

## Maths Year 12 – Curriculum Overview

**Intent:** This course will enable pupils to understand mathematics and mathematical processes in a way that promotes confidence, fosters enjoyment, and provides a strong foundation for progress to further study. It extends their range of mathematical skills and techniques. With the application of mathematics in other fields of study and be aware of the relevance of mathematics to the world of work and to situations in society in general. They will use their mathematical knowledge to make logical and reasoned decisions in solving problems both within pure mathematics and in a variety of contexts and communicate the mathematical rationale for these decisions clearly.

	AUTUMN 1	AUTUMN 2	SPRING 1	SPRING 2	SUMMER 1	SUMMER 2
<b>Core Course Topic:</b> These topics are taught through the identified terms. They are taught in small bitesize chunks and revisited regularly.	<u>Pure</u> - Algebra and functions - Coordinate Geometry  <u>Applied</u> - Statistical Sampling - Data representation	<u>Pure</u> - Coordinate Geometry - Further Algebra  <u>Applied</u> - Probability - Statistical Distribution	<u>Pure</u> - Trigonometry - Vectors  <u>Applied</u> - Hypothesis Testing - Quantities and Units	<u>Pure</u> - Differentiation - Integration  <u>Applied</u> - Constant Acceleration - Forces and Newton's Law	<u>Pure</u> - Exponentials and Logarithms - Revision  <u>Applied</u> - Variable Acceleration - Kinematics - Revision	<u>Pure</u> - Algebraic Methods - Functions and Graphs - Series and Sequences - Binomial Theorem  <u>Applied</u> - Regression and Correlation - Probability
<b>Additional support links:</b> Here are links to additional resources which will help your child	<a href="#">Edexcel A-level Maths Revision - PMT</a> <a href="#">Your Complete Guide to Bicen Maths and Acing your A-Levels</a> 📖 🌐 <a href="#">Maths Genie • Learn A Level Maths for Free</a> <a href="#">Jethwa Maths - Jethwa Maths</a> <a href="#">A-LEVEL   Dr Austin Maths</a>					
<b>Knowledge:</b> Included here is the specific knowledge your child will learn in detail	<ul style="list-style-type: none"> <li>Application of algebraic manipulation and index laws</li> <li>Use the rules of surds and rationalise denominators</li> <li>Solve quadratic equations</li> <li>Solve simultaneous equation using elimination, substitution and graphically</li> <li>Solve linear and quadratic inequalities</li> <li>Sketching cubic, quartic and reciprocal graphs</li> <li>Apply transformations and sketch the resultant graph</li> </ul>	<ul style="list-style-type: none"> <li>Find the equation of a line including parallel and perpendicular</li> <li>Find lengths and areas given the equation of straight line</li> <li>Find the equation of a circle</li> <li>Find points of intersection between a circle and a line</li> <li>Apply methods of proof</li> <li>Use factor Theorem and perform algebraic division</li> <li>Use binomial expansion to expand brackets</li> <li>Find unknown coefficients and make approximations using binomial expansion</li> </ul>	<ul style="list-style-type: none"> <li>Use sine, cosine and area (sine) rule</li> <li>Solve trigonometric equations within a given interval</li> <li>Solve complicated trigonometric equations</li> <li>Solve trigonometric equations with produces quadratics</li> <li>Understand and transform trigonometric graphs</li> <li>Carry out arithmetic operators on vectors and magnitude and direction</li> <li>Use vectors to solve geometric problems</li> </ul>	<ul style="list-style-type: none"> <li>Perform basic differentiation</li> <li>Find second derivatives</li> <li>Differentiate to find gradients, tangents and normal</li> <li>Using second derivative to determine maxima and minima</li> <li>Integrate simple polynomials</li> <li>Evaluate definite integral and find area below a curve</li> </ul>	<ul style="list-style-type: none"> <li>Introduction to exponential and exponential modelling</li> <li>Exponential modelling</li> <li>Understand laws of logarithm and use to solve equations</li> </ul>	<ul style="list-style-type: none"> <li>Use proof by contradiction</li> <li>Convert an expression into partial fractions</li> <li>Using Partial fractions to expand binomial expressions</li> <li>Expand <math>(a+bx)^n</math> for any rational constant <math>n</math></li> <li>Sketch and transform a modulus graph</li> <li>Understand and use arithmetic and geometric sequences</li> </ul>
	<ul style="list-style-type: none"> <li>Understanding sampling techniques</li> <li>Understanding mathematical models</li> <li>Calculate measures of location and variation</li> <li>Draw and interpret boxplots and cumulative frequency graphs</li> <li>Draw and interpret histograms</li> </ul>	<ul style="list-style-type: none"> <li>Investigate correlation and use regression lines</li> <li>Calculate probabilities from Venn and tree diagrams</li> <li>Calculate probabilities using binomial distribution</li> </ul>	<ul style="list-style-type: none"> <li>Perform a hypothesis test for a binomial model</li> <li>Use derived quantities and units</li> <li>Apply constant acceleration formulae to solve problems</li> </ul>	<ul style="list-style-type: none"> <li>Use Newton's law</li> <li>Interpret displacement and velocity time graphs</li> </ul>	<ul style="list-style-type: none"> <li>Use calculus to model motion of a particle</li> </ul>	<ul style="list-style-type: none"> <li>Understand linear and exponential regression models</li> <li>Finding probabilities, mean, standard deviation and hypothesis testing data with normal distribution</li> <li>Understand and use conditional probability</li> </ul>
<b>Common Lexicon:</b> These are the key words and terms learnt. These can be found on knowledge organisers.	Integer, Product, Surd, Irrational, Rational, Base, Quadratic, Function, Discriminant, Gradient, Parallel, Perpendicular, Linear, Magnitude, Population, Census, Sampling unit, Sampling frame, Strata	Equation, Inequalities, Periodic, Derivative, Intersection, Complement, Mutually exclusive, Union, Sample space, Displacement, Velocity, Acceleration, Boxplot, Cumulative, Outliers	Cubic function, Quartic function, Reciprocal, asymptote, Polynomial, Integral, Integrand, Correlation, Regression, Bivariate, Dependent, Independent, Interpolation, Extrapolation	Proof, Axioms, Theorems, Binomial expansion, Factorial, Coefficients, Approximation, Combinations, Identities, Resultant, Scalar, Equilibrium, Stationary, Resultant, Weight, Reaction, Connected particles, Distribution, Cumulative probability	Gradient, Tangent, Normal, Stationary points, Function, Maxima, Minima, Limits, Null hypothesis, Alternate hypothesis, Binomial model, Identities, Differentiation, Integration, Vectors, Test Statistic, Critical Value, Critical Region, Significance level	Definite Integral, Intersection, Parameters Natural Logarithm, Base, Constraints