KEY 4 STAGE OVERVIEW (Long Term Planning)

Subject: Mathematics (Higher Tier)

Year 10

Week/ Lesson	Term	Topic	Knowledge	Skills
Unit 1 13 hours	**Autumn T1**	**Number** **Unit 1a: Calculations, checking and rounding**	• Students have a firm grasp of place value and be able to order integers and decimals and use the four operations. • Students should have knowledge of integer complements to 10 and to 100, multiplication facts to 10 × 10, strategies for multiplying and dividing by 10, 100 and 1000. • Students will have encountered squares, square roots, cubes and cube roots and have knowledge of classifying integers.	• 1.1 - Number Problems and reasoning • 1.2 - Place value and estimating
		Number **Unit 1b: Indices, roots, reciprocals and hierarchy of operations**		• 1.3 - HCF and LCM • 1.4 - Calculating with powers • 1.5 - Zero, negative and fractional indices
		Number **Unit 1c: Factors, multiples, primes, standard form and surds**		• 1.6 - Powers of 10 and standard form • 1.7 - Surds
Unit 1 2 hours		**Reteach, Review, Assess and Feedback**		
Unit 2 12 hours		**Algebra** **Unit 2a: Algebra the basics, setting up, rearranging and solving equations**	• Have the ability to use negative numbers with the four operations and recall and use the hierarchy of operations and understand inverse operations • Be able to deal with decimals and negatives on a calculator • Be able to use index laws numerically	• 2.1 - Algebraic indices • 2.2 - Expanding and factorising • 2.3 - Equations • 2.4 - Formulae • 2.7 - More expanding and factorising
		Algebra **Unit 2b: Sequences**		• 2.5 - Linear sequences • 2.6 - Non-linear sequences
Unit 2 2 hours		**Reteach, Review, Assess and Feedback**		
Unit 3 7 hours		**Interpreting and representing data**		• 3.5 - Averages and range

		Unit 3a: Averages and range	• be able to read scales on graphs, draw circles, measure angles and plot coordinates in the first quadrant. • have experience of tally charts. • will have used inequality notation • must be able to find the midpoint of two numbers.	
		Interpreting and representing data **Unit 3b: Representing and interpreting data and scatter graphs**		• 3.1 - Statistical diagrams 1 • 3.2 - Time series • 3.3 - Scatter graphs • 3.4 - Line of best fit • 3.6 - Statistical diagrams 2
Unit 3 2 hours		**Reteach, Review, Assess and Feedback**		
Unit 4 16 hours	**Autumn T2**	**Fractions, ratio and percentages** **Unit 4a: Fractions and percentages**	• Know the four operations • Be able to find common factors • Have a basic understanding of fractions as being 'parts of a whole' • Can define percentage as 'number of parts per hundred' • Are aware that percentages are used in everyday life	• 4.1 - Fractions • 4.4 - Percentages • 4.5 - Fractions, decimals and percentages
		Fractions, ratio and percentages **Unit 4b: Ratio and proportion**		• 4.2 - Ratios • 4.3 - Ratio and proportion
Unit 4 2 hours		**Reteach, Review, Assess and Feedback**		
Unit 5 10 hours		**Angles and trigonometry** **Unit 5a: Polygons, angles and parallel lines**	• Should be able to rearrange simple formulae and equations, as preparation for rearranging trig formulae • Should recall basic angle facts • Should understand that fractions are more accurate in calculations than rounded percentage or decimal equivalents	• 5.1 - Angle properties of triangles and quadrilaterals • 5.2 - Interior angles of a polygon • 5.3 - Exterior angles of a polygon
		Angles and trigonometry **Unit 5b: Pythagoras theorem and trigonometry**		• 5.4 - Pythagoras' theorem 1 • 5.5 - Pythagoras' theorem 2 • 5.6 - Trigonometry 1 • 5.7 - Trigonometry 2
Unit 5 2 hours		**Reteach, Review, Assess and Feedback**		
		End of Term Assessment		
Unit 6 3 hours	**Spring T1**	**Graphs** **Unit 6a: Graphs: the basics and real life graphs**	• Can identify coordinates of given points in the first quadrant or all four quadrants • Can use Pythagoras' Theorem and calculate the area of compound shapes • Can use and draw conversion graphs for these units	• 6.3 - Graphing rates of change • 6.4 - Real-life graphs • 6.5 - Line segments • 6.8 - More graphs
		Graphs **Unit 6b: Linear graphs and coordinate geometry**		• 6.1 - Linear graphs • 6.2 - More linear graphs • 6.5 - Line segments
		Graphs		• 6.6 - Quadratic graphs

