Maths Curriculum Overview - Year 13

	Unit	Details
Autumn One	**Pure:** Proof, Algebraic fractions and partial fractions, Functions and modelling, Transformation of graphs **Statistics:** Probability, Normal Distribution, Normal approximation	Year 13 starts by revisiting a theme from Year 12, with pupils learning the formal method of proof by contradiction. They then cover partial fractions, if not studied in Year 12, functions including inverse and the modulus function and transformations of graphs. In statistics concepts encountered in Year 12 are developed by looking at conditional probability and modelling. These ideas are developed further by learning the properties on the normal distribution, and using the normal approximation to the binomial distribution.
Autumn Two	**Pure:** Arithmetic series, Geometric series & recurrence relationships, Binomial Expansion, Trigonometry: radians and approximations **Statistics:** Regression, Hypothesis Testing	In Pure maths we will learn how to find the sum of both arithmetic and geometric series, and look at recurrence relationships. Pupils will then extend their understanding of the binomial expansion from Year 12 to include fractional and negative powers, and develop prior learning of trigonometry to work in radians and find arc lengths, sector areas and small angle approximations. In statistics they will calculate regression lines and conduct hypothesis tests involving correlation.
Spring One	**Pure:** Trigonometry: proving and solving, Trigonometry in context, Parametric Equations, Differentiation: product, quotient and chain rule **Mechanics:** Vectors in constant and non-constant acceleration, Projectile motion	In the final unit on trigonometry pupils will learn identities for double and compound angles and use them to solve equations and prove identities. They will then convert between Cartesian and parametric equations and learn to sketch graphs from parametric functions. Calculus is then developed further by differentiating using chain, product and quotient rules. In mechanics, pupils will use SUVAT in vector equations and calculus for non-constant acceleration equations of motion. They will extend their projectiles work into two dimensions.
Spring Two	**Pure:** Implicit and parametric differentiation, Numerical Methods, Integration **Mechanics:** Forces, Connected particles	The previous topic is then extended by applying differentiation to parametric and implicit functions before locating roots by considering change of sign, using iteration to find roots and applying the Newton- Raphson method and trapezium rule. We conclude with integration, covering standard Integrals, integration by substitution, integration by parts, integrating using partial fractions and parametric integration. In mechanics, pupils will solve problems in statics and dynamics involving equilibrium, friction, inclined planes and connected particles.
Summer One	**Pure:** Differential Equations, Vectors **Mechanics:** Perpendicular Moments, Non-perpendicular Moments	In this final term pupils will learn to solve differential equations with variables separable, applying this to problems in context. They will then finish by studying vectors in three dimensions and modelling and solving geometric problems. In mechanics they will tackle moments, solving problems where the system is on the point of moving and modelling situations where the forces are not parallel or perpendicular.