

Weeks	Key knowledge	Previous experience (NCETM Guidance) Support gaps in learning	National Curriculum statement	NCETM links with PD materials
<b>Arithmetic and fluency needs to be embedded into daily learning</b>				
Weeks 1 -2	<p><b>Decimals</b> Relate the place value rules for decimal to that of the whole numbers. Understand one tenth, one hundredth and one thousandth. Understand <math>\frac{1}{10}</math> is read as 1 tenth and 0.1 is also read as 1 tenth. Know that <math>\frac{1}{10} = 0.1 = 1</math> 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.</p>	<p>Knows decimal notation and the language associated with it for up to three decimal places. Knows that decimals are different ways of expressing proportions.</p>	<p>Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, <math>\frac{3}{8}</math>]. 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. Multiply one-digit numbers with up to two decimal places by whole numbers. Use written division methods in cases where the answer has up to two decimal places. Solve problems which require answers to be rounded to specified degrees of accuracy. Recall and use equivalences between simple fractions, decimals and percentages, including in different</p>	<p><b>2:29 Decimal PV knowledge, multiplication and division</b> <b>TP 1</b> To multiply a number by 10/100/1,000, move digits 1/2/3 places to the left; (and dividing, to the right) <b>TP 2 (also in 'measurement below)</b> Measures can be converted from one unit to another using knowledge of multiplication and division by 10/100/1,000.</p> <p><b>3:10 Linking fractions, decimals and percentages.</b> <b>TP 1</b> (Converting fractions to decimals) <b>TP 2</b> (Fraction-decimal equivalents can be found throughout the number system) <b>TP 3</b> (Fraction-decimal equivalence can sometimes be used to simplify calculations.) <b>(NB TPs 4-6 appear later in 'Percentages')</b></p>

	<p>Understand dividing decimals when regrouping and renaming with 1-digit numbers is required.</p> <p>Multiplying and dividing decimals by 2-digit numbers, which involves regrouping and renaming</p> <p>Use a variety of methods and strategies, including: number bonds, the 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>		contexts.	
<p>Week 3</p>	<p><b>Measurement</b></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>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</p>	<p><b>2:29 Decimal PV knowledge, multiplication and division</b></p> <p><b>TP 2</b> Measures can be converted from one unit to another using knowledge of multiplication and division by 10/100/1,000.</p> <p><b>3:10 Linking fractions, decimals and percentages -</b></p> <p>Within <b>3:10</b>, measures appear on:</p> <p>slides 8-11 (capacity)</p> <p>32 weight</p> <p>65-67, 70-71 (Distance)</p> <p>77 Time</p> <p>Also some in context of money.</p>

	<p>Use zero as a placeholder in decimal numbers.          Avoid confusion between millilitres and millimetres          Know the relationship between hours, minutes and seconds          Determine how many seconds there are in a minute, how many minutes in an hour, how many hours in a day, and so on.          Find fractions of time and convert these into decimals using division.</p>		<p>different perimeters and vice versa.          Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm<sup>3</sup>) and cubic metres (m<sup>3</sup>), and extending to other units [for example, mm<sup>3</sup> and km<sup>3</sup>].</p>	
<p>Week 4</p>	<p><b>Word problems</b>          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 calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.</p>	<p><b>2:25 Using compensation to calculate</b>  <b>TPs 1, 2, 3</b></p> <p><b>TPs 1 and 2</b> For multiplication (and division), if there is a multiplicative change to one factor (or the dividend if division) the product (or quotient) changes by the same scale factor.</p> <p><b>2:27 Scale factors, ratio and proportional reasoning.</b>  <b>All TPs</b></p>
<p>Week 5</p>	<p><b>Percentages</b>          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%.</p>		<p>Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</p> <p>Solve problems involving the calculation of percentages [for example, of measures,</p>	<p><b>3:10 Linking Fractions, decimals and percentages</b>  <b>TP 4</b> Percent means the number of parts per hundred. A percentage can be an operator on a quantity, indicating the proportion of a quantity being considered.  <b>TP 5</b> Percentages have</p>

