Mulberry Academy Woodside

Mathematics

Curriculum Overview 2023 - 2024

Curriculum intent statement:

At Mulberry Academy Woodside all students have the opportunity to become the best mathematicians that they can be. To do this, our mathematics curriculum is designed to make mathematics accessible to all. It intends to develop a life-long love of mathematics that challenges students to be curious as well as develop skills that they will need in their daily lives and future careers. The curriculum provides students with the following:

- Nurture a love of mathematics and produce confident mathematicians that appreciate the value of Mathematics and its relevance in everyday life.
- Develop mathematical knowledge and skills that students can apply confidently, opening up opportunities to better careers and lives.
- Produce inquisitive, independent learners who love to question and problem solve with resilience.
- Remove the fear and mystery that historically surrounds the subject of maths and to remove the obstacle of mathematical illiteracy.
- Making maths accessible for all of our students.
- Gain fluency in mathematics, to facilitate problem solving and mastery in mathematics.
- Provide multiple pathways for all learners to securely develop mathematical cognition from concrete to abstract such that learned skills and knowledge can be used in standard and non-standard scenarios.
- Support students to learn conceptually with depth in thinking and breadth in application.
- Enable learners to articulate their thinking with increasing proficiency of mathematical language.
- Develop an appreciation of the historical evolution of a discipline that spans continents and cultures.
- Understand the relevance of mathematics in human endeavour historically, presently and for the future.

KS4 Edexcel		AUTUMN TERM		SPRING TERM		SUMMER TERM	
		TERM 1A	TERM 1B	TERM 2A	TERM 2B	TERM 3A	TERM 3B
YEAR 10	KNOWLEDGE	**Algebraic Representations. Congruence, Similarity and Enlargement. Trigonometry.**	**Representing Solutions of Equations and Inequalities. Simultaneous Equations.**	**Angles and Bearings. Working with Circles. Vectors.**	**Ratios and Fractions. Percentage and Interest. Probability.**	**Collecting, Representing and Interpreting data. Non-calculator methods.**	**Types of number and sequences. Indices and roots. Manipulating Expressions.**
	SKILLS	**Revisit** Enlarge a shape by a positive integer scale factor, Enlarge a shape by a fractional scale factor, use parallel line rules to work out missing angles, Pythagoras' Theorem. **Core** Represent inequalities. Interpret reciprocal, piece-wise and quadratic graphs. Identify similar shapes, work out missing sides and angles in a given pair of similar shapes, Similar triangles, Difference between congruence and similarity, Conditions for congruent triangles, Trigonometric ratios to find missing sides and angles. **Higher** Investigate graphs of simultaneous equations. Enlarge a shape by a negative scale factor, areas and volumes of similar shapes, Prove a pair of triangles are similar shapes, Trigonometry in 3-D shapes, Find the area of triangles using A=1/2abSinC, Sine and cosine rule.	**Revisit** Form and solve one and two step equations, Form and solve one and two step inequalities, Draw straight line graphs, Form and solve equations with unknowns on both sides, derive related facts from a given equation. **Core** Show solutions to an inequality on a number line, Find solutions to equations on straight line graphs, Form and solve inequalities with unknowns on both sides, Form and solve more complex equations and inequalities, Solve a pair of linear simultaneous equations by elimination, substitution and graphically. **Higher** Represent solutions to inequalities using set notation, Represent solutions to single and multiple inequalities on a graph, Solve quadratic equations by factorisation, Solve quadratic inequalities in one variable, Solve a pair of simultaneous equations (linear and quadratic) algebraically and graphically.	**Revisit** Use cardinal directions, draw and interpret scale diagrams, Recognise and label parts of a circle. **Core** Understand, represent, measure and read bearings, make scale drawings of bearings, calculate bearings using angle rules, Solve bearings using Pythagoras and trigonometry, Calculate fractional parts of a circle, Calculate arc length and sector area, Understand and use the volume and surface area of a cylinder, cone and sphere, Understand and represent vectors, Use and read vector notation, Draw and understand vectors addition and subtraction of vectors and those multiplied by a scalar. **Higher** Solve bearings using the sine and cosine rules, Circle theorems, Area and volume problems of similar shapes, Explore vector journeys in shapes, Understand parallel vectors, Use vectors to construct geometric arguments and proofs.	**Revisit** Compare quantities using a ratio, Link ratios and fractions, Share in a ratio, Link ratios and scales, Convert and compare fractions, decimals and percentages, Work out percentages of amounts, Increase and decrease by a given percentage, Express a number as a percentage of another, Find the original value after a percentage change, use single event probability, Add, subtract and multiply fractions, Find probabilities using equally likely outcomes, Use the property that probabilities sum to 1, Construct and interpret sample spaces, Construct and interpret two-way tables. **Core** Use ratios and fractions to make comparisons, Link ratios and graphs, Solve problems with currency conversion, Use and interpret ratios of the form 1:n and n:1, Solve best buy problems, Combine a set of ratios, Link ratio and Algebra, Calculate simple and compound interest,	**Revisit** Construct and interpret pie charts, time series graphs, scatter graphs, Find and interpret averages from a list and averages from a table, Draw and use a line of best fit, Mental/written methods of integer/decimal addition and subtraction, Fractional arithmetic, Rounding to decimal places and significant figures, Estimating answers to accuracy. **Core** Understand populations and samples, primary and secondary data, Construct and interpret frequency tables and frequency polygons, line and bar charts, stem-and-leaf diagrams, Criticise graphs and charts, Compare distributions using charts and measures, Understand extrapolation, Mental/written methods of integer/decimal multiplication and division, Exact answers to trigonometric calculations, Understand and use limits of accuracy, Solve financial maths problems.	**Revisit** Understand the difference between factors and multiples, Understand primes and express a number as a product of its prime factors, Find the HCF and LCM, Find the rule for the nth term of a linear sequence, Square and cube numbers, Powers of ten and standard form, Addition and subtraction rule of indices, Calculate with numbers in standard form, Simplify algebraic expressions. **Core** Describe and continue arithmetic and geometric sequences, Explore other sequences, Calculate higher powers and roots, Understand and use the power zero and negative indices, work with powers, Use identities, Multiply and divide simple algebraic fractions, Form and solve equations and inequalities with algebraic fractions, Represent numbers algebraically, algebraic arguments and proof. **Higher** Describe and continue and sequence involving surds,

