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Curriculum Summary Document

Year 9 – Maths

Module/Unit of Learning	Taught During	What will students learn?	How does this prepare students for transition into Key Stage 4?	Links to other Subjects
Analysing Data 2	**Autumn Term 1**	In this module, students will consolidate and extend their statistical skills, starting with stem-and-leaf diagrams to calculate averages and ranges. They will find measures of central tendency from frequency tables and grouped data, tackle reverse mean problems, and explore measures of variance such as quartiles and interquartile range. Students will draw and interpret box plots from complete or partially provided data, and compare data sets to draw meaningful conclusions, using both stem- and-leaf diagrams and box plots as evidence.	Mastery of statistical representation and analysis enables students to interpret and compare data accurately, a skill vital in mathematics, science, and real-world decision-making. Understanding averages, spread, and data visualisation builds the foundation for higher-level statistics, probability, and analytical problem-solving, while encouraging clear communication of findings.	
Expanding & Factorising Expressions 4	**Autumn Term 1**	In this module, students will consolidate their understanding of key algebraic vocabulary and practise forming simple expressions. They will revisit negative number skills before progressing to expanding single and quadratic brackets, and will explore special cases such as perfect squares and the difference of two squares. The module concludes with expanding and simplifying cubic expressions, developing fluency in algebraic manipulation.	Fluency in expanding and simplifying expressions underpins success in algebra, enabling students to work confidently with equations, factorising, and polynomial manipulation. These skills are essential for higher-level topics such as solving quadratics, algebraic fractions, and proof, and support logical reasoning across the mathematics curriculum.	
Percentages 2		In this module, students will consolidate their understanding of percentages through calculating percentage amounts, increases, and decreases. They will work with reverse percentages, percentage change, and apply these skills to profit and loss contexts. The topic will extend to simple and	Percentage skills are vital for real-world financial literacy and problem-solving across mathematics. Mastery of both straightforward and complex applications, such as compound	

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	Autumn Term 1 & 2	compound interest, as well as growth and decay, with reverse calculations for challenge. Students will also tackle repeated and iterative percentage change, building on their familiarity with iterative processes from algebra, and practise all skills in mixed problem sets.	interest and iterative change, ensures students can approach GCSE- level percentage problems with confidence, while also strengthening their proportional reasoning for use in algebra, ratio, and data analysis.	
Expanding & Factorising Expressions 5	**Autumn Term 2**	In this module, students will begin by factorising single brackets, identifying the highest common factor and dividing through, building towards algebraic fractions. They will progress to factorising quadratics where a>1 using the splitting method, and where a=1 using both the split and a shortcut approach. Special cases such as the difference of two squares and completing the square will also be explored, including for a>1. The topic extends to an introduction to iteration through rearranging equations and solving problems, and concludes with mixed factorising practice covering all types.	Mastery of factorising techniques is critical for solving equations, simplifying expressions, and manipulating algebra at a higher level. Understanding quadratic structures and special cases equips students for advanced topics such as algebraic fractions, functions, and proof, while iteration skills strengthen their problem-solving toolkit for both mathematical and real-world applications.	
Enlargement and Reflections	**Autumn Term 2**	In this module, students will explore enlargements on a coordinate grid using integer, fractional, and negative scale factors, and learn how to accurately describe these transformations. They will revisit and combine prior transformation skills, bringing in translations and rotations for retrieval practice and challenge. The topic will also cover line and rotational symmetry, recap key points from linear graphs, and develop skills in reflecting shapes on a coordinate grid, including describing reflections. The module concludes with performing multiple transformations in sequence.	Mastery of transformations strengthens spatial reasoning and precision, enabling students to visualise and manipulate shapes with accuracy. By combining enlargements, reflections, rotations, and translations, students deepen their understanding of geometric relationships and symmetry, while also reinforcing coordinate geometry skills that are essential for higher-level mathematics and real-world applications such as design, engineering, and computer graphics.	

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Algebraic Graphs	**Autumn Term 2 and Spring Term 1**	In this module, students will learn to draw quadratic graphs, beginning without a calculator and then progressing to using the calculator's table function for efficiency. They will interpret key features of quadratic graphs, including roots and turning points, and make links to factorising quadratics. The topic will also introduce the recognition of cubic, exponential, and reciprocal graphs, with asymptotes included for challenge. The module concludes with mixed practice, applying all graphing skills in a variety of contexts.	Understanding how to draw and interpret a range of graphs equips students with essential skills for connecting algebra and geometry. These abilities are crucial for solving equations, modelling real-life situations, and preparing for higher-level topics such as calculus, transformations of functions, and advanced problem-solving in mathematics and science.	
Representing Data 2	**Spring Term 1**	In this module, students will explore why additional graph types are needed for data analysis, beginning with time series graphs to identify trends. They will construct cumulative frequency graphs from frequency tables and use them to determine quartiles and the interquartile range. Building on earlier work, students will draw box plots from cumulative frequency graphs and interpret data from these graphs to answer contextual questions, including percentages and fractions. The module concludes with mixed practice on grouped frequency tables, combining techniques such as estimating the mean, using midpoints, and working with frequency polygons.	Developing skills with cumulative frequency graphs and related data representations enhances students' ability to analyse, interpret, and compare data sets effectively. This knowledge supports advanced statistical work, improves problem-solving in real-life contexts, and reinforces the connections between different statistical methods, preparing students for higher-level data handling and critical analysis.	
Polygons	**Spring Term 1**	In this module, students will explore the properties and vocabulary of polygons, including opportunities to use etymology to support retrieval. They will solve angle problems involving triangles, quadrilaterals, and particularly parallelograms, before deriving the sum of interior angles using triangles. Students will also work with exterior angles and combine these rules to find unknown angles in a variety of polygons. The topic concludes with combining	A thorough understanding of polygons and their angle properties equips students with essential geometric reasoning skills. These concepts are fundamental for tackling more advanced geometry topics such as tessellations, circle theorems, and proofs, while also strengthening	

