

## Curriculum Intent & Overview

The aim of the mathematics curriculum is to show students that mathematics underpins every aspect of life, so numerical and problem solving skills will be extremely valuable and sought after in all future careers, hobbies and general activities. The curriculum empowers students to question and explore where and why each skill will be used in a modern society, whilst also allowing them the opportunity to be curious and combine different skills and methods to solve complex multi-step problems in real life scenarios. All topics are in line with the National Curriculum standards and the order is chosen to meet the needs of our diverse cohort and to ensure there is a logical "building block" approach.

Students are taught by a team of passionate teachers who focus on building up the mathematical competency of their pupils over their journey from Y7 to Y11. Following a Mastery approach throughout, the first year is focused on developing student's understanding of basic core skills, such as arithmetic, algebra and using mathematical equipment. This enables students to smoothly transition and bridge the gap between KS2 & KS3, whilst also getting them to question some of the core principles taught at primary school and start to develop a deep understanding of the subject. Y8 and Y9 builds on these core skills and allows students to apply them to more challenging problem solving questions - a big focus of the GCSE exam papers. Topics taught in Y7 & Y8 are the same across the different ability sets, with the main difference being more applied and multi-step problems used in the upper sets. Top sets in Y9 start to look at topics that only apply to the Higher GCSE papers, whilst the lower sets will look to cover these at GCSE. Our shared resources ensure that lessons are consistent across classes and that topics are shown to have applicability in other subjects across the school curriculum (mainly sciences, but also geography, technology, computer science, etc).

At GCSE, the skills and techniques learnt at KS3 are applied to more complex topics and questions. Students are in sets that focus on either the Foundation or Higher papers and, as such, must follow different schemes of work. Our curriculum is divided into three sections - Foundation (low sets), Cross-Over (middle sets) and Higher (top sets). Although each of the three sections has an overall theme (e.g. number work), there is a big difference between the type of question that can be asked at Foundation level compared to Higher, even if the type of question falls under the same theme. Teachers are professionals with vast amounts of experience, so are given flexibility with which areas they feel their group needs to work on but always follow an approach that enables their students to have no boundaries and push for the most advanced skills possible. The two year SoW acts as a checklist, where any topics not covered in Y10 can be taught/retaught in Y11. Higher tier classes are advised to check basic understanding before attempting more complex topics - the layout of the SoW makes it easy to do this. Students regularly get a flavour for the types of questions asked in the exams by sitting GCSE papers - termly in Y10 and fortnightly in Y11. This approach at GCSE has proved hugely successful over the years and means that students leave with the valuable and transferrable skills required to thrive in society.

By KS5, mathematics students are confident and successful with the topic but must now apply their knowledge to mechanical, statistical and more abstract problems. They are still able to use the core skills and techniques learnt in the lower school, but mathematics always follows a building block approach and, as such, students must further develop these skills to solve real world problems. Our scheme of work ensures students bridge the gap between GCSE and A level and allows them to see the connections across topics.

## Term 1 - Number Work

Basic number work is one of the foundations of higher level mathematics. We like to start the year with this after a long summer break to ensure the students are confident with these basic skills and methods before moving onto the more challenging topics that rely on them. Within number work, there are core and more advanced skills - the SoW follows a linear progression that enables students to slowly build on prior knowledge and apply it to the later topics in the term. Topics should be taught in the order suggested as they rely on skills taught in the same term.

### Foundation

### Cross Over

### Higher

Basic Number Skills  
Product of Prime Factors  
Standard Form  
Laws of Indices  
Rounding & Estimating  
Bounds & Error Intervals

Recurring Decimals & Fractions  
Surds

Extend Foundation & Cross Over Topics with Problem Solving

Assessment: Full GCSE Exam Paper

## Term 2 - Algebra

Similar to basic number work, algebraic manipulation has many skills that underpin higher level mathematics. Like all topics, a building block approach is followed by starting with core skills and then using them later in the term with more advanced topics. A lot of the basic number skills from last term are also useful here. Topics should be taught in the order stated as they rely on skills taught in the same term. Higher tier groups should not worry if they do not cover every topic in Y10, it is expected that some will be looked at in Y11.

### Foundation

### Cross Over

### Higher

Basic Algebra Skills  
Inequalities  
Straight Line Graphs  
Quadratics  
Simultaneous Equations

Circles & Tangents  
Rates of Change & Area Under Curves

Extend Foundation & Cross Over Topics with Problem Solving

Assessment: Full GCSE Exam Paper

### Term 3 - Shape & Measure

The focus of term 3 is shape and measure. This involves a variety of topics such as constructions, angles, transformations, area/volume, trigonometry and compound measures. Skills from basic number and algebraic manipulation are extremely important here, but there is room for flexibility with the order of teaching as topics this term do not rely on skills from other topics in the same term. Teachers are professionals and may wish to change the order if it meets the needs of their students. Higher tier teachers are not expected to cover every topic in Y10, so please note and finish them in Y11.

#### Foundation

#### Cross Over

#### Higher

Constructions  
 Angle Reasoning  
 Transformations  
 Similarity & Congruence  
 Pythagoras & Trigonometry  
 Area & Volume  
 Compound Measures

Circle Theorems  
 3D Trigonometry  
 Vectors  
 Velocity-Time Graphs

Extend Foundation & Cross Over Topics with Problem Solving

Assessment: Full GCSE Exam Paper

### Term 4 - Number & Probability

Term 4 starts by looking at the number work not covered in term 1 - percentages and ratios. These are topics that have not been needed so far, but parts of them are needed later in the term when covering probability and can be useful with the problem solving parts of statistics (covered in term 5). Topics should be taught in the order stated as they rely on skills taught in the same term. Depending on term dates, it is possible to cover all topics in Y10 but more detail and problem solving activities will be needed in Y11.

#### Foundation

#### Cross Over

#### Higher

Unit Conversions  
 Percentages  
 Ratios  
 Proportions  
 Probability

Algebraic Probability

Extend Foundation & Cross Over Topics with Problem Solving

Assessment: Full GCSE Exam Paper

## Term 5 - Algebra & Statistics

Term 5 looks at more advanced algebra topics, such as functions and sequences, which rely on some of the skills learnt earlier in the year. These include substitution, rearranging equations and plotting graphs from a table of values. All of the different statistical graphs and analysis are taught after this, which somewhat rely on skills learnt earlier in the year. The algebra topics should be taught in the order suggested as there are key links with the substitution skills used in them and also links between sequences and tables of values created for plotting graphs. The scheme of work lists the statistical topics in order of difficulty, so it is recommended to teach in this order.

### Foundation

Functions  
Sequences  
Graphs  
Statistics

### Cross Over

### Higher

Graph Transformations  
Algebraic Fractions  
Proof

Assessment: Full GCSE Exam Paper

Extend Foundation & Cross Over Topics with Problem Solving

## Term 6 - DIRT & Consolidation

Term 6 is a fantastic opportunity to reflect on everything that has been achieved so far. Using test data in the mark books, teachers have the flexibility to choose weak topics to work on with their class. The focus should be on stretching and extending beyond the types of questions that were previously taught, to ensure students get a deep understanding of the topics.