MATHEMATICS	Using and applying mathematics	Calculating, numbers and the number system	Algebra	Geometry & measures	Statistics & probability	Ratio, proportion and rates of change
Beginning	 Recall and select the mathematics they use in a range of classroom activities Identify different approaches and find ways of overcoming difficulties when problem solving Needs help to organise their work Recall, and use and mathematical symbols and diagrams Describe a general statement by finding particular examples that match it Review their work and reasoning 	 Read and write numbers up to 100 Begin to add and subtract two-digit and three digit numbers mentally With support multiply two digit numbers by 2, 3, 4 or 5 as well as 10 with whole number answers and remainders Develop mental strategies for division by halving and halving again etc. Identify place value and use this to make approximations Round positive whole numbers to the nearest 10, 100 and 1000. Recognise and interpret negative numbers in contexts such as temperature and money with the support of a number line 	 Recognise a small range of basic sequences Begin to use pictures/symbols to represent unknown numbers or variables Begin to understand the role of '=' (the 'equals' sign) Relate the numbers of a linear sequence to their position on a number line or on a counting stick or equivalent Describe positions on the full coordinate grid (all four quadrants) 	 Classify 3-D and 2-D shapes in various ways using mathematical properties such as reflective symmetry for 2-D shapes Begin to identify nets of familiar 3-D shapes, e.g. cube, cuboid, triangular prism, square-based pyramid Identify shapes in different orientations and reflect shapes, presented on a grid, in a vertical or horizontal mirror line use a range of measures including non-standard units and standard metric units of length, capacity and mass use standard units of time Identify different types of angles 	 Collect information Construct bar charts and pictograms, where the symbol represents a group of units Use a Venn diagrams to record and classify information Describe information presented in simple tables, lists, bar charts, pictograms and state simple trends Begin to identify the mode of data sets 	Describe the connection between division and fractions with support Starting to identify simple fractions such as a half and a quarter identify the percent symbol (%) and be able to describe how per cent relates to 'number of parts per hundred'. Begin to solve simple problems involving direct proportion by scaling quantities up or down
Developing	 Develop own strategies for solving problems and give reasons Identify their own strategies within mathematics and in applying mathematics to practical contexts Present information and results in a clear and organised way Search for a solution by trying out ideas of their own 	 Use efficient written methods of addition ,subtraction, short multiplication and division Multiply a simple decimal by a single digit Give reasons for results with reference to the context or size of numbers Identify and describe number patterns Identify number relationships including multiple, factor and square Start to use negative numbers and decimal notation in contexts use place value to multiply and divide whole numbers by 10 or 100 order decimals to three decimal places 	 Begin to use simple formulae expressed in words Substitute positive numbers into simple expressions with more than one unknown Use and interpret coordinates in the first quadrant Understand the concept of simplification Represent simple functions with function machines. 	 Use the properties of 2-D and 3-D shapes Make 3-D models by linking given faces or edges and draw common 2-D shapes in different orientations on grids Reflect simple shapes in a mirror line, translate shapes horizontally or vertically and begin to rotate a simple shape or object about its centre or a vertex Choose and use appropriate units and instruments Describe with appropriate accuracy, numbers on a range of measuring instruments Identify perimeters of simple shapes and find areas by counting squares 	 Collect and record discrete data Group data, where appropriate, in equal class intervals Construct and interpret frequency diagrams and simple line graphs Identify the mode and range of data sets and use this to describe sets of data 	 Begin to understand simple ratio Describe one quantity as a fraction of another, where the fraction is less than 1 and greater than 1. Give reasons as to why fractions are equivalent Recognise approximate proportions of a whole and use simple fractions and percentages to describe these Identify simple percentages of diagrams
