

Department Name: MATHEMATICS

Department's vision: The study of Mathematics contributes to the school curriculum by developing the ability to calculate; to reason logically, algebraically, and geometrically; to solve problems and to handle data.

Year Group	Half-Term 1	Half-Term 2	Half-Term 3	Half-Term 4	Half-Term 5	Half-Term 6
Year 7	<ul style="list-style-type: none"> Negative numbers Algebraic expressions 	<ul style="list-style-type: none"> Types of numbers Decimal calculations Fractional operations 	<ul style="list-style-type: none"> Percentage calculations Fractions, decimals and percentages equivalence 	<ul style="list-style-type: none"> Solving linear equations Averages 	<ul style="list-style-type: none"> Perimeter and area 	<ul style="list-style-type: none"> Angles Probability Statistical graphs
What will students know by the end of the topic...	Students will be able to confidently apply negative number rules to the four operations. Students will begin to form algebraic expressions from a context and manipulate these, which will lead to students using these expressions when substituting values to calculate values.	Knowledge of types of numbers from KS2 such as factors, multiples and prime numbers are utilised at this time to write a number as a product of its prime factors. Competence in decimal and fractional calculations are worked on.	Deeper understanding of percentages are explored, such as calculating the original value before a percentage change. To round off the KS2 into KS3 number work, students must be able to fluently convert between fractions, decimals and percentages of different denominations.	Students are exposed to the method of balancing to solve a variety of 1-variable equations, this will eventually lead onto solving equations involving different operations. Understanding of the measures of location (mean/median/mode) are delved into, this will lead to calculations from a frequency table.	Properties of important 2D shapes such as triangles and quadrilaterals are explored, leading onto area and perimeter problems which includes formula for the area of parallelograms and trapezia. Compound area problems are considered the pinnacle of this topic.	Knowledge of KS2 angles are developed to include triangles and quadrilaterals, continuing into problem solving and forming and solving equations. The concept of probability is introduced, looking at theoretical probability of single and two events and experimental probability.
Year 8	<ul style="list-style-type: none"> Index laws Algebraic expressions 	<ul style="list-style-type: none"> Solving equation Rounding and estimation Circles 	<ul style="list-style-type: none"> Sequences Ratio 	<ul style="list-style-type: none"> Volume Pythagoras' Theorem Proportion 	<ul style="list-style-type: none"> Further percentages Angles in parallel lines Pie charts 	<ul style="list-style-type: none"> Further probability Scatter graphs Factors and multiples
What will students know by the end of the topic...	Number and algebra skills are interwoven within the index laws content. Prior knowledge on algebraic manipulation from year 7 is developed in year 8 algebraic manipulation involving expanding double brackets and factorising expressions involving a variety of factors. Problem solving involving number and algebra is seen.	Core solving equation skills are explored in this half term, this includes operations such as squares, roots and fractions. The most complex of these skills will be applied in problem solving contexts. Circles and their related formula are introduced, understanding of area and perimeter of circles are applied to sectors.	Patterns in numbers and shapes are used to derive algebraic expressions, these are used to generate a multitude of different sequences. Concept of ratio is introduced, where it is the act of comparing parts. Ratio is linked to proportion in the form of fractions, decimals and percentages. This will lead to more problem solving.	The concept of volume is introduced, comparing the volume with capacity, focusing on prisms including cylinders. Further geometry knowledge is seen in the form of Pythagoras' Theorem, using the theorem to calculate sides of right-angle triangles. The ratio table is utilised in proportion problems, this includes contexts such as recipes and best buys.	Efficiency in tackling percentage related problems are introduced in the form of decimal multipliers. Angles knowledge is developed from year 7 by including angle facts involving two or more sets of parallel lines. Multi-step angles problems are a focus point. Construction and interpretation of pie charts are seen.	Year 7 probability knowledge is extended to include mutually exclusive events, expected outcomes and tree diagrams. Scatter graphs and its uses are studied, includes types of correlation and lines of best fit. Further techniques involving factors and multiples such as listing and Venn diagrams are used to work out the LCM and HCF, leading to problem solving.
