Mathematics @ KS4

Assessment Objectives:
AO1 Demonstrate knowledge and understanding of mathematical techniques
AO2 Reason, interpret and communicate mathematically when solving problems

Assessment in mathematics will be ongoing and based on the Assessment Objectives.

Exams (for 2023 and 2024 only, format to change from 2025**)**:

Core candidates take:		Extended candidates take:	
Paper 1 (Core)	1 hour 35%	**Paper 2 (Extended)**	1 hour 30 minutes 35%
56 marks		70 marks	
Short-answer questions		Short-answer questions	
Questions will be based on the Core curriculum		Questions will be based on the Extended curriculum	
Externally assessed		Externally assessed	
and:		**and:**	
Paper 3 (Core)	2 hours 65%	**Paper 4 (Extended)**	2 hours 30 minutes 65%
104 marks		130 marks	
Structured questions		Structured questions	
Questions will be based on the Core curriculum		Questions will be based on the Extended curriculum	
Externally assessed		Externally assessed	

Domains and Concepts:
The subject content is organised by topic: number, algebra, shape and space, and probability and statistics. The content is not presented in a teaching order

Number: Number
Algebra: Algebra and graphs, Coordinate geometry
Shape and Space: Geometry, Mensuration, Trigonometry, Vectors and transformations
Probability and Statistics: Probability, Statistics

Application of 5Cs in Mathematics:
Mathematics provides a rich context for teaching and cultivating values such as **community, compassion, creativity, confidence, and challenge**. In a maths classroom, students can engage in collaborative problem-solving activities, fostering a sense of **community** as they work together, share ideas, and learn from one another. The exploration of mathematical concepts and real-world applications encourages students to develop **compassion** by understanding how maths can be used to address societal issues and make a positive impact. Mathematics also nurtures creativity by encouraging students to think critically, explore different problem-solving strategies, and discover innovative solutions. As students tackle **challenging** mathematical problems, they develop **confidence** in their abilities to analyse, reason, and persevere. The inherent nature of mathematics, with its logical structures and puzzles, presents a continuous **challenge** that pushes students to think deeply, expand their skills, and embrace new mathematical frontiers. Through the study of mathematics, students not only gain mathematical knowledge but also acquire valuable life skills and attitudes that contribute to their growth and success.

Support and Opportunities:
Maths Support Club
Maths Challenge Club
UKMT Maths Challenges

Recommended Sites:
Dr Frost Maths
MyIMaths
UKMT

	Year 10	Year 11	
Term 1	*Mixed ability classes, covering Overlap topics*	Extended Students	Core Students
Topic and Content	**Topic 1**: Number (10N1, 10N2, 10N3) **Topic 2**: Algebra (10A1, 10A2)	**Algebra**: 11EA1, 10EA6, 10EA7, 11EA2	**Topic 1:** Algebra (11CA1, 11CA2) **Topic 2:** Data (11CD1, 11CD2)
Skills	**Number**: factors, multiples, primes, finding HCF and LCM; using indices, converting to/from standard form; converting between fractions, decimals and percentages, calculating with all four operations using fractions and decimals **Algebra:** simplifying, rearranging, factorising and expanding algebraic brackets; solving linear equations from 1- to 3-step, solving linear simultaneous equations	**Recap:** factorising and expanding algebraic brackets; solving linear simultaneous equations; rearranging formulae; indices in algebra **Y10:** sketching quadratic graphs, simplifying quadratic expressions, solving quadratic equations; simplify algebraic fractions, complete the four operations with algebraic fractions **Functions:** function notation, finding composite and inverse functions, sketching functions	**Recap:** factorising and expanding algebraic brackets; solving linear simultaneous equations; rearranging formulae; indices in algebra **Algebra:** construct tables of values for linear and quadratic functions, draw and interpret these graphs, solve linear and quadratic equations approximately, including by graphical methods, recognise, sketch and interpret graphs **Data:** calculate probability of a single event, extract information from tables to give probabilities, use the probability scale, understand the probability of an event not occurring, calculate the probability of combined events using sample spaces; apply understanding of venn diagrams to probability, use and interpret tree diagrams, use relative frequency to make predictions from probabilities
Methods of Assessment	Tests (baseline and end of term) and Home Learning tasks (combination of MyiMaths and worksheets) *Students' test performance will determine whether they continue with extended topics or move to a Core class.*	Baseline test, End of Term Test (cumulative) and Home Learning tasks (exam question worksheets)	

