygons, Pythagoras' Theorem</p> <p>Skills Content:</p> <p>Communication and reasoning, proof, application of formulae, space and shape awareness.</p>	<p>Topic: Graphs</p> <p>Assessment: End of year exam covering all six units.</p> <p>Knowledge:</p> <p>Linear graphs, rates of change, real life graphs, line segments, quadratic, cubic and reciprocal graphs</p> <p>Skills Content:</p> <p>Real life problems, pencil and ruler work, moving between visual and algebraic representations, pattern Spotting.</p>
	<p>Rationale:</p> <p>This unit contains the numeracy fundamentals, and no other units are separate from these skills. Therefore, it is imperative to complete this unit first as it underpins all the work in mathematics.</p>	<p>Rationale:</p> <p>Students' experience of algebra prior to Year 9 is varied, and so it is important to establish the fundamentals here early on. It gives students a chance to see something new and a chance for us to judge them on new content rather than exposure to old content.</p>	<p>Rationale:</p> <p>Communication is a big element of GCSE course, and this topic introduces students to real life problems and scenarios when maths would be helpful. After the abstract nature of unit 2, it is an important theme.</p>	<p>Rationale:</p> <p>This topic again supports numeracy themes and helps students to gain confidence without a calculator. Although the work is simple, the concepts here add challenge and provide scope for differentiation. Students are now starting to develop reasoning and an understanding of "why".</p>	<p>Rationale:</p> <p>This is the first time in the GCSE course that students cover shape and space and this unit compliments previous algebraic units with use of formulae. They can develop their reasoning and communication which they started with in term 4.</p>	<p>Rationale:</p> <p>Students need to start early with the concept of functions and how they can be represented graphically, as equations, or as tables of values. This first unit introduces them to this concept and allows them to explore it for simple graphs. This unit is typically challenging and so is introduced after fundamental topics have been covered</p>

GCSE Subject AOS	AO1	AO2	AO3	AO4
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KS4	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
10	<p>Topic: Areas, Volume, Transformations and Constructions</p> <p>Assessment: Reported Assessment covering material from Year 9 and 10 so far.</p> <p>Knowledge:</p> <p>Area, perimeter, Bounds, Circles and sectors, 3D shapes, four transformations, bearings and scale drawings, Constructions, Loci</p> <p>Skills Content:</p> <p>Shape and space awareness, real life application, use of equipment, accuracy</p>	<p>Topic: Equations and Inequalities</p> <p>Assessment: Unit tests only</p> <p>Knowledge:</p> <p>Solving linear equations (recap), solving quadratic equations, completing the square, simultaneous equations (including one non-linear), properties of quadratics, Inequalities</p> <p>Skills Content:</p> <p>Algebraic manipulation, understanding abstract rules, creation of algebra to express real-life situations, understanding equivalence and inequality</p>	<p>Topic: Probability</p> <p>Assessment: Assessment to inform the writing of students' reports.</p> <p>Knowledge:</p> <p>Combined events, Mutually exclusive and independent events, Experimental probability, Tree diagrams, conditional probability, Venn diagrams and set notation</p> <p>Skills Content:</p> <p>Conducting and evaluating experiments, real life problems, deciding how to answer questions, use of diagrams</p>	<p>Topic: Multiplicative Reasoning and Similarity and Congruence</p> <p>Assessment: Unit tests only</p> <p>Knowledge:</p> <p>Growth and decay, compound measures, ratio and proportion, congruence, geometric proof, similarity in length, area and volume</p> <p>Skills Content:</p> <p>Understanding number theory, Shape and space awareness, mathematical reasoning and communication, proof.</p>	<p>Topic: Further Trigonometry</p> <p>Assessment: Year 10 exams to cover all year 9 and 10 content – 2 papers.</p> <p>Knowledge:</p> <p>Accuracy, sine rule, cosine rule, area formulae, graphs of trigonometric functions, 3D trigonometry, transformation of trig graphs</p> <p>Skills Content:</p> <p>Precision and accuracy, mathematical reasoning, decision making, representing abstract concepts as graphs, calculator work, revision skills and exam skills</p>	<p>Topic: Further Statistics</p> <p>Assessment: Unit Tests only</p> <p>Knowledge:</p> <p>Sampling, Cumulative Frequency, Boxplots, Histograms, Comparison of populations.</p> <p>Skills Content:</p> <p>Appreciation of averages in real life, application of methods, real life problems, social interaction and issues, SMSC, Drawing</p>
