

# KS4 Curriculum Overview

# Mathematics

## Curriculum Intent

Our KS4 curriculum develops the mathematical knowledge to solve problems that they will encounter in the world around us whether in their career, financial or personal life. In addition, students need to understand and be fluent in the application of knowledge required for further study. The curriculum creates curiosity in mathematics and enthusiasm for further study.

Mathematical content is delivered through a spiral based curriculum where strands are revisited throughout KS4 to re-establish foundations, students then explore new content.

## How does the KS4 curriculum build on that from KS3?

Students continue to study units across the strands of Number, Algebra, Geometry and Measure, Probability and Statistics and Proportional Reasoning. Students are split in to Higher and Foundation tiers for GCSE, building on different levels of understanding of the content covered throughout KS3. Students will go on to study new topics such as Functions, Advanced trigonometry and Circle theorems at Higher, and Trigonometry, Simultaneous and Quadratic Equations at the Foundation tier.

## What do students *do* with this knowledge or these skills?

Students will increasingly face more complex problems incorporating several areas of maths. They will apply conditional knowledge to recognise which methods are needed to solve problems. KS4 students will be encouraged to find the most efficient method and present their mathematical arguments logically.

## How does the KS4 curriculum align to the National Curriculum?

Our KS4 curriculum contains all elements of the national curriculum as part of the preparation for the GCSE examinations and further study. In addition, our most able students are entered for UKMT challenges and work towards the Advanced Free Standing Maths Qualification.

## What new knowledge or skills are students taught?

Term	Year 10		Year 11	
	Higher	Foundation	Higher	Foundation
<b>Autumn</b>	<ul style="list-style-type: none"> <li>• Ratio</li> <li>• Indices and Standard Form</li> <li>• Venn Diagrams</li> <li>• Algebraic Expressions and Proof</li> <li>• Parallel lines, Internal and External angles</li> <li>• Pythagoras (2d &amp; 3d)</li> <li>• Right Angled Trigonometry</li> <li>• Surds</li> </ul>	<ul style="list-style-type: none"> <li>• Multiplying and Dividing</li> <li>• Multiples, Factors &amp; Primes</li> <li>• Venn Diagrams</li> <li>• Negative Numbers</li> <li>• Algebraic Simplification</li> <li>• Direct Proportion</li> <li>• Solving Equations</li> <li>• Fractions</li> </ul>	<ul style="list-style-type: none"> <li>• Sine Rule and Cosine Rule</li> <li>• Quadratic Sequences and Iteration</li> <li>• Plotting and using non linear graphs</li> <li>• Graphs and equation solving</li> <li>• Graph Transformations</li> <li>• Circle Theorems</li> </ul>	<ul style="list-style-type: none"> <li>• Percentages</li> <li>• Compound Interest</li> <li>• Negative Numbers</li> <li>• Solving equations</li> <li>• Areas and volumes</li> <li>• Pythagoras</li> <li>• Rounding and Estimating</li> <li>• Standard Form</li> <li>• Plotting and using linear graphs</li> <li>• Expanding and Factorising</li> <li>• Solving a quadratic by Factorising</li> <li>• Rearranging Formula</li> </ul>

<p><b>Spring</b></p>	<ul style="list-style-type: none"> <li>• Rearranging formulae</li> <li>• Solving linear equations</li> <li>• Simultaneous equations</li> <li>• Solving Quadratics</li> <li>• Completing the square</li> <li>• Simultaneous equations (quadratic)</li> <li>• Area/Perimeter of circles/sectors</li> <li>• Volumes of solids &amp; prisms</li> <li>• Area/volume scale factors</li> <li>• Upper and Lower Bounds</li> </ul>	<ul style="list-style-type: none"> <li>• Percentages</li> <li>• Angles Problems</li> <li>• Internal and External Angles of polygons</li> <li>• Probability of multiple events</li> <li>• Timetables</li> <li>• Time Series</li> <li>• Standard Form</li> </ul>	<ul style="list-style-type: none"> <li>• The equation of a circle</li> <li>• Vector Geometry</li> <li>• Percentage growth</li> <li>• Gradients of curves</li> <li>• Areas under curves</li> <li>• Algebraic Fractions</li> <li>• Transformations</li> </ul>	<ul style="list-style-type: none"> <li>• Simultaneous equations</li> <li>• Constructions</li> <li>• Bearings</li> <li>• Scale diagrams</li> <li>• Internal and External angles in a polygon</li> <li>• Transformations</li> <li>• Vectors</li> <li>• Right Angled Trigonometry</li> </ul>
<p><b>Summer</b></p>	<ul style="list-style-type: none"> <li>• Probability of multiple events</li> <li>• Averages, Pie Charts, Bar Charts</li> <li>• Linear Graphs</li> <li>• Inequalities</li> <li>• Direct and Inverse Proportion</li> <li>• Histograms</li> <li>• Cumulative Frequency</li> <li>• Ratio</li> </ul>	<ul style="list-style-type: none"> <li>• Linear Graphs</li> <li>• Area (including circles)</li> <li>• Pythagoras</li> <li>• Trigonometry</li> <li>• Charts &amp; Graphs</li> </ul>	<ul style="list-style-type: none"> <li>• Final Exam Preparation</li> </ul>	<ul style="list-style-type: none"> <li>• Final Exam Preparation</li> </ul>
<p><b>Rationale for this sequencing</b></p>	<p>The topics are carefully sequenced to build on prior knowledge from KS3. Different elements of each strand are interweaved to create a schema of mathematical knowledge. As a broader understanding of the curriculum is created, students can solve increasingly challenging problems using knowledge from across the curriculum.</p>			