

Cam Hopton C of E Primary School

Scheme of Work for Mathematics

YEAR 1		Learning Objectives	
To know and use numbers	Counting	Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number	
		Count, read and write numbers to 100 in numerals.	
		Given a number, identify one more and one less.	
		Count in steps of 2, 5 and 10 from 0 or 1 and in tens from any number, forwards and backwards.	
	Representing	Identify, represent and estimate numbers using different representations, including the number line.	
		Read and write numbers initially from 1 to 20 and then to at least 100 in numerals and in words.	
	Comparing	Use the language of equal to, more than, less than (fewer), most and least.	
Math Vocab	Read and spell mathematical vocabulary at a level consistent with their increasing word reading and spelling knowledge at KS1.		
To add and subtract	Number facts	Represent and use number bonds and related subtraction facts to 20.	
	Methods	Add and subtract numbers using concrete objects and pictorial representations, and mentally, including: - One-digit and two-digit numbers to 20, including zero - A two-digit number and ones - A two-digit number and tens - Two two-digit numbers - Adding three one-digit numbers	
		Solve one-step problems that involve addition and subtraction, including missing number problems.	
To multiply and divide		Solve one-step problems involving multiplication and division.	

To use fractions	Recognising 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.
Geometry	Properties of shapes	Recognise and name common 2-D (rectangle, squares, circles, triangles).
		Recognise and name common 3-D shapes (cuboids, cubes, pyramids, sphere).
	Position, direction and movement	Describe position, direction and movement, including whole, half, quarter and three-quarter turns.
To use measures		Compare, describe and solve practical problems for: lengths and heights, mass/weight, capacity and volume, time.
		Measure and begin to record: lengths and heights, mass/weight, capacity and volume, time (hours, minutes, seconds).
		Sequence events in chronological order using language.
		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.
		Recognise and know the value of different denominations of coins and notes.

YEAR 2		Learning Objectives
To know and use numbers	Counting	Count in steps of 2, 3, 5 and 10 from 0 or 1 and in tens from any number, forwards and backwards.
	Representing	Identify, represent and estimate numbers using different representations, including the number line.
		Read and write numbers initially from 1 to 20 and then to at least 100 in numerals and in words.
	Comparing	Compare and order numbers from 0 up to 100; use $<$, $>$ and $=$ signs.
	Place Value	Recognise the place value of each digit in a two-digit number (tens, ones).
	Solving Problems	Use place value and number facts to solve problems.
To add and subtract	Checking	Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.
		Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100.
	Complexity	Solve one-step problems with addition and subtraction, using: - Concrete objects and pictorial representations including those involving numbers, quantities and measures. - The addition (+), subtraction (−) and equals (=) signs.
	Methods	Add and subtract numbers using concrete objects and pictorial representations, and mentally, including: - One-digit and two-digit numbers to 20, including zero - A two-digit number and ones - A two-digit number and tens - Two two-digit numbers - Adding three one-digit numbers
		Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot.
T	M e t h o d s	Calculate mathematical statements for multiplication and division within the

		multiplication tables and write them using the multiplication (x), division ($\div$) and equals (=) signs.
		Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.
		Solve problems involving multiplication and division using mental methods.
	Checking	Use known multiplication facts to check the accuracy of calculations.
	Complexity	Solve one-step problems involving multiplication and division.
	Using X and $\div$ facts	Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables.
		Recognise odd and even numbers.
		Use multiplication and division facts to solve problems.
To use fractions	Solving problems	Write simple fractions.
	Recognising fractions	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.
	Equivalence	Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.

YEAR 3		Learning Objectives
To know and use numbers	Counting	Count in multiples of 2, 3, 4, 5, 8, 10, 50, 100 and 1000.
	Representing	Identify, represent and estimate numbers using different representations.
	Comparing	Order and compare numbers up to 1000.
		Can work out if a given number is greater or less than 10 and 100.
	Place Value	Read and write numbers up to 1000 in numerals and words. Recognise the place value of each digit in a three-digit number (hundreds, tens and ones).
	Solving Problems	Solve number and practical problems with increasingly large positive numbers.
To add and subtract	Checking	Estimate and use inverse operations to check answers to a calculation.
	Methods	Add and subtract numbers with up to three digits using the formal written methods of columnar addition and subtraction where appropriate.
		Add and subtract numbers mentally, including: - A three-digit number and ones - A three-digit number and tens - A three-digit number and hundreds
		Solve problems, including missing number problems, using number facts, place value and more complex addition and subtraction
To multiply and divide	Methods	Write and calculate mathematical statements for $\times$ and $\div$ using multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods
	Problem solving	Solve problems, including missing numbers, including positive integer scaling problems in which n objects are connected to m objects
	Using $\times$ & $\div$ facts	Recall multiplication and division facts for multiplication tables 2, 3, 4, 5, 8 and 10.

