THE ADVANCED MATHEMATICS PROGRAMME

Curriculum intent map
2025 – 2026

Empowering Ambition, Embracing All

Overview

Curriculum Objectives
Our AMP curriculum is designed to maximise the potential of our highest attaining students, by providing them with a tailored, comprehensive mathematics education, coupled with enrichment and pastoral support, to unlock the pathways to become the mathematicians of the future.

Curriculum Values and Context
We aim to create an academically excellent and supportive learning environment that develops and extends students' mathematical reasoning, problem-solving abilities, and resilience. Our goal is to equip students for the rigours of higher level STEM education, whilst ensuring true engagement and enjoyment of the subject.

Knowledge and Understanding
Students will be studying the three assessed components concurrently, and they run complimentary to one another, helping developed a coherent picture of mathematics as they progress, and therefore a deeper understanding of the key topics highlighted below.

Curriculum Sequencing and Structure
During the first year, greater emphasis will be placed on the statistical elements of the mathematics course; to align with the content delivered in GCSE statistics. This time will be spent on building on key principles and reinforcing understanding. Following the Statistics course, the focus moves towards algebraic and geometrical reasoning, with mathematics and further mathematics taught concurrently to build a comprehensive picture. Revisit time is built into the curriculum to allow for addressing misconceptions and review of development areas.

Cultural Capital, British Values, and Personal Development
Mathematics is contextualised within real-world applications and career pathways, highlighting its relevance across disciplines and industries. We promote mathematics as a gateway to opportunity, not just a qualification, but helping students develop the analytical skills needed to navigate and contribute to the modern world.

Curriculum Equality and Access
Aligned with our values of 'Embracing Ambition, Embracing all', Selection to this course is analysed without any identifiers, but solely on academic attainment and attitude to learning.

Extracurricular activities **Curriculum links** **Threshold topics (bold)** ***Denotes further maths L2 content**

Year 10 AMP	Knowledge	Curriculum and wider links	Understanding
Autumn Term 1	**Basic Number, Fractions, Decimals, Indices, Surds**	Preparing for Algebraic manipulation, standard form, and surds in further maths.	Mastery here ensures students can apply number skills in a wide range of contexts
	Coordinates and Linear Equations	Puts in place the fundamental understanding, to introduce Functions, gradients, and calculus in further mathematics.	Builds on number skills and introduces graphical representation of algebraic relationships.
	Measures	Compound units and problem-solving with formulae, using very large or small values in standard form is key in advanced STEM courses and careers.	Applies number skills in scientific and real-world contexts, how to manipulate large and small values efficiently.
	Angles, scale diagrams and bearings	Scaffolding for the introduction of more complex geometrical problems, including the introduction of trigonometric functions and identities later in the GCSE maths and further maths course.	The understanding of notation of properties in an array of contexts, including polygons, properties of parallel lines and angles on a point, in both a numerical and algebraic sense.
	Ratio and proportion	Underpins several key concepts introduced later in the maths and further maths curriculum, such as growth, decay in proportional algebraic relationships in graphical and algebraic form.	Understand the key concept of dividing an amount into a series of parts, manipulation of ratio through scalar multiplication.
	Equations/linear equations	Fundamental to algebraic manipulation and problem-solving across mathematics and science. Supports understanding of formulae in physics and real-world contexts such as finance and engineering.	Develops fluency in solving for variables using inverse operations and balancing techniques. Builds logical reasoning and prepares students for more complex algebraic structures, including simultaneous and quadratic equations.
	Indices/index laws	Supports algebraic manipulation and scientific notation; foundational for exponential functions in science and further maths.	Develops applying index laws to simplify expressions and solve problems involving powers, both numerically and algebraically with negative and fractional indices
Autumn term 2	**Rounding**	Essential for scientific notation, estimation in real-world contexts, and error bounds in measurement. Central to all STEM level 2 and 3 courses, and beyond.	Develops precision in numerical work and prepares students for handling bounds and approximations in problem-solving, including estimation of calculations.
	Fractions and decimals	Reinforces foundational number skills and supports proportional reasoning in algebra and statistics, as well as preparing for algebraic fraction manipulation in A level mathematics	Builds fluency in converting between forms and applying operations, which is critical for algebraic manipulation and data interpretation.
	Collecting and representing data	Links to GCSE Statistics and real-world applications in science, geography, and social sciences. Prepares students for advanced statistical analysis in GCSE statistics and further Maths, as well as being critical to social sciences such as sociology	Introduces students to data collection methods and visual representation, fostering analytical thinking and interpretation skill; as well as the notion of discrete and continuous variables and their associated representations in table and graphical form.
	Statistical measures	Prepares students for advanced statistical analysis in GCSE Statistics and Further Maths, as well as being critical to social sciences such as sociology and psychology	Enables students to summarise data sets using averages and spread, supporting critical thinking and decision-making based on data.

