

| Mathematical aspect | Mathematical themes | National Curriculum statement |
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| | Arithmetic and fluency needs to be embedded into daily learning | |
| Weeks 1 -2 | <p>Decimals</p> <p>Relate the place value rules for decimal to that of the whole numbers. Understand one tenth, one hundredth and one thousandth. Understand $\frac{1}{10}$ is read as 1 tenth and 0.1 is also read as 1 tenth. Know that $\frac{1}{10} = 0.1 = 1$ tenth. Be able to count, order and record the decimals in different ways. See equivalence between tenths and hundredths. See a link between different decimal values Be able to compare and order the numbers Be able to relate 1 tenth to 1 part out of 10 equal parts of 1. Know that there are ten 0.1 in 1. Know that 1 is 10 times as much as 0.1. Understand the role of zero as a placeholder. Be able to relate 1 hundredth to 1 part out of 100 equal parts of 1. Use Base 10 materials to represent decimals. Use place-value cards to represent decimals. Read and write decimals up to thousandths. Use fractions to help read and write decimals Dividing and multiplying decimals by 1-digit numbers with no regrouping or renaming. Write fractions as decimals using division Multiplying fractions which involve some regrouping and renaming by 1-digit numbers. Understand dividing decimals when regrouping and renaming with 1-digit numbers is required. Multiplying and dividing decimals by 2-digit numbers, which involves regrouping and renaming Use a variety of methods and strategies, including: number bonds, the</p> | <p>Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$].</p> <p>Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places.</p> <p>Multiply one-digit numbers with up to two decimal places by whole numbers.</p> <p>Use written division methods in cases where the answer has up to two decimal places.</p> <p>Solve problems which require answers to be rounded to specified degrees of accuracy.</p> <p>Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</p> |

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| | <p>worded method (writing down a problem in words and numbers), long division and the column method.</p> <p>Identify the pattern when dividing by 10, 100 and 1000.</p> <p>Rewrite a whole number as tenths, hundredths or thousandths to help with the division.</p> <p>Associate a fraction with an equivalent decimal</p> <p>Can turn 1 into tenths, hundredths or thousandths.</p> <p>Pupils may think that, in multiplication, the product should always be larger than the numbers being multiplied.</p> <p>Pupils may struggle to partition numbers appropriately.</p> | |
| Week 3 | <p>Measurement</p> <p>Convert units of measurement using fractions and decimals.</p> <p>Convert units of length and distance, units of mass, volume and time.</p> <p>Considers metric conversions,</p> <p>Understand that time is challenging as it does not follow multiples of 10, 100 or 1000.</p> <p>Know the relationship between millimetres and centimetres</p> <p>Know which operation to use when converting a smaller unit of measurement to a larger one and vice versa.</p> <p>Convert between centimetres and millimetres.</p> <p>Use a ruler to measure 2-D shapes.</p> <p>Use decimals to express units of measure when converting</p> <p>Convert between grams and kilograms.</p> <p>Compare measurements in different units and determine 'greater than', 'less than' and 'equal to'</p> <p>Know the relationship between litres and millilitres.</p> <p>Use zero as a placeholder in decimal numbers.</p> <p>Avoid confusion between millilitres and millimetres</p> <p>Know the relationship between hours, minutes and seconds</p> <p>Determine how many seconds there are in a minute, how many minutes in an hour, how many hours in a day, and so on.</p> <p>Find fractions of time and convert these into decimals using division.</p> | <p>Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.</p> <p>Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to three decimal places.</p> <p>Convert between miles and kilometres.</p> <p>Recognise that shapes with the same areas can have different perimeters and vice versa.</p> <p>Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm³) and cubic metres (m³), and extending to other units [for example, mm³ and km³].</p> |

