

Year 9	Aut 1	Aut 2	Spr 1	Spr 2	Sum 1	Sum 2
TOPIC	<u>W1/2 - Presentation of data</u> <u>W2/3 - Calculating space</u> <u>W4 - Numbers and the number system</u> <u>W5 - Calculating FDP</u> <u>W6 - Proportional reasoning</u> <u>W7/8 - Algebraic proficiency</u>	<u>W1/2 - Solving equations and inequalities</u> <u>W3/4 - Algebraic proficiency</u> <u>W6/7 - Numbers and the number system pt 2</u>	<u>W1/2 - Investigating angles</u> <u>W3/5 - Algebraic proficiency: visualising</u> <u>W6 - Pattern Sniffing</u>	<u>W1/2 - Proportional reasoning</u> <u>W4/5 - Numbers and the number system pt 3</u> <u>W5/6 - Exploring FDP</u>	<u>W1/2 - Understanding risk</u> <u>W3/4 - Calculating FDP</u> <u>W5 - Measuring data</u>	<u>W1/2 - Visualising and constructing</u> <u>W6/7 - Calculating space</u>
KNOWLEDGE TAUGHT	<p>Presentation of data</p> <ul style="list-style-type: none"> Construct and interpret a grouped frequency table for continuous data Construct and interpret histograms for grouped data with equal class intervals Plot a scatter diagram of bivariate data Interpret a scatter diagram using understanding of correlation <p>Calculating space</p> <ul style="list-style-type: none"> Know circle definitions and properties, including: centre, radius, chord, diameter, circumference Calculate the circumference of a circle when radius or diameter is given Calculate the perimeter of composite shapes that include sections of a circle Calculate the area of a circle when radius or diameter is given Calculate the area of composite shapes that include sections of a circle <p>Numbers and the number system</p> <ul style="list-style-type: none"> Round numbers to a given number of significant figures Estimating answers to calculations <p>Calculating FDP</p> <ul style="list-style-type: none"> Identify the multiplier for a percentage increase or decrease when the percentage is greater than 100% Use calculators to increase an amount by a percentage greater than 100% Solve problems involving percentage change Solve original value problems when working with percentages Solve financial problems including simple interest Solve problems that require exact calculation with fractions <p>Proportional reasoning</p> <ul style="list-style-type: none"> Understand and use compound units Convert between units of speed Solve problems involving speed Solve problems involving rates of pay Solve problems involving unit pricing <p>Algebraic proficiency</p> <ul style="list-style-type: none"> Substitute positive and negative numbers into formulae 	<p>Solving equations and inequalities</p> <ul style="list-style-type: none"> Solve linear equations with the unknown on one side when calculating with negative numbers is required Solve linear equations with the unknown on both sides when the solution is a whole number Solve linear equations with the unknown on both sides when the solution is a fraction Solve linear equations with the unknown on both sides when the solution is a negative number Solve linear equations with the unknown on both sides when the equation involves brackets Recognise that the point of intersection of two graphs corresponds to the solution of a connected equation <p>Algebraic proficiency</p> <ul style="list-style-type: none"> Know that graphs of functions of the form $y = mx + c$, $x \pm y = c$ and $ax \pm by = c$ are linear Plot graphs of functions of the form $y = mx \pm c$ Plot graphs of functions of the form $ax \pm by = c$ Find the gradient of a straight line on a unit grid Find the y-intercept of a straight line Sketch linear graphs <p>Numbers and the number system pt 2</p> <ul style="list-style-type: none"> Write a number as a product of its prime factors Use prime factorisations to find the highest common factor of two numbers Use prime factorisations to find the lowest common multiple of two numbers Solve problems using highest common factors or lowest common multiples 	<p>Investigating angles</p> <ul style="list-style-type: none"> Solve missing angle problems involving alternate angles Solve missing angle problems involving corresponding angles Use knowledge of alternate and corresponding angles to calculate missing angles in geometrical diagrams Establish the fact that angles in a triangle must total 180° Establish the size of an interior angle in a regular polygon Establish the size of an exterior angle in a regular polygon Solve missing angle problems in polygons <p>Algebraic proficiency: visualising</p> <ul style="list-style-type: none"> Distinguish between a linear and quadratic graph Plot graphs of quadratic functions of the form $y = x^2 \pm c$ Sketch a simple quadratic graph Plot and interpret graphs of piece-wise linear functions in real contexts Plot and interpret distance-time graphs (speed-time graphs) including approximate solutions to kinematic problems <p>Pattern Sniffing</p> <ul style="list-style-type: none"> Generate terms of a sequence from a position-to-term rule Find the nth term of an ascending linear sequence Find the nth term of an descending linear sequence Use the nth term of a sequence to deduce if a given number is in a sequence Recognise geometric sequences and appreciate other sequences that arise. 	