Mathematics Progression Map Knowledge and Skill Breakdown				Number	Skills and understanding		
Communication			Year Group	Knowledge	AO1: Use and apply standard techniques	AO2: Reason, interpret and communicate mathematically	AO3: Solve problems within mathematics and in other contexts
Across all year groups	Understanding knowledge	Comprehension, translation, summarising, demonstrating, discussion, describe	9	• I can use a number line to represent negative numbers • I can use inequalities with negative numbers • I can compare and order positive and negative numbers • I can add and subtract negative numbers • I can multiply and divide positive and negative numbers • I can use the four rules of arithmetic with integers and decimals • I can work out the answers to problems with more than one mathematical operation • I can multiple a decimal number by another decimal number • I can multiply and divide with decimals • I can find and recognise multiples of numbers • I can identify factors of a number • I can identify prime numbers • I can identify prime factors • I can find the highest common factor (HCF) and lowest common multiple (LCM) of two numbers • I can identify square numbers • I can identify triangular numbers • I can use a calculator to find the square of a number • I can recognise the square roots of square numbers up to 225 • I can identify square roots of any number using a calculator	**I can:** **• accurately recall facts, terminology and definitions** **• use and interpret notation correctly** **• accurately carry out routine procedures or set tasks requiring multi-step solutions**	**I can:** **• make deductions, inferences and draw conclusions from mathematical information** **• construct chains of reasoning to achieve a given result** **• interpret and communicate information accurately** **• present arguments and proofs** **• assess the validity of an argument and critically evaluate a given way of presenting information**	**I can:** **• translate problems in mathematical or non-mathematical contexts into a process or a series of mathematical processes** **• make and use connections between different parts of mathematics** **• interpret results in the context of the given problem** **• evaluate methods used and results obtained** **• evaluate solutions to identify how they may have been affected by assumptions made**
		Remember, Recall of information, discovery, observation, listing/ locating, naming					
	Analysis and linking	Identifying and analysing patterns, organisation of ideas, recognising trends, conclude. Beginning to establish a Line of Argument (LOA)					
		Using the core, solving problems using methods, manipulating, designing, experimenting, explain, compare					
	Evaluate application	Using concepts to create ideas, design and invention, composing, predicting, combining, justify. Beginning to establish a clear Line of Argument (LOA)					

				• I can identify and find cube numbers and cube roots • I can use important buttons on the calculator effectively • I can round a whole number • I can round decimals to a given accuracy • I can identify significant figures • I can round numbers to a given number of significant figures • I can use approximation to estimate answers and check calculations • I can round a calculation at the end of a problem to give a sensible answer • I can recognise different types of fraction, reciprocal, terminating decimal and recurring decimal • I can convert terminating decimals to fractions • I can convert fractions to decimals • I can find reciprocals of numbers or fractions • I can work out a fraction of a quantity • I can find one quantity as a fraction of another • I can add and subtract fractions with different denominators • I can multiply proper fractions and mixed numbers • I can divide by fractions • I can use a calculator to add and subtract fractions • I can use a calculator to multiply and divide fractions • I can increase and decrease quantities by a percentage • I can work out percentage change • I can express one quantity as a percentage of another			

Mathematics Progression Map Knowledge and Skill Breakdown				Algebra Knowledge	Skills and understanding		
Communication			Year Group		AO1: Use and apply standard techniques	AO2: Reason, interpret and communicate mathematically	AO3: Solve problems within mathematics and in other contexts
Across all year groups	Understanding knowledge	Comprehension, translation, summarising, demonstrating, discussion, describe	9	• I can use flow diagrams to draw graphs • I can work out the equations of horizontal and vertical lines. • I can draw linear graphs without using flow diagrams • I can draw linear graphs by finding points • I can work out the gradient of a straight line • I can draw a line with a certain gradient • I can draw graphs using the gradient-intercept method • I can draw graphs using the cover-up method • I can work out the equation of a line, using its gradient and y-intercept • I can work out the equation of a line given two points on the line • I can work out the equation of a linear graph that is parallel to another line and passes through a specific point • I can convert from one unit to another unit by using a conversion graph • I can use straight-line graphs to work out formulae • I can solve simultaneous linear equations using graphs • I can write an algebraic expression • I can recognise expressions, equations, formulae and identities	**I can:** **• accurately recall facts, terminology and definitions** **• use and interpret notation correctly** **• accurately carry out routine procedures or set tasks requiring multi-step solutions**	**I can:** **• make deductions, inferences and draw conclusions from mathematical information** **• construct chains of reasoning to achieve a given result** **• interpret and communicate information accurately** **• present arguments and proofs** **• assess the validity of an argument and critically evaluate a given way of presenting information**	**I can:** **• translate problems in mathematical or non-mathematical contexts into a process or a series of mathematical processes** **• make and use connections between different parts of mathematics** **• interpret results in the context of the given problem** **• evaluate methods used and results obtained** **• evaluate solutions to identify how they may have been affected by assumptions made**
		Remember, Recall of information, discovery, observation, listing/ locating, naming					
	Analysis and linking	Identifying and analysing patterns, organisation of ideas, recognising trends, conclude. Beginning to establish a Line of Argument (LOA)					
		Using the core, solving problems using methods, manipulating, designing, experimenting, explain, compare					
	Evaluate application	Using concepts to create ideas, design and invention, composing, predicting, combining, justify. Beginning to establish a clear Line of Argument (LOA)					