Extracurricular activities **Curriculum links** **Threshold topics (bold)** ***Denotes further maths L2 content**

Spring term 1	**Perimeter and area**	Applies to real-world contexts such as architecture, design, and land measurement, as well as laying the foundation for understanding algebraic expressions of area in problem solving in the maths GCSE	Strengthens spatial reasoning and the ability to calculate and compare measurements in 2D shapes. Including curved surfaces and compound shapes.
	Circumference and area	Links to geometry in science and engineering, including circular motion in A level physics, as well as laying foundations for understanding the unit circle and conics in A level mathematics.	Enhances understanding of π and its applications in calculating circular measurements, including the notion that pi is the ratio between diameter and circumference, and it's associated implications.
	Coordinates and linear graphs/Gradients, equations of a straight line	Fundamental to algebra and physics; supports understanding of motion and rates of change which are central notions later in the maths and physics GCSE	Develop skills in interpreting and constructing linear relationships graphically and algebraically, including lengths of line segments.
	Scatter graphs	Used in statistics and science to identify correlations and trends in data. Central to many social sciences and STEM subjects, laying foundations for understanding of regression analysis and ANOVA.	Introduces correlation and line of best fit, supporting data analysis and interpretation of bivariate data, including regression.
	Real life graphs	Applies to real-world scenarios such as travel, finance, and population growth. Central to many social sciences and STEM subjects.	Builds ability to interpret and construct graphs representing real-life situations, including velocity time and distance time graphs and associated calculations
Spring term 2	**Basic Probability**	Foundational for statistics and decision-making in real-world contexts. Builds understanding for more complex problems later in the qualification.	Introduces the concept of likelihood and basic probability calculations.
	Probability	Links to GCSE Statistics and real-world applications in risk assessment and predictions, scaffolds key knowledge for the statistics GCSE programme, as well as economics and business	Develops understanding of combined events, probability trees, and theoretical vs experimental probability.
	Surds/manipulation of surds	Prepares students for manipulation of irrational numbers in further maths and A-level topics.	Builds skills in simplifying and rationalising expressions involving irrational numbers, including rationalising the denominator.
Summer term 1	**Standard form**	Used in science and engineering to manipulate very large or small numbers. Key to all STEM level 3 courses.	Builds fluency in converting and calculating with numbers in standard form, in all four operations.
	Basic percentages	Applies to finance, statistics, and everyday problem-solving. Scaffolds the more complex calculations found later in this and the GCSE statistics programme.	Develops percentage calculations including finding percentages of amounts and percentage change, using both numerical and algebraic platforms.
	Percentages	Essential for financial literacy and interpreting data in real-world contexts, but also central to developing the central idea that growth is not always linear.	Extends topic on reverse percentages, percentage increase/decrease, and compound interest, by looking at more complex examples, such as iteration.
	Growth and decay	Links to exponential functions in science and finance, so critical	Develops understanding of exponential change and its

Extracurricular activities **Curriculum links** **Threshold topics (bold)** ***Denotes further maths L2 content**

		for Business, Economics and STEM A levels.	representation in real-life contexts. Builds on previous topic with more complex problem solving.
	2d representations of 3D shapes	Supports spatial reasoning and design in engineering and architecture. Key for accessing more complex geometric concepts later in the course.	Enhances ability to visualise and interpret 3D shapes from 2D drawing, including nets of polygons and conics and isometric drawing.
	Properties of polygons	Links to geometry in design, construction, and tessellation, which appear again in a level and further mathematics.	Develops understanding of angles, symmetry, and classification of shapes within polygons, both regular and irregular.
	Measures	Applies to real-world contexts including science, cooking, and construction. Builds the idea of dimensional analysis when looking at problems raised to a power in A level physics.	Builds fluency in converting units and understanding metric and imperial systems, with both linear and area/volume scaling.
Summer term 2	**Construction and loci**	Used in engineering, design, and navigation, useful for all notions of geometry in a 2D plane.	Develops precision and logical reasoning through geometric constructions and loci.
	Direct and inverse proportion	Applies to physics, economics, and real-life problem-solving, builds up to the idea of the inverse square law in Newtonian mechanics.	Builds understanding of proportional relationships and their graphical and algebraic representations, including the notion of the constant of proportionality (both as a variable and raised to a power)

Extracurricular activities **Curriculum links** **Threshold topics (bold)** ***Denotes further maths L2 content**

