

Burghfield St. Mary's Maths Skills Progression Map

EYFS	Key Stage 1 National Curriculum Expectations
Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.	The principal focus of mathematics teaching in key stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the 4 operations, including with practical resources [for example, concrete objects and measuring tools]. At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money. By the end of year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency. Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

Lower Key Stage 2 National Curriculum Expectations	Upper Key Stage 2 National Curriculum Expectations
The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the 4 operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number. By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work. Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word-reading knowledge and their knowledge of spelling.	The principal focus of mathematics teaching in upper key stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio. At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them. By the end of year 6, pupils should be fluent in written methods for all 4 operations, including long multiplication and division, and in working with fractions, decimals and percentages. Pupils should read, spell and pronounce mathematical vocabulary correctly.

	FS2	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Place value: Counting	*Have a deep understanding of number to 10, including the composition of each number. *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 numbers to 100 in numerals; count in multiples of twos, fives and tens.	* Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward.	*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 1000. * 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 * Count forwards and backwards with positive and negative whole numbers, including through zero.	
Place Value: represent	*Have a deep understanding of number to 10, including the composition of each number. * Subitize (recognise quantities without counting) up to 5.	* Identify and represent numbers using objects and pictorial representations including the number line * Read and write numbers to 100 in numerals. * Read and write numbers from 1 to 20 in numerals and words.	* Read and write numbers to at least 100 in numerals and words. * Identify, represent and estimate numbers using different representations, including the number line.	* Read and write numbers up to 1000 in numerals and in words. *Identify, represent and estimate numbers using different representations.	* 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.	* Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit. * Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.	* Read, write, order and compare numbers up to 10 000 000 and determine the value of each digit.

Place Value: Use place value and compare	*Subitize (recognise quantities without counting) up to 5. *Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity. *Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.	* Given a number, identify one more and one less.	* Recognise the place value of each digit in a two-digit number (tens, ones.) * Compare and order numbers from 0 up to 100; use <, > and = sign.	*Recognise the place value of each digit in a three-digit number (hundreds, tens, ones) * Compare and order numbers up to 1000.	* Recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones) * Order and compare numbers beyond 1000. * Find 1000 more or less than a given number.	* Read, write, order and compare numbers to at least 1 000 000 and determine the value of each digit.
Place value: Problems & rounding	*Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.		* Use place value and number facts to solve problems.	* Solve number problems and practical problems involving these ideas. (Place value above)	* Round any number to the nearest 10, 100 or 1000. * Solve number and practical problems that involve all of the above and with increasingly large positive numbers.	* Round any number up to 1 000 000 to the nearest 10, 100, 1000, 10 000 and 100 000. * Interpret negative numbers in context. * Solve number problems and practical problems that involve all of the above.
Addition and subtraction: recall, represent, use	*Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.	* Read, write and interpret mathematical statements involving addition (+), subtraction (−) and equals (=) signs. * 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. * Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot. * 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, in the context of a problem, levels of accuracy.
Addition and subtraction: calculations	*Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.	* Add and subtract one-digit and two-digit numbers to 20, including zero.	* Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: - a two-digit number and ones - a two-digit number and tens - two two-digit numbers - adding three one-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 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.) * Add and subtract numbers mentally with increasingly large numbers.

Addition and subtraction: solve problems		* Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = ? - 9$.	* Solve problems with addition and subtraction: - using concrete objects and pictorial representations, including those involving numbers, quantities and measures - 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 multi-step problems in contexts, deciding which operations and methods to use and why. * Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign.
Multiplication and division: recall, represent, use	* Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.		* Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers. * Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.	* Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.	* 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.	* 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. * 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).
Multiplication and division: calculations			* Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication ($\times$), division ($\div$) and equals (=) signs.	* 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.	* Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.	* 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 and divide numbers mentally drawing upon known facts. * 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 and divide whole numbers and those involving decimals by 10, 100 and 1000.