		Unit 6c: Quadratic, cubic and other graphs	• Can use function machines and inverse operations	• 6.7 - Cubic and reciprocal graphs • 6.8 - More graphs
Unit 6 2 hours		**Reteach, Review, Assess and Feedback**		
Unit 7 15 hours		**Area and volume** **Unit 7a: Perimeter, area and circles**	• Should know the names and properties of 3D forms • The concept of perimeter and area by measuring lengths of sides will be familiar • Should be able to substitute numbers into an equation and give answers to an appropriate degree of accuracy • Should know the various metric units	• 7.1 - Perimeter and area • 7.4 - Circles • 7.5 - Sectors of circles
		Area and volume **Unit 7b: 3D forms and volume, cylinders, cones and spheres**		• 7.3 - Prisms • 7.6 - Cylinders and spheres • 7.7 - Pyramids and cones
		Area and volume **Unit 7c: Accuracy and bounds**		• 7.2 - Units and accuracy • 13.1 - Accuracy
Unit 7 2 hours		**Reteach, Review, Assess and Feedback**		
Unit 8 11 hours		**Transformations and constructions** **Unit 8a: Transformations**	• Be able to recognise 2D shapes • Be able to plot coordinates in four quadrants and linear equations parallel to the coordinate axes	• 8.2 - Reflection and rotation • 8.3 - Enlargement • 8.4 - Transformations and combinations of transformations
		Transformations and constructions **Unit 8b: Constructions, loci and bearings**		• 8.1 - 3D solids • 8.5 - Bearings and scale drawings • 8.6 - Constructions 1 • 8.7 - Constructions 2 • 8.8 - Loci
Unit 8 2 hours		**Reteach, Review, Assess and Feedback**		
Unit 9 11 hours	**Spring T2**	**Equations and inequalities** **Unit 9a: Solving quadratics and simultaneous equations**	• Understand the $\geq$ and $\leq$ symbols • Can substitute into, solve and rearrange linear equations • Be able to factorise simple quadratic expressions • Be able to recognise the equation of a circle	• 9.1 - Solving quadratic equations 1 • 9.2 - Solving quadratic equations 2 • 9.3 - Completing the square • 9.4 - Solving simple simultaneous equations • 9.5 - More simultaneous equations • 9.6 - Solving linear and quadratic simultaneous equations
		Equations and inequalities **Unit 9b: Inequalities**		• 9.7 - Solving linear inequalities
Unit 9		**Reteach, Review, Assess and Feedback**		

2 hours				
Unit 10 6 hours		**Probability** **Unit 10a: Probability**	• Understand that a probability is a number between 0 and 1, and distinguish between events which are impossible, unlikely, even chance, likely and certain to occur • Be able to mark events and/or probabilities on a probability scale of 0 to 1 • Know how to add and multiply fractions and decimals • Have an experience of expressing one number as a fraction of anthe number	• 10.1 - Combined events • 10.2 - Mutually exclusive events • 10.3 - Experimental probability • 10.4 - Independent events and tree diagrams • 10.5 - Conditional probability • 10.6 - Venn diagrams and set notation
Unit 10 2 hours		**Reteach, Review, Assess and Feedback**		
Unit 11 6 hours	**Summer T1**	**Multiplicative reasoning** **Unit 11a: Multiplicative reasoning**	• Be able to find a percentage of an amount and relate percentages to decimals • Be able to rearrange equations and use these to solve problems • Knowledge of speed=distance/time, density=mass/volume	• 14.1 - Percentages (from Foun) • 14.2 - Growth and decay (from foun) • 14.3 - Compound measures (from foun) • 14.4 - Distance, speed and time (from foun) • 14.5 - Direct and inverse proportion (from foun) • 11.1 - Growth and decay • 11.2 - Compound measures • 11.3 - More compound measures • 11.4 - Ratio and proportion
Unit 11 2 hours		**Reteach, Review, Assess and Feedback**		
Unit 12 4 hours		**Similarity and congruence** **Unit 12a: Similarity and congruence in 2D and 3D**	• Be able to recognise and enlarge shapes and calculate scale factors • Knowledge of how to calculate area and volume in various metric measures • Be able to measure lines and angles, and use compasses, ruler and protractor to construct standard constructions	• 12.1 - Congruence • 12.2 - Geometric proof and congruence • 12.3 - Similarity • 12.4 - More similarity • 12.5 - Similarity in 3D solids
Unit 12 2 hours		**Reteach, Review, Assess and Feedback**		
Unit 13 13 hours		**More trigonometry**	• Be able to use axes and coordinates to specify points in all four quadrants	• 13.2 - Graph of sine function • 13.3 - Graph of cosine function