Year 9	<ul style="list-style-type: none"> Decimals Rounding and Bounds Compound Measures 	<ul style="list-style-type: none"> Algebraic Expressions Changing the Subject Right Angled Trigonometry 	<ul style="list-style-type: none"> Surface Area Percentages Linear & Non-Linear Graphs 	<ul style="list-style-type: none"> Standard Form Angles in Polygons Algebraic Proportion 	<ul style="list-style-type: none"> Transformations Venn Diagrams 	<ul style="list-style-type: none"> Similarity & Congruency Constructions Scale Drawings & Bearings
What will students know by the end of the topic...	Students build fluency with decimals, percentages, and fractions, including conversions and calculations. They develop skills in rounding, estimation, bounds, and unit conversions, applying maths to real-world contexts like speed, density, and pressure through structured problem-solving.	Focus shifts to algebraic manipulation: expanding and factorising expressions, rearranging formulae, and applying trigonometry. Students solve geometric problems and explore surface area of 3D shapes, strengthening reasoning and preparing for advanced algebra and geometry.	Students deepen understanding of percentages, including growth, decay, and interest. They explore linear and quadratic graphs, learning to plot, interpret, and solve equations graphically, enhancing algebraic reasoning and preparing for exam-style problem solving.	Learners master standard form, including conversions and calculations with large and small numbers. They apply angle rules to polygons, explore tessellation, and solve complex geometric problems using reasoning and formulae.	Students explore algebraic proportion and shape transformations, including translation, rotation, reflection, and enlargement. These topics develop spatial awareness and algebraic fluency, supporting real-world applications and higher-level problem-solving.	Reserved for review, consolidation, and exam preparation. Students revisit key concepts, strengthen problem-solving strategies, and apply mathematical reasoning across topics to ensure readiness for assessments and future learning.

Year Group	Half-Term 1	Half-Term 2	Half-Term 3	Half-Term 4	Half-Term 5	Half-Term 6
Year 10 H	<ul style="list-style-type: none"> Indices & Surds Advanced Trigonometry Quadratics 	<ul style="list-style-type: none"> Arcs Sectors & Segments Straight Line Graphs Averages & Quartiles 	<ul style="list-style-type: none"> Ratio Simultaneous Equations 	<ul style="list-style-type: none"> Probability & Systematic Listing Equations & Inequalities Volume & Surface Area 	<ul style="list-style-type: none"> Loci Compound Measures Congruency & Similarity 	<ul style="list-style-type: none"> Statistical Graphs Growth & Decay Algebraic Fractions Identities & Proof
What will students know by the end of the topic...	Pupils deepen understanding of indices and surds, including fractional and negative powers. They apply these in algebra and geometry, exploring scale drawings, bearings, constructions, and percentages. Skills support problem solving and prepare for advanced trigonometry and quadratic equations.	Pupils explore circles, sectors, and segments, applying area and perimeter in real contexts. They develop fluency with straight-line graphs and equations. Data handling skills are strengthened through averages, quartiles, and interpreting frequency tables to support statistical reasoning and problem solving.	Pupils develop fluency with ratio, including sharing, combining, and algebraic applications. They solve simultaneous equations using multiple methods, including graphical and substitution. Coordinate geometry is introduced through midpoints and ratios, supporting deeper understanding of linear relationships and geometric reasoning.	Pupils explore probability through systematic listing, frequency trees, and tree diagrams. They solve equations and inequalities, including quadratic cases. Volume and surface area of 3D shapes are applied in real-world contexts, enhancing spatial reasoning and problem-solving skills.	Pupils explore geometric reasoning through loci, congruence, and similarity. They apply compound measures in real-life contexts, including speed and density. These topics strengthen spatial awareness and problem-solving, preparing students for higher-level geometry and applied mathematics.	Pupils interpret and construct statistical graphs, explore exponential growth and decay, and manipulate algebraic fractions. They also develop reasoning through identities and mathematical proof, building confidence in abstract thinking and preparation for advanced algebra topics in Year 11.