Secure	 Consistently identify and obtain relevant information to carry through a task and solve mathematical problems Check results, and explain whether these are reasonable Solve word problems and investigations from a range of contexts Show understanding of situations by describing them mathematically using symbols, words and diagrams Draw simple conclusions of their own and give an explanation of their using and applying mathematics 	 use known facts, place value, knowledge of operations and brackets to calculate use all four operations with decimals to two places Use a relevant non-calculator method for solving problems that involve multiplying and dividing any three-digit number by any two-digit number Solve simple problems involving ordering, adding, subtracting negative numbers in context Apply inverse operations and approximate to check answers to problems are of the correct magnitude Use place value to multiply and divide whole numbers and decimals by 10, 100 and 1000 and explain the effect Round decimals to the nearest decimal place and order negative numbers in context Recognise and use number patterns and relationships multiply and divide an integer by a fraction Use the order of operations, excluding brackets and indices within a calculation 	Construct, express in symbolic form, and use simple formulae involving one or two operations Interpret coordinates in all four quadrants Identify a term to term rule for a sequence Simplify and manipulate simple algebraic expressions Solve two step linear equations including brackets.	 Use a wider range of properties of 2-D and 3-D shapes and identify all the symmetries of 2-D shapes Use language associated with angles and know and use the angle sum of a triangle and that of angles at a point Reason about position and movement and transform shapes Measure and draw angles to the nearest degree, when constructing models and drawing or using shapes Read scales on a range of measuring instruments, explaining what each labelled division represents Solve problems involving the conversion of units and make sensible estimates of a range of measures in relation to everyday situations Understand and use the formula for the area of a rectangle Explain the difference between area from perimeter 	 Structure questions, plan how to answer them and collect the data required In probability, select methods based on equally likely outcomes and experimental evidence, as appropriate Explain how to use the probability scale from 0 to 1 Use the mean of discrete data and compare two simple distributions, using the range and one of mode, median or mean understand that different outcomes may result from repeating an experiment Interpret graphs and diagrams, including pie charts, and draw conclusions create and interpret line graphs where the intermediate values have meaning 	 Solve problems involving ratio and direct proportion Use equivalence between fractions and order fractions and decimals Reduce a fraction to its simplest form by cancelling common factors Convert between mixed numbers and improper fractions Describe how to simplify a ratio and be able to use this to solve problems Explain how to extend percentage calculation strategies to find any percentage

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Confident	 Independently solve tasks by breaking them down into smaller more manageable tasks Consider and discuss information presented in a variety of forms Present a precise argument with reasons, using symbols, diagrams, graphs and related explanatory text. 	Explain how to find the HCF and LCM using prime factor decomposition Strengthen and extend mental methods of calculations to independently solve complex contextual problems Solve problems by applying the order of operations to more complex calculations involving positive and negative numbers	 Use systematic trial and improvement and ICT to find solutions to equations such as X³ + x = 20 Construct and solve linear equations with whole-number coefficients Generate terms of a sequence using term to term and position to term definitions of the sequence Find the nth term of a linear sequence Plot the graphs of linear functions Recognise that equations of the form y=mx + c represent a straight line. Construct graphs arising from real-life problems, interpret graphs arising from real situations Know and use the laws of indices Solve linear equations with letters both side, fractional and negative solutions Solve simple inequalities e.g. 3x + 1 < 16 Factorise algebraic expressions including quadratics Multiply two expressions of the form (x ± 	 classify quadrilaterals by their geometric properties providing reasons Solve geometrical problems using angle properties of intersecting and parallel lines, of triangles and other polygons Prove that the angle sum of a triangle is 180° and of a quadrilateral is 360° Visualise and use 2-D representations of 3-D objects Explore enlargement of shapes given a centre of enlargement and a positive whole number scale factor Use straight edge and compasses to do standard constructions Use the formula for the area of a triangle, parallelogram and circle and a circle's circumference Calculate volumes and surface areas of cuboids Interpret and apply Pythagoras' theorem 	Design a survey or experiment; design, trial and modify data collection sheets Construct tables for large data sets choosing suitable class intervals Design and use two-way tables Construct and modify pie charts Construct and modify bar charts for continuous data Construct and modify simple time graphs for time series Construct frequency polygons Construct and modify scatter graphs Find and record all mutually exclusive outcomes for a single events and two successive events Use knowledge that the total probability of all the mutually exclusive outcomes of an experiment is 1. Consider interpretations of a survey or experiment, using selected tables, graphs and diagrams in support	Use the equivalences between fractions, decimals and percentages to compare proportions Compare and order fractions of different dominators Add and subtract fractions by writing them with a common denominator Explore the effect of dividing simple pairs of proper fractions, writing the answer in its simplest form. ecalculate percentages and find the outcome of a given percentage increase or decrease divide a quantity into two or more proportions use proportional reasoning to solve a problem entering the answer in the simple set of the
