Mathematics Curriculum – Year 10 Higher Tier

Big Ideas & Purpose	The aims of teaching and learning mathematics are to encourage and enable students to: recognise that mathematics permeates the world around us; appreciate the usefulness, power and beauty of mathematics and enjoy mathematics and develop patience and persistence when solving problems.					
Programme of Study	**HT1** **Number** Number problems and reasoning Place value and estimating HCF and LCM Calculating with powers (indices) Zero, negative and fractional indices Powers of 10 and standard form Surds **Algebra** Algebraic indices Expanding and factorising Equations Formulae Linear sequences Non-linear sequences More expanding and factorising	**HT2** **Interpreting and representing data** Statistical diagrams Time series Scatter graphs Line of best fit Averages and range **Fractions, ratio and percentages** Fractions Ratios Ratio and proportion Percentages Fractions, decimals and percentages **Angles and trigonometry** Angle properties of triangles and quadrilaterals Interior and exterior angles of a polygon Pythagoras' theorem Trigonometry	**HT3** **Graphs** Linear graphs More linear graphs Graphing rates of change Real-life graphs Line segments Quadratic graphs Cubic and reciprocal graphs More graphs **Area and volume** Perimeter and area Units and accuracy Prisms Circles & Sectors Cylinders and spheres Pyramids and cones **Transformations and constructions** 3D solids Reflection and rotation Enlargement Combinations of transformations	**HT4** Bearings and scale drawings Constructions Loci **Equations and inequalities** Solving quadratic equations Completing the square Solving simple simultaneous equations Solving linear and quadratic simultaneous equations Solving linear inequalities **Probability** Combined events Mutually exclusive events Experimental probability Independent events and tree diagrams Conditional probability Venn diagrams and set notation	**HT5** **Multiplicative reasoning** Growth and decay Compound measures Ratio and proportion **Similarity and congruence** Congruence Geometric proof and congruence Similarity Similarity in 3D solids **More trigonometry** Accuracy Graph of the sine function Graph of the cosine function The tangent function Calculating areas and the sine rule The cosine rule and 2D trigonometric problems Solving problems in 3D Transforming trigonometric graphs	**HT6** **Further statistics** Sampling Cumulative frequency Box plots Drawing histograms Interpreting histograms Comparing and describing populations **Equations and graphs** Solving simultaneous equations graphically Representing inequalities graphically Graphs of quadratic functions Solving quadratic equations graphically Graphs of cubic functions
Key Assessments	• Assessments take place after every unit. • Usually 2 per half term.		• Year 10 will take an examination based on the work covered in units 1-5 in January. • Assessments take place after every unit.		• Year 10 will also take an end of year examination in the summer term. This will be a full GCSE examination, with 3 papers.	

Key Skills

- To provide opportunities for learner to demonstrate their knowledge of mathematics across a whole range of topic areas.
- To allow learners to develop their problem-solving strategies and provide the confidence and skills required to tackle unfamiliar challenges.
- To build on work carried out in Key Stage 3 to prepare the learner to function mathematically.

Links to Careers

GCSE maths is a requirement for all degree courses. It teaches accuracy and precision in work. The analytical and problem-solving skills you learn are valuable in many different careers, for example Accountancy, Teaching, Business, Medicine, Architecture and Computer Studies.

Mathematics Curriculum – Year 10 Middle Tier

Big Ideas & Purpose	The aims of teaching and learning mathematics are to encourage and enable students to: recognise that mathematics permeates the world around us; appreciate the usefulness, power and beauty of mathematics and enjoy mathematics and develop patience and persistence when solving problems.

Programme of Study	HT1	HT2	HT3	HT4	HT5	HT6
	Algebra Algebraic expressions Simplifying expressions Substitution Formulae Expanding brackets Factorising Using expressions and formulae **Equations, inequalities and sequences** Solving equations with brackets Inequalities More formulae Generating sequences Using the nth term of a sequence **Graphs** Coordinates Linear graphs Gradient y = mx + c Real-life graphs	Distance-time graphs More real-life graphs **Quadratic equations and graphs** Expanding double brackets Plotting quadratic graphs Using quadratic graphs Factorising quadratic expressions Solving quadratic equations algebraically **More algebra** Graphs of cubic and reciprocal functions Non-linear graphs Solving simultaneous equations graphically Solving simultaneous equations algebraically Rearranging formulae Proof **Number** Calculations Decimal numbers Place value	Factors and multiples Squares, cubes and roots Index notation Prime factors **Fractions and percentages** Working with fractions Operations with fractions Multiplying fractions Dividing fractions Fractions and decimals Fractions and percentages Calculating percentages **Ratio and proportion** Writing ratios Using ratios Ratios and measures Comparing using ratios Using proportion Proportion and graphs Proportion problems **Multiplicative reasoning** Percentages Growth and decay Compound measures	Distance, speed and time Direct and inverse proportion **Fractions, indices and standard form** Multiplying and dividing fractions The laws of indices Writing large and small numbers in standard form Calculating with standard form **Angles** Properties of shapes Angles in parallel lines Angles in triangles Exterior and interior angles Geometrical patterns **Perimeter, area and volume** Rectangles, parallelograms and triangles Trapezia and changing units Area of compound shapes Surface area of 3D solids Volume of prisms	**Perimeter, area and volume** Circumference of a circle Area of a circle Semicircles and sectors Composite 2D shapes and cylinders Pyramids and cones Spheres and composite solids **Right-angled triangles** Pythagoras' theorem Trigonometry: the sine ratio Trigonometry: the cosine and tan ratio Finding lengths and angles using trigonometry	**Congruence, similarity and vectors** Similarity and enlargement More similarity Using similarity Congruence Vectors **Transformations** Translation Reflection Rotation Enlargement Describing enlargements Combining transformations **Constructions, loci and bearings** 3D solids Plans and elevations Accurate drawings Scale drawings and maps Constructions Loci and regions Bearings