				• I can substitute into, manipulate, simplify and use algebraic expressions • I can expand brackets such as 2(x–3) • I can expand and simplify brackets • I can factorise an algebraic expression • I can expand two linear brackets to obtain a quadratic expression. • I can expand the square of a binomial • I can expand more than two binomials • I can factorise a quadratic expression of the form $x^2 + ax + b$ into two linear brackets • I can change the subject of a formula			

Mathematics Progression Map Knowledge and Skill Breakdown				Geometry	Skills and understanding		
Communication			Year Group	Knowledge	AO1: Use and apply standard techniques	AO2: Reason, interpret and communicate mathematically	AO3: Solve problems within mathematics and in other contexts
Across all year groups	Understanding knowledge	Comprehension, translation, summarising, demonstrating, discussion, describe	9	• I can convert from one metric unit to another • I can convert from one imperial unit to another • I can use approximate conversion factors to change between imperial units and metric units • I can read and draw scale drawings • I can use a scale drawing to make estimates • I can convert measurements to calculate actual distances • I can draw nets of some 3D shapes • I can identify a 3D shape from its net • I can read from and draw on isometric grids • I can interpret diagrams to draw plans and elevations • I can calculate angles on a straight line • I can calculate angles around a point • I can use vertically opposite angles • I can recognise and calculate the angles in different sorts of triangle • I can calculate the sum of the interior angles in a polygon • I can calculate the exterior angles and the interior angles of a regular polygon • I can calculate angles in parallel lines including alternate, corresponding, vertically opposite, co-interior	**I can:** **• accurately recall facts, terminology and definitions** **• use and interpret notation correctly** **• accurately carry out routine procedures or set tasks requiring multi-step solutions**	**I can:** **• make deductions, inferences and draw conclusions from mathematical information** **• construct chains of reasoning to achieve a given result** **• interpret and communicate information accurately** **• present arguments and proofs** **• assess the validity of an argument and critically evaluate a given way of presenting information**	**I can:** **• translate problems in mathematical or non-mathematical contexts into a process or a series of mathematical processes** **• make and use connections between different parts of mathematics** **• interpret results in the context of the given problem** **• evaluate methods used and results obtained** **• evaluate solutions to identify how they may have been affected by assumptions made**
		Remember, Recall of information, discovery, observation, listing/ locating, naming					
	Analysis and linking	Identifying and analysing patterns, organisation of ideas, recognising trends, conclude. Beginning to establish a Line of Argument (LOA)					
		Using the core, solving problems using methods, manipulating, designing, experimenting, explain, compare					
	Evaluate application	Using concepts to create ideas, design and invention, composing, predicting, combining, justify. Beginning to establish a clear Line of Argument (LOA)					

				• I can use angle properties in quadrilaterals • I can solve missing angle problems in triangles • I can calculate the size of angles in special quadrilaterals using their geometric properties • I can use a bearing to specify a direction • I can read, interpret and draw bearings diagrams • I can use the geometrical properties of a diagram to calculate a bearing • I can demonstrate that two triangles are congruent • I can find the order of rotational symmetry for a 2D shape • I can recognise shapes with rotational symmetry • I can translate, reflect, rotate and enlarge a 2D shape • I can combine transformations • I can construct the bisectors of lines and angles • I can construct angles of 60° and 90° • I can draw a locus for a given rule • I can solve practical problems using loci • I can construct and interpret plans and elevations of 3D shapes • I can calculate the circumference and area of a circle • I can calculate the area of a parallelogram • I can calculate the area of a trapezium • I can calculate the length of an arc • I can calculate the area and angle of a sector			

				• I can calculate the volume of a prism • I can calculate the volume and surface area of a cylinder • I can calculate the volume of a pyramid • I can calculate the volume and surface area of a cone • I can calculate the volume and surface area of a sphere • I can calculate the length of the hypotenuse in a right angled triangle • I can calculate the length of a shorter side in a right angled triangle • I can solve practical problems involving Pythagoras' theorem • I can use Pythagoras' Theorem and isosceles triangles • I can use Pythagoras' theorem to solve problems involving three dimensions • I can use the three trigonometric ratios • I can use the trigonometric ratios to calculate an angle • I can find lengths of sides and angles in right-angled triangles using the sine and cosine functions • I can find lengths of sides and angles in right-angled triangles using the tangent function • I can decide which trigonometric ratio to use in a right-angled triangle • I can solve practical problems using trigonometry • I can solve problems using an angle of elevation or an angle of depression • I can solve bearing problems using trigonometry			