<p>Proportional reasoning</p> <ul style="list-style-type: none"> Express the division of a quantity into two parts as a ratio Understand the connections between ratios and fractions Find a relevant multiplier in a situation involving proportion Solve ratio problems involving mixing Solve ratio problems involving comparison Solve ratio problems involving concentrations <p>Numbers and the number system pt 3</p> <ul style="list-style-type: none"> Use standard form to write large numbers Use standard form to write small numbers <p>Exploring FDP</p> <ul style="list-style-type: none"> if a fraction is terminating or recurring Recall some decimal and fraction equivalents (e.g. tenths, fifths, eighths, thirds, quarters, etc.) Write a terminating decimal as a fraction Write a fraction in its lowest terms by cancelling common factors Use a calculator to change any fraction to a decimal 	<p>Understanding risk</p> <ul style="list-style-type: none"> List all elements in a combination of sets using a Venn diagram List outcomes of an event systematically Use a table to list all outcomes of an event Use frequency trees to record outcomes of probability experiments Construct theoretical possibility spaces for combined experiments with equally likely outcomes Calculate probabilities using a possibility space Use theoretical probability to calculate expected outcomes Use experimental probability to calculate expected outcomes <p>Calculating FDP</p> <ul style="list-style-type: none"> Identify the multiplier for a percentage increase or decrease when the percentage is greater than 100% Use calculators to increase an amount by a percentage greater than 100% Solve financial problems including simple interest <p>Measuring data</p> <ul style="list-style-type: none"> Find the modal class of set of grouped data Find the class containing the median of a set of data Calculate an estimate of the mean from a grouped frequency table Estimate the range from a grouped frequency table Analyse and compare sets of data, appreciating the limitations of different statistics (mean, median, mode, range) Choose appropriate statistics to describe a set of data 	<p>Visualising and constructing</p> <ul style="list-style-type: none"> Use the centre and scale factor to carry out an enlargement with a positive integer scale factor Find the centre of enlargement Find the scale factor of an enlargement Use scale diagrams, including maps Use the concept of scaling in diagrams Interpret plans and elevations Understand and use bearings Construct scale diagrams involving bearings Solve geometrical problems using bearings <p>Calculating space</p> <ul style="list-style-type: none"> Calculate the volume of a right prism Calculate the volume of a cylinder Compare lengths, areas and volumes using ratio notation

	<ul style="list-style-type: none"> Change the subject of a formula when one step is required Change the subject of a formula when two steps are required 					
<p>SKILLS DEVELOPED (Include any trips and visits.)</p>	<ul style="list-style-type: none"> Apply the four operations with negative numbers Apply the multiplication, division and power laws of indices Find a relevant multiplier when solving problems involving proportion Solve problems involving percentage change, including original value problems Change the subject of a formula when two steps are required Apply the formulae for circumference and area of a circle 	<ul style="list-style-type: none"> Plot and interpret graphs of linear functions Solve linear equations with unknowns on both sides Factorise an expression by taking out common factors 	<ul style="list-style-type: none"> Find and use the nth term for a linear sequence Plot and interpret graphs of quadratic functions Understand the rules of parallel lines 	<ul style="list-style-type: none"> Convert numbers into standard form and vice versa Convert between terminating decimals and fractions Share within a given ratio Convert between standard form and ordinary 	<ul style="list-style-type: none"> Calculate theoretical probabilities for single events Use multipliers to calculate percentages Use averages to measure data 	<ul style="list-style-type: none"> Use scale factors
<p>ASSESSMENTS (Minimum two per half term, with focussed marking.)</p>	<ol style="list-style-type: none"> Knowledge check 1 Knowledge check 2 	<ol style="list-style-type: none"> Knowledge check 1 PUMA Autumn 	<ol style="list-style-type: none"> Knowledge check 1 Knowledge check 2 	<ol style="list-style-type: none"> Knowledge check 1 PUMA Spring 	<ol style="list-style-type: none"> Knowledge check 1 Knowledge check 2 	<ol style="list-style-type: none"> Knowledge check 1 PUMA Summer