	<p>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 millilitres.  Look at difference and percentage change  Use percentage as a way to compare numbers and amounts.  Know that 10% equals <math>\frac{1}{10}</math>.</p>		<p>and such as 15% of 360] and the use of percentages for comparison.</p>	<p>fraction and decimal equivalents)  <b>TP 6</b> If the value of a whole is known, a percentage of that number or amount can be calculated.</p>
<p>Week 6</p>	<p><b>Algebra</b>  Learn some of the conventions of algebra in the context of patterns and real-life problems.  Describe patterns and using a letter to denote a variable.  Write expressions using the four operations and fractions,  Look for patterns and determine rules.  Write and evaluate algebraic expressions  Use formulae to solve problems in real-life contexts.  Use word problems to write equations with two unknown  Solve a range of equations.</p>	<p>Knows how to describe linear number sequences, including those involving fractions and decimals.  Be fluent in all key stage 2 additive and multiplicative number facts and calculation.  Manipulate additive equations.</p>	<p>Use simple formulae.  Generate and describe linear number sequences.  Express missing number problems algebraically.  Find pairs of numbers that satisfy an equation with two unknowns.  Enumerate possibilities of combinations of two</p>	<p><b>1.31</b> Problems with two unknown  <b>2:27 Scale factors, ratio and proportional reasoning.</b>  <b>TP 1</b> multiplication and division can be used to calculate unknown values in correspondence problems.  <b>TP 2</b> multiplication and understanding of</p>

	<p>Identify the relationship between one term and the next in a pattern. Describe the rule in a pattern with words.          Relate a symbol to an unknown value.          Use concrete materials to continue patterns.          Explain how a pattern progresses.          Make predictions based on their generalisations.          Express a rule using a symbol or letter in place of numbers.          Use letters, symbols and numbers to express the relationships and patterns in numbers.          Evaluate simple algebraic expressions.          Avoid misconception that repeated addition means the number should be added to n, rather than multiplied.          Use a formula to find specific terms in a sequence</p>	<p>Manipulate multiplicative equations.          Find a fraction of a quantity.</p>	<p>variables.</p>	<p>correspondence can be used to calculate the number of possible combinations of items.</p>
<p><b>Weeks</b> 7-8</p>	<p><b>Ratio</b>          Compare quantities, including numbers, objects, fractions and mass In the Use bar models and concrete materials to compare amounts.          Use both pictorial and abstract multiplication and division          Simplifying and comparing ratios.          Apply what they know about fractions and percentages to ratio problems.          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 <math>\frac{1}{4}</math> not <math>\frac{1}{3}</math>).          Describe a ratio using a pictorial representation.          Compare different amounts of objects using fractions.          Compare different amounts of objects using percentages.          Use the term 'ratio'.          Record ratio using the ':' symbol.          Read ratios as the relationship of one number to another number.          Find a common factor between large numbers to help them simplify ratios.          Use times tables to see how to simplify a ratio.          Simplify a ratio in multiple ways.</p>	<p>Knows that percentages, decimals and fractions are different ways of expressing proportions          Apply place-value knowledge to known additive and multiplicative number facts.          Know and recall 12 x 12 facts</p>	<p>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 of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison.          Solve problems involving similar shapes where the scale factor is known or can be found.          Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.</p>	<p><b>Y5</b>  <b>2.17</b> Structures: using measures and comparison to understand scaling  <b>2:27 Scale factors, ratio and proportional reasoning.</b>  <b>TP 3</b> scaling can be used to make and interpret maps  <b>TP 4</b> there is a proportional relationship between the dimensions of similar shapes; if the scale factor and dimensions of one shape is known, the dimensions of the similar shape can be calculated. If the dimensions of both shapes are known, the scale factor can be calculated.</p>