Year 10 F	<ul style="list-style-type: none"> Indices & Roots Pythagoras & Trigonometry 	<ul style="list-style-type: none"> Algebra Circles Coordinates & Straight-Line Graphs Averages 	<ul style="list-style-type: none"> Ratio Equations 	<ul style="list-style-type: none"> Probability Inequalities Volume & Surface Area 	<ul style="list-style-type: none"> Compound Measures Similarity Factors, Multiples & Primes 	<ul style="list-style-type: none"> Statistical Diagrams Fractions & Percentages
What will students know by the end of the topic...	Students strengthen understanding of indices, roots, and powers, including laws of indices and negative exponents. They apply Pythagoras’ Theorem and trigonometric ratios to solve geometric problems, building fluency in algebraic and spatial reasoning through structured problem-solving and exam practice.	Students develop algebraic fluency through simplifying, expanding, and factorising expressions, including quadratics. They apply these skills to geometric contexts like perimeter and area. Work on circles includes properties, circumference, area, sectors, and arcs, with problem-solving and exam-style questions throughout.	Students explore ratio and proportion through sharing, scaling, recipes, and best buys. They develop equation-solving skills, including linear, simultaneous, and quadratic equations. Lessons focus on applying algebra to real-world contexts and building confidence with structured problem-solving.	Students study probability using tables, trees, and diagrams, applying concepts like mutual exclusivity and independence. They also solve inequalities and explore volume and surface area of 3D shapes, including spheres, cones, and compound solids, through real-world problem-solving.	Students explore compound measures, including speed and density, and apply reasoning to similarity and congruence in shapes. They also revisit key number concepts such as factors, multiples, and primes, strengthening problem-solving and mathematical fluency across topics.	Students interpret and construct statistical diagrams and revisit key fraction and percentage skills. Lessons focus on applying mathematical reasoning to data and number problems, consolidating learning and preparing for assessments through fluency, accuracy, and problem-solving strategies.
Year 11H	<ul style="list-style-type: none"> Circle Theorems Plans & Elevations Vectors 	<ul style="list-style-type: none"> Transformation of Graphs Growth & Decay Identities & Proof 	<ul style="list-style-type: none"> Functions & Iteration Tangent to a Circle Area Under a Curve Transformations 	Bespoke Lessons addressing misconceptions.	Bespoke Lessons addressing misconceptions.	
What will students know by the end of the topic...	Pupils master advanced circle theorems, interpret and draw 3D shapes from different views, and use vectors for geometric proofs—developing strong reasoning, problem-solving, and mathematical communication skills .	Pupils master sketching and transforming graphs, solve growth and decay problems, and develop algebraic proof skills—building advanced understanding for higher-level maths, including exam techniques and real-world applications.	Pupils deepen understanding of functions, iteration, and circle algebra, estimate areas under curves, and master advanced shape transformations—preparing for higher-level problem-solving, mathematical reasoning, and exam success.	Focussed revision activities in preparation for GCSEs.	Focussed revision activities in preparation for GCSEs.	
Year 11F	<ul style="list-style-type: none"> Equations Angles 	<ul style="list-style-type: none"> Fractions & Percentages Proportion Similarity & Congruence 	<ul style="list-style-type: none"> Vectors Functions Transformations Standard Form 	Bespoke Lessons addressing misconceptions.	Bespoke Lessons addressing misconceptions.	
What will students know by the end of the topic...	Pupils learn to solve equations, expand and factorise brackets, and understand angles in triangles, parallel lines, and polygons, building strong algebra and geometry skills for future mathematical success.	Pupils strengthen skills with fractions, percentages, and proportion, and learn to recognise, compare, and solve problems involving similar and congruent shapes—preparing them for practical maths and future study.	Pupils explore vectors, functions, and transformations, and learn to use standard form—developing practical skills for describing movement, interpreting relationships, and working with large or small numbers in real-world contexts.	Focussed revision activities in preparation for GCSEs.	Focussed revision activities in preparation for GCSEs.	