<p>HOME LEARNING (To be made available via Century Tech; one per week.)</p>	<ol style="list-style-type: none"> Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 	<ol style="list-style-type: none"> Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 	<ol style="list-style-type: none"> Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 	<ol style="list-style-type: none"> Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 	<ol style="list-style-type: none"> Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 	<ol style="list-style-type: none"> Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2 Hegarty homework x2
<p>SEQUENCING (What must students already have been taught in order to begin to learn this topic? Identify opportunities to address knowledge gaps)</p>	<p>Presentation of data</p> <ul style="list-style-type: none"> Know the meaning of discrete data Interpret and construct frequency tables Construct and interpret pictograms, bar charts, pie charts, tables and vertical line charts <p>Calculating space</p> <ul style="list-style-type: none"> Know how to use formulae to find the area of rectangles, parallelograms, triangles and trapezia Know how to find the area of compound shapes <p>Numbers and the number system</p> <ul style="list-style-type: none"> Know the meaning of a prime number Recall prime numbers up to 50 Understand the use of notation for powers Know how to round to the nearest whole number, 10, 100, 1000 and to decimal places 	<p>Solving equations and inequalities</p> <ul style="list-style-type: none"> Choose the required inverse operation when solving an equation Solve linear equations by balancing when the solution is a whole number or a fraction <p>Algebraic proficiency</p> <ul style="list-style-type: none"> Use coordinates in all four quadrants Write the equation of a line parallel to the x-axis or the y-axis Draw a line parallel to the x-axis or the y-axis given its equation Identify the lines $y = x$ and $y = -x$ Draw the lines $y = x$ and $y = -x$ 	<p>Investigating angles</p> <ul style="list-style-type: none"> Use angles at a point, angles at a point on a line and vertically opposite angles to calculate missing angles in geometrical diagrams Know that the angles in a triangle total 180° <p>Algebraic proficiency: visualising</p> <ul style="list-style-type: none"> Use coordinates in all four quadrants Write the equation of a line parallel to the x-axis or the y-axis Draw a line parallel to the x-axis or the y-axis given its equation Identify the lines $y = x$ and $y = -x$ 	<p>Proportional reasoning</p> <ul style="list-style-type: none"> Understand and use ratio notation Divide an amount in a given ratio <p>Numbers and the number system pt 3</p> <ul style="list-style-type: none"> Know the meaning of a prime number Recall prime numbers up to 50 Understand the use of notation for powers Know how to round to the nearest whole number, 10, 100, 1000 and to decimal places Multiply and divide numbers by powers of 10 	<p>Understanding risk</p> <ul style="list-style-type: none"> Convert between fractions, decimals and percentages Understand the use of the 0-1 scale to measure probability Work out theoretical probabilities for events with equally likely outcomes Know how to represent a probability Know that the sum of probabilities for all outcomes is 1 <p>Calculating FDP</p> <ul style="list-style-type: none"> Apply the four operations to proper fractions, improper fractions and mixed numbers 	<p>Visualising and constructing</p> <ul style="list-style-type: none"> Use a protractor to measure angles to the nearest degree Use a ruler to measure lengths to the nearest millimetre Understand coordinates in all four quadrants Work out a multiplier given two numbers Understand the concept of an enlargement (no scale factor) <p>Calculating space</p> <ul style="list-style-type: none"> Know how to use formulae to find the area of rectangles, parallelograms, triangles and trapezia Know how to find the area of compound shapes

