Mathematics Year 13 Curriculum Overview

What is the Year 13 Mathematics curriculum aiming to achieve?

What do we want our Year 13 Mathematicians to be like?	How are we building on prior learning?	How can parents/carers support their child's learning?
• Able to analyse a problem and identify the appropriate techniques needed to solve it • Able to manipulate algebra accurately and efficiently, and write structured methods • Confident in using advanced calculus and trigonometry when solving problems • Able to apply mathematical concepts in Statistics and Mechanics problems	• Checking retention using starters, twice weekly homework tasks and fortnightly assessment tasks • Planning sequences of lessons • Reviewing techniques that form the foundation for new skills and concepts • Building on prior learning by linking it to new skills and concepts	• Ensure students are properly equipped with the correct textbook and calculator • Encourage students to complete homework to the best of their ability • Give support in organising their notes • Help students review and reflect on assessments and homework to identify areas for improvement

How are we organising the Year 13 Mathematics curriculum?

	Autumn Units	Spring Units	Summer
Threshold Concepts & Skills	Teacher 1 **Further Algebra**: general Binomial expansion; algebraic fractions; partial fractions **Further Differentiation**: logs, exponentials & trig functions; implicit differentiation **Integration**: area between curves; substitution; parts **Parametric Equations**: graphs; converting; differentiating Teacher 2 **Sequences:** series; arithmetic sequences & series; geometric sequences & series **Functions**: functions; domain & range; composite; inverse; modulus **Trig Functions**: Reciprocal trig functions and identities **Trig Identities**: Compound & double angle formulae; alternative forms **Numerical Methods**: change of sign; fixed point iteration; Newton Raphson; trapezium rule **Vectors**: problem solving	Teacher 1 **Differential Equations**: separating variables **Probability**: probability terms; combined events; conditional probability **Statistical Distributions:** Binomial distribution; Normal distribution **Hypothesis Testing:** using binomial or Normal distribution; correlation coefficients Teacher 2 **Kinematics**: use vectors in kinematics **Forces**: resolve forces into components; equilibrium; equation of motion **Moments**: moments of forces **Projectiles**: projectile motion; equation of trajectory **Friction**: model friction force F = μR; use Newton's Laws in friction problems	Exam preparation & external examinations
Enrichment within the curriculum	Students continually have opportunities to develop and practise problem-solving skills in advanced contexts, including more challenging extension questions. Concepts and skills will link to real-world applications wherever possible. Students also study, discuss and analyse a large data set, which uses real-life data. Full access to the Integral Maths website allows students to engage with a wide variety of support and enrichment resources, including extension work.		
Cross curricular links	• The content learned will support all the mathematical skills needed for Biology, Chemistry and Physics • Statistical skills will also be useful in Psychology, Economics, Business Studies and Geography • Algebra skills will be useful in Computing, and the Sciences • Most of the work on Mechanics overlaps with the A Level Physics course		
Extra-curricular opportunities	Students have the opportunity to enrol in enrichment courses run by the Advanced Mathematics Support Programme, including regular problem-solving sessions and courses aimed at preparing students for university entrance examinations such as STEP, MAT and TMUA. Students are able to seek help from their teachers outside lessons at any time, and homework support is always available.		

What are the intended outcomes of the Year 13 Mathematics curriculum?

	Autumn	Spring	Summer
Opportunities to show progress (Assessments)	Two homework assignments per week One P10 assessment per fortnight Autumn 1 test – 1 hour (in class test) Autumn 2 Pure mock – 2 hours (formal)	Two homework assignments per week One P10 assessment per fortnight Spring Pure Mock – 2 hours (formal)	Two homework assignments per week One P10 assessment per fortnight Summer 1 tests – 2 x 45 minutes (in class on Mechanics and Statistics)
Impact on personal development (SMSC)	Studying Mathematics helps students develop the skills of thinking logically, analytically, strategically and independently. Students are also able to communicate in a clear, precise way, and explain their reasoning for decisions. Mathematics students have excellent numeracy skills and can process and interpret information in a variety of formats. These will prove to be invaluable skills, both during education and in employment.		
Preparation for the next stage of education	Studying Mathematics at A Level will ensure that students are better prepared to make the transition to higher education. A Level Mathematics is a subject requirement for many university courses, which can involve mathematical skills and content far beyond GCSE. Students also gain valuable confidence in being able to approach difficult problems independently, which will help them succeed in a broad range of subjects.		