Term 2	*Mixed ability classes, covering Overlap topics*	Extended Students	Core Students
Topic and Content	**Topic 1**: Algebra (10A3, 10A4) **Topic 2**: Geometry (10G1, 10G2, 10G3)	**Algebra:** 11EA3 **Data:** 11ED1, 11ED2, 11EN4, 11ED4 **Geometry:** 11EG2	**Data:** 11CD3, 11CD4 **Geometry:** 11CG2 **Number:** 11CN1
Skills	**Algebra:** recognising, continuing and finding the nth term of linear/quadratic/geometric sequences; plot coordinates and simple straight lines, identifying and use $y = mx + c$, find the equations of lines given conditions **Geometry:** convert between metric units, use compound measures (speed/density); find the area and perimeter of common shapes; find the volume and surface area of common shapes	**Algebra:** draw graphs, draw tangents to estimate gradients, solve equations graphically, recognise asymptotes; differentiate terms of the form ax^n, use differentiation to find turning points, local minima/maxima, find the vertex by completing the square **Data:** calculate the mean, median, mode and range; compare data sets, find the average of grouped and continuous data, find quartiles; compare data using charts, construct and interpret histograms, stem and leaf, pie charts, scatter graphs, cumulative frequency curves and box plots; sort information into sets, interpret venn diagrams, understand notation of Venn diagrams, interpret set theory language; find probabilities of events, use and interpret tree diagrams, use venn diagrams to find probabilities **Geometry:** describe (and draw) a line segment as a vector, manipulate vector combinations, use position vectors	**Data:** collect data, read and make a tally chart, calculate the mean, median, mode and range of data, read and interpret tabulated data; compare data using pictographs, pie charts and bar charts, construct bar charts, histograms, stem and leaf diagrams, pie charts and scatter graphs **Geometry:** describe (and draw) a line segment as a vector, add, subtract and multiply vectors **Number:** understand and use Venn notation of Venn diagrams, read and define sets
Methods of Assess.	End of Term Test (cumulative, including Term 1 topics) and Home Learning tasks (combination of MyiMaths and worksheets)	End of Term Test (cumulative) and Home Learning tasks (exam question worksheets)	

Term 3	Extended Students	Core Students	Extended Students	Core Students
Topic and Content	**Topic 1:** Number (10EN4, 10EN5, 10EN6) **Topic 2:** Geometry (10EG4, 10EG5, 10G7)		Review and Recap Exam Practice	
Skills	**Number:** ordering decimals, rounding and estimating, finding bounds (for calculations); simplify and use ratio, solve problems on sharing in ratios, use unitary methods, work with direct/indirect proportion algebraically; find percentages, increase and decrease in percentages, solve % problems **Geometry:** know and basic angle rules, identify and find angles in parallel lines, find interior and exterior angles in polygons; know and use (basic) circle theorems; identify similar and congruent shapes, construct triangles, use similarity for length/area/volume, find and use bearings; use pythagoras' theorem, know and use trigonometric ratios to find sides/angles		**Review and recap**: of all content (see syllabus and above) **Exam Skills**: presentation of solutions, solving problems, recognising key words, remembering algorithms, use of mark schemes	
Methods of Assessment	End of Term Test (cumulative, including Term 1/2 topics) and Home Learning tasks (combination of MyiMaths and worksheets)		Mocks, End of Term Test (cumulative) and Home Learning tasks (exam question worksheets)	
Term 4	Extended Students	Core Students	Extended Students	Core Students
Topic and Content	**Topic 1:** Algebra (10EA5, 10EA6, 10EA7) **Topic 2:** Geometry (10EG6)	**Topic 1:** Algebra (10CA5, 10CA6, 10CA7) **Topic 2:** Geometry (10CG6)	Revision and Exam Practice	
Skills	**Algebra:** using inequalities, solving linear inequalities, representing inequalities on graphs; sketching quadratic graphs, simplifying quadratic expressions, solving quadratic equations; simplify algebraic fractions, complete the four operations with algebraic fractions **Geometry:** use pythagoras' theorem in 3D, solve	**Algebra:** simplifying, rearranging, factorising and expanding algebraic brackets; solving linear equations from 1- to 3-step, solving linear simultaneous equations; rearranging formulae, substituting in algebraic expressions, use indices in algebra	**Revision**: of all content (see syllabus and above) **Exam Skills**: time management, presentation of solutions, solving problems, recognising key words, remembering algorithms, use of mark schemes	

	trigonometric problems, use the sine rule, use the cosine rule, find the area of complex triangles, solve 3D trigonometry problems	**Geometry:** draw and use bearings, use pythagoras' theorem, use trigonometric ratios to find lengths/angles		
Methods of Assessment	End of Year Exam (cumulative) and Home Learning tasks (combination of MyiMaths and worksheets)	End of Year Exam (cumulative) and Home Learning tasks (combination of MyiMaths and worksheets)	**iGCSE Public Examinations** Paper 2: 1h 30 mins Paper 4: 2h 30 mins	**iGCSE Public Examinations** Paper 1: 1 hour Paper 3: 2 hours