



St Augustine's Catholic High School & Sixth Form

Curriculum Overview 2021 – 2022

Mathematics

Key Stage 5



Curriculum Overview

Mathematics

Autumn Term

	Y12	Y13
Autumn 1	Content: <i>Core algebraic tools and graphical analysis skills</i>	Content: <i>Graphs and functions, series and sequences, conditional probability and Normal distribution.</i>
	Why am I learning this? <i>The start of the year builds on Lvl 3 algebra and GCSE skills which once developed are used in the sciences and engineering sectors for data analysis. This links with statistics data collection and representations covered later in the year and are key tools used in all subsequent A level maths topics.</i>	Why am I learning this? <i>Building on the work from Y12 the difficulty and link between Graphs and functions will be enhances. Numerical and Geometric sequences will be explored which are an integral part of modelling the spread of disease. In the Statistics module probability is expanded upon from Y12 looking at how it can be used in complex events and it's quantifiability presented in nature from Biology to Physics.</i>
	Assessment Focus Deep assessment: Assessment week Formative / maintenance assessment: <i>Learning Journals follow your development and content covered with each assessment. Self-reflection and the teachers whole group feedback sheets identify the successes and areas for improvement for each topic covered.</i>	Assessment Focus Deep assessment: In class Assessment Formative / maintenance assessment: <i>Learning Journals follow your development and content covered with each assessment. Self-reflection and the teachers whole group feedback sheets identify the successes and areas for improvement for each topic covered.</i>
Autumn 2	Content: <i>Mathematical proof and methods. Binomial expansion and circle theorems with algebraic and graphical problems.</i>	Content: <i>Circle geometry, algebraic and applied trigonometry, parametric equations. Continuing the Normal distribution.</i>
	Why am I learning this? <i>The topics from Autumn 1 are now used and built upon by exploring mathematical proof and methods used in many topics covered in Y12 and Y13 as well as being used in actuary and accounting. Circles uses knowledge from graphical topics already covered and incorporates GCSE knowledge which is a primary component of geometry aiding 3D modellers.</i>	Why am I learning this? <i>The role of geometry in fields that models behaviour is essential from arcs of circles to advanced trigonometric proofs, the skills from GCSE and Y12 will be culminated here. Parametric equations and its powerful uses in applied problems will be explored using knowledge from both the Pure and Mechanics Y12 content.</i>
	Assessment Focus Deep assessment: Maintenance assessment: <i>Learning Journals follow your development and content covered with each assessment. Self-reflection and the teachers whole group feedback sheets identify the successes and areas for improvement for each topic covered.</i>	Assessment Focus Deep assessment: Assessment week Maintenance assessment: <i>Learning Journals follow your development and content covered with each assessment. Self-reflection and the teachers whole group feedback sheets identify the successes and areas for improvement for each topic covered.</i>
Termly themes	Links to Gospel Values/vocations: <i>Compassion and respect of others ability is encouraged at the start of a new journey together. A</i>	Links to Gospel Values/vocations: <i>As the students begin their final year of A levels, the humility of what has been accomplished last year and</i>

	<i>sense of community is developed in class and intervention sessions by supporting each other.</i>	<i>the integrity moving forward while learning new content helps prepare students for the year ahead.</i>
	Enrichment: <i>Weekly intervention sessions to support all students and develop maths skills and exam practice. Maths challenge During Autumn 1 to give the opportunity to practice mathematical problem solving.</i>	Enrichment: <i>Weekly intervention sessions to support all students and refine the knowledge from Y12 and further practice Y13 maths content in preparation for the summer exams.</i>

Spring Term

	Y12	Y13
Spring 1	Content: <i>Trigonometry, vectors and kinematics.</i>	Content: <i>Differentiation and numerical methods. Forces including frictions and moments.</i>
	Why am I learning this? <i>Builds on key mathematics skills from the Autumn term to advance the trigonometry learned at GCSE. The powerful tool of vectors is fully expanded from Y11 facilitating description of paths and important quantities such as forces, and velocity taught in the coming term. Kinematics looks at the descriptions of how things move without accounting for forces, an essential tool in Physics and Engineering. These topics are used by the optics industry as well as numerous engineering sectors and computing companies looking at simulating events.</i>	Why am I learning this? <i>The knowledge from Y12 differentiation, parametric equations and Y12/Y13 Trigonometry will be used to further explore and develop their understanding of differentiation. It's use in science and data analysis is essential facilitating the solving of many important problems. Numerical methods use the knowledge of sequences from Y13, and algebraic tools from Y12 to solve theoretical and applied problems. The Y12 mechanics knowledge will be enhances by incorporating friction when modelling movement and using moments to understand the behaviour of rigid bodies.</i>
	Assessment Focus Deep assessment: Formative / maintenance assessment: <i>Learning Journals follow your development and content covered with each assessment. Self-reflection and the teachers whole group feedback sheets identify the successes and areas for improvement for each topic covered.</i>	Assessment Focus Deep assessment: <i>Assessment week – last mock exams</i> Formative / maintenance assessment: <i>Learning Journals follow your development and content covered with each assessment. Self-reflection and the teachers whole group feedback sheets identify the successes and areas for improvement for each topic covered.</i>
Spring 2	Content: <i>Differentiation, forces and variable accelerations</i>	Content: <i>Integration, projectile motion and applying forces to real world problems</i>
	Why am I learning this? <i>Differentiation is a primary part of calculus which is a powerful tool used in science to describe rates of change in fields from electromagnetism to the financial sector. It will be used in the applied module when exploring speed and acceleration in the summer term. The forces and variable acceleration expand on knowledge of vectors from Spring 1 facilitating computational simulations and game design.</i>	Why am I learning this? <i>As in Y12 Summer 1, integration will complement the completed topic of differentiation utilising knowledge from the whole syllabus. New and powerful tools of integration will be explored which facilitate fields such as entropy and electricity. The physical descriptions of objects moving in 2D have aided mankind to reach the moon, essential principles will be explored by describing projectile motion and utilising the Y12 spring 2 knowledge on forces.</i>
	Assessment Focus Deep assessment: <i>Assessment week to identify growth since the start of the academic year.</i> Maintenance assessment: <i>Learning Journals follow your development and content covered with each assessment. Self-</i>	Assessment Focus Deep assessment: Maintenance assessment: <i>Learning Journals follow your development and content covered with each assessment. Self-reflection and the teachers whole group feedback</i>

