



St George's School

MATHEMATICS

KS4 Curriculum

PRIOR KNOWLEDGE <i>Knowledge and skills developed in KS3</i>	Mathematics specific knowledge as detailed in our KS3 curriculum maps. Skills developed: - Creativity through visual representations and open-ended tasks. - Critical Thinking through articulation and questioning. - Communication through discussion and clear written methods shown in modelling. - Reasoning through understanding 'why' methods work and generalising concepts. - Reflection through feedback and discussion. - Problem solving through challenge, enrichment and strategising.
COURSE DELIVERY & STRUCTURE <i>How the curriculum is delivered</i>	Lessons: In both Year 10 and 11, students have three Maths lessons per week. This forms part of their core curriculum. Grouping: Students are taught in banded ability sets, often with more than one group at each 'level'. The majority of students complete the GCSE Higher tier content and assessment. Students with lower attainment are entered for the Foundation tier. Structure: We begin teaching GCSE maths in Year 9. Our curriculum builds directly on the skills and knowledge gained in KS3. It is taught as a series of units. They are sequenced to cover the full GCSE specification and build students' knowledge and skills over time. Prep: Students will normally receive two prep (homework) tasks per week. These will predominantly consist of consolidation tasks. 'End of unit' consolidation prep will also feature throughout.
QUALIFICATION <i>Exam Board, aims and objectives</i>	GCSE (9-1) in Mathematics (1MA1) Pearson Edexcel Qualification aims and objectives: ➤ develop fluent knowledge, skills and understanding of mathematical methods and concepts. ➤ acquire, select and apply mathematical techniques to solve problems. ➤ reason mathematically, make deductions and inferences, and draw conclusions. ➤ comprehend, interpret and communicate mathematical information in a variety of forms appropriate to the information and context.
ASSESSMENT <i>Internal monitoring and final assessment</i>	Internal Assessment: Prep tasks will be monitored for completion and accuracy. Formative feedback will be given for 'end of unit' prep tasks, consisting of past exam questions. Regularly spaced checkpoints will provide summative feedback. Students will complete mock exams in Year 10 and Year 11. Final assessment: 3 equally-weighted written examination papers, each of which is 1 hour and 30 minutes long. Paper 1 is non-calculator and a calculator is allowed for Paper 2 and Paper 3.
BREADTH <i>Opportunities, trips, wider reading, cultural capital</i>	UKMT Intermediate Maths Challenge. Designated enrichment, extension and consolidation lessons throughout the course.

HIGHER	SUBJECT KNOWLEDGE <i>Overview of topics</i>	SKILLS & STRATEGIES <i>Procedural knowledge</i>
Autumn Y10	3D forms & volume, cylinders, cones and spheres Accuracy & bounds Transformations Constructions & loci Scale drawing & bearings Solving quadratics & simultaneous equations	Converting units; using and applying formulae; problem solving. Describing and calculating with error intervals Drawing and describing the four key transformations including in combination. Drawing accurate constructions, plans and elevations. Drawing and measuring scales and bearings. Factorising; using formula; completing square; forming and solving linear and non-linear simultaneous equations.
Spring Y10	Inequalities Probability Multiplicative reasoning Similarity & congruence	Solving inequalities and describing intervals. Calculating experimental and theoretical probability for singular and combined events; using Venn diagrams and set notation. Calculating percentage change; using ratio; converting units; using formula. Recognise and prove congruence; use scale factors to solve problems.
Summer Y10	Graphs of trig functions Further trigonometry Collecting data Cumulative frequency, box plots & histograms Inequalities	Drawing and using trig graphs to solve equations. Applying the sine, cosine and area rule; use all trig techniques in 3D. Selecting samples and explaining the purpose and assumptions in doing so. Drawing, interpreting and reading statistical diagrams; comparing distributions. Graphing solutions of inequalities.
Autumn Y11	Quadratics & graphs Circle theorems & geometry Algebraic techniques including proof & functions Vectors & geometric proof	Graphing solutions of simultaneous equations and equations (roots); using iterative processes. Recalling, applying and proving circle theorems; finding equations of circles and tangents. Changing subject of a formula; manipulating algebraic fractions; understanding and using function notation. Understand and use vector notation to calculate, problem solve and prove.
Spring Y11	Graphs Surds Proportion Proof	Recognise and sketch different graph types; transforming graphs. Further manipulation of surds, including rationalising the denominator. Forming equations and solving problems relating to direct and inverse proportion; using graphs. Algebraically proving results.
Summer Y11	Revision, consolidation & exam preparation	Spaced practice. Retrieval and recall practice. Interleaving of topics.

FOUNDATION	SUBJECT KNOWLEDGE <i>Overview of topics</i>	SKILLS & STRATEGIES <i>Procedural knowledge</i>
Autumn Y10	Perimeter, area and volume Real-life graphs Straight-line graphs Transformations	Converting units; using and applying formulae; problem solving. Drawing and interpreting graphs from real data. Calculating the midpoint and gradient given two coordinates; working with parallel lines; drawing, identifying and interpreting straight-line graphs. Drawing and describing the four key transformations including in combination.
Spring Y10	Ratio Proportion Pythagoras' theorem Right-angled trigonometry Probability	Understanding and using ratios to calculate and problem solve. Recognising proportionality; calculating and problem solving. Recalling, calculating and problem solving with Pythagoras' theorem. Recalling, calculating and problem solving with the trigonometric ratios; identifying and calculating angles of elevation and depression; recalling exact values of key trigonometric ratios. Calculating experimental and theoretical probability for singular and combined events; using Venn diagrams and set notation.
Summer Y10	Multiplicative reasoning Plans and elevations Constructions, loci and bearings	Calculating percentage change; using ratio; converting units; using formula. Drawing accurate plans and elevations. Drawing accurate constructions; drawing and measuring scales and bearings.
Autumn Y11	Quadratic equations: expanding and factorising Quadratic equations: graphs Circles, cylinders, cones and spheres Fractions and reciprocals Indices and standard form Similarity and congruence in 2D	Multiplying double brackets; recognising, factorising and solving quadratics. Plotting, recognising and using quadratic graphs. Using and applying formulae; problem solving. Performing fractional arithmetic. Recalling and using the laws of indices; converting numbers to and from standard form; performing arithmetic with standard form.
Spring Y11	Vectors Rearranging equations, graphs of cubic and reciprocal functions and simultaneous equations	Performing vector arithmetic; identifying parallel vectors; problem solving. Drawing and interpreting cubic and reciprocal graphs; forming and solving linear simultaneous equations; identifying expressions, equations, formulae and identities; rearranging the subject of an equation; proving results using algebra.
Summer Y11	Revision, consolidation & exam preparation	Spaced practice. Retrieval and recall practice. Interleaving of topics.