KS4 Long Term Curriculum Plan: **Mathematics - Year 11 Higher 2025-2026**

Curriculum Aim: The national curriculum for mathematics aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can 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 persevering in seeking solutions.

Link to prior learning: See KS3 National Curriculum for Mathematics

Rationale of sequencing: In mathematics, students follow a spiral curriculum that allows them to study requisite skills before moving onto more complex concepts. Students will revisit topics in subsequent years and build on prior knowledge and connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. Decisions about progression should be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems.
Autumn 1 focuses on building students' fluency in algebra, specifically algebraic fractions and proof, and further graphs. This is a more challenging topic which requires the student to apply skills learnt in the previous module to provide mathematical proofs algebraically. This naturally leads to our final module covering vector geometry and vector proofs which again builds on the skills considered in similarity and congruency and algebraic proof.

Term	Focus / Topic	Knowledge & Skills (from NC/Programmes of Study)	Assessment
Autumn 1	Module 20 - Algebraic fractions, functions & proof Module 21 - Further Pythagoras & trigonometry	Students should be able to: ● Simplify and manipulate algebraic fractions by: factorising quadratic expressions of the form $x^2 + bx + c$, including the difference of two squares; {factorising quadratic expressions of the form $ax^2 + bx + c$} ● Simplifying expressions involving sums, products and powers, including the laws of indices . ● Know the difference between an equation and an identity; ● Argue mathematically to show algebraic expressions are equivalent. ● where appropriate, interpret simple expressions as functions with inputs and outputs; ● {interpret the reverse process as the 'inverse function'; interpret the succession of two functions as a 'composite function'} ● Use algebra to support and construct arguments and proofs. ● know the exact values of sin θ, cos θ for θ = 0 , 30 , 45 , 60 and 90; know the exact value of tanθ for θ = 0 , 30 , 45 and 60 ● apply Pythagoras' Theorem and trigonometric ratios to find angles and lengths in right-angled triangles {and, where possible, general triangles} in two {and three} dimensional figures ● {know and apply to calculate the area, sides or angles of any triangle}	Half-term assessment on all topics covered since the start of year 11.

Autumn 2	Module 21 - Further Pythagoras & trigonometry Module 22 - Further graphs	Students should be able to: ● apply Pythagoras' Theorem and trigonometric ratios to find angles and lengths in right-angled triangles {and, where possible, general triangles} in two {and three} dimensional figures ● {know and apply to calculate the area, sides or angles of any triangle} ● Calculate or estimate gradients of graphs and areas under graphs including quadratic and other non-linear graphs. ● Interpret results in cases such as distance-time graphs and velocity-time graphs ● Recognise, sketch and interpret graphs of simple cubic functions, the reciprocal function ● $y = \frac{1}{x}$ with x ≠ 0, the exponential function $y = k^x$ for positive values of k, and the trigonometric functions (with arguments in degrees) , $y = sin(x), y = cos(x)$ & $y = tan(x)$for angles of any size. ● Sketch translations and reflections of the graph of a given function. ● Plot and interpret graphs (including reciprocal graphs {and exponential graphs}) and graphs of non-standard functions in real contexts, ● Find approximate solutions to problems such as simple kinematic problems involving distance, speed, acceleration and graphs in financial contexts.	PPE fortnight
Spring 1	Module 23 - Vector geometry	Students should be able to: ● Apply addition and subtraction of vectors. ● Multiplication of vectors by a scalar, and diagrammatic and column representations of vectors; ● Use vectors to construct geometric arguments and proofs.	Topic/skills test
Spring 2	Revision for final exams	Students should be able to: ● Revise all GCSE topics for the final exams ● Following on from the PPEs teachers will re-teach gaps from the weak areas in the PPEs ● This will be personalised based on each class and their results analysis from the PPEs	PPE week
Summer 1	Revision Public exams	Students should be able to: ● Revise all GCSE topics for the final exams ● Following on from the assessments teachers will re-teach gaps from the weak areas in the PPEs ● This will be personalised based on each class and their results analysis from the PPEs	Public exams
Summer 2	Public exams		Public exams

Further Information

The exam board used for Mathematics is **Edexcel** - http://qualifications.pearson.com/en/qualifications/edexcel-gcses/mathematics2015.html
Sparx Maths - https://sparxmaths.com/ (All students have individual logins and passwords to support with classwork, homework and revision)
Equipment - All students must attend lessons with pens (including a green pen), pencil, long ruler, rubber, protractor, pair of compasses, scientific calculator, exercise book and home learning book.

KS4 Long Term Curriculum Plan: **Mathematics - Year 11 Foundation 2025-2026**

Curriculum Aim: The national curriculum for mathematics aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
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Rationale of sequencing: In mathematics, students follow a spiral curriculum that allows them to study requisite skills before moving onto more complex concepts. Students will revisit topics in subsequent years and build on prior knowledge and connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. Decisions about progression should be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems.
Students begin with the study of Pythagoras and trigonometry before moving on to more advanced probability in the module combined sets which builds on the probability topics studied in year 10. Students also further develop their understanding of linear equations with the study of simultaneous equations. The final module of the year is non-linear graphs which brings together all of the previous topics on algebra.

Term	Focus / Topic	Knowledge & Skills (from NC/Programmes of Study)	Assessment
Autumn 1	Module 21 - Right-angled triangles Module 22 - Congruence & similarity Module 23 – Combined events	Students should be able to: ● Apply Pythagoras' Theorem and trigonometric ratios to find angles and lengths in right-angled triangles {and, where possible, general triangles} in two dimensional figures. ● Apply the concepts of congruence and similarity, including the relationships between lengths ● Apply the property that the probabilities of an exhaustive set of mutually exclusive events sum to one. ● Use a probability model to predict the outcomes of future experiments. ● Understand that empirical unbiased samples tend towards theoretical probability distributions, with increasing sample size. ● Calculate the probability of independent and dependent combined events, including using tree diagrams and other representations, and know the underlying assumptions	Half-term assessment on all topics covered since the start of year 11.
Autumn 2	Module 24 - Powers & standard form Module 25 – Inequalities & simultaneous equations	Students should be able to: ● Solve two simultaneous equations in two variables (linear/linear) algebraically; ● Find approximate solutions using a graph ● Solve linear inequalities in one variable{s}, ● Represent the solution set on a number line,	PPE fortnight
Spring 1	Module 26 – Non-linear graphs	Students should be able to: ● represent non-linear equations on a graph e.g. quadratic, cubic and reciprocal graphs ● Find approximate solutions using a graph	Half-term assessment on all topics covered since the start of year 11.

Spring 2	Revision for final exams	Students should be able to: ● Revise all GCSE topics for the final exams ● Following on from the PPEs teachers will re-teach gaps from the weak areas in the PPEs ● This will be personalised based on each class and their results analysis from the PPEs	PPE week
Summer 1	Revision Public exams	Students should be able to: ● Revise all GCSE topics for the final exams ● Following on from the PPEs teachers will re-teach gaps from the weak areas in the PPEs ● This will be personalised based on each class and their results analysis from the PPEs	Public exams
Summer 2			Public exams

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