Y12 Maths	Term 1	Term 2	Term 3	Term 4	Term 5	Term 6
Theme/Big Idea	Developing Advanced Algebraic and Graphical Thinking for Mathematical Modelling and Problem Solving	Developing Advanced Algebraic, Trigonometric and Calculus Thinking for Mathematical Reasoning and Proof	Developing Advanced Mathematical Modelling through Calculus, Vectors and Exponential Functions	Developing Mathematical Modelling and Statistical Reasoning for Analysing Real-World Situations	Developing Mathematical Modelling, and Statistical Inference for Problem Solving	Developing Advanced Algebraic and Functional Thinking for Mathematical Analysis and Modelling.
Content What are they learning? (including keywords)	**P1 Unit 1** Students simplify and evaluate expressions involving indices, brackets and surds, developing fluency, accuracy and understanding of algebraic structure. **P1 Unit 2** Students solve quadratic equations using various methods, interpret the discriminant, analyse quadratic graphs and apply quadratic models to problems. **P1 Unit 3** Students solve linear and non-linear equations and inequalities, including simultaneous equations, developing	**P1 Unit 7** Students manipulate algebraic fractions, divide polynomials, apply the factor theorem and begin formal mathematical proof, strengthening algebraic reasoning and logical argument. **P1 Unit 8** Students use binomial expansion to simplify expressions, solve problems and estimate roots, developing deeper understanding of approximation and algebraic structure. **P1 Unit 9** Students apply the sine rule, cosine rule and area formula to	**P1 Unit 11** Students develop vector methods using algebraic and i–j notation, exploring magnitude, direction, position vectors and geometric problem solving, including applications to mechanics. **P1 Unit 12** Students extend differentiation techniques to investigate gradients, tangents, normals and stationary points, using derivatives to model change and solve optimisation problems. **P1 Unit 13** Students develop formal integration techniques, finding	**M1 Units 8 - 10** Students are introduced to mathematical modelling in mechanics, developing an understanding of how mathematics describes physical motion. They use vectors to represent position, displacement, velocity and force, interpret motion graphs, apply constant acceleration formulae, analyse vertical motion under gravity, and investigate forces and acceleration in one and two dimensions. **S1 Units 1 – 5** Students develop statistical understanding through the study of	**M1 Units 10 – 11** Students extend mathematical modelling through connected particles and pulley systems, analysing forces and motion. They investigate variable acceleration using calculus, model velocity and displacement as functions of time, solve optimisation problems using differentiation, and apply integration to derive and use the constant acceleration formulae. **S1 Units 6 – 7** Students develop understanding of probability distributions and the rules governing them.	**P2 Unit 1** Students manipulate algebraic fractions, perform algebraic division and construct partial fractions to simplify expressions and prepare for integration. **P2 Unit 4** Students apply the full binomial expansion to approximate values, estimate roots and generate series expansions from expressions involving partial fractions. **P2 Unit 2** Students develop understanding of functions, mappings, modulus, inverse and composite functions, domain and range, and

	confidence in interpreting algebraic and graphical solutions. **P1 Unit 4** Students study non-linear functions, linking equations to graph features, exploring intersections and transformations, and strengthening connections between algebra and graphs. **P1 Unit 5** Students develop coordinate geometry skills through gradients and equations of lines, investigating parallel and perpendicular relationships and solving graphical problems. **P1 Unit 6** Students investigate equations of circles, tangents, chords and perpendicular bisectors, applying coordinate geometry to increasingly sophisticated mathematical situations. **Key words Appendix1**	solve problems involving non-right-angled triangles and real-life contexts. Students explore trigonometric graphs and transformations, linking algebraic forms to graphical behaviour and interpreting periodic mathematical relationships. **P1 Unit 10** Students study angles in all four quadrants, exact trigonometric values, identities and equations, developing fluency in solving and proving trigonometric relationships. **P1 Unit 12 (start)** Students begin calculus by investigating rates of change and deriving differentiation from first principles, establishing foundations for mathematical analysis. **Key words Appendix1**	definite integrals and evaluating indefinite integrals, interpreting areas under graphs and finding areas between curves and lines. **P1 Unit 14** Students investigate the nature of exponential functions and the significance of the constant e. They model and interpret growth and decay using exponentials in real-world contexts. Students develop understanding of logarithms, apply logarithmic laws, solve exponential equations, use natural logarithms, and analyse non-linear relationships through graphical and data-based methods. **Key words Appendix1**	populations, sampling methods and the Large Data Set. They analyse and compare distributions using graphical and numerical measures, including variance and standard deviation, investigate correlation and regression, and calculate probabilities using tree diagrams, Venn diagrams and conditional probability in increasingly complex contexts. **Key words Appendix1**	They investigate the binomial distribution, calculate probabilities and cumulative probabilities, and apply hypothesis testing using critical values in both one-tailed and two-tailed statistical tests to support evidence-based decision making. **Key words Appendix1**	combined graph transformations. **P2 Unit 3** Students generate and model arithmetic and geometric sequences, exploring recurrence relations, sum to n terms and infinity. **Key words Appendix1**
Skills	Apply algebraic thinking to manipulate	Apply algebraic thinking to manipulate	Apply mathematical thinking to represent	Apply mathematical modelling to represent	Apply mathematical modelling to analyse	Use algebraic thinking to manipulate complex

