Key Stage 4 Curriculum Overview – Maths
AQA Level 1/2 GCSE (9-1) in Mathematics QAN 601/4608/4

Curriculum Intent

The Mathematics department strives to give students the confidence to acquire and use mathematical skills that will stand them in good stead throughout their lifetime. The department seeks to achieve excellence in the teaching and learning of Mathematics, in order for the students to make significant progress, irrespective of their prior attachment in this interesting and varied subject. As a core subject studied by all students throughout their time at school, we believe Maths is one of the most important and interesting in the curriculum. Wherever you look in the world there is Maths and we aim to equip students with the knowledge, and more importantly, the skills to fully participate in our information driven society.

Approach / Philosophy / Implementation:

The curriculum in Maths aims to ensure that students:
Develop a culture of deep understanding, confidence and competence in Maths producing strong, secure learning and progress.
Develop fluency in the fundamental skills of Maths through practice in different contexts and in problem solving.
Reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
Solve problems by applying mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

How students are assessed

Students are assessed through three external exams worth 33% of the total grade. All three exams will be 1 hour and 30 minutes and focus on the following assessment objectives:
AO1: Use and apply standard techniques (50% at Foundation tier; 40% at Higher tier)
AO2: Reason, interpret, and communicate mathematically (25% at both tiers)
AO3: Solve problems within mathematics and in other contexts (25% at Foundation tier; 35% at Higher tier)
Paper 1: Non-Calculator. Paper 2 and 3 Calculator allowed

Term	Year 10	Year 11
Autumn term 1	**Congruence, similarity & enlargement** Enlarge shapes Similar shapes (angles/volume/area) Parallel lines & angles Congruence **Trigonometry** Ratio in right-angled triangles Tangent Sine/cosine Missing angles/sides Trigonometry in 3d shapes	**Gradients & lines** Straight line graphs Equations from graphs Perpendicular lines **Non-linear graphs** Quadratic graphs Cubic graphs Reciprocal graphs Roots and intercepts **Using graphs** Conversion graphs

	Using formulas/rules	Distance/time graphs Piece-wise graphs Direct/inverse proportion
Autumn term 2	**Representing solutions of equations & inequalities** One/two-step equations/inequalities Inequalities represented on number lines Straight line graphs Unknowns on both sides Quadratic equations **Simultaneous equations** Solve linear simultaneous equations by substitution Solve simultaneous equations using graphs Derive related facts Solve simultaneous equations using adjusting Solve a pair of linear equations	**Expanding and factorising** Single brackets Binomials quadratics **Changing the subject** Solve linear equations Solve inequalities Change the subject of formulae **Functions** Function machines Substitution Composite/inverse/quadratic/trigonometric functions
Spring term 1	**Angles & bearings** Measure angles Scale diagrams Measure & read bearings Scale drawings using bearings Bearings with Pythagoras/trigonometry/sine/cosine **Working with circles** Parts of a circle Arc length Area of sectors Circle theorem (angles in various parts) Volume of cylinder/cone/sphere Surface area of cylinder/cone/sphere **Vectors** Vector notation Addition/subtraction of vectors Vectors with shapes	**Multiplicative reasoning** Scale factors Direct/inverse proportion Pressure/density Ratio problems **Geometric reasoning** Angles at a point Angles in parallel lines Interior/exterior angles Circle theorems Pythagoras' theorem **Algebraic reasoning** Simplify complex expressions Nth term Simultaneous equations
Spring term 2	**Ratio & fractions** Share in a ratio Ratios & graphs	**Transforming & constructing** Line symmetry & reflection Rotation & rotational symmetry

	Currency conversion 1:n & n:1 Best buy problems Ratio algebra/area/volume problems **Percentages & interest** Convert/compare fractions/decimals/percentages Percentages with/without a calculator Simple/compound interest Percentage change Iterative processes **Probability** Fractional operations Probability sum to 1 Experimental data to estimate probabilities Probabilities from tables/Venn diagrams/frequency trees Sample spaces Independent/dependent events Conditional probabilities	Translations/enlargements Constructions Loci **Listing & describing** Organised lists Product rule Sample spaces Venn diagrams Plans/elevations Distributions Scatter graphs **Show that…** Number Algebra Shape Angles Data Vectors triangles
Summer term 1	**Collecting, representing & interpreting data** Populations/samples Primary/secondary data Frequency tables/polygons Two-way tables Line/bar/pie charts Histograms Averages Stem-and-leaf diagrams Cumulative frequency Box plots Scatter graphs **Non-calculator methods** Four operations with integers/decimals/fractions Rational & irrational numbers Surds Significant figures	**Revision & examinations**