To use fractions	Solving problems	Add and subtract fractions with the same denominator within one whole.
		Solve problems involving increasingly harder fractions.
	Recognising fractions	Recognize, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.
		Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and from dividing one-digit numbers or quantities by 10.
		Compare and order unit fractions and fractions with the same denominators.
		Recognize and show, using diagrams, equivalent fractions with small denominators.
		Recognize and use fractions as numbers: unit fractions and non-unit fractions with small denominators
	Methods	Add and subtract fractions with the same denominator within one whole.
		Solve problems involving recognizing equivalents and adding and subtracting fraction with the same denominator within one whole.
To use measures		Measure, compare, add and subtract: lengths/heights (m/cm/mm); mass/weight (kg/g); volume/capacity (l/ml).
		Measure the perimeter of simple 2-D shapes.
		Add and subtract amounts of money to give change (£ and p).
		Read, and write time on analogue 12- and 24-hour clocks, including using Roman numerals from I to XI.
		Estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours; use appropriate vocabulary.
		Know the number of seconds in a minute and the number of days in each month, year and leap year. Compare durations of events in terms of units of time.
		Solve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days.
Geometry To understand the properties of shapes		Draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them.
		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 make a complete turn; identify whether angles are greater than or less than a right angle.
		Identify horizontal and vertical lines and pairs of perpendicular and parallel lines.

Geometry Position, direction and movement	Recognise angles as a property of shape and as an amount of rotation.
	Identify angles that are greater than a right angle.
To use statistics	Interpret and present data using bar charts, pictograms and tables.
	Solve one-step and two-step questions (e.g. 'How many more?' and 'How many fewer?') using information presented in scaled bar charts, pictograms and tables.

YEAR 4		Learning Objectives	
To know and use numbers	Counting	Count in multiples of 2 to 9, 25, 50, 100 and 1000. (6, 7, 9, 25 and 50 specifically)	
		Find 1000 more or less than a given number.	
		Count backwards through zero to include negative numbers.	
	Representing	Identify, represent and estimate numbers using different representations.	
		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.	
	Comparing	Order and compare numbers beyond 1000.	
	Place Value	Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens and ones).	
		Round any number to the nearest 10, 100 or 1000.	
	Solving Problems	Solve number and practical problems with increasingly large positive numbers.	
To add and subtract	Checking	Estimate and use inverse operations to check answers to a calculation.	
	Complexity	Solve two-step addition and subtraction problems in contexts, deciding which operations and methods to use and why.	
	Methods	Add and subtract numbers with up to four digits using the formal written methods of columnar addition and subtraction where appropriate.	
To multiply and divide	Methods	Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.	
		Use place value, and 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 in mental calculations.	
	Checking	Recognise and use the inverse relationship between multiplication and division and use this to check calculations and solve missing number problems.	
	Complexity	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).	
	Using X and ÷ facts	Recall multiplication and division facts for multiplication tables up to 12 × 12.	

To use fractions	Solving problems	Solve problems involving increasingly harder fractions.
		Add and subtract fractions with the same denominator.
		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.
		Solve simple measure and money problems involving fractions and decimals to two decimal places.
	Recognising fractions	Round decimals with one decimal place to the nearest whole number.
		Compare numbers with the same number of decimal places up to two decimal places.
		Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and from dividing one-digit numbers or quantities by 10.
		Count up and down in hundredths; recognise that hundredths arise from dividing an object by 100 and dividing tenths by 10.
		Recognise and show, using diagrams, families of common equivalent fractions.
		Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.
	Equivalence	Recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$, $\frac{3}{4}$, any tenths or hundredths.
To use measures		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.
		Convert between different units of measure. (e.g. kilometre to metre, hour to minute).
		Measure and calculate the area and perimeter of a rectilinear figure (including squares) in centimetres and metres.
		Estimate, compare and calculate different measures, including money in pounds and pence.
		Solve problems involving converting from hours to minutes, minutes to seconds, years to months, weeks to days.
Geometry To understand the properties of shapes		Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes.
		Identify acute and obtuse angles and compare and order angles up to two right angles by size.
		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
Geometry To describe position, direction and movement		Describe positions on a 2-D grid as coordinates in the first quadrant.
		Describe movements between positions as translations of a given unit to the left/right and up/down.
		Plot specified points and draw sides to complete a given polygon.

To use statistics	Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs.
	Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.