	<p>Rationale:</p> <p>This is a nice unit to start the year as shape and space are familiar to students. This unit also introduces them to real life scenarios and helps them to see problems in context – a real theme of the 9-1 GCSE.</p>	<p>Rationale:</p> <p>Students have already seen the basics of algebra but now must develop their understanding to more complex quadratics. By now they should be happy with the abstract nature and ready to apply to higher order questions.</p>	<p>Rationale:</p> <p>Probability appears only once so it makes sense to see it in the middle of the course. Students are starting to see problems in real life contexts and this unit improves their communication and their reasoning in a forum other than proof.</p>	<p>Rationale:</p> <p>Following on from term 1, students are familiar with shapes and scale factors and can combine this information now they have established the link in numeracy (term 1) and algebra (term 2). They are starting to understand the rigour of reasoning via proof and how to set it out.</p>	<p>Rationale:</p> <p>After the simple trigonometry from year 9, students must extend understanding to non-right angled triangles. They are now questioning what sin, cos and tan are and showing the graphs and waves introduces a new element to these functions and helps improve understanding.</p>	<p>Rationale:</p> <p>This is a nice topic to complete after the year 10 exams and allows investigation into data and its uses and implications. It lends itself to project work and allows students a chance to recap the statistics.</p>

KS4	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
11	<p>Topic: Equations, Graphs and Circle</p> <p>Assessment: Unit Tests only</p> <p>Knowledge:</p> <p>Solving simultaneous equations graphically, graphs of quadratics and cubic, circle theorems</p> <p>Skills Content:</p> <p>Moving between algebraic and visual representations, pattern spotting, mathematical reasoning and communication, drawing, making links between topics.</p>	<p>Topic: Further Algebra</p> <p>Assessment: First set of mock examinations (two papers).</p> <p>Knowledge:</p> <p>Rearranging formulae, Algebraic fractions, Surds, Solving equations with algebraic fractions, Functions, Proof</p> <p>Skills Content:</p> <p>Understanding algebraic manipulation and representation, reversing actions and operations, higher level thinking, mathematical communication and reasoning.</p>	<p>Topic: Vectors and Geometric Proof</p> <p>Assessment: Unit tests only</p> <p>Knowledge:</p> <p>Vectors, geometric problems</p> <p>Skills Content:</p> <p>Space and shape awareness, higher level thinking</p>	<p>Topic: Proportion and graphs</p> <p>Assessment: Second set of mock examinations (three papers).</p> <p>Knowledge:</p> <p>Direct and inverse proportion, exponential functions, nonlinear graphs and transformation of graphs</p> <p>Skills Content:</p> <p>Drawing, moving between algebraic and visual representation.</p>	<p>Topic: Revision</p> <p>Assessment: Internal Assessment – to cover all topics</p> <p>Knowledge:</p> <p>Completion of all knowledge in units 1-19. Teachers may reteach some earlier content and classes will also look at past exam papers</p> <p>Skills Content:</p> <p>Revision, use of time, recap and review, self-reflection, use of previous papers, exam skills and techniques</p>	GCSE Examinations
	<p>Rationale:</p> <p>Students have now seen a lot of algebra work and can start to apply this to some higher topics they were previously not ready for. This unit links previous topics together and helps students to understand the parallels between graphical and algebraic representations of functions</p>	<p>Rationale:</p> <p>This is a challenging unit that requires a lot of previous knowledge and hence it comes towards the end. This higher-level thinking is excellent for higher learners. Lower achieving students may use some time to recap the basics in these areas in preparation for the exams.</p>	<p>Rationale:</p> <p>Students need to complete their communication in mathematics and ensure they are fluent in their proof and reasoning. These units provide algebraic and geometric outlets for reasoning and communication.</p>	<p>Rationale:</p> <p>This term is set aside for revision of all units and for the completion should any classes over run from the schedule. In the slot it is important to support students in their development of revision and exam skills as well as students undertaking the full mock practice. This is the first time they see a full set of papers.</p>		

A LEVEL Subject AOS	AO1	AO2	AO3
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We follow the Edexcel A level in Mathematics with Terminal Examinations at the end of year 13.