Year 11 AMP	Knowledge	Curriculum and wider links	Understanding
Autumn Term 1	**Pythagoras' Theorem and basic trigonometry/Pythagoras' Theorem and trigonometry in 3D**	Builds foundation for 3D geometry, physics, and engineering applications, especially useful in product design A level and an essential topic in mathematics and further maths A Level.	Develops spatial reasoning and ability to apply trigonometric ratios in 2D and 3D contexts, using the three basic trigonometric ratios.
	Sine and Cosine rule	Essential for solving non-right-angled triangles in physics and engineering A levels.	Enables solving triangle problems using side-angle relationships using the rules derived from basic trigonometry and extending these to non – right angled triangle problems.
	Quadratics, rearranging formulae/factorising polynomials and algebraic proof	Core algebraic skills for A-level maths, further maths and physics.	Builds fluency in manipulating expressions and constructing logical algebraic arguments, using simple proofs to verify mathematical rules. Builds an understanding of a polynomial and its decomposition into factors.
	Sequences/Further sequences	Links to functions and calculus in A level mathematics, and an understanding of Fibonacci style sequences prevalent in biology and economics.	Develops pattern recognition and algebraic representation of sequences, linear, quadratic, geometric progressions, as well as introducing divergent and convergent series.
Autumn Term 2	**Sketching Graphs of functions**	Supports understanding of function behavior in calculus and modelling, essential for maths and further maths A level.	Enhances ability to interpret and sketch key features of graphs, in both linear and quadratic form, and understand the effect of function transforms graphically.
	Drawing and sketching functions/Further graphs of equations and functions	Links to graphical solutions in physics and economics, as well as building up key knowledge for A level mathematics and further mathematics.	Enhances ability to interpret and sketch key features of graphs, as well as understanding domain, inverse and piecewise functions graphically.
	Equation of a circle	Foundation for coordinate geometry and conic sections in A-level maths.	Develops understanding of geometric properties of circles in algebraic form, and the relationship between the position of a circle on the coordinate plane relative to it's equation.
	Simultaneous equations/Simultaneous with 3 variables	Used in physics, economics, and systems modelling. Essential for all algebra in A level, plus key scaffolding for Matrices in further mathematics. Essential for any Degree level engineering.	Builds problem-solving skills with multiple constraints and variables, through the understanding of the connection between system of equations and their solutions.
Spring term 1	**Gradients and instant rate of change/Basic calculus (differentiation)**	Fundamental to physics, engineering, and A-level maths and further, this is a key threshold topic not available in the standalone GCSE syllabus.	Introduces the concept of rate of change and tangent lines, both graphically as an instantaneous rate of change, and algebraically, through differentiation of

Extracurricular activities **Curriculum links** **Threshold topics (bold)** ***Denotes further maths L2 content**

			polynomials and classification of stationary points.
	functions	Central to all areas of advanced mathematics, from a level through to degree level mathematics.	Develops understanding of input-output relationships and function notation, as well as the algebraic notion of composite, inverse and piece wise functions.
	Transforming functions	Links to graphical modelling and calculus, both of which underpin all STEM degree and higher level qualifications.	Builds on prior knowledge of functions by algebraically transforming them, and the relationship between the solutions of the transformed algebraic function.
	Numerical methods	Used in engineering, computing, and applied maths At a level and degree level.	Introduces approximation techniques for solving equations, and builds towards iterative solutions from sequences.
Spring term 2	**Congruence and similarity**	Key in geometry, design, and architecture.	Builds reasoning with shape properties and proportionality, and relates this to geometric reasoning and multiplicative scale.
	Transformations	Fundamental to the understanding of matrices, vectors and geometric transformations central to computer science and further maths A level.	Develops understanding of movement and mapping of shapes and a 2D coordinate plane, with reflection, vector translation, rotation and enlargement (positive, negative and fractional).
	Circle theorems/Geometric proof	Essential for logical reasoning in geometry, building into more complex planar geometry in engineering and maths A level.	Builds ability to construct and follow formal geometric arguments using axiomatic or algebraic geometric proof
	Volume	Applies to real-world contexts like construction and packaging.	Enhances spatial reasoning and calculation of 3D measure, to include compound shapes, curved surfaces and algebraic manipulation to identify length from volume.
Summer term 1	**Vectors**	Used in physics, engineering, and computer science A level, to describe kinematics in real terms, on a set of coordinate axes.	Develops understanding of direction and magnitude in 2D and 3D, and the relationship to real world problems through complex series of vectors.
	Algebraic fractions	Prepares for rational expressions in A-level maths and further maths.	Builds fluency in simplifying and manipulating complex algebraic expressions, including complex polynomials on both the numerator and denominator
	Inequalities/Further inequalities	Used in optimisation and decision-making problems.	Enhances reasoning with constraints and solution sets, both linearly and as a region on a plane

