Year 12 Maths

What have students at St. Crispin's been taught to understand and be able to do?

Core Knowledge

Year 12– Students are taught using the Oxford University Press AQA A Level Maths textbook.

Sequencing of learning is loosely based upon the chapters in the book. The exact order of the work is detailed in the scheme of work at the bottom of this document.

Year 12 content

Algebra– proof, index laws, surds, quadratics, simultaneous equations, lines and circles, inequalities

Polynomials and Binomial Theorem – expanding and factorising, binomial theorem, algebraic division, curve sketching

Trigonometry – sine, cosine and tangent ratios, the sine and cosine rules

Differentiation and Integration– differentiation from first principles, differentiating ax^n, rates of change, tangents and normals, turning points, integration, area under a curve

Exponentials and logarithms - laws of logarithms, exponential functions, exponential processes, curve fitting

Vectors - definitions and properties, components of a vector

Kinematics – standard units, motion in a straight line, motion under constant acceleration, motion with variable acceleration

Forces and Newton's Laws –forces, dynamics, motion under gravity, systems of forces

Collecting, Representing and Interpreting Data – sampling, central tendency and spread, single-variable data, bivariate data

Probability and Discrete Random Variables – probability, binomial distribution

Hypothesis testing – an introduction to formulating a test and critical regions.

Core Skills

Students in Year 12 follow the first year of a two-year A-Level scheme of work. In Year 12 students cover approximately half of the content from the content areas: Pure Maths, Mechanics and Statistics.

Core skills students will develop are to:

- Be able to reason mathematically
- To be able to follow mathematical processes but also apply knowledge from across the curriculum and make connections between their learning.
- To apply taught skills to solve functional real world mathematical problems
- To develop revision and exam techniques to prepare them for the formal A-Level assessments.

Students are pushed to develop their fluency in mathematics by having a large focus of every lesson on developing student's numeracy skills in every unit of work. Students are also given regular feedback and teacher modelling to encourage students to be able to write meticulous, detailed, and mathematically correct solutions so that students are able to communicate mathematically.

Year 12 Maths continued

How has learning been assessed?

Students take end of chapter tests throughout the year where areas of weakness are identified and intervention with specialist intervention teachers organised.

Students also sit two sets of mock exams in Year 12. The first summative assessment is in January and is based on chapter 1-5. The second is a full AS level mock exam which covers all content covered in Year 12.

What is coming up in the following year?

In Year 13 students finish receiving quality first teaching of the final half of content and then start a series of revision of key material from Year 12.

A-Level Scheme of Work - Year 13

AUTUMN TERM	AUTUMN TERM
Core	Core
1. Algebra	2. Polynomials and Biomial Expansion
HALF TERM	**HALF TERM**
3. Trigonometry	4. Calculus
5. Exponentials and Logarithms	
CHRISTMAS	**CHRISTMAS**
SPRING TERM	**SPRING TERM**
Mock week: January	Mock week: January
(dates subject to change)	(dates subject to change)
5. Exponentials and Logarithms	7. Kinematics
Statistics	
9. Collect, present and interpret data	
HALF TERM	**HALF TERM**
9. Collect, present and interpret data	6. Vectors
10. Probability	8. Forces
EASTER	**EASTER**
SUMMER TERM	**SUMMER TERM**
11. Hypothesis testing	8. Forces
Review and revise	Review and revise
HALF TERM	**HALF TERM**
Mock exam preparation and exams	Mock exam preparation and exams
(dates subject to change)	(dates subject to change)
Year 13	Year 13
12. Algebra (4 weeks)	14. Trig identities

Year 13 Maths

What have students at St. Crispin's been taught to understand and be able to do?

Core Knowledge

Year 13– Students are taught using the Oxford University Press AQA A-Level Maths textbook.

Sequencing of learning is loosely based upon the chapters in the book. The exact order of the work is detailed in the scheme of work at the bottom of this document.

Year 13 content

Trigonometry– radians, reciprocal and inverse trig functions, compound angles, equivalent forms for a cos x + b sin x

Algebra – mathematical proof, functions, parametric equations, algebraic fractions, partial fractions

Sequences and Series – binomial series, arithmetic sequences, geometric sequences

Numerical Methods– root finding, iterative methods, the Newton-Raphson method, numerical integration

Differentiation – shapes of functions, trigonometric functions, exponential and logarithmic functions, the chain rule, the product and quotient rules, inverse functions, implicit differentiation, parametric functions

Integration- standard integrals, integration by substitution, integration by parts, integrating rational functions, differential equations

Probability - conditional probability, the normal distribution, using the normal distribution as an approximation to the binomial

Hypothesis Testing – testing correlation, testing a normal distribution

Motion in Two Dimensions – motion with constant acceleration, motion with variable acceleration, motion under gravity, motion under forces

Forces - vectors in 3D, statics, dynamics, moments

Core Skills

Students in Year 13 follow the second year of a two-year A-Level scheme of work. In Year 13 students cover approximately half of the content from the content areas: Pure Maths, Mechanics and Statistics.

Core skills students will develop are to:

- Be able to reason mathematically
- To be able to follow mathematical processes but also apply knowledge from across the curriculum and make connections between their learning
- To apply taught skills to solve functional real world mathematical problems
- To develop revision and exam techniques to prepare them for the formal A-Level assessments.

Students are pushed to develop their fluency in mathematics by having a large focus of every lesson on developing student's numeracy skills in every unit of work.

Students are also given regular feedback and teacher modelling to encourage students to be able to write meticulous, detailed, and mathematically correct solutions so that students are able to communicate mathematically.

Year 13 Maths continued

How has learning been assessed?

Students take end of chapter tests throughout the year where areas of weakness are identified and intervention with specialist intervention teachers organised.

Students also sit two full sets of papers as mock exams in the run up to their formal exams in the summer: one during the mock exam period for all subjects in January and one in class in March.

Summer exams – Paper 1, 2hrs Pure Maths. Paper 2, 2hrs Pure Maths and Mechanics. Paper 3, 2hrs Pure Maths and Statistics.

There is no set Pure Maths content per paper. All content is covered across the 3 papers.

What is coming up in the following year?

In Year 13 students finish receiving quality first teaching of the final half of content and then start a series of revision of key material from Year 12.

A-Level Scheme of Work - Year 13

AUTUMN TERM	AUTUMN TERM
12. Algebra	14. Trigonometry
13. Sequences	15. Differentiation
HALF TERM	**HALF TERM**
13. Sequences	15. Differentiation
17. Numerical Methods	16. Integration and Differential Equations
20. Probability and Continuous Random Variables	
SPRING TERM	**SPRING TERM**
Mock week—January (subject to change)	Mock week—January (subject to change)
Statistics	Mechanics
20. Probability and Continuous Random Variables	18. Motion in 2 Dimensions
21. Hypothesis Testing 1 & 2	
HALF TERM	**HALF TERM**
21. Hypothesis Testing 1 & 2	18. Motion in 2 Dimensions
Review and Revise	19. Forces
	Review and Revise
SUMMER TERM	**SUMMER TERM**
Revision and final mock exam	Revision and final mock exam