Curriculum Plan Mathematics

Year 12 A level	Knowledge *(Topics covered, NC links)*	Subject Skills	Literacy and Numeracy	School values *(Attitude / Achievement / Community / Endeavour)*	Extra curricular opportunities	Personal development *(Character, SMSC, Fundamental British values, Careers guidance, healthy living, Citizenship, equality and diversity, financial capability, preparation for next stage)*
Cycle 1	Quadratic Equations	Algebraic and geometrical	Mathematical calculations and operations. Relating numbers, algebra and geometry.	Challenging concepts requiring endeavour in solving problems.	Senior Maths Challenge	Common applications of Quadratic equations to mechanics based careers.
	Surds	Simplifying and applying mathematical operations to surds		Collaborative working to support each others' understanding		Scientific applications.
	Coordinate Geometry	Equations of lines and circles. Calculating geometrical properties from equations and coordinate geometry	Geometrical definitions			
	Discrete Distributions	Using Probability	Interpreting scenarios including real world context			Interpreting and dealing with uncertainty. Applications such as risk analysis and medicine
	Binomial Distributions		Interpreting scenarios			Using distributions for real world applications used in society and news.

Curriculum Plan Mathematics

			including real world context			
	Differentiation	Algebraic differentiation. Applications related to rate of change and optimisation.				Scientific careers using study of change. Use of optimisation in real world applications.
	Inequalities	Solving using inequalities. Creating and interpreting graphs.				
	Kinematics	Displacement/velocity time graphs and calculations. Equations of motion.	Interpreting distance and time including graphs.			Careers involving mechanics and motion. Appreciation of day to day scenarios involving speed.
	Logs and Exponentials	Use the laws of logarithms. Use logarithms to find exact solutions of some exponential equations. Recognise and use graphs. Use modelling.	Growth and decay. Modelling mathematically			Applications in finance, physics, chemistry, biology and epidemiology.
	Trigonometry	Use the definitions of the sine, cosine and tangent functions, their basic properties and their graphs. Solve equations. Use identities. Use Sine and Cosine rules.	Relationship between equations and geometry			Modelling and understanding real life situations which involve repetition at regular intervals.

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Cycle 2	Vectors	Represent two-dimensional vectors. including magnitude and direction of a vector. Calculate using vectors. Apply principles of parallels. Work with points in the plane. Solve problems about geometrical figures.	Magnitude, displacement, parallel		Senior Team Maths Challenge	Careers including engineering and computer science.
	Forces	Use of Forces. Newton's laws.	Physical interpretation of mathematical concepts			Engineering and physics careers
	Integration	Algebraic manipulation including fractions. Powers and indices.	Powers and roots			Scientific careers
	Hypothesis Testing	Use of distributions and probability.	Basics of the scientific method			Understanding real world cultural issues

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Cycle 3	Polynomials	Algebraic manipulation Solving equations				
	Proof	Algebraic manipulation				Appreciation of necessary conclusive evidence
	Graphs	Plotting, sketching graphs. Use of intercepts and graphical properties of equations. Solving equations. Use the discriminant. Use of proportion.	Relating geometry with algebra and number. Proportionality			Graphs used in scientific study and careers. Interpreting graphs for real world issues such as finance.
	Circles	Algebraic manipulation. Graph transformations. Solving equations.	Use of distance and geometry			Careers involving use of shape e.g. design, architecture, engineering, computer science
	Transformations	Algebraic manipulation. Geometrical interpretation	Describing transformations			As above

Curriculum Plan Mathematics

	Calculus and Kinematics	Equations of motion. Differentiation and Integration.	Interpreting distance and time.			Careers involving mechanics and motion. Appreciation of day to day scenarios involving speed.
	Summary Statistics	Calculations and applications of averages and measures of spread. Use of tables, charts and graphs	Charts. Concept of average.			Common use of statistics in real world scenarios important for understanding of economic, political and societal issues.
	Probability	Using fractions, decimals, percentage.	Interpreting scenarios including real world context			Interpreting and dealing with uncertainty. Applications such as risk analysis and medicine