Exceptional	 Explore and analyse connections in mathematics across a range of contexts Give reasons for the choice of presentation, explaining and showing insight into the problem Justify generalisations, arguments or solutions Appreciate the difference between mathematical explanation and experimental evidence 	 Analyse the effects of multiplying and dividing by numbers between 0 and 1 Add, subtract, multiply and divide improper fractions Use approximations through rounding to estimate answers Solve numerical problems involving multiplication and division with numbers of any size, using a calculator efficiently and appropriately. Justify the use of simple index laws Interpret and compare numbers in standard form. 	 Multiply two expressions on the form (x ± n) and simplify the corresponding quadratic expressions Use algebraic and graphical methods to solve simultaneous linear equations in two variables Substitute numbers into expressions and formulae from mathematics and other subjects Derive a formula e.g. from a table of values found during an 'investigation' Change the subject of a formula, simple ones only Find the next term or nth term of quadratic sequences Plot graphs of simple quadratic and cubic functions Solve quadratic equations graphically and by factorisation 	 Interplet and apply - ythaguas theorem when solving problems Calculate lengths, areas and volumes in prisms Find the locus of an object moving according to a rule 	 Analyse a problem, identity possible solutions of bias and plan how to minimise it Draw a line of best fit on a scatter diagram, by inspection Estimate the mean, median and range of sets of grouped data and determine the modal class, selecting the most relevant statistic for the data Compare two or more distributions using measures of average and range Understand relative frequency as an estimate of probability and use this to compare outcomes of experiments Examine the results of a survey or experiment and justify the choice of diagrams and statistics used in your presentation 	 Interpret and use proportional change using multiplication Enlarge 2-D shapes by a fractional scale factor, and recognise the similarity of the resulting shapes Interpret and use compound measures, such as speed, density and pressure, to solve problems
Beyond	 Develop and follow a wide range of methods and approaches; Evaluate lines of enquiry when exploring mathematical tasks Convey mathematical meaning through precise and consistent use of symbols Examine generalisations or solutions reached in an activity, commenting Critique the reasoning and logic or the process employed, or the results obtained Distinguish between practical demonstration and proof 	Work interchangeably with terminating decimals and their corresponding fractions Use fractions or percentages to solve problems involving repeated proportional changes (compound interest) Calculate possible errors resulting from rounding and express this as an inequality Evaluate the use of fractional and negative indices solve problems involving calculating with powers, roots and numbers expressed in standard form	 Factorise quadratic expressions including the difference of two squares Manipulate algebraic formulae, equations and expressions, finding common factors and multiplying two linear expressions. Transform a formula to change its subject Evaluate algebraic formulae, substituting fractions, decimals and negative numbers Solve inequalities in two variables Sketch and interpret graphs of linear, quadratic, cubic and reciprocal functions, and graphs that model real situations Understand the effect on a graph of addition (or multiplication) by a constant Construct and solve a pair of simultaneous equations 	 use sine, cosine and tangent in right-angled triangles when solving problems in two dimensions, including bearings Evaluate the difference between formulae for perimeter, area and volume, by considering dimensions Use similarity of triangles to solve a wide variety of problems 	 Estimate and find the median, quartiles and inter-quartile range for large data sets, including using a cumulative frequency diagram Critique two or more distributions and make inferences, using the shape of the distributions and measures of average and spread including median and quartiles Know when to add or multiply probabilities Use a wide range of strategies to calculate probabilities of combinations of independent events including tree diagrams 	 Understand the effect of enlargement of area and volume. calculate the original quantity given the result of a proportional change understand and use congruence and mathematical similarity e.g. problems involving ratios of length, area and volume Solve problems involving inverse proportionality Set up, solve and interpret the answers in growth and decay problems, including compound interest and work with general iterative process