

Key Stage 4 Curriculum Overview

Foundation Pathway

Year 10: Consolidate and Secure

Students master the key concepts required for Foundation GCSE success, building confidence with algebra, ratio, geometry, statistics and probability.

Year 11: Refine and Apply

Students revisit and deepen core methods, improving accuracy, fluency and exam performance through increasingly complex problem-solving.

Higher Pathway

Year 10: Extend and Connect

Students develop advanced algebraic, graphical and geometrical understanding, making connections across mathematical strands.

Year 11: Generalise and Reason

Students study the most demanding Higher GCSE content, developing proof, abstraction and sophisticated mathematical reasoning in preparation for post-16 study.

Foundation Curriculum

Year 10: Consolidation

Students consolidate the core GCSE curriculum, building confidence with algebra, number, geometry and statistics. The focus is on securing methods, making connections between topics and developing problem-solving skills in preparation for Year 11 and the Foundation GCSE examination.

Unit	Focus	Key Learning
A - Calculations	Percentage methods and numerical fluency	FDP conversions; percentage of an amount; decimal multipliers; percentage increase and decrease; simple and compound interest; percentage change; reverse percentages; estimation; error intervals; standard form calculations.
B - Number Systems	Standard form and numerical reasoning	Standard form calculations; upper and lower bounds; truncation; calculator skills; indices and roots; estimation and accuracy.
C - Indices Plus	Algebraic fluency	Solving equations; substitution; index laws; simplifying algebraic terms; expanding binomials; factorising expressions; introduction to proof.
D - Equations & Formulae	Simultaneous equations and quadratics	Changing the subject; solving simultaneous equations; factorising quadratics; solving quadratic equations; basic inequalities; interpreting quadratic graphs.
E - Proportion	Direct and inverse proportion	Ratio problems; ratios involving fractions, decimals and percentages; combined ratios; direct and inverse proportion using unitary methods, graphs and equations.
F - Mensuration	Geometry and measure	Area and perimeter; surface area and volume of prisms and cylinders; spheres, cones and pyramids; Pythagoras' theorem; density; compound units and speed calculations.
G - Graphs & Sequences	Linear and non-linear relationships	Linear graphs; gradients; equations of lines; non-linear graphs; midpoint problems; solving simultaneous equations graphically.
H - Transformations	Transformations and similarity	Translations, reflections, rotations and enlargements; describing transformations; identifying similar shapes; scale factor calculations.
I - Angles	Trigonometry foundations	Parallel line rules; trigonometry in right-angled triangles; selecting suitable methods to solve geometric problems.

J - Probability	Probability reasoning	Frequency trees; sample spaces; two-way tables; tree diagrams; Venn diagrams; relative frequency; conditional probability and dependent events.
K - Data Handling	Statistical analysis	Pie charts; scatter graphs; time series and distance-time graphs; averages; estimated mean; grouped data comparisons.
L - Constructions & Loci	Geometric reasoning	Congruency; constructions; bisectors; loci and geometric interpretation.

Year 11: Foundation GCSE Preparation

Students revisit and strengthen the most important Foundation GCSE concepts. Learning focuses on securing examination techniques, applying mathematics in unfamiliar contexts and improving fluency across all curriculum strands

Number and Algebra

- FDP conversions and percentage methods.
- Percentage change and compound interest.
- Standard form and negative powers of ten.
- Solving equations and inequalities.
- Simultaneous equations.
- Expanding and factorising expressions and quadratics.
- Direct and inverse proportion.
- Multi-step ratio problems.

Geometry, Measure and Statistics

- Area, perimeter and volume.
- Surface area of prisms.
- Pythagoras' theorem.
- Similarity and scale factors.
- Parallel line angles.
- Constructions and loci. Graphs and Statistics
- Linear and non-linear graphs.
- Gradient and equations of lines.
- Statistical diagrams and averages.
- Probability using trees, Venn diagrams and sample spaces

Higher Curriculum

Year 10: GCSE Development

Students study the full Higher GCSE curriculum, developing deeper algebraic reasoning, advanced geometry and sophisticated problem-solving skills. The emphasis is on connections between mathematical ideas and preparing for the demands of Higher Tier GCSE.

Unit	Focus	Key Learning
A - Calculations	Advanced percentage methods	Percentage profit; reverse percentages; compound interest; successive percentage change; recurring decimals as fractions.
B - Number Systems	Surds and indices	Square and cube roots; simplifying surds; irrational calculations; negative and fractional indices; exponential equations.
C - Indices Plus	Advanced algebra	Algebraic fractions; proof; non-monic factorisation; expanding and manipulating algebraic expressions; rearranging complex formulae.
D - Equations & Formulae	Algebraic problem solving	Solving equations involving algebraic fractions; rearranging formulae with multiple variables; advanced simultaneous equations.
E - Proportion	Proportional modelling	Direct and inverse proportion using equations; proportionality graphs; advanced ratio reasoning and mathematical modelling.
F - Mensuration	Advanced geometry and measure	Arcs and sectors; density and pressure; volume and surface area of complex solids; frustums; coordinate geometry problems.
G - Graphs & Sequences	Coordinate geometry	Parallel and perpendicular lines; inequalities and regions; equations of circles; tangents; advanced line equations.
H - Transformations	Geometric reasoning	Similarity and enlargement; transformational problem solving; links between geometry and algebra.
I - Angles	Advanced trigonometry	Exact trigonometric values; 3D trigonometry; sine rule; cosine rule; area of triangles using trigonometry.
J - Probability	Set theory and probability	Independent events; Venn diagrams; set notation; probability from Venn diagrams and sample spaces.
K - Data Handling	Statistical interpretation	Averages from grouped data; cumulative frequency; box plots; histograms; statistical comparison.
L - Constructions & Loci	Geometric construction	Bearings; loci; constructions; scale drawings and applied geometric reasoning.

Year 11: Higher GCSE Preparation

Students complete the Higher GCSE curriculum through the study of advanced algebraic, graphical and geometrical concepts. The focus is on mathematical reasoning, proof, abstraction and examination readiness.

Advanced Algebra

- Iteration.
- Completing the square.
- Quadratic formula.
- Algebraic fractions.
- Simultaneous equations involving a quadratic.
- Identities and matching coefficients.
- Algebraic proof.
- Linear and quadratic inequalities.
- Quadratic sequences.

Graphs and Functions

- Graph sketching.
- Transforming graphs.
- Trigonometric graphs.
- Exponential graphs.
- Tangents and gradients.
- Area under a curve.

Geometry and Measure

- Congruence and similarity.
- Area and volume scale factors.
- Vectors.
- Combined transformations.
- Negative enlargements.
- Circle theorems.
- Sine rule and cosine rule.
- Area of a triangle using $\frac{1}{2}ab\sin C$.