YEAR 5		Learning Objectives
To know and use numbers	Counting	Read numbers up to 1 000 000.
		Interpret negative numbers in context and calculate intervals across zero.
		Count forwards or backwards in steps of powers of 10 for any given number up to 1 000 000
	Representing	Write numbers up to 1 000 000.
		Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.
	Comparing	Order and compare numbers up to 1 000 000.
	Place Value	Round any whole number to a required degree of accuracy.
		Determine the value of each digit in any number.
	Solving Problems	Solve number and practical problems
To add and subtract	Checking	Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.
	Complexity	Solve multi-step addition and subtraction problems in contexts, deciding which operations and methods to use and why.
	Methods	Add and subtract whole numbers with more than four digits, including using formal written methods (columnar addition and subtraction).
		Add and subtract numbers mentally with increasingly large numbers.
To multiply and divide	Methods	Multiply multi-digit numbers up to 4 digits by a one or two-digit whole number using the formal written method for multiplication.
		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.
		Multiply and divide numbers mentally drawing on known facts
	Complexity	Solve problems involving multiplication and division including knowledge of factors, multiples, squares and cubes
		Know and use the vocabulary of prime numbers, prime factors and composite numbers.
		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 fractions and problems involving simple rates.

	Using multiplication & division facts	Identify common factors, common multiples and prime numbers.
		Establish whether a number up to 100 is prime and recall prime numbers up to 19.
		Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.
		Recognise and use square numbers and cube numbers, and the notation for squared (2) and cubed (3).
To use fractions	Solving problems	Add and subtract fractions with the same denominator and denominators that are multiples of the same number.
		Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.
		Solve problems which require knowing percentage and decimal equivalents of $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$, $\frac{2}{5}$, $\frac{4}{5}$ and those fractions with a denominator of a multiple of 10 or 25.
	Recognising fractions	Compare and order fractions whose denominators are all multiples of the same number.
		Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements > 1 as a mixed number.
		Round decimals with two decimal places to the nearest whole number and to one decimal place.
		Read, write, order and compare numbers with up to three decimal places.
		Solve problems involving numbers up to three decimal places.
		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.
	Equivalence	Identify, name and write equivalent fractions of a given fraction, represented visually, including tenths and hundredths.
		Read and write decimal numbers as fractions.
		Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.
To use measures		Convert between different units of metric measure.
		Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints.
		Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres.

	Calculate and compare the area of rectangles (including squares), using standard units (square centimetres (cm ²) and square metres (m ²)) and estimate the area of irregular shapes.
	Estimate volume and capacity.
	Solve problems involving converting between units of time.
	Use all four operations to solve problems involving measure (for example, length, mass, volume, money) using decimal notation, including scaling.

YEAR 6		Learning Objectives	
To know and use numbers	Counting	Read numbers up to 10 000 000.	
		Use negative numbers in context and calculate intervals across zero.	
	Representing	Write numbers up to 10 000 000.	
	Comparing	Order and compare numbers up to 10 000 000.	
	Place Value	Round any whole number to a required degree of accuracy.	
		Determine the value of each digit in any number.	
Solving Problems	Solve number and practical problems		
	Checking	Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.	
		Solve multi-step addition and subtraction problems in contexts, deciding which operations and methods to use and why.	
Complexity	Add and subtract whole numbers with more than four digits, including using formal written methods (column addition and subtraction).		
	Add and subtract numbers mentally with increasingly large numbers.		
X and ÷	Methods	Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method for 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 numbers, 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.	
		Perform mental calculations, including with mixed operations and large numbers.	
	Checking	Estimate and use inverse operations and rounding to check answers to a calculation.	
	Complexity	Use knowledge of the order of operations to carry out calculations involving the four operations.	
	Using X and ÷ facts	Identify common factors, common multiples and prime numbers.	
	Solving Problems	Solve multi-step multiplication and division problems in contexts, deciding which operations and methods to use and why.	
	Checking	Use estimation to check answers to calculations and determine, in the context of a problem, levels of accuracy.	
To use fractions	Solving problems	Add and subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.	
		Multiply simple pairs of proper fractions, writing the answer in its simplest form.	

		Multiply one-digit numbers with up to two decimal places by whole numbers
		Divide proper fractions by whole numbers.
		Multiply and divide numbers by 10, 100 and 1000 giving answers up to three decimal places.
		Uses 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
	Recognising fractions	Compare and order fractions, including fractions > 1 .
		Identify the value of each digit in numbers given to three decimal places.
	Equivalence	Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.
		Associate a fraction with division and calculate decimal fraction equivalents
		Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.
To use measures		Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate
		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 miles and kilometres
		Recognise that shapes with the same area can have different perimeters and vice versa.
		Recognise when it is possible to use formulae for area and volume of shapes
		Calculate the area of parallelograms and triangles
		Calculate, estimate and compare the volume of cubes and cuboids using standard units, including cubic centimetres (cm ³) and cubic metres (m ³), and extending to other units.
Geometry	To understand the properties of shapes	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.
GEOMETRY	To describe position, direction and movement	Describe positions on the full coordinate grid (all four quadrants).
		Draw and translate simple shapes on the coordinate plane, and reflect them in the axes
Ratio and Proportion		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 of percentages (for example, of measures, and such as 15% of 360) and the use of percentages for comparison.
		Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples

To use statistics	Interpret and construct pie charts and line graphs and use these to solve problems.
	Calculate and interpret the mean as an average.
To use algebra	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 variables.