Mathematics Progression Map Knowledge and Skill Breakdown				Number 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	10	• I can multiply and divide by powers of 10 • I can use the laws of indices • I can change numbers between standard form and ordinary form • I can calculate using numbers in standard form • I can recognise rational numbers, reciprocals, terminating decimals and recurring decimals • I can convert terminal decimals to fractions • I can convert fractions to recurring decimals • I can find reciprocals of numbers or fractions • I can estimate powers and roots of any given positive number • I can apply the rules of powers to negative and fractional powers • I can find and use the relationship between negative powers and roots • I can simplify surds • I can calculate and manipulate surds, including rationalising a denominator • I can find the error interval or limits of accuracy of numbers that have been rounded to different degrees of accuracy • I can combine limits of two or more variables together to solve problems • I can work out the number of choices, arrangements or outcomes when choosing from lists or sets	**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				Algebra	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	10	• I can solve linear equations such as • $3x - 1 = 11$ where the variable only appears on one side • I can use inverse operations and inverse flow diagrams • I can solve equations by balancing • I can solve equations in which the variable (the letter) appears in the numerator of a fraction • I can solve equations where you have to first expand brackets • I can solve equations where the variable appears on both sides of the equals sign • I can use the laws of indices (powers) • I can solve equations in which the variable (the letter) appears as part of the numerator of a fraction • I can solve equations where you have to expand brackets first • I can solve equations where the variable appears on both sides of the equals sign • I can set up equations from given information and then solve them • I can solve simultaneous linear equations in two variables using the elimination method • I can solve simultaneous linear equations in two variables using the substitution method • I can solve simultaneous linear equations by balancing coefficients • I can solve problems using simultaneous linear equations	**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 solve a simple linear inequality and represent it on a number line • I can show a graphical inequality • I can find regions that satisfy more than one graphical inequality • I can draw and read values from quadratic graphs • I can solve a quadratic equation by factorisation • I can rearrange a quadratic equation so that it can be factorised • I can solve a quadratic equation by using the quadratic formula • I can recognise why some quadratic equations cannot be solved • I can solve a quadratic equation by completing the square • I can solve a quadratic equation by completing the square • I can identify the significant points of a quadratic function graphically • I can identify the roots of a quadratic function by solving a quadratic equation • I can identify the turning point of a quadratic function by using symmetry or completing the square • I can solve a pair of simultaneous equations where one is linear and one is non-linear, using graphs • I can solve equations by the method of intersecting graphs • I can solve simultaneous equations where one equation is linear and the other is non-linear • I can solve quadratic inequalities			

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	10	• I can calculate the perimeter and area of a rectangle • I can calculate the perimeter and area of a compound shape made from rectangles • I can calculate the area of a triangle • I can use the formula for the area of a triangle • I can calculate the area of a parallelogram • I can use the formula for the area of a parallelogram • I can calculate the area of a trapezium • I can use the formula for the area of a trapezium • I can recognise terms used for circle work • I can calculate the circumference of a circle • I can calculate the area of a circle. • I can give answers for circle calculations in terms of ð • I can work out the order of rotational symmetry for a 2D shape • I can recognise shapes with rotational symmetry • I can translate a 2D shape • I can reflect a 2D shape in a mirror line • I can rotate a 2D shape about a point • I can enlarge a 2D shape by a scale factor • I can use more than one transformation	**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)					
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	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 represent vectors • I can add and subtract vectors • I can use the correct terms when working with 3D shapes • I can calculate the surface area and volume of a cuboid • I can calculate the volume and surface area of a prism • I can calculate the volume and surface area of a cylinder • I can construct accurate drawings of triangles, using a pair of compasses, a protractor and a straight edge • 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 show two triangles are similar • I can work out the scale factor between similar triangles • I can solve problems involving the area and volume of similar shapes			

Mathematics Progression Map Knowledge and Skill Breakdown				Statistics 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	10	• I can use the probability scale and the language of probability • I can calculate the probability of an outcome of an event • I can calculate the probability of an outcome not happening when you know the probability of that outcome happening • I can recognise mutually exclusive and exhaustive outcomes • I can calculate experimental probabilities and relative frequencies from experiments • I can recognise different methods for estimating probabilities • I can predict the likely number of successful outcomes, given the number of trials and the probability of any one outcome • I can apply systematic listing and counting strategies to identify all outcomes for a variety of problems • I can obtain a random sample from a population • I can collect unbiased and reliable data for a sample. • I can draw and interpret pie charts • I can draw, interpret and use scatter diagrams • I can draw and use a line of best fit • I can identify the modal group • I can calculate an estimate of the mean from a grouped table • I can calculate experimental probabilities and relative frequencies • I can estimate probabilities from experiments	**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 different methods to estimate probabilities • I can recognise mutually exclusive, complementary and exhaustive events • I can predict the likely number of successful events, given the number of trials and the probability of any one outcome • I can read two-way tables and use them to work out probabilities • I can use Venn diagrams to solve probability questions			

<table>
<tr><td colspan="3">Mathematics Progression Map
Knowledge and Skill Breakdown</td><td colspan="2">Ratio and Proportion</td><td colspan="3">Skills and understanding</td></tr>
<tr><td colspan="3">Communication</td><td>Year Group</td><td>Knowledge</td><td>AO1: Use and apply standard techniques</td><td>AO2: Reason, interpret and communicate mathematically</td><td>AO3: Solve problems within mathematics and in other contexts</td></tr>
<tr><td rowspan="4">Across all year groups</td><td rowspan="2">Understanding knowledge</td><td>Comprehension, translation, summarising, demonstrating, discussion, describe</td><td rowspan="4">10</td><td rowspan="4">• I can convert percentages to fractions and decimals and vice versa
• I can calculate a percentage of a quantity
• I can increase and decrease quantities by a percentage
• I can express one quantity as a percentage of another
• I can work out percentage change
• I can recognise and solve problems involving the compound measures of rates of pay, density and pressure
• I can calculate simple interest
• I can calculate compound interest
• I can solve problems involving repeated percentage change
• I can calculate original amounts using reverse percentages
• I can solve problems in which two variables have a directly proportional relationship (direct variation)
• I can work out the constant of proportionality
• I can recognise graphs that show direct variation
• I can solve problems in which two variables have an inversely proportional relationship (inverse variation)
• I can work out the constant of proportionality
• I can show two triangles are similar
• I can work out the scale factor between similar triangles
• I can solve problems involving the area and volume of similar shapes</td><td rowspan="4">I can:
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