	Understand the relationship between the radius and diameter of a circle			
Week 9	<p><b>Area and Perimeter</b></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 <math>L \times W</math> 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>	Compare areas and calculate the area of rectangles (including squares) using standard units.	<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>	<p><b>MNP/Powermaths/ WR can be used to support planning</b></p> <p><b>2:30 Multiplicative contexts: area and perimeter 2 (NB '1' is in Year 4)</b></p> <p><b>TP 1</b> The area of a parallelogram can be calculated by multiplying the base by the perpendicular height; all parallelograms with the same base and perpendicular height will have the same area.</p> <p><b>TP 2</b> The area of a triangle can be calculated by multiplying the base by the perpendicular height and then dividing by two.</p> <p><b>TP 3</b> Shapes with the same area can have different perimeters; shapes with the same perimeter can have different areas.</p> <p><b>TP 4</b> When a shape has been transformed by a scale factor, the perimeter is also transformed by the same scale factor.</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>Identify the height of parallelogram given the base.</p> <p>Identify the base of the parallelogram given the height.</p> <p>Find the area of parallelograms using the formula</p>			
<p>Weeks 10-11</p>	<p><b>Geometry</b></p> <p>Investigate angles</p> <p>Know angles on a straight line = 180 degrees.</p> <p>Around a point = 360 degrees.</p> <p>Multiples of 90 are linked to quarter turns.</p> <p>Understand vertically opposite angles</p> <p>Understand angles in triangles and quadrilaterals</p> <p>Investigating the parts of a circle and know about angles in a circle.</p> <p>Know the properties of 2D and 3D shapes.</p> <p>Understand parallel, perpendicular, vertical and horizontal lines</p> <p>Calculate missing angles using addition and subtraction (bar model to support)</p> <p>Draw the nets of 3-D shapes.</p> <p>Name and identify the angles, vertices and sides in a 2-D shape.</p> <p>Key vocabulary (acute, obtuse, right, reflex).</p> <p>Describe the sides using 'perpendicular' and 'parallel'</p> <p>Explores angles: measuring angles, the investigation of angles on a line/point and drawing angles,</p> <p>Understanding angles as a descriptor for common shapes.</p> <p>Use a protractor to measure right angles</p> <p>Describe the properties of squares and rectangles</p> <p>Solving problems involving angles and investigating angles inside regular polygons.</p> <p>Understand degrees as a unit of measure</p> <p>Identify vertically opposite angles.</p>	<p>Find the perimeter of regular and irregular polygons.</p> <p>Compare angles, estimate and measure angles in degrees (°) and draw angles of a given size.</p> <p>Knows how to use angle sum facts and other properties to find missing angles and lengths.</p> <p>Knows the conventional markings for parallel lines and right angles</p>	<p>Draw 2-D shapes using given dimensions and angles.</p> <p>Recognise, describe and build simple 3-D shapes, including making nets.</p> <p>Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.</p> <p>Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.</p> <p>Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.</p>	<p>MNP/Powermaths/ WR can be used to support planning</p>

	<p>Use ratio and knowledge of angles to find the proportion of the angles and then their exact sizes.</p> <p>Understand the relationship between the radius and diameter.</p> <p>Calculate the diameter when given the radius.</p> <p>Calculate the radius when given the diameter.</p> <p>Use known angles to find unknown angles on a straight line or in a circle.</p> <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:				
<p><b>Week 12</b></p>	<p><b>Statistics:</b></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>Knows how to read a table / timetable and complete missing information.</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>	<p><b>MNP/Powermaths/ WR can be used to support planning</b></p> <p><b>2:26 Mean average and equal shares</b></p> <p><b>TP 1</b> The mean is the size of each part when a quantity is shared equally.</p> <p><b>TP 2</b> The mean is defined as the sum of all the numbers in a set of data divided by the number of values that make</p>

				<p>up the set of data.</p> <p><b>TP 3</b> The mean can be used to compare data.</p> <p><b>TP 4</b> The mean is not always an appropriate representation of a set of data.</p>
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