

KS3 Curriculum Overview

Mathematics

Curriculum Intent

By the end of year 9, we intend for students to be confident in the 6 key areas of Mathematics:

- Number and calculations
- Proportional reasoning
- Expressions and equations
- Sequences and graphs
- Geometry and measure
- Probability and statistics

Students will have strong declarative and procedural knowledge, be able to solve multi step problems in both real life and abstract contexts, and use mathematical reasoning in both their written work and orally in class.

How does the KS3 curriculum build on that from KS2?

The main purpose of our Key Stage 3 curriculum is to challenge all students and for them to aspire to maximise their potential in the subject. The Key Stage 2 curriculum places a large focus on the skill element of mathematics and learners are expected to remember and retrieve key facts methods to answer questions. Our Key Stage 3 curriculum takes their core skills and places the emphasis on application and problem solving. This allows for a deeper understanding of the topic and allows students to feel confident in applying knowledge in a number of ways. Year 7 study several new topics including dividing by a decimal, solving inequalities, rearranging formulae and calculating angles in parallel lines.

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

Students will apply their knowledge to solve different types of problems. They will regularly practise key skills such as calculating areas, expanding brackets or calculating with percentages. Increasingly throughout units, they will be faced with multi-step problems in both real-life and abstract ways and will develop their conditional knowledge by recognising which skills to apply.

How does the KS3 curriculum align to the National Curriculum?

Our KS3 curriculum exceeds the National Curriculum. We cover all content from the National Curriculum as well as:

- Fractional and negative indices
- Surds
- Factorising and solving quadratics
- Equations of parallel and perpendicular lines
- Nth term of quadratic sequences
- Volume and surface area of cylinders, Pyramids and Spheres

In addition to our normal curriculum, we also enter our most able students into the UKMT challenges.

What new knowledge or skills are students taught?

Term	Year 7	Year 8	Year 9
Autumn	<ul style="list-style-type: none"> • Exploring rounding numbers through the use of different methods such as significant figures and estimating. • Exploring the relationship between square numbers, cube numbers and roots. • Writing numbers in standard form and how these numbers are interpreted and displayed on a calculator. • Sequences and patterns in a real life. 	<ul style="list-style-type: none"> • Algebraic manipulation including expanding of brackets and factorising, leading into geometric and quadratic sequences. • Calculating interior and exterior angles of polygons. • Fraction arithmetic. • Transformations – rotations, reflections and translations. 	<ul style="list-style-type: none"> • Indices and Standard Form. • Compound measures such as a speed, pressure and density. Converting between units of compound measures. • Algebraic proof, linked to sequences and geometry. • Bearings. • Solving the most complex linear equations including fractions and multiple terms. • Relative frequency. • Similarity and Enlargements. • Interquartile range, cumulative frequency and box plots.
Spring	<ul style="list-style-type: none"> • Decimal Arithmetic and the relationship between fractions decimals and percentages. • Drawing and interpreting graphs of linear functions. 	<ul style="list-style-type: none"> • 3d shapes, representation and volumes • Fractions decimals and percentages with a focus on percentage problems • Plotting straight line graphs and the relationship between a graph and its equation 	<ul style="list-style-type: none"> • Right angled trigonometry. • Circles, including Sector Area and Arc Length. • Graph working including parallel and perpendicular lines and non-linear functions. • Constructions and Loci.

<p>Summer</p>	<ul style="list-style-type: none"> • Writing and solving equations and basic inequalities. • Calculating averages and presenting data using bar charts and pie charts. • Calculating Ratio and distribution in real life scenarios. 	<ul style="list-style-type: none"> • Metric units and solving problems using direct proportion. • Collecting data, data and analysing data sets which may need to be grouped. 	<ul style="list-style-type: none"> • Simultaneous equations. • Advanced ratio. • Surds. • Algebraic fluency and quadratic equations. • Advanced problem solving from UKMT.
<p>Rationale for this sequencing</p>	<p>Our year 7 curriculum relies on students to retrieve the challenging content which is studied during year 6 as well as encouraging students to look at reasoning such as why? And how? They are not only expected to understand how to answer a question but also apply their knowledge and understanding to complex problems.</p> <p>The curriculum is designed to reflect the fact that although student experiences at KS2 may be mixed, the majority of students joining the school will have sound numeric skills. The curriculum is designed to enable students to quickly explore other areas of mathematics not covered at KS2, whilst still providing support or those students who are weaker at basic numeracy.</p>	<p>Throughout year 8, students explore reasoning in Maths and our more able students are introduced to problem solving more regularly in lessons. All students will work on their retrieval and understanding of core skills such as expanding brackets, solving linear equations, calculating averages and understanding different types of number. Year 8 prepares students for the step up in content and difficulty in Year 9.</p>	<p>Year 9 topics build on skills learnt throughout year 7 and 8. This year focuses more on developing conditional knowledges as well as acquiring further declarative and procedural knowledge of topics such as factorising quadratics.</p> <p>As students deepen their knowledge of topics, they are more frequently required to recall different facts and methods to identify the correct process to solve a problem.</p>