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| <p>Week 4</p> | <p>Word problems Complex word problems using the four operations and bar model diagrams. Learn that making bar models of the same size can be helpful, but that one must remember to change the information in the problem to match. Models of the same size can make solving word problems simpler. Use high-order reasoning and picture drawing. Be able to identify the operations needed Understand all of the words in the problems and visualise what they mean. Interpret bar models and determine which calculation should be carried out. Check their answers against information provided in the problem Organise multiple pieces of information Relate word problems to the equation given</p> | <p>Solve problems involving the relative sizes of two quantities where missing values can be found using integer multiplication and division facts. Solve problems involving similar shapes where the scale factor is known or can be found. Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts. Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.</p> |
| <p>Week 5</p> | <p>Percentages Compare quantities and expose percentage as an amount out of 100. Convert fractions to hundredths, both by expanding fractions and by simplifying them. Use a variety of representations showing equivalence (decimals, percentage, and equivalent fractions). Draw a bar model to represent a number or quantity as 100%. Determine 10% of a number or quantity using the bar model. Refer to the percentage bubble to make connections Write part of an amount as a fraction. Write the total number of parts as a denominator and the selected number of parts as a numerator. Simplify a fraction to its simplest form. Find equivalent fractions, changing the denominator to 10 or 100. Convert a fraction with a denominator of 100 into a percentage. Understand that percentage is a measure of proportion. Find equivalent fractions, changing the denominator to 10 or 100. Calculate percentage of numbers and quantities. Solve percentage change and use percentage to compare amounts. Find percentage of a whole number. Use both division and multiplication skills Find the percentage of a quantity, measured in amounts such as litres and</p> | <p>Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts. Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison.</p> |

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| | <p>millilitres.</p> <p>Look at difference and percentage change</p> <p>Use percentage as a way to compare numbers and amounts.</p> <p>Know that 10% equals $\frac{1}{10}$.</p> | |
| Weeks 6-7 | <p>Ratio</p> <p>Compare quantities, including numbers, objects, fractions and mass In the</p> <p>Use bar models and concrete materials to compare amounts.</p> <p>Use both pictorial and abstract multiplication and division</p> <p>Simplifying and comparing ratios.</p> <p>Apply what they know about fractions and percentages to ratio problems.</p> <p>Avoid misconception fractions and ratios (e.g. If the ratio of boys to girls is 1: 3, the fraction of children who are boys is $\frac{1}{4}$ not $\frac{1}{3}$).</p> <p>Describe a ratio using a pictorial representation.</p> <p>Compare different amounts of objects using fractions.</p> <p>Compare different amounts of objects using percentages.</p> <p>Use the term 'ratio'.</p> <p>Record ratio using the ':' symbol.</p> <p>Read ratios as the relationship of one number to another number.</p> <p>Find a common factor between large numbers to help them simplify ratios.</p> <p>Use times tables to see how to simplify a ratio.</p> <p>Simplify a ratio in multiple ways.</p> <p>Understand the relationship between the radius and diameter of a circle</p> | <p>Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.</p> <p>Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison.</p> <p>Solve problems involving similar shapes where the scale factor is known or can be found.</p> <p>Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.</p> |
| Week 8 | <p>Algebra</p> <p>Learn some of the conventions of algebra in the context of patterns and real-life problems.</p> <p>Describe patterns and using a letter to denote a variable.</p> <p>Write expressions using the four operations and fractions,</p> <p>Look for patterns and determine rules.</p> <p>Write and evaluate algebraic expressions</p> <p>Use formulae to solve problems in real-life contexts.</p> <p>Use word problems to write equations with two unknown</p> <p>Solve a range of equations.</p> <p>Identify the relationship between one term and the next in a pattern.</p> <p>Describe the rule in a pattern with words.</p> | <p>Use simple formulae.</p> <p>Generate and describe linear number sequences.</p> <p>Express missing number problems algebraically.</p> <p>Find pairs of numbers that satisfy an equation with two unknowns.</p> <p>Enumerate possibilities of combinations of two variables.</p> |

