

Curriculum

In GCSE Mathematics pupils learn about six aspects of mathematics:

- Number
- Algebra
- Ratio, proportion and rates of change
- Geometry and measure
- Probability
- Statistics

In addition to learning to use and apply standard techniques, pupils will learn to:

- Reason, interpret and communicate mathematically;
- Solve problems within mathematics and in other contexts.

	What pupils will learn	How it builds on learning
Year 10	Number 1: Number skills including order of operations, place value, negative numbers, decimal numbers, indices, surds and standard form. Investigating and discovering special properties of certain numbers.	Builds on the content and skills learnt in Number 1 across Key Stage 3
	Algebra 1: Expressions, including linear and quadratic, and manipulating algebra including using letters to represent numbers. Manipulation of more complex expressions, in particular fractions.	Builds on the content and skills learnt in Algebra 1 across Key Stage 3
	Geometry 1: Angles and angle facts at a variety of levels from looking at angles along a straight line to angles in polygons of various sizes and circle theorems. Accurately drawing shapes using a ruler and a protractor. Pythagoras' theorem. Trigonometry for both right-angled and, at some levels, non-right-angled triangles.	Builds on the content and skills learnt in Data Handling 1 across Key Stage 3
	Data Handling 1: Representing data using tables, charts and graphs. Understanding correlation. Methods of sampling. Use of quartiles and representing data using boxplots and cumulative frequency diagrams.	Builds on the content and skills learnt in Geometry 1 across Key Stage 3
	Number 2: Calculations including different methods of multiplication or division and rounding. Developing skills at using a calculator. Compound measures and upper and lower bounds. Using the product rule for counting.	Builds on the content and skills learnt in Number 2 across Key Stage 3

	<p>Algebra 2: Forming equations, looking at ways to solve them including using a number machine and writing the problem as a sentence. Solving equations as well as inequalities. Solving linear simultaneous equations and for some groups more advanced simultaneous equations. Drawing more complicated graphs, eg. the reciprocal and exponential functions. Using iteration to find solutions to equations.</p>	<p>Builds on the content and skills learnt in Algebra 2 across Key Stage 3</p>
	<p>Geometry 2: Area and perimeter of shapes, ranging from rectangles to compound shapes and then circles, including arcs, sectors and segments. Volume and surface area of 3D shapes.</p>	<p>Builds on the content and skills learnt in Data Handling 2 across Key Stage 3</p>
	<p>Data handling 2: Analysing data using averages and measures of how spread out the data is. At some levels this will include finding averages from data presented in frequency tables or graphs and presenting data in histograms.</p>	<p>Builds on the content and skills learnt in Geometry 2 across Key Stage 3</p>
	<p>Number 3: Fractions, decimals and percentages, including recurring decimals.</p>	<p>Builds on the content and skills learnt in Number 3 across Key Stage 3</p>
	<p>Algebra 3: Sequences including spotting patterns; filling in gaps, finding the rule to generate the sequence and finding the nth term. Plotting coordinates onto a graph and plotting ones which follow a set rule with a view to looking at how this links in with straight line graphs. Further work with straight line graphs, including mid points of line segments, linear inequalities, perpendicular gradients and kinematics graphs. At some levels transformations of graphs is introduced.</p>	<p>Builds on the content and skills learnt in Algebra 3 across Key Stage 3</p>
	<p>Ratio and Proportion 3: Looking at the differences between ratio and proportion, then linking this to skills done previously with percentages. Percentages of amounts. Simple and compound interest. Creating and using scale drawings. Iterative processes. Direct and inverse proportion.</p>	<p>Builds on the content and skills learnt in the Ratio & Proportion parts of Number 3 across Key Stage 3</p>
	<p>Geometry 3: Reflective and rotational symmetry, similarity including congruency, and a selection of the different transformations depending on the level of the pupil – from translations, reflections, rotations and enlargements. Properties of 2D and 3D shapes will also be considered. Use of</p>	<p>Builds on the content and skills learnt in Geometry 3 across Key Stage 3</p>