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		shapes to find missing angles and mixed practice using angle chase problems to challenge reasoning skills.	problem- solving abilities and logical thinking in both pure mathematics and applied contexts.	
Factors & Indices	**Spring Term 1 and 2**	In this module, students will consolidate their understanding of indices by revisiting prior knowledge and extending it to include the rules for non-unit fractions and combinations of index laws. They will also be introduced to standard form, learning what it is, how to convert numbers in and out of this form, and how it is used in context. The module will then focus on performing calculations in standard form, including addition, subtraction, multiplication, and division.	Mastering index laws and standard form equips students with the skills to work confidently with very large and very small numbers, an essential skill in both mathematics and science. These topics strengthen algebraic fluency, enhance problem-solving efficiency, and prepare students for higher-level work in topics such as exponential growth, scientific notation, and complex calculations in physics and engineering.	Science
Number Properties and Indices	**Spring Term 2**			
Probability 2	**Spring Term 2**	In this module, students will list all possible outcomes in a sample space and use this information to calculate and estimate probabilities theoretically. They will compare theoretical probability with experimental probability, introducing the concept of relative frequency, and use it to make informed predictions based on collected data.	Understanding probability through both theoretical and experimental approaches helps students to interpret data, assess risk, and make reasoned predictions. These skills underpin more advanced topics such as conditional probability and probability distributions, while also developing analytical thinking applicable in everyday decision-making and scientific investigations.	

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Multiples, Factors and Roots	**Spring Term 2**	In this module, students will consolidate their understanding of prime factor decomposition, including the use of the calculator FACT function, and practise finding the LCM and HCF of numbers to avoid common errors. They will apply prime factors to calculate large number roots before progressing to work with surds, starting with simplification and moving on to addition, subtraction, multiplication, and expansion using brackets. Students will tackle problem-solving tasks involving surds, and learn to rationalise denominators for both single surds and expressions involving surds and constants. The module concludes with mixed practice that brings all these skills together.	Mastering prime factors, roots, and surds equips students with the algebraic precision and problem-solving skills needed for higher-level mathematics. These concepts underpin advanced topics such as trigonometry, coordinate geometry, and algebraic proof, while also strengthening logical reasoning and the ability to work with exact forms in problem contexts where accuracy is essential.	
Numerical and Algebraic Fractions and Equations	**Summer Term 1**	In this module, students will begin by revisiting numerical operations and simplification before applying these skills to algebraic fractions. They will practise addition, subtraction, multiplication, and division of algebraic fractions where variables appear in the numerator, denominator, or both. Students will also simplify algebraic fractions through linear and quadratic factorisation, and progress to solving linear equations as well as equations involving algebraic fractions. Throughout the unit, learning will be interleaved with prior knowledge to strengthen understanding and fluency.	Confidence with algebraic fractions is essential for tackling complex algebra problems at higher levels. This topic develops accuracy, logical reasoning, and the ability to manipulate expressions and equations efficiently. It also underpins further study in functions, calculus, and proof, while reinforcing connections between algebraic manipulation and problem- solving in a variety of mathematical contexts.	
		In this module, students will calculate the volume of prisms before exploring surface area and understanding how it differs from volume. They will find the surface area of cubes, cuboids, and other prisms, using the perimeter method to support	A solid grasp of volume and surface area builds essential spatial reasoning skills and prepares students for more complex 3D geometry.	

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Surface Area	**Summer Term 2**	the transition to cylinders. The topic will extend to calculating the surface area of cylinders, including semi- circular extensions, with a focus on understanding circumference. Students will apply these skills to problem- solving tasks, such as determining volume from given surface area and vice versa.	These skills are critical for real-world applications in design, engineering, and construction, and they lay the groundwork for advanced problem-solving involving compound shapes, optimisation, and practical measurement contexts.	
Proportion	**Summer Term 2**	In this module, students will apply their understanding of direct proportion to solve real- world context problems before moving on to inverse proportion, where they will identify and address common misconceptions. They will then complete mixed practice tasks that require them to distinguish between direct and inverse proportion, selecting and applying the correct method for each scenario.	Developing fluency with direct and inverse proportion strengthens students' proportional reasoning and problem-solving skills, which are essential for higher-level mathematics. These concepts are widely applicable in topics such as speed, density, pressure, and scaling, as well as in science, economics, and engineering contexts where interpreting and modelling relationships is key.	