Key Assessments	• Assessments take place after every unit. • Usually 2 per half term.	• Year 10 will take an examination based on the work covered in units 1-5 in January. Assessments take place after every unit.	• Year 10 will also take an end of year examination in the summer term. This will be a full GCSE examination, with 3 papers.

Key Skills	• To provide opportunities for learner to demonstrate their knowledge of mathematics across a whole range of topic areas. • To allow learners to develop their problem-solving strategies and provide the confidence and skills required to tackle unfamiliar challenges. • To build on work carried out in Key Stage 3 to prepare the learner to function mathematically.	**Links to Careers** Mathematics teaches accuracy and precision in work. The analytical and problem-solving skills you learn are valuable in many different careers, for example Accountancy, Finance, Teaching, Business, Medicine, Engineering, Architecture and Computer Studies.

Mathematics Curriculum – Year 10 Lower Tier

Big Ideas & Purpose	The aims of teaching and learning mathematics are to encourage and enable students to: recognise that mathematics permeates the world around us; appreciate the usefulness, power and beauty of mathematics and enjoy mathematics and develop patience and persistence when solving problems.				
Programme of Study	**HT1** **Number** Calculations Decimal numbers Place value Factors and multiples Squares, cubes and roots Index notation Prime factors **Algebra** Algebraic expressions Simplifying expressions Substitution Formulae Expanding brackets Factorising Using expressions and formulae **Graphs, tables and charts** Frequency tables Two-way tables Representing data Time series	**HT2** Stem and leaf diagrams Pie charts Scatter graphs Line of best fit **Fractions and percentages** Working with fractions Operations with fractions Multiplying fractions Dividing fractions Fractions and percentages Calculating percentages **Equations, inequalities and sequences** Solving equations Solving equations with brackets Inequalities More formulae Generating sequences Using the nth term of a sequence	**HT3** **Angles** Properties of shapes Angles in parallel lines Angles in triangles Exterior and interior angles Geometrical patterns **Averages and range** Mean and range Mode, median and range Types of average Estimating the mean Sampling **Perimeter, area and volume** Triangles, Rectangles and parallelograms Trapezia and changing units Area of compound shapes Surface area of 3D solids Volume of prisms More volume and surface	**HT4** area **Graphs** Coordinates Linear graphs Gradient y = mx + c Real-life graphs Distance-time graphs More real-life graphs **Transformations** Translation Reflection Rotation Enlargement Describing enlargements Combining transformations	**HT5** **Ratio and proportion** Writing ratios Using ratios Ratios and measures Comparing using ratios Using proportion Proportion and graphs Proportion problems **Right-angled triangles** Pythagoras' theorem Trigonometry: the sine ratio Trigonometry: the cosine and tangent ratio Finding lengths and angles using trigonometry	**HT6** **Probability** Calculating probability Two events Experimental probability Venn diagrams Tree diagrams **Multiplicative reasoning** Percentages Growth and decay Compound measures Distance, speed and time Direct and inverse proportion **Constructions, loci and bearings** solids Scale drawings and maps Loci and regions
Key Assessments	• Assessments take place after every unit. • Usually 2 per half term.		• Year 10 will take an examination based on the work covered in units 1-5 in January. • Assessments take place after every unit.		• Year 10 will also take an end of year examination in the summer term. This will be a full GCSE examination, with 3 papers.
Key Skills	• To provide opportunities for learner to demonstrate their knowledge of mathematics across a whole range of topic areas. • To allow learners to develop their problem-solving strategies and provide the confidence and skills required to tackle unfamiliar challenges. • To build on work carried out in Key Stage 3 to prepare the learner to function mathematically.		**Links to Careers** GCSE maths is a requirement for all degree courses. It teaches accuracy and precision in work. The analytical and problem-solving skills you learn are valuable in many different careers, for example Accountancy, Teaching, Business, Medicine, Architecture and Computer Studies.		