

Mathematics KS5 Curriculum Overview

Links to KS4		There are many topics which are covered at both GCSE Maths and A level - e.g. functions, quadratics, transformations of graphs. To support transition to A level Maths, it is important that students understand how these topics can be built upon.					
Intent	Statement of Intent	Students will have the opportunity to: - Reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language. - Solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and preserving in seeking solutions. - Communicate, justify, argue and prove using mathematical vocabulary.					
	Timeline	Term 1 - 7 Weeks	Term 2 - 7 Weeks	Term 3 - 6 Weeks	Term 4 - 6 Weeks	Term 5 - 6 Weeks	Term 6 - 7 Weeks
Implementation (Year 12)	Year 12 Overview	On one hand A level Mathematics deals with highly abstract topics which require considerable imagination combined with the discipline of 'proof'. On the other hand mathematics underpins virtually all the practical developments in science, IT and economics which have formed our modern world. A level Mathematics gives the opportunity to study topics such as geometry, calculus and trigonometry (pure mathematics) and to use these ideas within the 'applied' topics such as mechanics and statistics. Mechanics is strongly linked to physics and builds on ideas of motion and forces to work out how and why objects move. Statistics allows us to make sense of the complex and variable world around us via analytical methods in order to draw reliable conclusions from 'sets' of information.					
	SOW	Pure Maths - Algebraic Expressions - Quadratics - Algebraic Methods - Binomial Expansion 1 - Differentiation (Part 1) Applied (Mechanics) - Modelling in mechanics - Constant acceleration Applied (Statistics) - Measure of location & spread - Statistical distribution	Pure Maths - Differentiation (Part 2) - Integration Applied (Mechanics) - Constant acceleration Applied (Statistics) - Probability - Data collection	Pure Maths - Vectors 2D - Straight line graphs - Circles Applied (Mechanics) - Force and motion Applied (Statistics) - Hypothesis Testing	Pure Maths - Trigonometric ratios - Trigonometric identities and equations - Equations and inequalities - Graphs and transformations Applied (Mechanics) - Force and motion	Pure Maths - Exponentials and Logs Applied (Mechanics) - Variable acceleration Applied (Statistics) - Representation of data	Pure Maths - Proof - Algebraic Methods - Radians (Part 1)
	Assessment Type & Unit Focus	RP1 - Terminology / initial content. (Sept/Oct) Each topic has a 'Topic Assessment'. These consist of questions which test an entire topic (e.g. Differentiation), and usually include exam-style questions. These topic assessment are set as homeworks and marked to a formal mark scheme. Students are given the mark scheme as part of their feedback.		RP2/PPE 1 - Exam style questions based on content covered Each topic has a 'Topic Assessment'. These consist of questions which test an entire topic (e.g. Differentiation), and usually include exam-style questions. These topic assessment are set as homeworks and marked to a formal mark scheme. Students are given the mark scheme as part of their feedback.		RP3/PPE3 - AS papers set by OCR for previous summer exam Each topic has a 'Topic Assessment'. These consist of questions which test an entire topic (e.g. Differentiation), and usually include exam-style questions. These topic assessment are set as homeworks and marked to a formal mark scheme. Students are given the mark scheme as part of their feedback.	
Implementation (Year 13)	Year 13 Overview	Students begin to appreciate that mathematic skills are transferable to many other A levels. For instance, the skills developed can be applied to: - Mechanics in Physics, including moments, vectors and uniform acceleration - Balancing equations and calculating quantities in Chemistry - Data analysis in Biology - Evaluating statistics from studies in Psychology - Drawing graphs and evaluating macroeconomic indicators in Economics - Understanding algorithms in Computing - Evaluating arguments in Philosophy - Analysing financial performance in Business Studies More generally, the logical way of thinking and focus on clear methods gained from Mathematics A level provides a way of thinking about problems in a clear and methodical manner which can complement all subjects from essay-based to social sciences and beyond.					