Multiplication and division: solve problems		* 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, 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.	* 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 multiplication and division, including scaling by simple fractions and problems involving simple rates.
Multiplication & division: comb oper						* Solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign.
Fractions: recognise and write		* 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.	* 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.	* 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, $\frac{2}{5} + \frac{4}{5} = \frac{6}{5} = 1 \frac{1}{5}$]
Fractions: compare			* Recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$.	* Recognise and show, using diagrams, equivalent fractions with small denominators. * Compare and order unit fractions, and fractions with the same denominators.	* Recognise and show, using diagrams, families of common equivalent fractions.	* Compare and order fractions whose denominators are all multiples of the same number.
Fractions: calculations			* Write simple fractions for example, $\frac{1}{2}$ of 6 = 3.	* 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. * Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.

Fractions: solve problems				* Solve problems that involve all of the above. (Year 3 fraction statements.)	* 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.	
Decimals: recognise and write					* 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.
Decimals: compare					* 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.	* 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.
Decimals: calculations & problems					* 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 problems involving number up to three decimal places.
Fractions, decimals and percentages					* Solve simple measure and money problems involving fractions and decimals to two 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. * 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.

Ratio and proportion						* 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.
Algebra		* Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = ? - 9$.	* Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.	* Solve problems including missing number problems.		
Measurement: using 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.	* Compare, describe and solve practical problems for: - lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] - mass/weight [for example, heavy/light, heavier than, lighter than] - capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] - time [for example, quicker, slower, earlier, later] * Measure and begin to record the following: - lengths and heights - mass/weight - capacity and volume - time (hours, minutes, seconds)	* Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature ($^{\circ}\text{C}$); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels * Compare and order lengths, mass, volume/capacity and record the results using $>$, $<$ and $=$	* Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	* Convert between different units of measure [for example, kilometre to metre; hour to minute] * Estimate, compare and calculate different measures.	* Convert between different units of metric measure (for example, kilometre and metre; centimetre and metre; centimetre and millimetre; gram and kilogram; litre and millilitre) * Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints. * Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.

Measurement: 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. * Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change.	* Add and subtract amounts of money to give change, using both £ and p in practical contexts.	* Estimate, compare and calculate different measures, including money in pounds and pence.	* Use all four operations to solve problems involving measure [for example, money] using decimal notation.
Measurement: time	* Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.	* 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.	* Compare and sequence intervals of time - 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.
Measurement: area, perimeter, volume				* Measure the perimeter of simple 2-D shapes.	* Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres. * Find the area of rectilinear shapes by counting squares	* Measure and calculate the perimeter of composite rectilinear shapes in centimetres and metres. * Calculate and compare the area of rectangles (including squares), and including using standard units, square centimetres (cm²) and square metres (m²) and estimate the area of irregular shapes. * Estimate volume [for example, using 1 cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water.]

Geometry: 2-D shapes		* Recognise and name common 2-D shapes, [for example, rectangles (including squares), circles and triangles]	* Identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line * Identify 2-D shapes on the surface of 3-D shapes, [for example, a circle on a cylinder and a triangle on a pyramid] * Compare and sort common 2-D and 3-D shapes and everyday objects.	* Draw 2-D shapes.	* 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.	* Distinguish between regular and irregular polygons based on reasoning about equal sides and angles. * Use the properties of rectangles to deduce related facts and find missing lengths and angles.
Geometry: 3-D shapes		* Recognise and name common 3-D shapes, [for example, cuboids (including cubes), pyramids and spheres]	* Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces. * Name and recognise common 3-D shapes, [for example, cubes, pyramids and spheres.] * Compare and sort common 3-D shapes and everyday objects.	* 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.
Geometry: angles and lines				* 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 horizontal and vertical lines and pairs of perpendicular and parallel lines.	* 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.	* Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles. * Draw given angles, and measure them in degrees (o) * Identify: - angles at a point and one whole turn (total 360o) - angles at a point on a straight line and 2 1 a turn (total 180o) - other multiples of 90o
Geometry: position and direction		* Describe position, direction and movement, including whole, half, quarter and three-quarter turns.	* Order and arrange combinations of mathematical objects in patterns and sequences. * 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 anticlockwise).		* 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.	* 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.

Statistics: present & interpret			* 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.
Statistics: Solve problems			* Ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity. * Ask and answer questions about totalling and comparing categorical data.	* Solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.	* 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.