KS5	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
12	<p>Topic: Algebra and functions, co-ordinate geometry</p> <p>Assessment: Baseline test at the beginning of term</p> <p>Knowledge:</p> <p>Algebraic expressions, surds, indices, quadratic functions, equations, inequalities, graphs, transformations, straight line graphs, circles.</p> <p>Skills Content:</p> <p>Algebraic manipulation, communication, precision, sketching, modelling</p>	<p>Topic: Further algebra, trigonometry and 2D vectors</p> <p>Assessment: Class-based assessment only.</p> <p>Knowledge:</p> <p>Algebraic division, factor theorem, proof, binomial expansion, trigonometric ratios and graphs, identities and equations, vector properties and definitions, position vectors, distance between points and geometric problems with vectors</p> <p>Skills Content:</p> <p>Algebraic manipulation, visual concepts, proof and reasoning, communication in mathematics</p>	<p>Topic: Differentiation, Integration Exponentials and logarithms</p> <p>Assessment: Year 12 examinations – two papers.</p> <p>Knowledge:</p> <p>Differentiation, from first principles, gradients, tangents, normal and extrema, integration, definite and indefinite integration, area under graphs or between lines, exponential functions, and logarithm laws.</p> <p>Skills Content:</p> <p>Modelling, application of abstract concepts, developing links between multiple methods, application of laws</p>	<p>Topic: Statistics and (introduction to) Mechanics</p> <p>Assessment: Class-based assessment only.</p> <p>Knowledge:</p> <p>Sampling, data presentation and interpretation, measures of location and spread, coding, statistical diagrams, regression, probability, statistical distributions, hypothesis testing, mathematical modelling, Force as a vector, Kinematics</p> <p>Skills Content:</p> <p>Application of mathematics, real life concepts, modelling, moving between diagrams and written information</p>	<p>Topic: Mechanics</p> <p>Assessment: Year 12 UCAS Exams – two papers.</p> <p>Knowledge:</p> <p>Kinematics formulae, SUVAT, Newton's first law, force diagrams, equilibrium, Newton's second law, pulleys, variable acceleration using differentiation and integration</p> <p>Skills Content:</p> <p>Application of mathematics, real life concepts, modelling, moving between diagrams and written information</p>	<p>Topic: YEAR 2 CONTENT: Algebraic and partial fractions, Trigonometry</p> <p>Assessment: Class-based assessment only.</p> <p>Knowledge:</p> <p>Algebraic Fractions, Partial Fractions, Radians, Arcs and Sectors, Reciprocal and Inverse Functions, Compound and Double Angle Formulae</p> <p>Skills Content:</p> <p>Algebraic manipulation and representation, making links between methods, modelling, proof</p>
	<p>Rationale:</p> <p>It is important that students establish a strong basis in Algebra and that they understand how it reacts to certain operations. This is the fundamental aspect of the whole course and is needed for everything.</p>	<p>Rationale:</p> <p>The algebra needs to continue before all basics are covered. After this, vectors provide a lighter break and allows students to start to see things visually. It also is one of the first chances to explore geometric proof in detail.</p>	<p>Rationale:</p> <p>This unit helps them to understand all the processes and applications with simple polynomial functions so that they can apply this to more complex functions later.</p>	<p>Rationale:</p> <p>Students can now confidently work with both numbers and algebra and the development of these key skills into an applied context is important. This term allows students to develop their communication</p>	<p>Rationale:</p> <p>Completing the applied modules, the mechanics can link other aspects of algebraic solving and modelling to real and familiar situations and allows the students to draw some parallels between subjects.</p>	<p>Rationale:</p> <p>We start promptly on the year 2 content to provide revision time in year 13. These topics start to develop higher thinking and provide a good intro to a few new topics for the new year.</p>

				and reasoning away from abstract concepts.	This term is also used for revision and exam skills.	
