MATHEMATICS

YEAR 9

Mathematical Modelling and Probability

In this engaging unit, students dive into the practical world of mathematical modelling and probability. They'll tackle real-world problems involving ratios, similarity, and scale in two-dimensional contexts. Through hands-on activities, learners will develop critical evaluation skills as they create and assess mathematical models addressing issues of direct proportion, ratio, and scale. The unit also explores enlargement transformations, challenging students to interpret the outcomes when shapes and objects are scaled. Probability concepts round out the curriculum, with students determining outcome sets for compound events and assigning probabilities. Digital tools will be employed to design and conduct experiments for combined events, bringing probability to life through practical applications.

Advanced Algebra and Trigonometry

Venturing into advanced mathematical territory, this unit equips students with powerful tools for solving complex problems. Rational and irrational numbers take center stage as students explore their properties and applications. Exponent laws are extended, while techniques for expanding binomial products and factorising monic quadratic expressions are mastered. The curriculum delves into practical applications, covering percentage errors in measurements and the use of Pythagoras' theorem. Right-angled triangles become a playground for applying trigonometric ratios. To cap it off, students learn to express extreme numbers using scientific notation, a crucial skill for handling real-world data.

Cartesian Geometry and Mathematical Modelling

Cartesian geometry and mathematical modelling form the core of this comprehensive unit. Students will navigate the Cartesian plane, solving problems involving distances, gradients, and midpoints. Financial and applied contexts become fertile ground for mathematical modelling, with a focus on linear and quadratic functions. Graphing quadratic functions and solving monic quadratic equations with integer roots algebraically add depth to the learning experience. Throughout the unit, digital tools enhance understanding by providing visual connections between graphical and algebraic representations.

Geometry and Data Analysis

Practical problem-solving takes centre stage in this unit, combining geometric principles with data analysis techniques. Students will apply formulas to determine surface area and volume of right prisms and cylinders, while also designing and testing algorithms based on geometric constructions or theorems. Data analysis skills are honed as learners compare and analyse multiple numerical data sets, employing appropriate representations and summary statistics. The unit culminates in a critical examination of how outliers, sampling techniques, and data representation can influence conclusions and promote viewpoints, fostering informed decision-making skills.