	vectors. Combinations of transformations of shapes, including the use of matrices for such transformations.	
	Data handling 3: Continuing to investigate probability ranging from words to describe likelihood, working out numerical probabilities and drawing diagrams to display all possible outcomes. Conditional probability.	Builds on the content and skills learnt in Data Handling 3 across Key Stage 3
	What pupils will learn	How it builds on learning
Year 11	Algebra 1: Expressions, including linear and quadratic, and manipulating algebra including using letters to represent numbers. Manipulation of more complex expressions, in particular fractions. Identities and proof. Factor theorem. Composite functions.	Builds on the content and skills learnt in Year 10 Algebra 1
	Geometry 1: Angles and angle facts at a variety of levels from looking at angles along a straight line to angles in polygons of various sizes and circle theorems. Accurately drawing shapes using a ruler and a protractor. Pythagoras' theorem including in 3D for some groups. Trigonometry for both right-angled and, at some levels, in 3D and for non-right-angled triangles. More advanced students will also investigate the trigonometric functions in more depth and meet differentiation and some of its applications.	Builds on the content and skills learnt in Year 10 Geometry 1
	Data Handling 1: Representing data using tables, charts and graphs. Understanding correlation. Methods of sampling. Use of quartiles and representing data using boxplots and cumulative frequency diagrams.	Builds on the content and skills learnt in Year 10 Data Handling 1
	Number 2: Calculations including different methods of multiplication or division and rounding. Developing skills at using a calculator. Compound measures and upper and lower bounds. Using the product rule for counting.	Builds on the content and skills learnt in Year 10 Number 2
	Algebra 2: Forming equations, looking at ways to solve them including using a number machine and writing the problem as a sentence. Solving equations as well as inequalities; for some groups solving quadratic inequalities. Solving linear simultaneous equations and for some groups more advanced simultaneous equations. Drawing more complicated graphs, e.g. the reciprocal and exponential functions. Using	Builds on the content and skills learnt in Year 10 Algebra 2

	iteration to find solutions to equations. Inverse functions	
	Geometry 2: Area and perimeter of shapes, ranging from rectangles to compound shapes and then circles, including arcs, sectors and segments. Volume and surface area of 3D shapes.	Builds on the content and skills learnt in Year 10 Geometry 2
	Data handling 2: Analysing data using averages and measures of how spread out the data is. At some levels this will include finding averages from data presented in frequency tables or graphs and presenting data in histograms.	Builds on the content and skills learnt in Year 10 Data Handling 2
	The summer term will be spent revising.	Consolidation and review of all learning from across Key Stage 3 and Key Stage 4 in preparation for GCSE assessment.

Assessment

During Year 10, students will continue the same assessment structure as in Key Stage 3. After each unit, pupils complete an end of topic review task; this may be in class or at home.

At the end of the Autumn and Spring terms, students sit a progress test in class. The test is to assess the students' learning and understanding of the topics taught in each term. At the end of the Summer term, student will sit a practice GCSE exam paper in order to assess their understanding of all topics taught across Key Stage 3 and Key Stage 4 so far.

At the end of Year 11, pupils sit three exam papers. Each exam is 1 hour 30 minutes long.

For two of the three papers, pupils are allowed to use a calculator. The three papers are weighted equally, and each paper may assess content from any part of the specification.

There is no coursework or controlled assessment for GCSE Mathematics.

Pupils sit papers at one of two tiers:

Tier	Grades available
Higher	4, 5, 6, 7, 8, 9
Foundation	1, 2, 3, 4, 5

We choose each pupil's tier of entry based on which course will allow that pupil to achieve the highest GCSE grade possible.

Pupils who may not achieve a GCSE grade 1 are able to work towards a nationally recognised Entry Level Certificate.

Supporting your child

What you can do at home:

Please regularly look at your child's individual learning log with them. This can be found either in the front of their exercise book or on OneNote. This will detail the learning objectives that are being covered in each topic and your child's progress with them. Please support us with the expectations on equipment and homework (detailed below) and encourage your child to be independent with these too.

Many pupils find revision guides helpful and we make recommendations about appropriate guides once the course have started.

Equipment:

We would expect all pupils to have the following equipment the core equipment, plus some maths essentials. During assessments the department operates a zero-tolerance policy and will not lend out any equipment.

The additional maths equipment is: a pair of compasses, a scientific calculator and a protractor.

Extended learning

Homework policy:

Homework is set weekly, which will take between 30 to 60 minutes to complete, depending on the task set.

We will regularly assess pupils to monitor attainment and to adjust targets as necessary. This assessment will continue to include end-of-term progress tests as well as practice GCSE papers in class; homework for the preceding 1 to 2 weeks will be revision for the test.

Clubs/ Enrichment opportunities:

The UKMT Intermediate Maths Challenge takes place in February. Other enrichment opportunities will be provided throughout the year. Examples from previous years include Christmas origami, Hurricane Houses project and MegaMenger.

Extended study suggestions:

The school subscribes to the SparxMaths website: www.SparxMaths.com

This resource can be used both to review learning done in classes but also to complete online homework on topics recently covered.

For a more open-ended selection of maths problems, the nrich website can prove useful: <http://nrich.maths.org>

Many pupils find revision guides helpful, and we make recommendations about appropriate guides once the course have started.