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KS5	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
13	<p>Topic: Trigonometry cont'd, Functions and modelling, Parametric equations</p> <p>Assessment: Class-based assessment</p> <p>Knowledge:</p> <p>Radians, Inverse and Reciprocal Trig, Compound and Double angle formulae, Geometric Proof, Rcos and Rsin, Proving Identities, Proof, Modulus Function, Composite and Inverse functions, Transformations, Modelling, Domain and Range, sketching graphs, Parametric Equations including sketching and modelling</p> <p>Skills Content:</p> <p>Communication and proof, graphical representation, algebraic manipulation, making links</p>	<p>Topic: Differentiation, Integration, Binomial Expansion, Sequences</p> <p>Assessment: First set of mock examinations (two papers)</p> <p>Knowledge:</p> <p>Parametric differentiation and integration, differentiation of trig functions, exponential functions, second derivatives, product rule, quotient rule, chain rule, connected rates of change, Integration of exponentials, polynomials and trig.</p> <p>Integration by substitution, by parts, by partial fractions, using identities Area under graphs or between 2 curves, trapezium rule. differential equations, binomial expansion – link to partial fractions</p> <p>Skills Content:</p> <p>Understanding of a process, application and selection of a variety of rules, communication and reasoning</p>	<p>Topic: Numerical Methods, Proof, Vectors, Statistics, Mechanics</p> <p>Assessment: Class-based assessment only</p> <p>Knowledge:</p> <p>Location of roots, solving by iterative methods, Newton-Raphson method, 3D vectors, Proof by deduction, counter – example, contradiction and exhaustion, Correlation coefficients, hypothesis testing, probability, conditional probability, set notation, the Normal distribution, approximations, hypothesis testing.</p> <p>Skills Content:</p> <p>Calculator work (statistics), shape and space awareness (in 3D), application and selection of rules, real life situations, application of mathematics, modelling, communication, proof</p>	<p>Topic: Mechanics</p> <p>Assessment: Second set of mock examinations.</p> <p>Knowledge:</p> <p>Moments, Resolving forces, friction forces, coefficient of friction, projectiles, equilibrium, static particles, ladder problems, dynamics, constant acceleration using the i,j system, variable, acceleration using the i,j system.</p> <p>Skills Content:</p> <p>Mathematical reasoning and communication, proof, algebraic manipulation and representation, modelling, real life situations (and assumptions)</p>	<p>Topic: REVISION</p> <p>Assessment: Class-based assessment only</p> <p>Knowledge:</p> <p>Recap and revision only.</p> <p>Skills Content:</p> <p>exam practice, revision skills, exam skills, use of time, focus on key points, exam style</p>	A Level Examinations
	<p>Rationale:</p> <p>These topics link well together and form a basis of many other topics in the</p>	<p>Rationale:</p> <p>Calculus is a large part of the course, and this unit deepens students</p>	<p>Rationale:</p> <p>Integration links to many parts of the course and students start selecting</p>	<p>Rationale:</p> <p>The second half of mechanics builds on year 1 knowledge and has more</p>	<p>Rationale:</p> <p>Revision of the two-year course is key with terminal exams. It is important to</p>	

	year 2 course. It is essential to start off with these in Year 2.	understanding of both integration and differentiation now that they have knowledge of more function types.	appropriate methods as an exam skill. Furthermore, this term introduces the first half of the applied module based on last year's previous knowledge of statistics.	complex scenarios. This unit also helps them to understand modelling assumptions they also use in the pure and statistics elements.	support exam skills and ensure students understand the tone of the exam	
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