

Moss Valley Primary Academy: Mathematics Early Learning Goals/ National Curriculum Strand Tracker (Power Maths: White Rose Edition)

Strand	Reception	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Number – number and place value							
Counting	Verbally count beyond 20, recognising the pattern of the counting system.	Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number Count in multiples of twos, fives and tens	Count in steps of 2, 3 and 5 from 0 and in tens from any number, forwards and backwards	Count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number.	Count in multiples of 6, 7, 9, 25 and 1,000. Count backwards through zero to include negative numbers.	Count forwards or backwards in steps of powers of 10 for any given number up to 1,000,000.	
Read, write, order and compare numbers	Have a deep understanding of number to 10, including the composition of each number. Subitise (recognise quantities without counting) up to 5. Recognise the pattern of the counting system Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.	Count, read and write numbers to 100 in numerals Given a number, identify one more and one less Read and write numbers from 1 to 20 in numerals and words	Read and write numbers to at least 100 in numerals and in words Compare and order numbers from 0 up to 100; use and = signs	Compare and order numbers up to 1,000. Read and write numbers up to 1,000 in numerals and in words.	Find 1,000 more or less than a given number. Order and compare numbers beyond 1,000.	Read, write, order and compare numbers to at least 1,000,000 and determine the value of each digit.	Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit.
Place value; Roman numerals			Recognise the place value of each digit in a two-digit number (tens, ones)	Recognise the place value of each digit in a three-digit number (hundreds, tens, ones).	Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones). Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.	Read Roman numerals to 1,000 (M) and recognise years written in Roman numerals.	
Identify, represent and estimate; rounding		Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least	Identify, represent and estimate numbers using different representations, including the number line	Identify, represent and estimate numbers using different representations.	Identify, represent and estimate numbers using different representations. Round any number to the nearest 10, 100 or 1,000.	Round any number up to 1,000,000 to the nearest 10, 100, 1,000, 10,000 and 100,000.	Round any whole number to a required degree of accuracy.
Negative numbers					Count backwards through zero to include negative numbers.	Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers, including through zero.	Use negative numbers in context, and calculate intervals across zero.
Number problems			Use place value and number facts to solve problems	Solve number problems and practical problems involving these ideas.	Solve number and practical problems that involve all of the above and with increasingly large positive numbers.	Solve number problems and practical problems that involve all of the above.	Solve number and practical problems that involve all of the above.
Number – addition, subtraction, multiplication and division							

Add/ subtract mentally	Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10, including double facts. Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.	Represent and use number bonds and related subtraction facts within 20	Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 Add/ subtract numbers mentally including two-digit numbers	Add and subtract numbers mentally, including: - a three-digit number and ones - a three-digit number and tens - a three-digit number and hundreds.		Add and subtract numbers mentally with increasingly large numbers.	
Add/ subtract using written methods		Add and subtract one-digit and two-digit numbers to 20, including zero Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs	Add and subtract numbers using concrete objects, pictorial representations, including: two two-digit numbers	Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction.	Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.	Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction).	
Estimate, use inverse and check			Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	Estimate the answer to a calculation and use inverse operations to check answers.	Estimate and use inverse operations to check answers to a calculation.	Use rounding to check answers to calculations and determine level of accuracy	Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.
Add/ subtract to solve problems	Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.	Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$	Solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures. Solve problems with addition and subtraction: applying their increasing knowledge of mental and written methods	Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.	Solve addition and subtraction two-step problems in contexts, deciding which operations and methods to use and why.	Solve addition and subtraction multistep problems in contexts, deciding which operations and methods to use and why.	Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.
Properties of number (multiples, factors, primes, squares and cubes						Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers. Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.	Identify common factors, common multiples and prime numbers.

						Establish whether a number up to 100 is prime and recall prime numbers up to 19. Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3).	
Multiply/ divide mentally			Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers	Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods.	Recall multiplication and division facts for multiplication tables up to 12×12 . Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers. Recognise and use factor pairs and commutativity in mental calculations.	Multiply and divide numbers mentally drawing upon known facts. Multiply and divide whole numbers and those involving decimals by 10, 100 and 1,000.	Perform mental calculations, including with mixed operations and large numbers.
Multiply/ divide using written methods			Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs	Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.	Multiply two-digit and three-digit numbers by a one-digit number using formal written layout. Divide numbers up to 4 digits by a one digit number using the formal written method of short division and interpret remainders appropriately for the context.	Multiply numbers up to 4 digits by a one- or two-digit number using a formal written method, including long multiplication for two-digit numbers.	Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication. Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context. Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context.
Solve problems (commutative, associative, distributive and all four operations		Solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher	Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts including problems in contexts		Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one-digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.	Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes. Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign. Solve problems involving multiplication and division, including scaling by simple	Solve problems involving addition, subtraction, multiplication and division.