	Bounds Financial maths problems	
Summer term 2	**Types of number & sequences** Factors/multiples/primes/prime factors HCF/LCM Sequences Nth term **Indices & roots** Powers/roots Standard form **Manipulating expressions** Simplify expressions Identities Operations with algebraic fractions	
Evidence of learning	Students complete 20-minute end of block assessments (at foundation and higher levels) that cover each of the small steps after each unit of work. These are recorded and compared as a cohort to ensure good progress is being made. Assessment will be ongoing through lessons the use of mini-whiteboards and 'live' marking. Students will also have end of term tests to showcase retention of knowledge – this will help inform their grades and targets.	
Links to prior learning	Links back directly to Year 7, 8 and 9 work completed at Holywell and all of our units of work build upon prior knowledge gained throughout KS3. Throughout the year skills learnt at Holywell will be revisited in different contexts. Our scheme builds over time and allows for small steps to be taught by teachers so Students can be the best they can be. If there are gaps we will endeavour to close these and adjust lessons accordingly.	
Links to future learning	These skills are built upon in KS4 and are used regularly to solve problems. Start of GCSE curriculum – base works for this, especially algebra units.	

Reading in the curriculum (Literacy & Vocabulary)

Key vocabulary is identified in each unit and taught explicitly during lessons.
We encourage Students to talk like a Mathematician using the key words in Mathematics.
Verbal discussion and Oracy in Maths are encouraged throughout learning.
Students are encouraged to use full sentences in their explanations and reading strategies are reinforced when teaching.

Careers in the curriculum

Computer analyst Criminology expert Civil engineering – structure using shapes Programming Financial analyst Product designing/industry Software engineering Data analyst Computer Software developer System analyst Mathematical modeller Space scientist Accountant Growth analyst Pilot Construction Midwifery/Nursing Architecture Design/Industry Banking Teacher

EVERY JOB!!

Protected Characteristics in the curriculum

By maintaining high standards of behaviour, including mutual respect and tolerance for different faiths and beliefs and encouraging learners to respect the protected characteristics, class teachers will be promoting British values.

Safeguarding including safety in the curriculum

Ensuring students are seated in a way that takes account of safeguarding notes and which promotes positive learning and social outcomes. Reporting any concerns within department and school policies.

Spirituality in the curriculum

Links to real-world scenarios – farming, transporting goods etc.
Discussions on how we can use Maths to improve the world.

Values across the curriculum

Respect – Respecting different abilities in the classroom, different styles and approaches
Perseverance & Resilience – Keeping on going is key to solving problems and improving within Maths
Trust – Trusting the process – keep going and you will improve
Community/Co-operation – working together to solve problems, fins mistakes and improve
Joy/Happiness - To enjoy the subject of Maths
Determination - To keep going

How we track your progress

Linking to the progress descriptors all students' progress is tracked through the work they produce and contribute to in class, homework, end of unit assessments and in class assessments/quizzes.

Students access end of block tests when a unit of work is complete – this allows everyone to see where progress has been made. These are out of 20 each time and the papers go home so parents can see them. All learners also have end of term tests – these cover all skills in Maths and help to decide progress points – this is shared with learners. Homework on Sparx Maths also shows Students their progress and rewards consistency/effort.

GCSE assessments

Mocks throughout Y10-11 to build up towards main GCSE papers at the end of Y11

AQA exam board

Content from any part of the specification may be assessed

3 tests – 1 calculator, 2 non-calculator. 90 minutes each – 80 marks each. Each paper 33⅓% of the GCSE Mathematics assessment. Questions are A mix of question styles, from short, single-mark questions to multi-step problems. The mathematical demand increases as a student progresses through the paper.

The weighting of the topic areas has been prescribed by Ofqual and is common to all exam boards. The table below shows the approximate weightings of the topic areas for the overall tier of assessment, not for each individual question paper.

Topic Area	Foundation Tier (%)	Higher Tier (%)
Number	25	15
Algebra	20	30
Ratio	25	20
Geometry	15	20
Probability & Statistics	15	15

Parents/Carers can support their child by:

Being positive with Students. Checking test papers that come home and discussing Maths with Students. Ensuring times tables facts are known for rapid recall. Making sure homework is completed and to a good standard.

Sustainability within the subject

Links to real-world scenarios – farming, transporting goods etc.

Discussions on how we can use Maths to improve the world.