

GCSE Maths Curriculum Map

Curriculum Vision	Mathematics develops resilience, logical reasoning, and confidence in problem solving, equipping students with essential analytical and quantitative skills to tackle real-world challenges such as managing finances, interpreting data, and understanding technology. It supports informed decision-making and enables learners to engage with global issues including climate change, public health, and economic inequality. Through analysing and interpreting data, students are empowered to recognise and challenge societal inequities, fostering fairness and equity. At the same time, mathematics inspires curiosity by revealing patterns and structures that underpin the modern world. Ultimately, it combines practical relevance with intellectual depth, preparing learners to contribute meaningfully to their communities and wider society.		
Domains of Knowledge	• Number • Algebra	• Geometry • Ratio & Proportion	• Statistics & Probability • Problem Solving
End points (KS4)	Number – Students confidently apply a wide range of numerical skills with accuracy and efficiency. They can perform written and mental calculations fluently, round numbers to appropriate degrees of precision, and use factors, multiples, and primes to simplify and solve problems. Students reason about numerical relationships, check the validity of results, and select suitable methods for different contexts. These skills enable them to approach complex mathematical problems with confidence and form a secure foundation for algebraic and proportional reasoning. Algebra – Students confidently use algebra to generalise, represent, and solve mathematical problems. They can manipulate expressions, expand and factorise accurately, and solve equations and inequalities using a range of methods. Students understand and interpret algebraic graphs, recognising key features and relationships between variables. They apply algebraic reasoning to model real-world situations, make predictions, and justify their methods. This deep understanding of structure and generalisation enables them to connect algebra fluently with number, geometry, and functions across the GCSE curriculum. Geometry – Students extend their understanding of geometry to solve complex, multi-step problems involving 2D and 3D shapes. They apply geometric reasoning to justify results, derive and use formulae, and construct formal proofs involving congruence, similarity, and circle theorems. Students confidently use Pythagoras' Theorem and trigonometry in a wider range of contexts, including problem solving with bearings and vectors. They interpret and manipulate geometric information algebraically, analyse relationships between shapes, and communicate reasoning using precise mathematical language and diagrams. Ratio & Proportion – Students extend their understanding of ratio and proportion to reason multiplicatively across a wide range of contexts. They apply proportional reasoning to complex, multi-step problems, linking it to algebraic, graphical, and geometric representations. Students interpret gradients and equations as measures of proportional change, use ratio to compare compound measures such as speed, density, and pressure, and solve growth and scaling problems with accuracy. They move beyond procedural fluency to justify methods, interpret results, and model real-world situations using proportional reasoning with confidence and precision. Statistics & Probability – By the end of KS4, students develop a deep understanding of statistics and probability, enabling them to interpret, analyse, and evaluate data with confidence and precision. They extend their KS3 skills by working with complex, grouped, and bivariate data, using appropriate diagrams, averages, and measures of spread to draw valid comparisons and conclusions. Students understand the role of sampling and bias in data collection and can critically assess the reliability of statistical representations. In probability, they move beyond simple events to calculate and represent combined and conditional probabilities using diagrams, tables, and algebraic methods. They use these tools to model uncertainty, justify reasoning, and make informed predictions about real-world situations. Problem Solving – By the end of KS4, students confidently tackle complex, multi-step and non-routine problems that require them to draw on knowledge from across all mathematical domains. They plan and refine strategies independently, selecting efficient methods and evaluating the validity of their approaches. Students generalise patterns, form and test conjectures, and justify conclusions using rigorous mathematical reasoning. They interpret and model real-world situations, communicate solutions precisely using appropriate notation and structure, and reflect critically on the effectiveness of their methods and results.		

Term	Weeks	Domain	Key Concepts	Broken Down Knowledge
Y10 Autumn 1	4	Algebra	Unit 9: Quadratic & Simultaneous Equations, Inequalities	Solve linear and non-linear simultaneous equations using graphical, elimination and substitution methods; factorise quadratic expressions; solve quadratic equations by factorisation, completing the square and the quadratic formula; solve quadratic and linear inequalities, including representing solutions on number lines and in two dimensions.

