

Mathematics Curriculum Key Stage 3

Vision

The Mathematics Faculty aims to build and uphold a rich, diverse and challenging curriculum that is deep and intense in subject knowledge, which not only meets the needs of the annual examinations but simultaneously is inclusive of the needs of all students. We aim to prepare students with the confidence and mathematical skills required in life and the workplace. Our syllabus is led by the national curriculum with a range of tasks that emphasize problem solving, investigations and practical activities. This encourages students to become independent learners.

Students are set from Year 7 through to Year 11 (they are placed according to prior attainment and are able to move between sets depending on their progress)

Decisions about progression are based on the security of students' understanding and their readiness to progress to the next stage of their education. Students who grasp concepts rapidly will be challenged through being offered rich and sophisticated problems before any acceleration through new content in preparation for the next stage of their education. Those who are not sufficiently fluent will be given the opportunity to consolidate their understanding, including through additional practice, before moving on. At Key Stage 3 students are taught so they:

Develop fluency

- Consolidate their numerical and mathematical capability from Key Stage 2 and extend their understanding of the number system and place value to include decimals, fractions, powers and roots;
- Select and use appropriate calculation strategies to solve increasingly complex problems;
- Use algebra to generalise the structure of arithmetic, including formulating mathematical relationships;
- Substitute values in expressions, rearrange and simplify expressions, and solve equations;
- Move freely between different numerical, algebraic, graphical and diagrammatic representations;
- Develop algebraic and graphical fluency, including understanding linear and simple quadratic functions;
- Use language and properties precisely to analyse numbers, algebraic expressions, 2-D and 3-D shapes, probability and statistics.

Reason mathematically

- Extend their understanding of the number system; make connections between number relationships, and their algebraic and graphical representations;
- Extend and formalise their knowledge of ratio and proportion in working with measures and geometry, and in formulating proportional relations algebraically;
- Identify variables and express relations between variables algebraically and graphical;
- Make and test conjectures about patterns and relationships; look for proofs or counter-examples;
- Begin to reason deductively in geometry, number and algebra, including using geometrical constructions;
- Interpret when the structure of a numerical problem requires additive, multiplicative or proportional reasoning;
- Explore what can and cannot be inferred in statistical and probabilistic settings, and begin to express their arguments formally;

Solve problems

- Develop their mathematical knowledge, in part through solving problems and evaluating the outcomes, including multi-step problems;
- Develop their use of formal mathematical knowledge to interpret and solve problems, including in financial mathematics;
- Begin to model situations mathematically and express the results using a range of formal mathematical representations;
- Select appropriate concepts, methods and techniques to apply to unfamiliar and non-routine problems.

Teaching and Learning

There are **six** key strands of Mathematics taught as part of the national curriculum, which are weighted differently depending on the tier of examination:

1. Number
 - Structure and calculation
 - Fractions, decimals and percentages
 - Measures and accuracy
2. Algebra
 - Notation, vocabulary and manipulation
 - Graphs
 - Solving equations and inequalities
 - Sequences
3. Ratio, proportion and rates of change
4. Geometry and measures
 - Properties and constructions
 - Mensuration and calculations
 - Vectors
5. Probability
6. Statistics

Extra Curricular Activities and Homework

Homework Clubs

UKMT

Programmes of Study for KS3 (Foundation)

KS3	YEAR 7	YEAR 8	YEAR 9
Term	FOUNDATION SoW	FOUNDATION SoW	FOUNDATION SoW
Autumn 1	Unit 1 Analysing and displaying data	Unit 1 Number properties and calculations	Unit 1 Number calculations
	Unit 2 Calculating	Unit 2 Shapes and measures in 3D	Unit 2 Sequences and equations
	Half Term Test		
Autumn 2	Unit 3 Expressions, functions and formulae	Unit 3 Statistics	Unit 3 Statistics
	Unit 4 Graphs	Unit 4 Expressions and equations	Unit 4 Fractions, decimals and percentages
	End of Term Test		
Spring 1	Unit 5 Factors and multiples	Unit 5 Decimal calculations	Unit 5 Geometry in 2D and 3D
	Unit 6 Decimals and measures	Unit 6 Angles	Unit 6 Algebraic and real-life graphs
	Half Term Test		
Spring 2	Unit 7 Angles and lines	Unit 7 Number properties	Unit 7 Multiplicative reasoning
	End of Term Test		
Summer 1	Unit 8 Measuring and shapes	Unit 8 Sequences	Unit 8 Algebraic and geometric formulae
	Unit 9 Fractions, decimals and percentages	Unit 9 Fractions and percentages	Unit 9 Probability
	Half Term Test		
Summer 2	Unit 10 Transformation	Unit 10 Probability	Unit 10 Polygons and transformations
	End of Year Test		

Programmes of Study for KS3 (Higher)

KS3	YEAR 7	YEAR 8	YEAR 9
Term	FOUNDATION SoW	FOUNDATION SoW	FOUNDATION SoW
Autumn 1	Unit 1 Analysing and displaying data	Unit 1 Factors and powers	Unit 1 Powers and roots
	Unit 2 Number skills	Unit 2 Working with powers	Unit 2 Quadratics
Half Term Test			
Autumn 2	Unit 3 Equations, functions and formulae	Unit 3 2D shapes and 3D solids	Unit 3 Inequalities, equations and formulae
	Unit 4 Fractions	Unit 4 Real-life graphs	Unit 4 Collecting and analysing data
End of Term Test			
Spring 1	Unit 5 Angles and shapes	Unit 5 Transformations	Unit 5 Multiplicative reasoning
	Unit 6 Decimals	Unit 6 Fractions, decimals and percentages	Unit 6 Non-linear graphs
Half Term Test			
Spring 2	Unit 7 Equations	Unit 7 Constructions and loci	Unit 7 Accuracy and measures
	End of Term Test		
Summer 1	Unit 8 Multiplicative reasoning	Unit 8 Probability	Unit 8 Graphical solutions
	Unit 9 Perimeter, area and volume	Unit 9 Scale drawings and measurements	Unit 9 Trigonometry
Half Term Test			
Summer 2	Unit 10 Sequences and graphs	Unit 10 Graphs	Unit 10 Mathematical reasoning
	End of Year Test		

Useful Websites Exam boards

<https://qualifications.pearson.com/en/qualifications/edexcel-gcses/mathematics-2015.html>

Learning Resources

<https://www.mathsgenie.co.uk> - A bank of exam questions by topic with worked solutions.

<https://vle.mathswatch.co.uk/vle> - MathsWatch is the complete online Maths platform that makes learning available to your students 24/7 with a personalised log-in.