Composite: Number Structure
Year 7-11

This composite develops students' **numerical fluency, precision, and mathematical reasoning**. It strengthens their understanding of place value, rounding, estimation, standard form, metric conversion, and error intervals — building the foundations required for higher mathematics, science, engineering, finance, and everyday decision-making.

We teach this because students must be able to:

- Work confidently with very large and very small numbers
- Estimate and check whether answers are sensible
- Understand the impact of rounding and measurement error
- Apply mathematics accurately in real-world contexts

These are essential life skills and core GCSE competencies

Composite: Number Calculation
Year 7-11

This composite develops students' **numerical fluency, financial awareness, and structured problem-solving skills**. It strengthens their ability to calculate accurately, interpret results meaningfully, and apply mathematics confidently in real-life contexts.

We teach this because students must be able to:

- Perform calculations accurately and efficiently
- Understand financial information and personal money management
- Use structured methods reliably
- Interpret answers in context
- Solve multi-step problems logically

Composite: Number Properties
Year 7-11

This composite develops students' understanding of **number structure, algebraic rules, and abstract mathematical reasoning**. It builds from foundational number knowledge (factors, primes, negative numbers) to advanced manipulation (index laws, fractional powers, and surds).

We teach this because students must:

- Understand how numbers are constructed and related
- Apply general mathematical laws confidently
- Move from arithmetic to algebraic thinking
- Manipulate exact values symbolically
- Develop reasoning skills required for Higher GCSE

Composite: Fundamental Algebra
Year 7-11

This composite develops students' ability to **think algebraically**, manipulate symbolic expressions fluently, and apply mathematical structure with confidence. It builds from forming expressions and substitution through expansion, factorisation, and algebraic index laws — forming the foundation of Higher GCSE algebra.

We teach this because students must:

- Move from arithmetic to generalised mathematics
- Understand structure rather than memorise procedures
- Manipulate expressions accurately and efficiently
- Recognise patterns within algebra
- Solve increasingly complex, multi-step problems

This unit represents a major step toward formal mathematical reasoning

Composite: Extending Algebra
Year 8-11

This composite represents the culmination of students' algebraic development. It brings together factorisation, quadratics, algebraic fractions, proof, functions, inequalities and iteration into a coherent framework of higher-level mathematical reasoning.

We teach this because students must:

- Solve increasingly complex equations systematically
- Understand how algebra models relationships
- Interpret graphical meaning from algebraic structure
- Justify and prove general results
- Approximate solutions when exact ones are not possible

Composite: Working with Fractions
Year 7-10

This composite develops students' fluency, reasoning and confidence with **fractions, decimals and proportional thinking**. Fractions are one of the most important — and most misunderstood — areas of mathematics. Secure understanding here is essential for success across algebra, ratio, probability and GCSE problem solving.

We teach this because students must:

- Understand fractions as numbers, not just procedures
- Move flexibly between fractions, decimals and mixed numbers
- Apply fraction skills confidently in context
- Use calculators accurately and efficiently
- Develop proportional reasoning that underpins higher mathematics

Fractions are foundational for mathematical maturity.

Composite: Working with Percentages
Year 7-11

Why do we deliver this?

This composite develops students' fluency, reasoning and confidence with percentages, interest, growth and decay. Understanding percentages and financial mathematics is essential for interpreting real-life situations involving money, investment, loans, depreciation and change over time. These skills support success across algebra, ratio, statistics and GCSE problem solving.

- We teach this because students must:
- Understand percentages as proportional change and comparison
- Move flexibly between percentages, fractions and decimals
- Calculate and interpret simple and compound interest
- Apply growth and decay skills in financial and real-life contexts
- Use multipliers and calculators accurately and efficiently
- Develop reasoning skills needed for mortgages, depreciation and investment problems

Percentages and financial maths are foundational for numeracy in everyday life and future study

Composite: Equations and Inequalities
Year 8-11

Why do we deliver this?

This unit develops students' fluency, reasoning and confidence with algebraic manipulation, equations and inequalities. Understanding how to form, rearrange and solve equations is essential for expressing relationships mathematically and solving a wide range of structured and real-life problems. These skills support success across algebra, geometry, graphs, statistics and higher-level GCSE mathematics.