					repeated percentage change, Solve problems involving growth and decay, Solve problems involving percentages, ratios and fractions, Use relative frequency, expected outcomes, and independent events. Use experimental data to estimate probabilities, Find probabilities from Venn diagrams and frequency trees, Calculate probabilities with independent events, Use tree diagrams for independent and dependent events **Higher** Ration in area and volume problems, Understand iterative processes, Tree diagrams, Construct and interpret conditional probabilities using tree diagrams, Venn diagrams and two-way tables	**Higher** Construct a stratified sample, Construct and interpret Histograms, cumulative frequency diagrams, box plots, Rational and irrational numbers, Understand, use and calculate with surds, Upper and lower bounds.	Find the rule for the nth term of a quadratic sequence, Add and subtract algebraic fractions, Multiply and divide complex algebraic fractions,
YEAR 11	KNOWLEDGE	**Probability. Collecting, Representing and Interpreting Data. Types of Number and Sequences.**	**Manipulating Expressions. Gradients and Lines. Non-Linear Graphs. Using Graphs.**	**Expanding and Factorising. Changing the Subject. Functions. Multiplicative Reasoning. Geometric Reasoning.**	**Algebraic Reasoning. Transforming and Constructing.**	**Listing and Describing. Show That…**	
	SKILLS	**Revisit** Add, subtract and multiply fractions, Find probabilities using equally likely outcomes, Use the property that probabilities sum to 1, Construct and interpret sample spaces, Construct and interpret two-way tables, Construct and interpret pie charts, time series graphs, scatter graphs, Find and interpret averages from a list and averages from a table, Draw and use a line of best fit, Understand the difference between factors and multiples, Understand	**Revisit** Simplify algebraic expressions, equations of parallel lines, plot straight line graphs, interpret y=mx+c, Find the equation of a straight line from a graph, Solve linear simultaneous equations graphically, Reflect shapes in given lines, Construct and interpret conversion graphs and real-life straight line graphs. **Core** Use identities, Multiply and divide simple algebraic fractions, Form and solve	**Revisit** Expand and factorise, single brackets and binomials, Solve linear equations and inequalities, Use function machines, Substitute into formulae, Use scale factors, Solve ratio problems. Work with angles at a point, in parallel lines and shapes, Exterior and interior angles of polygons, Solve problems with vectors, Review Pythagoras' theorem and using trigonometric ratios. **Core** Factorise and solve quadratic equations, Form	**Revisit** Find the rule for the nth term of a linear sequence, Solve linear simultaneous equations, Perform and describe line symmetry, reflection, rotational symmetry and enlargements of shapes, Perform standard constructions. **Core** Simplify complex equations, Use rules for sequences, Describe a series of transformations of shapes, solve loci problems. **Higher**	**Revisit** Sample spaces and probability, Complete and use Venn diagrams, Construct and interpret plans and elevations, Use data to compare distributions, Interpreting scatter graphs **Core** Work with organised lists, Show that with number, algebra, shape, angles, data and congruent triangles. **Higher** Product rule for counting,	