						fractions and problems involving simple rates.	
Order of operations							Use their knowledge of the order of operations to carry out calculations involving the four operations.
Number – Fractions (including decimals and percentages)							
Recognise, find, write, name and count fractions		Recognise, find and name a half as one of two equal parts of an object, shape or quantity Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity	Recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity Write simple fractions for example, $\frac{1}{2}$ of 6 = 3	Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10. Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators.	Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.		
Equivalent fractions			Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$	Recognise and show, using diagrams, equivalent fractions with small denominators.	Recognise and show, using diagrams, families of common equivalent fractions.	Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths. Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number [for example, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1 \frac{1}{5}$]	Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.
Compare and order fractions				Compare and order unit fractions, and fractions with the same denominators.		Compare and order fractions whose denominators are all multiples of the same number.	Compare and order fractions, including fractions > 1 .
Add/ subtract fractions				Add and subtract fractions with the same denominator within one whole [for example, $\frac{5}{7} + \frac{1}{7} = \frac{6}{7}$]	Add and subtract fractions with the same denominator.	Add and subtract fractions with the same denominator and denominators that are multiples of the same number.	Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.
Multiply/ divide fractions						Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.	Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example, $\frac{1}{4} \times \frac{1}{2} = \frac{1}{8}$]. Divide proper fractions by whole numbers [for example, $\frac{1}{3} \div 2 = \frac{1}{6}$].

Fractions/ decimals equivalence					Recognise and write decimal equivalents of any number of tenths or hundredths. Recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$	Read and write decimal numbers as fractions [for example, $0.71 = \frac{71}{100}$]. Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.	Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example, $\frac{3}{8}$].
Rounding decimals					Round decimals with one decimal place to the nearest whole number.	Round decimals with two decimal places to the nearest whole number and to one decimal place.	
Compare and order decimals					Compare numbers with the same number of decimal places up to two decimal places.	Read, write, order and compare numbers with up to three decimal places.	
Multiply and divide decimals					Find the effect of dividing a one- or two digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths.		Identify the value of each digit in numbers given to three decimal places and multiply and divide numbers by 10, 100 and 1,000 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 with fractions and decimals				Solve problems that involve all of the above.	Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number. Solve simple measure and money problems involving fractions and decimals to two decimal places.	Solve problems involving number up to three decimal places.	Solve problems which require answers to be rounded to specified degrees of accuracy.
Fractions/ decimals/ percentages equivalence						Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal.	Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.
Solve problems with percentages						Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25.	

Ratio and proportion							
Relative sizes, similarity							Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.
Use of percentage for comparison							Solve problems involving the calculation of percentages [for example, of measures, and such as 15% of 360] and the use of percentages for comparison.
Scale factors							Solve problems involving similar shapes where the scale factor is known or can be found.
Unequal sharing and grouping							Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.
Algebra							
Missing number problems expressed in algebra							Express missing number problems algebraically.
Simple formulae expressed in words							Use simple formulae.
Generate and describe linear number							Generate and describe linear number sequences.
Number sentences involving two unknowns							Find pairs of numbers that satisfy an equation with two unknowns.
Enumerate all possibilities of combinations of two variables							Enumerate possibilities of combinations of two variables.
Measurement							
Compare, describe and order measures	Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity in the context of measures.	Compare, describe and solve practical problems for: lengths and heights, mass/weight, capacity and volume and time	Compare and order lengths, mass, volume /capacity and record the results using $>$, $<$ and $=$	Compare: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).			
Estimate, measure and read scales		Measure and begin to record the following: mass/weight, lengths and heights, capacity and volume and time	Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature ($^{\circ}$ C); capacity (litres/ml) to the nearest	Measure: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).	Estimate, compare and calculate different measures, including money in pounds and pence.		