We teach this because students must:

- Rearrange and manipulate algebraic expressions confidently, including factorisation methods
- Change the subject of formulae and understand how variables relate within equations
- Form and solve equations from a variety of mathematical and real-world contexts
- Solve linear equations and inequalities with increasing complexity and accuracy
- Represent and interpret inequalities on number lines and in solution sets
- Develop logical reasoning through step-by-step algebraic problem solving
- Use substitution and rearrangement within formulae for area, volume and other applications

- Understand and apply inverse operations and function machines to generate and solve expressions
- Interpret mathematical structure to move flexibly between different forms of an equation

Algebraic manipulation is foundational for problem solving, modelling relationships and progressing into advanced mathematics and related disciplines

Composite: Plotting and Interpreting Graphs
Year 7-11

Why do we deliver this?

This composite develops students' fluency, reasoning and confidence with coordinates, graphs and transformations. Understanding how graphs represent relationships between variables is essential for modelling, interpreting and solving mathematical problems visually and algebraically. These skills support success across algebra, geometry, statistics and higher-level GCSE mathematics.

We teach this because students must:

- Understand how coordinates and graphs represent mathematical relationships
- Plot and interpret linear and quadratic graphs accurately
- Recognise and apply gradient, intercepts and equations of lines
- Use graphical methods to solve equations and simultaneous equations
- Interpret real-life information from graphs and coordinate models
- Develop geometric reasoning through reflections, symmetry and transformations
- Solve problems involving midpoints, coordinates and geometric properties
- Use tables, scales and calculators accurately and efficiently
- Develop visualisation and analytical skills needed for algebraic thinking and mathematical modelling

Graphs and coordinate geometry are foundational for understanding patterns, relationships and problem solving in mathematics and real-world contexts

Composite: Sequences
Year 7-11

Why do we deliver this?

This unit develops students' fluency, reasoning and confidence with sequences, patterns and iterative methods. Understanding sequences and iteration helps students recognise mathematical structure, model change and solve problems where exact solutions are not always possible. These skills support success across algebra, graphs, functions and higher-level GCSE mathematics.

We teach this because students must:

- Recognise and describe patterns within numerical and algebraic sequences
- Generate and interpret linear and quadratic sequences confidently
- Develop algebraic reasoning through finding and using nth term rules
- Understand how iterative methods can approximate solutions efficiently
- Use calculators accurately to support iteration and numerical methods
- Interpret mathematical language and notation related to sequences and convergence
- Apply reasoning skills to determine whether values belong to a sequence
- Develop problem-solving strategies using substitution, patterns and recurrence processes
- Connect visual, numerical and algebraic representations of mathematical relationships

Sequences and iteration are foundational for algebraic thinking, mathematical modelling and advanced problem solving in further study and real-world applications

Composite: 2D and 3D Shapes
Year 7-11

Why do we deliver this?

This composite develops students' fluency, reasoning and confidence with geometry, mensuration and 3D shapes. Understanding area, perimeter, volume, surface area and similarity is essential for interpreting and solving real-world problems involving shape, space, design and measurement. These skills support success across geometry, algebra, ratio and higher-level GCSE problem solving.

We teach this because students must:

- Understand the properties and relationships of 2D and 3D shapes
- Calculate accurately with perimeter, area, surface area and volume
- Apply formulas confidently using correct units and mathematical notation
- Use scale factors and similarity to solve geometric problems
- Interpret and construct nets, plans and elevations of 3D objects
- Develop spatial reasoning and visualisation skills

- Apply geometry in practical and real-life contexts involving design, construction and engineering
- Use algebra, ratio and Pythagoras within geometric problem solving

Geometry and mensuration are foundational for mathematical reasoning, spatial awareness and real-world application in further study and everyday life

Composite: Angles, Constructions and Loci
Year 7-11

Why do we deliver this?