Year Group	Half Term One	Half Term Two	Half Term Three	Half Term Four	Half Term Five	Half Term Six
Year 12 A level	<u>Pure Maths:</u> <ul style="list-style-type: none">Quadratic functionsIndices and surdsPolynomialsGraphs and transformationsVectorsCoordinate geometry	<u>Pure Maths:</u> <ul style="list-style-type: none">DifferentiationIntegrationAlgebraic proofBinomial expansionTrigonometry	<u>Pure Maths:</u> <ul style="list-style-type: none">Exponentials and logarithms <u>Statistics:</u> <ul style="list-style-type: none">Working with dataBivariate dataLarge data sets <u>Mechanics:</u> <ul style="list-style-type: none">Kinematics	Summative assessment and feedback <u>Statistics:</u> <ul style="list-style-type: none">Probability <u>Mechanics:</u> <ul style="list-style-type: none">ForcesObjects in contact	<u>Pure Maths:</u> <ul style="list-style-type: none">Rational functionsPartial fractionsFunctionsRadian measures <u>Statistics:</u> <ul style="list-style-type: none">Hypothesis testingSampling techniques	Summative assessment and feedback <u>Pure Maths:</u> <ul style="list-style-type: none">TrigonometryBinomial expansionFurther differentiation <u>Mechanics:</u> <ul style="list-style-type: none">2D forcesMoments
	Year 12 Maths begins with the review of bridging tasks from GCSE, necessary for the understanding and interpretation of core concepts such as differentiation.	The basic foundations of pure Maths is explored. The skills and techniques acquired from these topics will supplement the learning of applied Maths in the coming term.	Maths is applied to two different paths in Maths: statistics and mechanics. In statistics, students will review high-level GCSE content to bridge the gap and then study data handling, including interpretation within a large data set. In mechanics, students will study kinematics (study of motion) which will lead to forces (causes of motion).	Students will continue with their applied work, connecting concepts from kinematics and applying it to forces. In statistics, probability and their distributions are explored, which will lead to hypothesis testing.	A2 pure content begins with honing algebra techniques, dealing with rational functions and partial fractions. Meanwhile in statistics, sampling techniques and hypothesis testing is introduced to model problems and probability.	Familiar topics are revisited and further developed during this half term, paving the way for future content that requires the interleaving of these skills.
Year 12 Further A level	<u>Core Pure Maths:</u> <ul style="list-style-type: none">Matrix calculations and transformationsComplex number calculations and geometry	<u>Core Pure Maths:</u> <ul style="list-style-type: none">Sequences and seriesProof by inductionVector geometry in 2D and 3D	<u>Modelling with Algorithms</u> <ul style="list-style-type: none">AlgorithmsGraph theoryAlgorithms on networksCritical path analysisNetwork flows	<u>Modelling with Algorithms</u> <ul style="list-style-type: none">Linear programmingSimplex method	<u>Modelling with Algorithms</u> <ul style="list-style-type: none">Reformulation	Summative assessment <u>Statistics Minor:</u> <ul style="list-style-type: none">Discrete random variablesDiscrete probability distributions (binomial and Poisson)Bivariate data (correlation coefficients)Chi-squared tests
	Introduction to matrices: Be able to compute calculations, transformations and solve equations using matrices. Introduction to complex numbers: Understand the properties of the complex plane and make links with equations and their roots.	Series: Introduction to the “summation” notation and compute the sum of a series using standard results and the method of differences. Proof: Be able to construct a proof by mathematical induction on a variety of problems. Vectors: Extend knowledge of GCSE vectors to include equation of lines and planes.	One of the applied modules begin this half term. Various algorithms are explored in this half term and their techniques are applied to real life scenarios. Critical path analysis and network flows are used in business and other operational settings that will enhance logical reasoning.	The invention of computers had opened up this area of maths to flourish, linear programming problems are solved to determine optimal integer solutions, which can be further optimised using the powerful simplex algorithm.	To conclude the module, all previous algorithms and methods are reformulated to linear programming problems, this is so they can be solved and optimised using technology.	Extend statistics knowledge to different types of statistical distributions, namely Poisson distribution. Will also explore the usefulness of bivariate data and chi-squared tests and their links to hypothesis tests.