How are they learning it?	expressions, solve equations and generalise mathematical relationships. Use mathematical reasoning to justify methods, interpret solutions and connect algebraic, graphical and geometrical representations. Apply graphical thinking to analyse functions, identify key features and model relationships mathematically. Use precise algebraic and geometric techniques to solve increasingly complex problems involving coordinates, graphs and circles. Represent and communicate mathematical ideas clearly using formal notation, diagrams, graphs and rigorous mathematical arguments.	expressions, prove results and generalise mathematical relationships. Use mathematical reasoning to justify methods, construct proofs and communicate rigorous mathematical arguments. Apply trigonometric reasoning to solve problems, interpret functions and establish mathematical relationships. Use graphical and analytical methods to model, transform and interpret mathematical functions. Develop calculus thinking by investigating rates of change and connecting graphical, numerical and algebraic representations.	position, movement and geometric relationships using vector methods. Use calculus to analyse rates of change, classify stationary points and model real-world optimisation problems. Apply integration techniques to interpret accumulation and determine areas from graphical representations. Use exponential and logarithmic functions to model growth and decay and solve non-linear equations. Represent and communicate mathematical ideas rigorously using algebraic, graphical and numerical methods.	and analyse motion, forces and physical situations. Use vector reasoning to describe position, movement and forces in one and two dimensions. Apply statistical thinking to analyse data, compare distributions and interpret statistical measures. Use probabilistic reasoning to calculate and interpret probabilities involving combined, conditional and independent events. Represent and communicate mathematical ideas clearly using graphs, diagrams, statistical measures and mathematical notation.	forces, motion and changing quantities using algebraic, graphical and calculus-based methods. Use mathematical reasoning to interpret statistical evidence, evaluate probability models and draw justified conclusions from data. Use differentiation and integration to connect displacement, velocity and acceleration, modelling motion and solving problems.	expressions, including partial fractions, series expansions and binomial approximations. Apply functional thinking to analyse relationships, transformations and mappings between mathematical representations. Use mathematical reasoning to interpret and manipulate composite, inverse and modulus functions. Apply sequence and series methods to model patterns, growth and repeated mathematical processes.
Key Questions	**What** do algebraic expressions, equations and functions reveal about mathematical	**What** does the Factor Theorem tell us about the relationship between roots and	**What** are vectors and **how** can they help represent position and	**What** assumptions underpin mathematical models, **why** are they useful, and **how** can	**What** are the fundamentals of the way connected particles move	**Why** are algebraic fractions and series expansions important, and **how** can partial

	relationships, **why** is this understanding important, and **how** can we use it to model and solve problems? **How** do graphical representations help us understand and interpret algebraic functions, and **why** are connections between equations and graphs fundamental to mathematics? **What** geometric relationships exist between lines, curves and circles, **wh**y do these relationships hold true, and **how** can they be used to solve complex mathematical problems?	factors, **why** is this important, and **how** can it help us analyse and solve polynomial equations? **What** mathematical structures underpin algebra and **why** do they enable proof? **What** patterns emerge in the binomial expansion, **why** are they useful, and **how** can they help estimate roots? **How** do trigonometric relationships help us model, interpret and solve problems, and **why** are identities and graphs important? **What** is differentiation, **why** does it describe rate of change, and **how** can it be developed from first principles?	movement, and solve geometric problems? **What** does differentiation reveal about a function, **why** is change important, and **how** can derivatives model and optimise situations? **What** does integration measure, **why** is area a powerful interpretation, and **how** can integrals be used to analyse functions? **What** is the relationship between differentiation and integration and **how** can we use this to analyse functions? **What** makes exponential and logarithmic functions unique and **how** can they be used to solve problems?	they be used to analyse motion and forces? **What** do vectors, graphs and acceleration reveal about motion, **why** are these representations important, and **how** can they be applied to solve problems? **What** do statistical measures and graphical representations tell us about data, **why** is this information valuable, and **how** can it be used to compare distributions? **What** determines the probability of an event, **why** do relationships between events matter, and **how** can probability models be used to make predictions?	together and **how** can we use this to solve problems **Why** is calculus essential for understanding motion, and **how** can calculus be used to solve problems? **What** is a probability distribution, **why** and **how** does it help us model uncertainty? **How** can hypothesis testing help us make decisions from data, **why** are critical values important, and **what** do they tell us about evidence and conclusions?	fractions make complex mathematics more manageable? **What** is a function, **why** do domain and range matter, and **how** can functions be combined, transformed and reversed? **How** do arithmetic and geometric sequences model patterns, **why** are series important, and **how** can they represent long-term behaviour?
Assessment (specific assessed piece(s); milestone(s))	L Review Units 1&2 L Review Units 5&6	L Review Units 3&4 L Review Units 7&8 L Review Units 9 December exams	L Review Unit 10 L Review Unit 11 L Review Unit 12	L Review Unit 13 L Review Unit 14 L Review M9 L Review S1&2 L Review S3&4	L Review M10 L Review M11 L Review S5 L Review S6&7	Summer exams L Review P1 L Review P4 L Review P2 L Review P3