		Unit 13a: Graphs of trigonometric functions	• Be able to recall and apply Pythagoras' Theorem and trigonometric ratios • Be able to substitute into formulae	• 13.4 - The tangent function • 13.8 - Transforming trigonometric graphs 1 • 13.9 - Transforming trigonometric graphs 2
		More trigonometry **Unit 13b: Further trigonometry**		• 13.5 - Calculating areas and the sine rule • 13.6 - The cosine rule and 2D trigonometric problems • 13.7 - Solving problems in 3D
Unit 13 2 hours		**Reteach, Review, Assess and Feedback**		
Unit 14 8 hours	**Summer T2**	**Further statistics** **Unit 14a: Collecting data**	• Understand the different types of data: discrete/continuous • Have experience of inequality notation • Be able to multiply a fraction by a number • Understand the data handling cycle	• 14.1 - Sampling
		Further statistics **Unit 14b: Cumulative frequency, box plots and histograms**		• 14.2 - Cumulative frequency • 14.3 - Box plots • 14.4 - Drawing histograms • 14.5 - Interpreting histograms • 14.6 - Comparing and describing populations
Unit 14 2 hours		**Reteach, Review, Assess and Feedback**		
Unit 15 5 hours		**Equations and graphs** **Unit 15a: Quadratic, expanding more than two brackets, stretching graphs, graphs of circles, cubes and quadratics**	• Be able to solve quadratics and linear equations • Be able to solve simultaneous equations algebraically	• 15.1 - Solving simultaneous equations graphically • 15.2 - Representing inequalities graphically • 15.3 - Graphs of quadratic functions • 15.4 - Solving quadratic equations graphically • 15.5 - Graphs of cubic functions • 15.6 - Using iteration to solve equations
Unit 15 2 hours		**Reteach, Review, Assess and Feedback**		
		End of Year Assessment		

KAT KEY 4 STAGE OVERVIEW (Long Term Planning)

Year 11

Week/ Lesson	Term	Topic	Knowledge	Skills

3 hours		**Monitoring and addressing gaps from mini low stakes assessment**		
Unit 16 8 hours	**Autumn T1**	**Circle theorems** **Unit 16a: Circle theorems**	• Have a practical experience of drawing circles with compasses • Recall the words, centre, radius, diameter and circumference • Recall the relationship of the gradient between two perpendicular lines • Be able to find the equation of the straight line, given a gradient and a coordinate	• 16.1 - Radii and chords • 16.2 - Tangents • 16.3 - Angles in circles 1 • 16.4 - Angles in circles 2 • 16.5 - Applying circle theorems
		Circle theorems **Unit 16b: Circle geometry**		• 16.5 - Applying circle theorems
Unit 16 2 hours		**Reteach, Review, Assess and Feedback**		
Unit 17 9 hours		**More algebra** **Unit 17a: Changing the subject of formulae (more complex) solving equations from algebraic fractions, rationalising surds, proof**	• Be able to simplify surds • Be able to use negative numbers with all four operations • Be able to recall and use the hierarchy of operations	• 17.1 - Rearranging formulae • 17.2 - Algebraic fractions • 17.3 - Simplifying algebraic fractions • 17.4 - More algebraic fractions • 17.5 - Surds • 17.6 - Solving algebraic fraction equations • 17.7 - Functions • 17.8 - Proof
Unit 17 2 hours		**Reteach, Review, Assess and Feedback**		
Unit 18 9 hours	**Autumn T2**	**Vectors and geometric proof** **Unit 18a: Vectors and geometric proof**	• Have used vectors to describe translations and have knowledge of Pythagoras' Theorem and the properties of triangles and quadrilaterals	• 18.1 - Vectors and vector notation • 18.2 - Vector arithmetic • 18.3 - More vector arithmetic • 18.4 - Parallel vectors and collinear points • 18.5 - Solving geometric problems
Unit 19 14 hours		**Proportion and graphs** **Unit 19a: Reciprocal and exponential graphs; Gradient and area under graphs**	• Be able to draw linear and quadratic graphs • Be able to calculate the gradient of a linear function between two points • Recall transformations of trigonometric functions • Have knowledge of writing statements of direct proportion and forming an equation to find values	• 19.4 - Exponential functions • 19.5 - Non-linear graphs • 19.6 - Translating graphs of functions • 19.7 - Reflecting and stretching graphs of functions
		Proportion and graphs **Unit 19b: Direct and inverse proportion**		• 19.1 - Direct proportion • 19.2 - More direct proportion • 19.3 - Inverse proportion
8 hours		**PPE1**		
6 hours		**QLA and Feedback from PPE1**		
	Spring T1			

8 hours	**Spring T2**	**PPE2**		
6 hours		**QLA and Feedback from PPE2**		
	Summer T1			
		GCSEs Begin		
		GCSEs		
	Summer T2	Potential Study Leave		