Year 13 A level	<u>Pure Maths:</u> <ul style="list-style-type: none">Further integrationParametric equationsDifferential equationsSequences and series <u>Statistics:</u> <ul style="list-style-type: none">Conditional probability	October/November mock examinations <u>Pure Maths:</u> <ul style="list-style-type: none">Numerical methodsAlgebraic proof <u>Statistics:</u> <ul style="list-style-type: none">Normal distributionHypothesis testing <u>Mechanics:</u> <ul style="list-style-type: none">Projectiles2D kinematics	Bespoke delivery informed by summative assessment in preparation for external examinations.	February/March mock examinations Bespoke delivery informed by summative assessment in preparation for external examinations.	Bespoke delivery informed by summative assessment in preparation for external examinations.	
	High level pure content in the form of integration and differential equations are tackled. Deeper understanding of sequences and series are explored, improving mathematical reasoning skills. Logical reasoning is tested in conditional probability.	The A-level Maths course is rounded off with numerical methods, important when exact solutions cannot be found. The most widely used statistical distribution is introduced and utilised in statistics. The use of vectors and calculus is extended to 2-dimensions in projectiles and kinematics.				

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Year 13 Further A level	<u>Core Pure Maths:</u> <ul style="list-style-type: none">Matrices, series and proof by induction reviewFurther vectorsMaclaurin seriesPolar coordinatesHyperbolic functions	Summative Assessment <u>Core Pure Maths:</u> <ul style="list-style-type: none">Further complex numbersFurther calculusFirst order differential equationsSecond order differential equations	<u>Mechanics Minor:</u> <ul style="list-style-type: none">Work, energy and powerImpulse and momentumCentre of massDimensional analysis	February/March mock examinations Bespoke delivery informed by summative assessment in preparation for external examinations.	Bespoke delivery informed by summative assessment in preparation for external examinations.	
	Topics seen earlier in year 12 are now reviewed with additional challenge, such as the inclusion of partial fractions. New coordinate systems and hyperbolic functions are introduced to support future content.	High level calculus is introduced in the form of solving first and second order differential equation, including applying the Maths to systems of differential equations (e.g. predator-prey model in biology).	Concepts of mechanics from A-level Maths are developed further when studying impulse and momentum and centres of mass of laminas. Alternative principles are explored in the work, energy and power chapter, where kinetic and potential energy is introduced. The module is rounded off by deriving and analysing mathematical formula and its consistency.			

Key Stage Four Specification Link	Key Stage Five Specification Link
https://www.aqa.org.uk/subjects/mathematics/gcse/mathematics-8300/specification-at-a-glance	A level Mathematics: https://www.ocr.org.uk/Images/308723-specification-accredited-a-level-gce-mathematics-a-h240.pdf Further Mathematics : https://www.ocr.org.uk/qualifications/as-and-a-level/further-mathematics-b-mei-h635-h645-from-2017/specification-at-a-glance/

What will students see in their books or folders? <ul style="list-style-type: none">Worked examples to scaffold learningIndependent work that has been marked in green pen and corrections madeRegular prior knowledge quizzing that informs homeworkMarking from staff in line with school policy	This subject supports students’ reading and literacy through... <ul style="list-style-type: none">Use of key terminology both in class and in the Maths’ absolutesUse of the UNPACK strategy to support with reading and interpreting text heavy questionsStaff model precise use of terminology and give reasons for methods used to solve problemsStudents are supported, through questioning, to use key terminology and justify answers	This subject supports students’ numeracy through... <ul style="list-style-type: none">Modelling key written techniques for number calculationsConsolidating number fluency regularly through prior knowledge quizzingRegularly addressing the skills needed for non-calculator questions	This subject promotes the following revision strategies as the most effective means of retaining content... <ul style="list-style-type: none">Revisiting of topics to promote long term retention as modelled by prior knowledge quizzing in classUse your Maths book / videos to revisit the methods you are revisingDo at least 7 questionsMark the questions correcting any errorsCome to the daily lunch support sessions for help.	Opportunities for exploring this subject further are available through ... <ul style="list-style-type: none">The Mathematical Challenges run annually for allCelebrating Pi dayInvolvement in Maths Week EnglandThe Half-termly Maths competitions open to all students	The following trips run through this subject... UKMT Maths Challenge Team Maths Challenge Year 10 Maths Feast
					Stock Graphic representing department.