			appropriate unit, using rulers, scales, thermometers and measuring vessels				
Money		Recognise and know the value of different denominations of coins and notes	Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value Find different combinations of coins that equal the same amounts of money	Add and subtract amounts of money to give change, using both £ and p in practical contexts.			
Telling time, ordering time, duration and units of time		Sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening] Recognise and use language relating to dates, including days of the week, weeks, months and years Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times	Tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times Know the number of minutes in an hour and the number of hours in a day	Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12- hour and 24-hour clocks. Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight. Know the number of seconds in a minute and the number of days in each month, year and leap year. Compare durations of events [for example to calculate the time taken by particular events or tasks].	Read, write and convert time between analogue and digital 12- and 24-hour clocks. Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.	Solve problems involving converting between units of time.	
Convert between metric units					Convert between different units of measure [for example, kilometre to metre; hour to minute].	Convert between different units of metric measure [for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre].	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.
Convert between metric/imperial						Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints.	Convert between miles and kilometres.
Perimeter, area				Measure the perimeter of simple 2-D shapes.	Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres.	Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.	Calculate the area of parallelograms and triangles. Recognise when it is possible to use formulae for the area of shapes.

					Find the area of rectilinear shapes by counting squares.	Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm ²) and square metres (m ²) and estimate the area of irregular shapes.	Recognise that shapes with the same areas can have different perimeters and vice versa.
Volume						Estimate volume [for example, using 1 cm ³ blocks to build cuboids (including cubes)] and capacity [for example, using water].	Calculate, estimate and compare volume of cubes and cuboids using standard units, including cubic centimetres (cm ³) and cubic metres (m ³), and extending to other units [for example, mm ³ and km ³]. Recognise when it is possible to use formulae for the volume of shapes.
Solve problems – money, length, mass/ weight, capacity/ volume			Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change			Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.	Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.
Geometry – properties of shapes							
Recognise and name common shapes		Recognise and name common 2D and 3D shapes, including: 3D shapes [for example, cuboids (including cubes), pyramids and spheres]	Compare and sort common 2D and 3D shapes and everyday objects.				
Describe properties and classify shapes			Identify and describe the properties of 2D shapes, including the number of sides and line symmetry in a vertical line Identify and describe the properties of 3D shapes, including the number of edges, vertices and faces	Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.	Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. Identify lines of symmetry in 2-D shapes presented in different orientations. Complete a simple symmetric figure with respect to a specific line of symmetry.	Use the properties of rectangles to deduce related facts and find missing lengths and angles. Distinguish between regular and irregular polygons based on reasoning about equal sides and angles.	Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals, and regular polygons.
Draw and make shapes and relate 2-D to 3-D shapes (including nets)	Select, rotate and manipulate shapes in order to develop spatial reasoning. Continue, copy and create repeating patterns. (All from Development Matters)			Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them.		Identify 3-D shapes, including cubes and other cuboids, from 2-D representations. Use the properties	Draw 2-D shapes using given dimensions and angles. Recognise, describe and build simple 3-D shapes, including making nets.

Angles – measuring and properties				Recognise angles as a property of shape or a description of a turn. Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn; identify whether angles are greater than or less than a right angle.	Identify acute and obtuse angles and compare and order angles up to two right angles by size.	Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles. Draw given angles, and measure them in degrees (°). Identify: - angles at a point and one whole turn (total 360°) - angles at a point on a straight line and ½ a turn (total 180°) - other multiples of 90°.	Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.
Circles							Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.
Geometry – position and direction							
Patterns			Order and arrange combinations of mathematical objects in patterns and sequences				
Describe position, direction and movement		Describe position, direction and movement, including whole, half, quarter and three-quarter turns	Use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)		Describe movements between positions as translations of a given unit to the left/right and up/down	Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.	Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.
Coordinates					Describe positions on a 2-D grid as coordinates in the first quadrant. Plot specified points and draw sides to complete a given polygon.		Describe positions on the full coordinate grid (all four quadrants).
Statistics							
Interpret and represent data			Interpret and construct simple pictograms, tally charts, block diagrams and simple tables	Interpret and present data using bar charts, pictograms and tables.	Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.	Complete, read and interpret information in tables, including timetables.	Interpret and construct pie charts and line graphs and use these to solve problems.
Solve problems involving data			Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity	Solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in	Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.	Solve comparison, sum and difference problems using information presented in a line graph.	

				scaled bar charts and pictograms and tables.			
Mean average			Ask and answer questions about totalling and comparing categorical data				Calculate and interpret the mean as an average.