		primes and express a number as a product of its prime factors, Find the HCF and LCM, Find the rule for the nth term of a linear sequence, Square and cube numbers. **Core** Use experimental data to estimate probabilities, Find probabilities from Venn diagrams and frequency trees, Calculate probabilities with independent events, Use tree diagrams for independent and dependent events, Understand populations and samples, primary and secondary data, Construct and interpret frequency tables and frequency polygons, line and bar charts, stem-and-leaf diagrams, Criticise graphs and charts, Compare distributions using charts and measures, Understand extrapolation, Describe and continue arithmetic and geometric sequences, Explore other sequences. **Higher** Construct and interpret conditional probabilities using tree diagrams, Venn diagrams and two-way tables. Construct a stratified sample, Construct and interpret Histograms, cumulative frequency diagrams, box plots, Describe and continue and sequence involving surds, Find the rule for the nth term of a quadratic sequence.	equations and inequalities with algebraic fractions, Represent numbers algebraically, algebraic arguments and proof, Find the equation of a straight line from a graph, Determine whether a point is on a graph, Plot and read from quadratic, cubic and reciprocal graphs, Recognise graph shapes, identify and interpret roots and intercepts of quadratics, Construct and interpret distance-time graphs, speed time graphs and piece-wise graphs, Recognise and interpret direct and inverse proportion graphs, find approximate solutions to graphs. **Higher** Add and subtract algebraic fractions, Multiply and divide complex algebraic fractions, Explore perpendicular lines, Find the equation of perpendicular lines, Understand exponential graphs, Find and use the equation of a circle centre (0,0), Find the equation to the tangent of any curve, Estimate the area under a curve.	and solve linear equations and inequalities in the context of shape, change the subject of formulae, Use function notation, Graphs of quadratic functions, Understand direct and inverse proportion, Proving geometric facts. **Higher** Factorise and solve complex quadratic equations, Complete the square, Use the quadratic formula, Change the subject where it appears more than once, Solve equations by iteration, Work with composite and inverse functions, Solve quadratic inequalities, Construct direct and inverse proportion equations, Review of circle theorems.	Find the rule for the nth term of a quadratic sequence, Solve simultaneous equations with one quadratic, Formal Algebraic proof, Inequalities with two variables, Perform and describe negative enlargements, Identify invariant points and lines, Understand and use trigonometric graphs, Sketch and identify the translations and reflections of a given function.	Show that with vectors, Formal proof with congruent triangles.	