Curriculum Implementation Mapping – Skills and Knowledge

Subject: Maths **Year group: 9 Higher**

Topic	Term 1	Term 2	Term 3
Knowledge	Basic number and introducing surds: Solving real-life problems, Multiplication and division with decimals, Approximation of calculations, Multiples, factors, prime numbers, powers and roots, Prime factors, LCM, HC, Negative numbers, Surds, Standard form Algebra Review Fractions, ratio and proportion: One quantity as a fraction of another, Multiplying and dividing fractions, Increasing and decreasing quantities by a percentage, Percentage change, Expressing one quantity as a percentage of another	Statistical diagrams and averages - Statistical representation - Statistical measures - Scatter diagrams Number and sequences - Number patterns and sequences - Find nth term of a linear sequence and generating terms. - Special sequences - Finding the nth term of a quadratic sequence Ratio and proportion - Ratio - Direct proportion problems - Best buys	Ratio and proportion - Compound measures - Compound interest/ repeated percentage change - Reverse percentages Angles - Angle facts, including angles in triangles - Angles in a polygon, including regular polygons - Angles in parallel lines - Special quadrilaterals - Scale bearings and drawings Linear graphs - Drawing linear graphs from points - Finding the gradient of a line - Drawing graphs by gradient-intercept and cover-up methods - Finding the equation of a line from its graph
Skills	- Solve problems set in a real-life context. - Complete calculations involving decimal numbers. - Estimate before calculating and round to a given number to give a reasonable answer. - Find multiples and factors; identify prime, square, cube and triangular numbers. Find square and cube roots. - Identify the LCM and HCF of two or more numbers. - Multiply and divide positive and negative numbers - Calculate and manipulate surds. - Covert a number between standard and ordinary form and complete standard form calculations. - Writing and simplifying expressions, substitution, expanding and factorising with single brackets, solving linear equations including variables on both sides and setting up and solving equations from worded problems or geometrical problems - Applying rules of subtraction, multiplication and division to fractions and mixed numbers with fractions, including with different denominators. - Increase and decrease quantities by a percentage. - Work out percentage change and - Express one quantity as a percentage of another.	- Draw and interpret bar charts, pie charts and line graphs. - Use averages to solve more complex problems. Identify the advantages/ disadvantages of each average. - Calculate the mode, the median and the mean from a frequency and grouped frequency table. - Draw, interpret and use scatter diagrams. - Recognise patterns in number sequences. - Find the nth term of a sequence and quadratic sequence, and use the nth term to generate terms. - Recognise and continue some special number sequences such as square numbers. - Simplifying ratios, writing fractions from ratios, dividing into a ratio, solving ratio problems - Recognise and solve problems using direct proportion. - Find either the cost per unit weight or the weigh per unit cost and use to identify the cheapest product.	- Recognise and solve problems involving the compound measures of rates of pay, speed, density and pressure. - Calculate compound interest. - Solve problems involving repeated percentage change. - Calculate the original amount after a percentage change. - To know the sum of the angles on a straight line, around a point, in a triangle and in a quadrilateral. - To solve missing angle problems in triangles. - Calculate the size of interior and exterior angles of any polygon. - To solve problems involving alternate, corresponding, allied and opposite angles. - To be able to calculate the size of angles in special quadrilaterals using their geometric properties. - To be able to make a scale drawing to a given scale. - To be able to read, interpret and draw bearings diagrams. To use the geometrical properties of a diagram to calculate a bearing. - Draw linear graphs by finding points. - Draw a line with a given gradient, find the gradient from a line - Find the equation of a line, using its gradient and intercept. - Find the equation of a line given two points on the line.
Assessment Pattern	Teacher Assessment	1 hour Summary Assessment to be sat in class	Teacher Assessment