				• I can find the length x in this isosceles triangle • I can calculate the area of the triangle			

Mathematics Progression Map Knowledge and Skill Breakdown				Statistics	Skills and understanding		
Communication			Year Group	Knowledge	AO1: Use and apply standard techniques	AO2: Reason, interpret and communicate mathematically	AO3: Solve problems within mathematics and in other contexts
Across all year groups	Understanding knowledge	Comprehension, translation, summarising, demonstrating, discussion, describe	9	• I can use tally charts and frequency tables to collect and represent data • I can use grouped frequency tables to collect and represent data • I can draw pictograms to represent statistical data • I can draw bar charts and vertical line charts to represent statistical data. • I can draw a line graph to show trends in data. • I can work out the mode, median, mean and range of small sets of data • I can decide which is the best average to use to represent a data set • I can draw and interpret bar charts and pie charts • I can draw and interpret line graphs • I can use averages to solve more complex problems • I can identify the advantages and disadvantages of each type of average and learn which one to use in different situations • I can calculate the mode, median and mean from a frequency table • I can identify the modal group • I can estimate the mean from a grouped frequency table • I can draw, interpret and use scatter diagrams • I can draw and use a line of best fit	**I can:** **• accurately recall facts, terminology and definitions** **• use and interpret notation correctly** **• accurately carry out routine procedures or set tasks requiring multi-step solutions**	**I can:** **• make deductions, inferences and draw conclusions from mathematical information** **• construct chains of reasoning to achieve a given result** **• interpret and communicate information accurately** **• present arguments and proofs** **• assess the validity of an argument and critically evaluate a given way of presenting information**	**I can:** **• translate problems in mathematical or non-mathematical contexts into a process or a series of mathematical processes** **• make and use connections between different parts of mathematics** **• interpret results in the context of the given problem** **• evaluate methods used and results obtained** **• evaluate solutions to identify how they may have been affected by assumptions made**
		Remember, Recall of information, discovery, observation, listing/ locating, naming					
	Analysis and linking	Identifying and analysing patterns, organisation of ideas, recognising trends, conclude. Beginning to establish a Line of Argument (LOA)					
		Using the core, solving problems using methods, manipulating, designing, experimenting, explain, compare					
	Evaluate application	Using concepts to create ideas, design and invention, composing, predicting, combining, justify. Beginning to establish a clear Line of Argument (LOA)					

Mathematics Progression Map Knowledge and Skill Breakdown				Ratio and proportion	Skills and understanding		
Communication			Year Group	Knowledge	AO1: Use and apply standard techniques	AO2: Reason, interpret and communicate mathematically	AO3: Solve problems within mathematics and in other contexts
Across all year groups	Understanding knowledge	Comprehension, translation, summarising, demonstrating, discussion, describe	9	• I can simplify a ratio • I can express a ratio as a fraction • I can divide amounts into given ratios • I can complete calculations from a given ratio and partial information • I can recognise the relationship between speed, distance and time • I can calculate average speed from distance and time • I can calculate distance travelled from the speed and the time taken • I can calculate the time taken on a journey from the speed and the distance • I can recognise and solve problems that involve direct proportion • I can find the cost per unit mass • I can find the mass per unit cost • I can use the above to find which product is better value • I can recognise and solve problems involving the compound measures of rates of pay, speed, density and pressure • I can calculate compound interest • I can solve problems involving repeated percentage change • I can calculate the original amount after a known percentage change	**I can:** **• accurately recall facts, terminology and definitions** **• use and interpret notation correctly** **• accurately carry out routine procedures or set tasks requiring multi-step solutions**	**I can:** **• make deductions, inferences and draw conclusions from mathematical information** **• construct chains of reasoning to achieve a given result** **• interpret and communicate information accurately** **• present arguments and proofs** **• assess the validity of an argument and critically evaluate a given way of presenting information**	**I can:** **• translate problems in mathematical or non-mathematical contexts into a process or a series of mathematical processes** **• make and use connections between different parts of mathematics** **• interpret results in the context of the given problem** **• evaluate methods used and results obtained** **• evaluate solutions to identify how they may have been affected by assumptions made**
		Remember, Recall of information, discovery, observation, listing/ locating, naming					
	Analysis and linking	Identifying and analysing patterns, organisation of ideas, recognising trends, conclude. Beginning to establish a Line of Argument (LOA)					
		Using the core, solving problems using methods, manipulating, designing, experimenting, explain, compare					
	Evaluate application	Using concepts to create ideas, design and invention, composing, predicting, combining, justify. Beginning to establish a clear Line of Argument (LOA)					