

Stage 9 Mathematics Curriculum Plan							
Unit	Core		Hinterland		NC Coverage	Assessment	Whole Education Opportunities
	Knowledge	Skills	Knowledge	Skills			
Algebraic manipulation and thinking	<ul style="list-style-type: none"> understand and use the concepts and vocabulary of identities know the difference between an equation and an identity argue mathematically to show algebraic expressions are equivalent, and use algebra to support and construct arguments translate simple situations or procedures into algebraic expressions or formulae 	<ul style="list-style-type: none"> simplify and manipulate algebraic expressions by expanding products of two binomials and factorising quadratic expressions of the form $x^2 + bx + c$ Work out why two algebraic expressions are equivalent Create a mathematical argument to show that two algebraic expressions are equivalent Create an expression or a formula to describe a situation 			4SA2 3WD4 3SA4a 3SA4b 3SA4c 3SA4d	<ul style="list-style-type: none"> Review of prior learning Formative assessment Low stakes end of unit test Integrated examples and review exercise Problems in real world contexts 	<ul style="list-style-type: none"> Computer programming and science crossover Explore history and development of algebra and numerical representation in various civilisations
Pythagoras' Theorem	<ul style="list-style-type: none"> Know the formulae for: Pythagoras' theorem, $a^2 + b^2 = c^2$ Square and square roots Identify the hypotenuse of a right angled triangle Determine where is a triangle is a right-angled Calculate the hypotenuse of a right-angled triangle Calculate missing sides in right-angled triangle Use a Pythagoras's theorem on coordinate axes Explore proofs of Pythagoras's theorem Use a Pythagoras's theorem in 3D shapes 	<ul style="list-style-type: none"> Calculate missing sides in right-angled triangle Use a Pythagoras's theorem on coordinate axes Explore proofs of Pythagoras's theorem Use a Pythagoras's theorem in 3D sha 	Pythagoras Planning developments: estates, building. Travel		3WR5 3SG4 4SG5	<ul style="list-style-type: none"> Review of prior learning Formative assessment Low stakes end of unit test Integrated examples and review exercise Problems in real world contexts 	<ul style="list-style-type: none"> Links with art, architecture, product design and engineering
<ul style="list-style-type: none"> Linear and non-linear graphs 	<ul style="list-style-type: none"> Explore linear and non-linear graphs, perpendicular graphs Use the tables of values Compare gradients Compare intercepts Understand and use of $y=mx+c$ identify and interpret gradients and intercepts of linear functions algebraically use the form $y = mx + c$ to identify parallel lines find the equation of the line through two given points, or through one point with a given gradient interpret the gradient of a straight-line graph as a rate of change 	<ul style="list-style-type: none"> Identify and interpret gradients of linear functions algebraically Identify and interpret intercepts of linear functions algebraically Plot graphs of: <ul style="list-style-type: none"> quadratic functions cubic functions reciprocal functions Sketch & interpret the graphs of quadratic functions Recognise, sketch & interpret the graphs of cubic functions & reciprocal functions Plot graphs of non-standard functions in real contexts 			4SR5 3WD6 3SA9 3SA11 3SA12 4SA6 4SA8 4WD5	<ul style="list-style-type: none"> Review of prior learning Formative assessment Low stakes end of unit test Integrated examples and review exercise Problems in real world contexts 	<ul style="list-style-type: none"> Computer programming and science crossover Explore history and development of algebra and numerical representation in various civilisations

	<ul style="list-style-type: none"> interpret graphs of quadratic functions recognise graphs of simple cubic functions and the reciprocal function $y = 1/x$ with $x \neq 0$ interpret graphs (including reciprocal graphs) and graphs of non-standard functions in real contexts. 	<ul style="list-style-type: none"> Solve kinematic problems involving distance, speed and acceleration 					
Three-Dimensional Shapes	<ul style="list-style-type: none"> Know names of 2D and 3D shapes Volume of cubes and cuboids Volume of prisms and cylinders Explore volume of cones, pyramids and spheres Recognise prisms – language of edges and vertices Sketch and recognise nets of cuboids and other 3D shapes Plans and elevations Find area of 2D shapes difference between direct and inverse proportion Know the features of graphs that represent a direct or inverse proportion situation Know the features of expressions, or formulae, that represent a direct or inverse proportion situation Distinguish between situations involving direct and inverse proportion Understand the concepts of congruence and similarity, including the relationships between lengths in similar figures 	<ul style="list-style-type: none"> Understand loci and how it can form the basis of problems interpret plans and elevations of 3D shape Apply standard mathematical constructions Know how to construct the locus of points a fixed distance from a point and from a line Combine techniques to solve more complex loci problems Construct a shape from its plans and elevations Construct the plan and elevations of a given shape 	<ul style="list-style-type: none"> Planning developments: estates, building. Travel 		3WR6 3SR9 4SG9 3SR10 4WR5 4SR3 3WR2	<ul style="list-style-type: none"> Review of prior learning Formative assessment Low stakes end of unit test Integrated examples and review exercise Problems in real world contexts 	<ul style="list-style-type: none"> Explore proportions in recipes, construction and populations Links with Accounting and Finance
<ul style="list-style-type: none"> Constructions and congruency 	<ul style="list-style-type: none"> Draw and measure angles Construct an angle bisector recognise Construct triangles from given information Identify congruent figures Explore congruent triangles 	<ul style="list-style-type: none"> Generate Fibonacci type sequences & solve problems involving Fibonacci type sequences Explore growing patterns and other problems involving quadratic sequences Generate terms of a quadratic sequence from a written rule 	Fibonacci & the Golden ratio		4SA16 4SA17	<ul style="list-style-type: none"> Review of prior learning Formative assessment Low stakes end of unit test Integrated examples and review exercise Problems in real world contexts 	<ul style="list-style-type: none"> Links to congruence of patterns in textiles and architecture