Topic	Term 4	Term 5	Term 6
Knowledge	Pythagoras' theorem - Finding the length of the shorter side - Applying Pythagoras' theorem in real-life situations - Pythagoras' theorem and isosceles triangles - Pythagoras' theorem in three dimensions Length, area and volume - Circumference and area of a circle - Area of a parallelogram - Area of a trapezium - Sectors - Volume of a prism - Cylinders - Volume of a pyramid - Cones - Spheres Transformations, constructions and loci - Congruent triangles - Rotational symmetry - Transformations	Transformations, constructions and loci - Bisectors and defining a locus, including loci problems - Plans and elevations Algebra - Factorisation, quadratic expansion, expanding squares, more than 2 binomials, quadratic factorisation, changing the subject of a formula. Right angled Trigonometry - Calculating angles - Using the sine and cosine functions - Using the tangent function - Which ratio to use - Solving problems using trigonometry - Trigonometry and bearings - Trigonometry and isosceles triangles Linear graphs - Real-life uses for graphs - Solving simultaneous equations using graphs - Parallel and perpendicular lines	Probability - Expectation - Probability and two-way tables - Combined events - Tree diagrams - Independent events - Conditional probability Algebra - Indices - Linear equations - Linear inequalities - Plotting quadratic graphs - solving quadratic equations from graphs - graph sketching Real Life Graphs - Distance time graphs - Velocity time graphs
Skills	- Calculate the length of the hypotenuse in a right angled triangle. - Calculate the length of a shorter side in a right angled triangle. - Solve practical problems involving Pythagoras' theorem. - Use Pythagoras' Theorem and isosceles triangles - Use Pythagoras' theorem to solve problems involving three dimensions. - Calculate the circumference and area of a circle. - Calculate the area of a parallelogram. - Calculate the area of a trapezium. - Calculate the length of an arc. - Calculate the area and angle of a sector. - Calculate the volume of a prism. - Calculate the volume and surface area of a cylinder. - Calculate the volume of a pyramid. - Calculate the volume and surface area of a cone. - Calculate the volume and surface area of a sphere. - Demonstrate that two triangles are congruent - Find the order of rotational symmetry for a 2D shape - Recognise shapes with rotational symmetry. - Translate, reflect, rotate and enlarge a 2D shape. - Combine transformations - Construct the bisectors of lines and angles - Construct angles of 60° and 90°. - Draw a locus for a given rule - Construct and interpret plans and elevations of 3D shapes. - Recognise expressions, equations, formulae, identities.	- construct a perpendicular bisector, a perpendicular at a point,an angle bisector and construct triangles - Draw a locus for a given rule and solve practical problems and construct regions using loci - Factorising algebraic expressions - Expand 2 binomials to form a quadratic expression - Expand the square of a binomial (x+y)^2 - Expand more than 2 binomials - Factorise a quadratic expression into two linear brackets - Factorise a quadratic expression with a coefficient of x^2 greater than 1. - Rearrange a formula to change the subject - Use the three trigonometric ratios. - Use the trigonometric ratios to calculate an angle. - Find lengths of sides and angles in right-angled triangles using the sine and cosine functions. - Find lengths of sides and angles in right-angled triangles using the tangent function. - Decide which trigonometric ratio to use in a right-angled triangle. - Solve practical problems using trigonometry. - Solve problems using an angle of elevation or an angle of depression. - Solve bearing problems using trigonometry. - Find the length x in this isosceles triangle. - Calculate the area of the triangle.	- Predict the likely number of successful events, given the number of trials and the probability of any one outcome. - Read two-way tables and use them to work out probabilities. - Work out the probability of different outcomes of combined events. - Find the probability of two outcomes/events occurring at the same time. - Use tree diagrams to work out the probability of combined events. - Use the connectors 'and' and 'or' to work out the probabilities for combined events. - Work out the probability of combined events when the probabilities change after each event. - Use index laws for multiplication, division and raising power to a power - Solve equations in which the variable (the letter) appears as part of the numerator or denominator of a fraction. - Solve a simple linear inequality and represent it on a number line - Draw and read values from quadratic graphs. - Find approximate solutions of a quadratic equation from the graph of the corresponding quadratic function. - Sketch graphs of quadratic functions considering orientation and labelling the point of intersection with y axis and also considering what happens to y for large positive and negative values of x - Draw and interpret distance–time graphs. Understand that the gradient of a distance time graph represents speed. - Draw and interpret velocity–time graphs. Work out the speed and distance travelled from information on a travel graph

	- Substitute into, manipulate and simplify algebraic expressions. - Factorise an algebraic expression. - Expand two binomials to obtain a quadratic expression - Expand the square of a binomial. - Expand more than two binomials. - Factorise a quadratic expression of the form - Factorise a quadratic expression of the form - Change the subject of a formula.	- Use straight-line graphs to find formulae. - Use straight-line graphs to find formulae. - Solve simultaneous linear equations using graphs. - Draw linear graphs parallel or perpendicular to other lines and passing through a specific point.	
Assessment Pattern	1 hour Summary Assessment to be sat in class	Teacher Assessment	End of year test: Full set of GCSE past papers to be sat in class