Y10 Autumn 1	3	Probability	Unit 10: Probability	Calculate theoretical and experimental probabilities; use sample space diagrams, Venn diagrams and tree diagrams; calculate probabilities of mutually exclusive, independent and dependent events; interpret expectation and bias in experimental results.
Y10 Autumn 2	3	Ratio & Proportion	Unit 11: Multiplicative Reasoning	Apply ratio and proportion to real-life contexts; simplify ratios; solve problems involving speed and density; use multiplicative scaling to compare quantities.
Y10 Autumn 2	3	Geometry	Unit 12: Similarity & Congruence	Determine unknown lengths in similar shapes; use scale factors to relate length, area and volume; prove triangle congruence using SSS, SAS, ASA and RHS.
Y10 Autumn 2	3	Geometry	Unit 13: Trigonometry & Trigonometric Graphs	Use exact trigonometric values; interpret and sketch trigonometric graphs; apply graph transformations; use Pythagoras' theorem and trigonometry in 3D; apply sine and cosine rules and the area formula for triangles.
Y10 Spring 1	3	Statistics	Unit 14: Data Handling & Distributions	Understand data collection methods including capture–recapture; construct and interpret cumulative frequency graphs; interpret box plots; construct and interpret histograms with unequal class widths.
Y10 Spring 1	4	Algebra	Unit 15: Advanced Graphs & Inequalities	Analyse quadratic graphs including turning points; solve equations graphically and numerically; recognise cubic, reciprocal and exponential graphs; solve linear and quadratic inequalities in one and two variables.
Y10 Spring 2	3	Geometry	Unit 16: Circle Theorems & Circle Geometry	Apply circle theorems to solve geometric problems; understand loci; interpret and use equations of circles centred at the origin; determine equations of tangents to circles.
Y10 Summer 1	4	Algebra	Unit 17: Algebraic Manipulation, Functions & Proof	Change the subject of complex formulae; manipulate algebraic fractions; solve equations involving algebraic fractions; rationalise surds; use function notation including composite and inverse functions; construct algebraic proofs to show equivalence.
Y10 Summer 2	3	Geometry	Unit 18: Vectors & Geometric Proof	Add, subtract and scale vectors; use vectors involving variables; apply vectors to solve geometric problems and construct proofs.
Y11 Autumn 1	3	Algebra	Unit 19a: Reciprocal, Exponential & Other Graphs	Recognise and interpret the shapes of quadratic, cubic, reciprocal and exponential graphs from their equations; determine parameters in exponential functions of the form ($y = ka^x$); apply transformations to graphs including translations and reflections, including exponential functions.
Y11 Autumn 1	2	Algebra	Unit 19a: Gradient & Area Under Graphs	Interpret gradients of linear and non-linear graphs in context; construct and interpret speed–time graphs; estimate the area under a curve using trapezia and interpret area in real-life contexts.
Y11 Autumn 1	1	Ratio & Proportion	Unit 19b: Direct & Inverse Proportion	Model situations using direct and inverse proportion; solve problems involving proportional relationships using algebraic methods.
Assessment	Assessment is embedded throughout the curriculum, with topic tests after every Unit. At KS4, topic tests are 24 minutes long and are composed of a combination of 1-mark knowledge and recall questions alongside longer, multi-mark problem-solving questions. In addition, students sit three GCSE past papers spread across the year, each followed by a Question Level Analysis (QLA) to identify strengths and areas for development. While summative in nature, these assessments are also used formatively to inform future teaching; they assess recently taught content alongside key concept retrieval questions (such as directed numbers, percentages, and algebraic simplification) to support long-term retention, and teachers use the outcomes to revisit common areas of need identified across the class. QLAs reference Dr Frost website codes linked directly to support videos and practice.			

	Formative assessment also takes place in every lesson through common Do It Now tasks focusing on key concepts such as directed numbers, fractions–decimals–percentages, and algebraic basics. These tasks run for four weeks before changing to ensure interleaving of topics and promote long-term retention, alongside the use of mini whiteboards to regularly check understanding and enable timely reinforcement or reteaching key concepts such as directed numbers, fractions–decimals–percentages, and algebraic basics.
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