	<ul style="list-style-type: none"> Construct and interpret scale drawings Locus from distance of a point Locus of distance from a straight line Construct a perpendicular bisector Construct a perpendicular from a point Construct a perpendicular to a point Locus of distance from two lines Fibonacci type sequences, quadratic sequences 	<ul style="list-style-type: none"> Find the next terms of a quadratic sequence using first and second differences Generate terms of a quadratic sequence from its nth term 					
<ul style="list-style-type: none"> Integers, Real and Rational numbers 	<ul style="list-style-type: none"> Numbers in standard form understand and use surds Work with directed number Solve problems with integers Solve problems with decimals HCF and LCF Adding and subtracting, dividing and multiplying fractions Solve problems with fractions 	<ul style="list-style-type: none"> solve linear inequalities in one variable represent the solution set to an inequality on a number line 	<ul style="list-style-type: none"> Solve problems with Integers, Use of Algebraic Fractions in context of real-life scenarios such as shopping/bill at a restaurant total being shared amongst several individuals and the impact of people being included Real and Rational Numbers 	<ul style="list-style-type: none"> 	<p>4SA15 4WD4 3SA3</p>	<ul style="list-style-type: none"> Review of prior learning Formative assessment Low stakes end of unit test Integrated examples and review exercise Problems in real world contexts 	<ul style="list-style-type: none"> Computer programming and science crossover Explore history and development of algebra and numerical representation in various civilisations
Using percentages with money	<ul style="list-style-type: none"> Calculate simple and compound interest Solve problems with value added tax Calculate wages and taxes Solve problems with exchange rates Explore differences between direct and inverse proportion identify circle definitions and properties, know the formulae for: Pythagoras' theorem, $a^2 + b^2 = c^2$ 	<ul style="list-style-type: none"> Investigate ways of representing proportion in situation Solve problems involving proportion 	Household budget Use of proportion in context of real-life scenarios such as the link between staff numbers and time taken to serve customers		<p>4SG3 4SG7 4SG8 4SG10 3SG13 3SG14</p>	<ul style="list-style-type: none"> Review of prior learning Formative assessment Low stakes end of unit test Integrated examples and review exercise Problems in real world contexts 	<ul style="list-style-type: none"> Opportunities to development of early mathematics Link to world Pi day
Angle rules and Conjectures	<ul style="list-style-type: none"> use the basic congruence criteria for triangles (SSS, SAS, ASA, RHS) Know the conditions for triangles to be congruent Pose conjectures and derive results about angles and sides, including Pythagoras' Theorem and the fact that the base angles of an isosceles triangle are equal, and use 	<ul style="list-style-type: none"> Apply angle facts to derive results about angles and sides Create a geometrical proof Use the conditions for congruent triangles Use congruence in geometrical proofs Solve geometrical problems involving similarity 			<p>3SG6 3SG9 3SG13 3SG16 3WR4 4SG9</p>	<ul style="list-style-type: none"> Review of prior learning Formative assessment Low stakes end of unit test Integrated examples and review exercise Problems in real world contexts 	<ul style="list-style-type: none"> Links with Science and Textiles