	<ul style="list-style-type: none"> • Multiply and divide numbers by powers of 10 • Know how to identify the first significant figure in any number • Approximate by rounding to the first significant figure in any number <p>Calculating FDP</p> <ul style="list-style-type: none"> • Apply the four operations to proper fractions, improper fractions and mixed numbers • Use calculators to find a percentage of an amount using multiplicative methods • Identify the multiplier for a percentage increase or decrease • Use calculators to increase (decrease) an amount by a percentage using multiplicative methods • Know that percentage change = actual change ÷ original amount <p>Proportional reasoning</p> <ul style="list-style-type: none"> • Understand and use ratio notation • Divide an amount in a given ratio <p>Algebraic proficiency</p> <ul style="list-style-type: none"> • Know basic algebraic notation (the rules of algebra) • Simplify an expression by collecting like terms • Know how to multiply a single term over a bracket • Substitute positive numbers into expressions and formulae • Calculate with negative numbers 	<ul style="list-style-type: none"> • Substitute positive and negative numbers into formulae <p>Numbers and the number system pt 2</p> <ul style="list-style-type: none"> • Know the meaning of a prime number • Recall prime numbers up to 50 • Understand the use of notation for powers • Know how to round to the nearest whole number, 10, 100, 1000 and to decimal places • Multiply and divide numbers by powers of 10 • Know how to identify the first significant figure in any number • Approximate by rounding to the first significant figure in any number 	<ul style="list-style-type: none"> • Draw the lines $y = x$ and $y = -x$ • Substitute positive and negative numbers into formulae <p>Pattern Sniffing</p> <ul style="list-style-type: none"> • Use a term-to-term rule to generate a sequence • Find the term-to-term rule for a sequence • Describe a sequence using the term-to-term rule 	<ul style="list-style-type: none"> • Know how to identify the first significant figure in any number • Approximate by rounding to the first significant figure in any number <p>Exploring FDP</p> <ul style="list-style-type: none"> • Understand that fractions, decimals and percentages are different ways of representing the same proportion • Convert between mixed numbers and top-heavy fractions • Write one quantity as a fraction of another 	<ul style="list-style-type: none"> • Use calculators to find a percentage of an amount using multiplicative methods • Identify the multiplier for a percentage increase or decrease • Use calculators to increase (decrease) an amount by a percentage using multiplicative methods • Know that percentage change = actual change ÷ original amount <p>Measuring data</p> <ul style="list-style-type: none"> • Understand the mean, mode and median as measures of typicality (or location) • Find the mean, median, mode and range of a set of data • Find the mean, median, mode and range from a frequency table 	
<p>SCHEMAS (Where might students learn about elements of this topic in other subjects? Which subjects might this topic feed into beyond your own?)</p>	<p>Links with Geography</p> <ul style="list-style-type: none"> - Presentation of data <p>Links with Science</p> <ul style="list-style-type: none"> - Rearranging formulae - Rounding - Percentage change <p>Links with Business Studies</p> <ul style="list-style-type: none"> - Percentage change - Profit/ loss 	<p>Links with Science</p> <ul style="list-style-type: none"> - Solving equations - Sketching and understanding graphs - Multiples and factors <p>Links with Business studies</p> <ul style="list-style-type: none"> - Plotting and interpreting linear graphs 	<p>Links with Art</p> <ul style="list-style-type: none"> - Relationships between lines and angles - Patterns and sequences. <p>Links with Science</p> <ul style="list-style-type: none"> - Gradients and quadratic graphs 	<p>Links with Food Technology</p> <ul style="list-style-type: none"> - Sharing in a ratio <p>Links with Science</p> <ul style="list-style-type: none"> - Standard form - Decimals to fractions 	<p>Links with Business Studies</p> <ul style="list-style-type: none"> - Probability - Understanding risk - Multipliers and interest - Measuring data using averages <p>Links with Science</p> <ul style="list-style-type: none"> - Measuring data using averages 	<p>Links with Art</p> <ul style="list-style-type: none"> - Scale factors <p>Links with Geography</p> <ul style="list-style-type: none"> - Scale factors, diagrams and maps
<p>CAREERS LINKS (How might this benefit them in the future?)</p>	<p>Business and management Finance and economics Sound and graphics Space and navigation Communications and security Energy and environment</p>	<p>Business and management Finance and economics Sound and graphics Space and navigation Communications and security Energy and environment</p>	<p>Business and management Finance and economics Sound and graphics Space and navigation Communications and security Energy and environment</p>	<p>Business and management Finance and economics Sound and graphics Space and navigation Communications and security Energy and environment</p>	<p>Business and management Finance and economics Sound and graphics Space and navigation Communications and security Energy and environment</p>	<p>Business and management Finance and economics Sound and graphics Space and navigation Communications and security Energy and environment</p>