Curriculum Overview

Curriculum Area: Mathematics Year: 9

Autumn 1: Number, Algebra and Measure

Pupils begin Year 9 by consolidating and extending their understanding of number structure and properties. They explore factors, multiples, primes, powers and roots, applying these to problems involving percentages, including percentage change and reverse percentage calculations.

Work on area and volume revisits and extends earlier work to include compound shapes and surface area, as well as the relationships between units of measure. Pupils then strengthen their algebraic fluency by forming and manipulating equations, inequalities and formulae, applying these to geometric and real-life contexts. This term builds firm foundations for higher-level algebraic reasoning and proportional problem-solving.

Autumn 2: Fractions, Rates and Standard Form

Pupils refine their fluency with operations involving fractions, including complex calculations across mixed and improper forms. They apply their knowledge of fractions and decimals to problems involving rates and proportional change, such as speed, density and pressure.

Pupils also work with numbers in standard form, interpreting and performing calculations with very large and very small values. This unit strengthens their ability to reason with scale and representation, building links between number, measure and algebra.

Spring 1: Algebra, Ratio and Geometry

Pupils develop their use of algebra to represent linear relationships, constructing and interpreting straight line graphs. They solve problems involving gradient, intercept and the equation of a line, and apply these ideas to proportional and geometric contexts.

Work on ratio and proportion is extended to include compound and multi-step problems, scaling and inverse relationships. Pupils also explore constructions and congruence, using accurate drawing techniques and reasoning to justify results. They extend these concepts to similarity and begin to generalise geometric relationships through algebraic reasoning.

Spring 2: Real-life Mathematics and Algebraic Thinking

Pupils apply mathematics to financial contexts, including budgeting, interest, and best-buy problems, linking percentage change to proportional reasoning. They refine their algebraic manipulation, working with expanding and factorising expressions, and rearranging formulae involving powers and roots. This term develops their mathematical resilience and ability to apply abstract knowledge to practical, everyday problems.

Summer 1: Geometry, Probability and Graphs

Pupils study Pythagoras' theorem, understanding and applying the relationship between the sides of a right-angled triangle in both 2D and 3D problems. They then explore non-linear graphs, including quadratic and reciprocal forms, interpreting intersections and real-life contexts.

Probability is introduced through set notation, Venn diagrams and experimental versus theoretical probability. Pupils calculate probabilities from two-way tables and frequency

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trees, interpreting results and linking back to national and factual knowledge.

Summer 2: Transformations, Simultaneous Equations and Trigonometry

In the final term, pupils consolidate their understanding of transformations — translation, rotation, reflection and enlargement — and apply these to coordinate geometry and similarity problems. They then solve simultaneous equations algebraically and graphically, applying results to linear models and problem-solving tasks.

Finally, pupils are introduced to trigonometry, learning the sine, cosine and tangent ratios and using them to find missing sides and angles in right-angled triangles. By the end of Year 9, pupils confidently apply algebra, geometry and number reasoning to complex, multi-step problems, preparing them for GCSE mathematics.

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Links to National Curriculum

Our curriculum for Year 9 is based on White Rose Maths Curriculum and has been adapted to meet the needs of our pupils. It aligns with the KS3 National Curriculum. Pupils demonstrate their understanding and progressively build core knowledge and skills across strands: Number, Algebra, Ratio, Proportion and Rates of Change, and Geometry and Measures. Each unit integrates the key aims of developing fluency, reasoning mathematically, and problem-solving. This comprehensive approach ensures that pupils meet national standards and are equipped with a deep understanding and the ability to apply mathematical concepts confidently in various contexts, preparing them for advanced mathematical learning and real-world applications. The curriculum enhances pupils' understanding of ratios, scales, and multiplicative relationships. Allows pupils to delve deeper into algebraic techniques, building on their previous knowledge. They learn to solve equations and inequalities, work with quadratic functions, and understand sequences. The curriculum emphasises geometric reasoning, including the properties and relationships of shapes, angles, and transformations. Pupils explore the Cartesian plane, construct and interpret geometrical figures, and apply theorems.: Pupils are taught to collect, represent, and interpret data, fostering statistical literacy. They learn to use charts, graphs, and measures of central tendency, which are important for making informed decisions based on data in everyday life and in professional contexts. Throughout the curriculum, pupils develop reasoning and problem-solving skills. Pupils are encouraged to apply mathematical concepts to solve complex problems, think critically, and make connections between different areas of mathematics. By aligning with the National Curriculum, this ensures that pupils acquire the necessary skills and knowledge to succeed in further education and in their everyday lives, fulfilling the educational standards and goals set at the national level.

Knowledge and understanding of this curriculum will be assessed by:

Knowledge will be assessed using prior knowledge starters, allowing teachers to build on pupils' existing knowledge and address any gaps. Teachers will layer new knowledge on this foundation. During lessons, pupils' understanding will be assessed through whiteboard activities and questioning. Verbal feedback will be provided, and questions and modelling will be adapted to ensure comprehension.

At the end of each unit, pupils will take an assessment, which will be marked and reviewed to address any misconceptions before progressing. This ensures a solid understanding and readiness for subsequent learning topics.

Powerful Knowledge/Cultural Capital Opportunities

Mathematics is a creative and highly inter-connected discipline. Throughout Year 9 all pupils will continue to develop problem solving skills that can be transferred to other areas of the school curriculum and life outside of school. All pupils will use subject specific language and terminology as standard – they will learn to think and speak like mathematician.

Proportional reasoning: This knowledge is fundamental as it is widely applicable in subjects like science and geography, and in everyday contexts such as cooking and financial calculations.

Algebra: This progression is essential as algebra forms the basis for advanced mathematical concepts and is critical in various scientific and engineering fields.

Geometry: These skills are crucial for spatial awareness and are applicable in fields like architecture, engineering, and art.

Data handling: Pupils are taught to collect, represent, and interpret data, fostering statistical literacy. They learn to use charts, graphs, and measures of central tendency, which are important for making informed decisions based on data in everyday life and in professional contexts.