This composite develops students' fluency, reasoning and confidence with angles, geometric reasoning, transformations and constructions. Understanding angle relationships and geometric properties is essential for solving problems logically, constructing mathematical arguments and interpreting space and shape accurately. These skills support success across geometry, proof, trigonometry and higher-level GCSE problem solving.

We teach this because students must:

- Understand and apply angle facts in lines, polygons, triangles and parallel lines
- Develop logical reasoning by justifying each stage of mathematical working
- Recognise and use geometric properties to solve increasingly complex problems
- Interpret and describe transformations such as rotations accurately
- Construct and interpret loci, bearings and geometric constructions with precision
- Use congruency and circle theorems to form mathematical proofs and arguments
- Develop spatial awareness and visual reasoning skills
- Apply geometry confidently in practical and real-life contexts involving navigation, design and measurement

Geometric reasoning is foundational for mathematical proof, problem solving and advanced study in mathematics and related subjects

Composite: Pythagoras and Trigonometry
Year 9-11

Why do we deliver this?

This unit develops students' fluency, reasoning and confidence with trigonometry, Pythagoras' theorem and advanced geometric problem solving. Understanding trigonometric relationships and right-angled triangle properties is essential for modelling real-world situations involving distance, angles and measurement. These skills support success across geometry, algebra, physics, engineering and higher-level GCSE mathematics.

We teach this because students must:

- Understand and interpret trigonometric functions and their graphs confidently
- Use exact trigonometric values and special triangles to support non-calculator reasoning
- Apply sine, cosine and tangent relationships to find missing sides and angles
- Select and use appropriate methods such as sine rule, cosine rule and area formulae
- Develop algebraic and numerical fluency through exact values and surd manipulation
- Solve complex multi-step problems involving 2D and 3D geometry
- Use Pythagoras' theorem and trigonometry together in varied contexts
- Interpret and model real-life situations involving measurement, scale and distance
- Develop spatial reasoning and problem-solving skills in unfamiliar contexts

Trigonometry and Pythagoras are foundational for advanced mathematical modelling, scientific applications and real-world problem solving in further study and beyond

Composite: Transformation and Vectors
Year 9-11

Why do we deliver this?

This unit develops students' fluency, reasoning and confidence with graphical transformations, vectors and geometric proof. Understanding how shapes and graphs transform and how vectors describe movement is essential for developing spatial reasoning, algebraic thinking and formal mathematical argument. These skills support success across geometry, algebra, graph work and higher-level GCSE mathematics.

We teach this because students must:

- Understand and interpret function notation and graphical transformations confidently

- Recognise and describe transformations of graphs, including translations, reflections and stretches
- Develop spatial reasoning through enlargements and transformations of shapes
- Use vectors to represent movement, direction and position in geometric contexts
- Apply vector methods to solve problems involving collinearity, midpoints and geometric proof
- Understand invariance and how certain properties remain unchanged under transformations
- Combine multiple transformations and interpret their cumulative effect
- Translate between graphical, algebraic and geometric representations of transformations
- Develop logical reasoning and proof skills using structured vector arguments

Graphical transformations and vectors are foundational for advanced geometry, mathematical modelling and formal proof in further study and beyond

Composite: Compound Measures
Year 7-11

Why do we deliver this?

This unit develops students' fluency, reasoning and confidence with real-world measurement, motion and rates of change. Understanding how quantities such as pressure, density, speed and acceleration behave is essential for modelling physical situations and interpreting change over time. These skills support success across mathematics, physics, engineering and higher-level GCSE problem solving.

We teach this because students must:

- Understand and apply key formulae for pressure, density, speed and related quantities
- Rearrange formulae confidently to make different variables the subject
- Use correct units and conversions when working with real-world measurements
- Interpret and construct distance–time and velocity–time graphs
- Understand how gradients and areas represent speed, distance and acceleration
- Calculate and estimate rates of change using graphical methods, including tangents
- Analyse motion in context, including describing journeys and interpreting patterns
- Develop problem-solving skills involving multi-step and real-life applications
- Apply mathematical reasoning to physical contexts such as motion, force and flow

Rates of change and measurement are foundational for modelling the real world and applying mathematics to science, engineering and everyday decision-making

Composite: Ratio
Year 7-11

Why do we deliver this?

