

| 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 | <ul style="list-style-type: none"> • 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 the original amount, given the final amount, after a known percentage increase or decrease (reverse percentages) • I can write a number as a power of another number • I can use powers (also known as indices) • I can multiply and divide by powers of 10 • I can use rules for multiplying and dividing powers • I can multiply and divide numbers by powers of 10 • I can write a number in standard form • I can calculate with numbers in standard form • I can estimate powers and roots of any given positive number | I can: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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) | | | | | |

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| | | | <ul style="list-style-type: none">• 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 | | | |
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| Mathematics Progression Map Knowledge and Skill Breakdown | | Algebra | Skills and understanding | | | | |
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| 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 | 11 | <ul style="list-style-type: none"> • I can recognise patterns in number sequences • I can recognise how number sequences are built up • I can generate sequences, given the nth term • I can find the nth term of a linear sequence • I can recognise and continue some special number sequences • I can understand how prime, odd and even numbers interact in addition, subtraction and multiplication problems • I can find the nth term from practical problems involving sequences • 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 solve a simple linear inequality and represent it on a number line • I can interpret distance-time graphs • I can draw a graph of the depth of liquid as a container is filled • I can read information from a velocity-time graph • I can work out the acceleration | I can: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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 |
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| | | | | <p>from a velocity-time graph</p> <ul style="list-style-type: none">• I can draw and read values from quadratic graphs• I can solve a quadratic equation by factorisation• 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• I can recognise and plot cubic and reciprocal 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 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 | | | |
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| | | | <ul style="list-style-type: none">• I can interpret distance–time graphs• I can draw a graph of the depth of liquid as a container is filled• I can read information from a velocity–time graph• I can work out the distance travelled from a velocity–time graph• I can work out the acceleration from a velocity–time graph• I can use areas of rectangles, triangles and trapeziums to estimate the area under a curve• I can interpret the meaning of the area under a curve• I can draw a tangent at a point on a curve and use it to work out the gradient at a point on a curve• I can interpret the gradient at a point on a curve• I can find the equation of a tangent to a circle• I can recognise and plot cubic, exponential and reciprocal graphs• I can transform a graph• I can simplify algebraic fractions• I can solve equations containing algebraic fractions• I can change the subject of a formula where the subject occurs more than once• I can find the output of a function• I can find the inverse function• I can find the composite of two functions• I can find an approximate solution for an equation using the process of iteration | | | |
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| Mathematics Progression Map Knowledge and Skill Breakdown | | | Geometry | Skills and understanding | | |
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| 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 | <ul style="list-style-type: none"> • 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 calculate the length of an arc • I can calculate the area and angle of a sector • I can calculate the volume and surface area 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 know what Pythagoras' theorem is • 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 problems using Pythagoras' theorem • I can use Pythagoras' theorem in isosceles triangles • I can define, understand and use the three trigonometric ratios • I can use trigonometric ratios to calculate a length in a right-angled triangle • I can use the trigonometric ratios to calculate an angle | I can: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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 |
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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) | | | | | |

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| | | | <ul style="list-style-type: none">• I can work out and remember trigonometric values for angles of 30°, 45°, 60° and 90°• 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 use trigonometry to solve problems involving isosceles triangles• I can demonstrate that two triangles are congruent• I can recognise similarity in any two shapes• I can show that two shapes are similar• I can work out the scale factor between similar shapes• I can work out the size of angles in circles• I can find the size of angles in cyclic quadrilaterals• I can use tangents and chords to find the size of angles in circles• I can use the alternate segment theorem to find the size of angles in circles• I can use trigonometric ratios and Pythagoras' theorem to solve more complex two-dimensional problems• I can use trigonometric ratios and Pythagoras' theorem to solve more complex three-dimensional problems• I can find the sine, cosine and tangent of any angle from 0° to 360°• I can use the sine rule and the cosine rule to find sides and angles in any triangle | | | |
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| | | | <ul style="list-style-type: none">• I can work out the area of a triangle if you know two sides and the included angle• I can add and subtract vectors• I can use vectors to solve geometric problems | | | |
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| Mathematics Progression Map Knowledge and Skill Breakdown | | Year Group | Statistics | Skills and understanding | | |
|--|--|--|---|---|---|--|
| Communication | | | 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 | <ul style="list-style-type: none"> • 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 work out the probabilities when two or more events occur at the same time • I can read two-way tables and use them to work out probabilities • I can use Venn diagrams to solve probability questions • I can understand frequency tree diagrams and probability tree diagrams • I can use probability tree diagrams to work out the probabilities involved in combined events • I can understand sampling • I can collect unbiased reliable data for a sample • I can draw and interpret frequency polygons • I can draw and interpret cumulative frequency graphs • I can draw and interpret box plots • I can draw and interpret histograms where the bars are of equal width | I can: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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: <ul style="list-style-type: none"> • 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 |
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| | | | <ul style="list-style-type: none">• I can draw and interpret histograms where the bars are of unequal width• I can calculate the median, quartiles and interquartile range from a histogram• I can work out the probability of different outcomes of combined events• I can work out the probability of two outcomes or events occurring at the same time• I can use tree diagrams to work out the probability of combined events• I can use the connectors 'and' and 'or' to work out the probabilities for combined events• I can work out the probability of combined events when the probabilities change after each event | | | |
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| Mathematics Progression Map Knowledge and Skill Breakdown | | Year Group | Ratio and Proportion | Skills and understanding | | |
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| Communication | | | | Knowledge | AO1: Use and apply standard techniques | AO2: Reason, interpret and communicate mathematically |
| Across all year groups | Understanding knowledge | Comprehension, translation, summarising, demonstrating, discussion, describe | <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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: <ul style="list-style-type: none"> 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 | | | | |
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