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| | <p>Relate a symbol to an unknown value.</p> <p>Use concrete materials to continue patterns.</p> <p>Explain how a pattern progresses.</p> <p>Make predictions based on their generalisations.</p> <p>Express a rule using a symbol or letter in place of numbers.</p> <p>Use letters, symbols and numbers to express the relationships and patterns in numbers.</p> <p>Evaluate simple algebraic expressions.</p> <p>Avoid misconception that repeated addition means the number should be added to n, rather than multiplied.</p> <p>Use a formula to find specific terms in a sequence</p> | |
| Week 9 | <p>Area and Perimeter</p> <p>Calculate the area of rectangles, triangles and parallelograms.</p> <p>Use knowledge of the area of a rectangle to calculate the area of a parallelogram.</p> <p>Find multiple methods for calculating the area of a triangle.</p> <p>Find the area for a parallelogram using the triangle method.</p> <p>Define and use the word 'perimeter'.</p> <p>Define and use the word 'area'.</p> <p>Create rectangles with the same perimeter but different areas.</p> <p>Create rectangles with the same area but different perimeters.</p> <p>Use the terms 'length' and 'breadth'.</p> <p>Use area and one side length to find the perimeter and vice versa.</p> <p>Use the formula $L \times W$ to find area of rectangles.</p> <p>Find the area of a rectangle given both the length and breadth.</p> <p>Find the area of a rectangle given the perimeter and one side length.</p> <p>Find the area of a square given its perimeter.</p> <p>Find the perimeter of a rectangle given both the length and breadth.</p> <p>Find the perimeter of a rectangle given the area and one side length.</p> <p>Find the perimeter of a square given its area.</p> <p>Recognise the terms 'quadrilateral', 'parallel' and 'parallelogram'.</p> <p>Recognise a triangle as half of a rectangle.</p> <p>Recognise that triangles can be transformed into rectangles.</p> <p>Determine a formula for the area of a triangle.</p> <p>Use a formula to solve problems involving area.</p> | <p>Recognise that shapes with the same areas can have different perimeters and vice versa.</p> <p>Recognise when it is possible to use formulae for area and volume of shapes.</p> <p>Calculate the area of parallelograms and triangles.</p> |

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| | <p>Identify the height of parallelogram given the base. Identify the base of the parallelogram given the height. Find the area of parallelograms using the formula</p> | |
| Weeks 10-11 | <p>Geometry Investigate angles Know angles on a straight line = 180 degrees. Around a point = 360 degrees. Multiples of 90 are linked to quarter turns. Understand vertically opposite angles Understand angles in triangles and quadrilaterals Investigating the parts of a circle and know about angles in a circle. Know the properties of 2D and 3D shapes. Understand parallel, perpendicular, vertical and horizontal lines Calculate missing angles using addition and subtraction (bar model to support) Draw the nets of 3-D shapes. Name and identify the angles, vertices and sides in a 2-D shape. Key vocabulary (acute, obtuse, right, reflex). Describe the sides using 'perpendicular' and 'parallel' Explores angles: measuring angles, the investigation of angles on a line/point and drawing angles, Understanding angles as a descriptor for common shapes. Use a protractor to measure right angles Describe the properties of squares and rectangles Solving problems involving angles and investigating angles inside regular polygons. Understand degrees as a unit of measure Identify vertically opposite angles. Use ratio and knowledge of angles to find the proportion of the angles and then their exact sizes. Understand the relationship between the radius and diameter. Calculate the diameter when given the radius. Calculate the radius when given the diameter. Use known angles to find unknown angles on a straight line or in a circle.</p> | <p>Draw 2-D shapes using given dimensions and angles. Recognise, describe and build simple 3-D shapes, including making nets. Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons. Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius. Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.</p> |

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| | <p>Use their knowledge of the sum of angles in a triangle to find unknown angles.</p> <p>Use the cut-and-arrange method to measure angles totalling 180° and 360° degrees.</p> <p>Make a generalisation about the angles inside a quadrilateral.</p> <p>Find the missing angles inside a quadrilateral when other angles are given.</p> <p>Use knowledge of angles of triangles and quadrilaterals to find the interior angles of other shapes.</p> <p>Find an unknown angle in a regular polygon with more than 4 sides, using knowledge of the sum of angles for that polygon.</p> | |
| Seasonal theme: | | |
| Week 12 | <p>Statistics:</p> <p>Understand discrete and continuous data.</p> <p>Information arising from their own enquiry</p> <p>Know how to calculate a mean average</p> | <p>To interpret and construct pie charts and line graphs and use these to solve problems.</p> <p>Calculate and interpret the mean as an average</p> |