	<p>known results to obtain simple proofs</p> <ul style="list-style-type: none"> Know the meaning of a Pythagorean triple 						
Probability	<ul style="list-style-type: none"> Understand tree diagrams and know the underlying assumptions understand that empirical unbiased samples tend towards theoretical probability distributions, with increasing sample size 	<ul style="list-style-type: none"> List outcomes of combined events using a tree diagram Know and use the multiplication law of probability and the addition law of probability Use a tree diagram to solve simple problems involving independent combined events, and dependent combined events Use a tree diagram to solve complex problems involving dependent combined events 	<ul style="list-style-type: none"> Travel – planning a journey 	<ul style="list-style-type: none"> 	<p>4SR5 3WD6 3SA9 3SA11 3SA12 4SA6 4SA8 4WD5</p>	<ul style="list-style-type: none"> Review of prior learning Formative assessment Low stakes end of unit test Integrated examples and review exercise Problems in real world contexts 	<ul style="list-style-type: none"> Computer programming and science crossover Explore history and development of algebra and numerical representation in various civilisations
Solving Ratio and proportion problems	<ul style="list-style-type: none"> Use the equivalence of fractions, decimals and percentages Calculate percentages-increase and decrease Express a change as percentage Solve reverse percentage problems Recognise and solve percentage problems Solve problems with repeated percentage change Understand the concept of simultaneous equations 	<ul style="list-style-type: none"> Investigate ways of representing proportion in situation Solve problems involving proportion 	<ul style="list-style-type: none"> Use of proportion in context of real-life scenarios such as the link between staff numbers and time taken to serve customers 	<ul style="list-style-type: none"> Investigate proportional graphs and links with modelling 	<p>4WD4 4SA12 4SA14 3SA12</p>	<ul style="list-style-type: none"> Review of prior learning Formative assessment Low stakes end of unit test Integrated examples and review exercise Problems in real world contexts 	<ul style="list-style-type: none"> Computer programming and science crossover Explore history and development of algebra and numerical representation in various civilisations
Rates	<ul style="list-style-type: none"> Solve problems with bills and bank statements Calculate simple and compound interest Solve problems with value added tax Calculate wages and taxes Solve problems with exchange rates 	<ul style="list-style-type: none"> What is rates formula How to express a rate in maths Calculating a unit rate Using a unit rate in calculations Solving word problems involving rates List outcomes of combined events using a tree diagram Know and use the multiplication law of probability and the addition law of probability Use a tree diagram to solve simple problems involving independent combined events, and dependent combined events Use a tree diagram to solve complex problems involving dependent combined events 	<p>Travel – planning a journey</p>		<p>4SP3 4SP4</p>	<ul style="list-style-type: none"> Review of prior learning Formative assessment Low stakes end of unit test Integrated examples and review exercise Problems in real world contexts 	<ul style="list-style-type: none"> Budgeting
Indices and roots	<ul style="list-style-type: none"> Estimate with powers and roots 	<ul style="list-style-type: none"> Explore the impact of rounding 	<p>Use of powers and roots in context of real-life scenarios</p>	<p>Impact of rounding errors in accuracy of dimensions in</p>	<ul style="list-style-type: none"> 4SN2 4SN3 	<ul style="list-style-type: none"> Review of prior learning Formative assessment 	<ul style="list-style-type: none">

	<ul style="list-style-type: none"> Calculate with powers and roots Calculate higher powers and roots Powers of ten and standard form The addition and subtraction rules for indices Understand and use the power zero and negative indices Work with power of powers Understand and use fractional indices Calculate with numbers in standard form Square and cube numbers Interpret tables, charts and diagrams, know correlation does not indicate causation Understand the terms, interpolate and extrapolate, and apparent trends whilst knowing the dangers of so doing 	<ul style="list-style-type: none"> Construct and interpret graphs: time series compound bar charts frequency polygons stem and leaf diagrams scatter diagram using understanding of correlation Construct a line of best fit on a scatter diagram and use the line of best fit to estimate values Understand that correlation does not indicate causation 	such as carpentry or mass production	carpentry, area for flooring in rooms, turf for gardening	<ul style="list-style-type: none"> 4SN8 	<ul style="list-style-type: none"> Low stakes end of unit test Integrated examples and review exercise Problems in real world contexts 	
<ul style="list-style-type: none"> Collecting, representing and interpreting data 	<ul style="list-style-type: none"> Interpret tables, charts and diagrams, know correlation does not indicate causation Understand the terms, interpolate and extrapolate, and apparent trends whilst knowing the dangers of so doing 	<ul style="list-style-type: none"> Construct and interpret graphs: time series compound bar charts frequency polygons stem and leaf diagrams scatter diagram using understanding of correlation Construct a line of best fit on a scatter diagram and use the line of best fit to estimate values Understand that correlation does not indicate causation 	Covid data – ONS Census data	Interpretation of graphs, statistics and charts.	<ul style="list-style-type: none"> SN2 4SN3 4SN8 	<ul style="list-style-type: none"> Review of prior learning Formative assessment Low stakes end of unit test Integrated examples and review exercise Problems in real world contexts 	<ul style="list-style-type: none">
Rotation and translation	<ul style="list-style-type: none"> Identify the order of rotational symmetry of a shape Compare and construct rotational symmetry with line symmetry Shape rotation Compare rotation and reflection of a shape 	<ul style="list-style-type: none"> Describe and transform 2D shapes using single or combined rotations, reflections, translations, or enlargements by a positive scale factor and distinguish properties that are preserved under a particular transformation 			<ul style="list-style-type: none"> SN24SN3 4SN8 	<ul style="list-style-type: none"> Review of prior learning Formative assessment Low stakes end of unit test Integrated examples and review exercise Problems in real world contexts 	<ul style="list-style-type: none">