	SOW	Pure Maths - Trigonometric functions - Differentiation (Yr2) Applied (Mechanics) - Forces and friction Applied (Statistics) - Normal distribution	Pure Maths - Integration (Yr2) - Functions and graphs Applied (Mechanics) - Moments - Application of forces Applied (Statistics) - Normal distribution	Pure Maths - Series and sequences - Binomial expansion 2 - Radians - Trigonometry and modelling 1 Applied (Mechanics) - Projectiles	Pure Maths - Trigonometry and modelling 2 - Parametric equations Applied (Mechanics) - Projectiles - Variable acceleration Applied (Statistics) - Conditional probability - Correlation	Pure Maths - Numerical methods - Vectors 3D Applied (Mechanics) - Further kinematics	Pure Maths - Revision for external exams Applied (Mechanics) - Revision for external exams Applied (Statistics) - Revision for external exams
	Assessment Type & Unit Focus	RP1/PPE 1 - Paper 1 (pure with mechanics) and Paper 2 (pure with statistics) assessing topics covered so far using past exam questions. Each topic has a 'Topic Assessment'. These consist of questions which test an entire topic (e.g. Differentiation), and usually include exam-style questions. These topic assessment are set as homeworks and marked to a formal mark scheme. Students are given the mark scheme as part of their feedback.		RP2 - Paper 1 (pure with mechanics) and Paper 2 (pure with statistics) assessing topics covered so far using past exam questions. Each topic has a 'Topic Assessment'. These consist of questions which test an entire topic (e.g. Differentiation), and usually include exam-style questions. These topic assessment are set as homeworks and marked to a formal mark scheme. Students are given the mark scheme as part of their feedback.		RP3/PPE2 - Paper 1 (pure with mechanics) & Paper 2 (pure with statistics) from most recent exam series Each topic has a 'Topic Assessment'. These consist of questions which test an entire topic (e.g. Differentiation), and usually include exam-style questions. These topic assessment are set as homeworks and marked to a formal mark scheme. Students are given the mark scheme as part of their feedback.	
	Topic Texts	Why do buses come in threes? - <i>Rob Eastaway & Jeremy Wyndham</i> The Music of Primes - <i>Marcus du Sautoy</i> The Code Book - <i>Simon Singh</i> Exam board - OCR B (MEI) – the specification can be found here: https://www.ocr.org.uk/Images/308740-specification-accredited-a-level-gce-mathematics-b-mei-h640.pdf					
Impact	Year 12 Review Points	RP1: T1, Wk3		RP2 (PPE1): T3, Wk2			RP3 (PPE2): T6, Wk4
	Year 13 Review Points		RP1 (PPE1): T2, Wk1		RP2: T4, Wk1	RP3 (PPE2): T5, Wk1	
	How It Is Used / Skills Set Developed / Outcomes	Mathematics hones the ability to solve mathematical problems as well as abstract and scientific ones. These problem-solving skills can then be applied to many different areas of life. It also teaches how to analyse patterns, structures and problems, which will in turn, help to develop a critical eye. This will come in handy in both further study and future careers. Mathematics at A level gives research skills enables finding solutions to problems, investigating theories, and therefore gives the ability to find new information more effectively. Finally, logical abilities will be developed providing the tools needed to tackle a number of diverse areas, from managing finances to planning projects.					
	Links to Higher Education	Mathematics A level is a pre-requisite for many degrees including mathematics, physics, engineering, statistics, actuarial science and economics. Mathematics is a "facilitating" subject. This means that it is among a list of A level subjects which are asked for most frequently by universities.					
	Careers in the Curriculum	The logical thinking, problem-solving and decision-making skills learned while studying mathematics are highly valued by employers across many job sectors. These are a few examples of careers that use mathematics: Health Informatics Specialists, Accountant, Computer Programmer, Business Intelligence Analyst, Financial Analyst, Pharmacy Technician, Supply Chain Manager, Auditors and more.					