	<i>reflection and the teachers whole group feedback sheets identify the successes and areas for improvement for each topic covered.</i>	<i>sheets identify the successes and areas for improvement for each topic covered.</i>
Termly themes	Links to Gospel Values/vocations: <i>The humility and compassion that has developed over the two terms produces a true sense of community in the class. This provides opportunities for selflessness and service in supporting others socially and academically.</i>	Links to Gospel Values/vocations: <i>The advancement in the student's individual knowledge enhances the truths found in maths and the tools used to understand the work around them. A greater sense of respect and presence in the community is developed as they come to the end of their time at St Augustine's.</i>
	Enrichment: <i>Weekly intervention sessions to support all students and develop the core maths skills covered in the Autumn term and new content.</i>	Enrichment: <i>Weekly intervention sessions will be continued for all students bringing together the content taught in Y12 and Y13. Exam practice questions will be used primarily to enhance exam technique and broaden knowledge ready for the summer exam.</i>

Summer Term

	Y12	Y13
Summer 1	Content: <i>Integration, logarithms and exponentials with essential statistics</i>	Content: <i>3D vectors and conceding kinematics</i>
	Why am I learning this? <i>Integration complements differentiation covered last term and facilitated further understanding of graphical properties from the Autumn term. Exponentials are explored proving the tool kit which is used in fields from astronomy to modelling disease spread. The statistics begins to develop a key understanding of data collection and analytical skills preparing for the statistics topics covered in Y12 and Y13, which can be applied to psychological studies and ecological surveys.</i>	Why am I learning this? <i>As the final topics of A level Maths are completed the final vectors topic draws on all of the problems solving skills honed over the two years to build on knowledge from Y12 Spring 1. The applied module is concluding by bringing together the Mechanics content covered in Y12 and Y13 to solve real world scenarios involving particles and rigid bodies. Both topics are essential tools in computer simulations, game design and structural engineering.</i>
	Assessment Focus Deep assessment: Formative / maintenance assessment: <i>Learning Journals follow your development and content covered with each assessment. Self-reflection and the teachers whole group feedback sheets identify the successes and areas for improvement for each topic covered.</i>	Assessment Focus Deep assessment: Formative / maintenance assessment: <i>Learning Journals follow your development and content covered with each assessment. Self-reflection and the teachers whole group feedback sheets identify the successes and areas for improvement for each topic covered.</i>
Summer 2	Content: <i>Probability with statistical distributions and Hypothesis testing. Beginning Y13 content</i>	Content: <i>Revision</i>
	Why am I learning this? <i>Probability and statistics empower a deeper understanding of repeated phenomena. From actuary to political data analysis and thermodynamics, statistics plays a significant role in all aspects of life, science and society. With the reminding time left of Y12 the beginning of the Y13 course will begin looking at more advanced algebraic methods building on</i>	Why am I learning this? <i>Revising and refining knowledge from both years in readiness for the formal examination.</i>

	<p><i>content from Autumn 2 proving sound foundations for the rest of Y13 content.</i></p> <p>Assessment Focus Deep assessment: <i>Final Y12 Assessment to assess and consolidate the content learned over the academic year.</i></p> <p>Maintenance assessment: <i>Learning Journals from the year will be reviewed with the whole class feedback sheets and personal areas for improvement. This provides a tailored starting point for revision to optimise both time studying and resources.</i></p>	<p>Assessment Focus Deep assessment: Formal Assessment</p> <p>Maintenance assessment: <i>The Learning Journals used since the beginning of Y12 with the class feedback sheets will provide an excellent resource to identify key areas to work on and be mindful of in the exam.</i></p>
Termly themes	<p>Links to Gospel Values/vocations: <i>With an enriched knowledge of mathematics and its applications a greater sense of truth about the world will be developed. The passion and integrity of their interest in maths will facilitate development towards academic goals and their desired place in society.</i></p>	<p>Links to Gospel Values/vocations: <i>Having a complete knowledge of A level Maths and its diverse uses and involvement in key aspects of society and the technology of the future brings a sense of responsibility to the community as they pursue their post 18 choices.</i></p>
	<p>Enrichment: <i>The weekly intervention sessions will lead up to the Y12 final assessment accumulating the essential principles of maths taught to fully prepare them for Y13 and beyond.</i></p>	<p>Enrichment: <i>The weekly intervention sessions will lead up to the Y13 final summer assessment ending the A level Maths journey. The diverse skills learnt are highly sought after in academia and the workplace, the future options after Y13 are always vast and exciting.</i></p>