This composite develops students' fluency, reasoning and confidence with ratio, proportion and multiplicative relationships. Understanding ratio is essential for comparing quantities, scaling values and interpreting relationships in mathematics and real-life contexts. These skills support success across algebra, geometry, probability and higher-level GCSE problem solving.

We teach this because students must:

- Understand ratios as multiplicative relationships rather than additive comparisons
- Move flexibly between ratios, fractions, algebraic expressions and unit forms
- Simplify, compare and represent ratios accurately
- Divide quantities into ratios and interpret proportional relationships
- Rearrange and manipulate ratio relationships algebraically
- Apply ratio reasoning confidently in contexts involving money, scale, geometry and rates
- Develop problem-solving and reasoning skills using equivalent ratios and proportional thinking
- Use graphical and calculator methods accurately and efficiently

Ratio and proportional reasoning are foundational for mathematical modelling, algebraic thinking and real-world application in further study and everyday life

Composite: Proportion
Year 7-11

Why do we deliver this?

This composite develops students' fluency, reasoning and confidence with proportional relationships, including direct and inverse proportion. Understanding proportion is essential for interpreting relationships between variables, solving real-world problems and modelling change mathematically. These skills support success across algebra, graphs, geometry, science and higher-level GCSE problem solving.

We teach this because students must:

- Understand and interpret direct and inverse proportional relationships
- Use algebraic equations and constants of proportionality confidently
- Recognise and interpret proportional graphs, tables and real-life models

- Apply proportional reasoning to contexts involving speed, scale, recipes, exchange rates and best buys
- Develop multiplicative reasoning skills rather than relying on additive methods
- Solve multi-step and worded problems using unitary methods and algebraic approaches
- Interpret and compare value in financial and everyday situations
- Convert confidently between metric and imperial measures where appropriate
- Use estimation and scaling accurately in practical contexts

Proportional reasoning is foundational for mathematical modelling, scientific understanding and informed decision-making in everyday life and further study

Composite: Probability
Year 7-11

Why do we deliver this?

This composite develops students' fluency, reasoning and confidence with probability, statistical representations and systematic problem solving. Understanding probability helps students interpret uncertainty, analyse data and make informed predictions in mathematical and real-life contexts. These skills support success across statistics, algebra, decision-making and higher-level GCSE problem solving.

We teach this because students must:

- Understand how probabilities are represented, calculated and interpreted
- Use diagrams and tables to organise information systematically and accurately
- Apply probability concepts to real-life situations involving chance and risk
- Interpret and calculate probabilities from two-way tables, Venn diagrams, tree diagrams and sample spaces
- Distinguish between independent and dependent events
- Develop logical reasoning through systematic listing and structured problem solving
- Use relative frequency to analyse reliability, fairness and bias in data
- Apply fractions, decimals, percentages and proportional reasoning within probability contexts
- Develop mathematical communication through correct notation and clear working

Probability and statistical reasoning are foundational for interpreting data, evaluating uncertainty and making informed decisions in further study and everyday life

Composite: Statistics and Averages
Year 7-11

Why do we deliver this?

This unit develops students' fluency, reasoning and confidence with data handling, statistics and interpretation of information. Understanding how to represent, analyse and interpret data is essential for making sense of real-world information, identifying trends and drawing justified conclusions. These skills support success across statistics, probability, algebra and higher-level GCSE problem solving.

We teach this because students must:

- Interpret and represent data accurately using a range of statistical diagrams
- Understand and describe relationships, trends and correlations in data
- Calculate and compare averages and measures of spread confidently
- Use statistical reasoning to draw conclusions and evaluate data critically
- Select and construct appropriate graphs and charts for different types of data
- Understand the importance of sampling, variability and data reliability
- Compare data sets using meaningful statistical measures such as median and IQR
- Develop skills in estimating, analysing and presenting data clearly and logically
- Apply statistical thinking to real-life contexts involving research, science and decision-making

Statistics and data interpretation are foundational for informed analysis, critical thinking and evidence-based reasoning in further study and everyday life