Extracurricular activities **Curriculum links** **Threshold topics (bold)** ***Denotes further maths L2 content**

	Year 10					
	Half term 1	**Half term 2**	**Half term 3**	**Half term 4**	**Half term 5**	**Half term 6**
Knowledge, Skills and Understanding 	• Basic Number, • Fractions, Decimals, Indices, Surds • Coordinates and Linear Equations • Standard Form & Measures • Angles, scale diagrams and bearings • Ratio and proportion • Equations/linear equations • Indices/index laws	• Rounding • Fractions and decimals • Collecting and representing data • Statistical measures	• Perimeter and area • Circumference and area • Coordinates and linear graphs/Gradients, equations of a straight line • Scatter graphs • Real life graphs	• Basic Probability • Probability • Surds/manipulation of surds	• Standard form • Basic percentages • Percentages • Growth and decay • 2d representations of 3D shapes • Properties of polygons • Measures	• Construction and loci • Direct and inverse proportion
	• Week 7 – Baseline assessment • Week 16 – GCSE statistics assessment		• Week 30 – Term 2 assessment • Week 30 – GCSE statistics mock (1 Paper AQA Higher)		• Week 40 – 41 - GCSE statistics (2 AQA 1hour 45 min papers) • Week 42 – 41 GCSE mocks - (3 AQA full papers – 1 hour 30 min each)	
 **Embed your knowledge**	• Collins revision guide, workbook and answer book – AQA higher statistics Collins GCSE Statistics - AQA GCSE Statistics Student Book | Anne Busby, Rob Ellis, Rachael Harris, Andrew Manning, Jayne Roper | 9780007410095 | Awesome Books • CGP GCSE higher revision and workbooks GCSE Maths AQA Revision Guide: Higher inc Online Edition, Videos & Quizzes | CGP Books • CGP L2 further maths revision and workbooks AQA Level 2 Certificate in Further Maths: Revision Guide (with Online Edition) | CGP Books					

Extracurricular activities **Curriculum links** **Threshold topics (bold)** ***Denotes further maths L2 content**

Extend your learning 	• Read **The Art of Statistics** by David Spiegelhalter, a wide-ranging guide to how statistics work, full of vivid and humane examples.	• Read **Invisible Women** by C Criado Perez – it is a truly eye-opening book, exploring the consequences of data-gathering with the assumption that the default human is male.	• **Bad Science** by Ben Goldacre – a hilarious, razor-sharp critique of media foolishness about stats, science and medicine.

	Year 11					
	Half term 1	**Half term 2**	**Half term 3**	**Half term 4**	**Half term 5**	**Half term 6**
Knowledge, Skills and Understanding 	• Pythagoras' Theorem and basic trigonometry/Pythagoras' Theorem and trigonometry in 3D • Sine and Cosine rule • Quadratics, rearranging formulae/factorising polynomials and algebraic proof • Sequences/Further sequences	• Sketching Graphs of functions • Drawing and sketching functions/Further graphs of equations • Equation of a circle • Simultaneous equations/Simultaneous with 3 variables	• Gradients and instant rate of change/Basic calculus (differentiation) • functions • Transforming functions • Numerical methods	• Congruence and similarity • Transformations • Circle theorems/Geometric proof • Volume	• Vectors • Algebraic fractions • Inequalities/Further inequalities	•
	• Week 7 – 8 - GCSE mocks (3 AQA full papers – 1 hour 30 min each, higher) • Week 8 GCSE further mathematics assessment – (bespoke 1 hour assessment)		• Week 24 - GCSE mocks (3 AQA full papers – 1 hour 30 min each, higher) • Week 25 – L2 Further maths mock examinations (2 papers, 1 hour 30 min each)		• Summer Examinations	
 **Embed your knowledge**	• Collins revision guide, workbook and answer book – AQA higher statistics Collins GCSE Statistics - AQA GCSE Statistics Student Book | Anne Busby, Rob Ellis, Rachael Harris, Andrew Manning, Jayne Roper | 9780007410095 | Awesome Books • CGP GCSE higher revision and workbooks GCSE Maths AQA Revision Guide: Higher inc Online Edition, Videos & Quizzes | CGP Books • CGP L2 further maths revision and workbooks AQA Level 2 Certificate in Further Maths: Revision Guide (with Online Edition) | CGP Books					

Extracurricular activities **Curriculum links** **Threshold topics (bold)** ***Denotes further maths L2 content**

Extend your learning 	• Read The Ten Equations That Rule the World - by David Sumpter Paperback – A look at the ten key equations that govern many facets of modern life, from sports to air traffic control	• Read Love Triangle: The Life-changing Magic of Trigonometry – A great author who brings the complex notions of trigonometry to life with humour and great maths	• Revision!