Bledlow Ridge School Skills and Knowledge Progression Maths

EYFS

Numbers

Early Learning Goal -

"Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number. Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing."

Shape, Space and Measures

Early Learning Goal -

"Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them."

Mathematics in EYFS involves providing children with opportunities to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe shapes, spaces, and measure. All of these areas should enhance the child's love of learning in maths and prepare them for KS1 maths learning and beyond.

National Curriculum Statutory Requirements – KS1

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 four 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.

	National Curriculum Statutory Requirements – Lower KS2

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The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four 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.

National Curriculum Statutory Requirements – Upper KS2

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 four operations, including long multiplication and division, and in working with fractions, decimals and percentages. Pupils should read, spell and pronounce mathematical vocabulary correctly.

	Year 1	Year 2	Year 3	Year 4	Year 5	Year 6
Counting	Count to and across 100 forwards and backwards. Count numbers to 100 in numerals. Count in multiples of 2s, 5s and 10s.	Count in 2s, 3s, 5s from 0 and in 10s from any given number, forwards and backwards.	Count from 0 in multiples of 4, 8, 50 and 100. Find 10 or 100 more or less than any given number.	Count in multiples of 6, 7, 9, 25 and 1000. Count backwards through 0 to include negative numbers.	Count forwards and 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 0.	

Number	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.	Read and write numbers up to 1000 in numerals and in words	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

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Place Value		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, 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.
Mental Addition and Subtraction	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: 2 digit and ones, 2 digit and tens, 2 digit x2, adding 3 1 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	perform mental calculations, including with mixed operations and large numbers
Written Addition and Subtraction	Use the whole part model to solve addition and subtraction problems. To use Think 10 to solve subtraction.	Expanded written method with regrouping of ones (2-digit numbers)	Formal written addition with regrouping (up to three-digit numbers)			
Problem Solving		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.
Mental Multiplication and Division	Counting in 2s, 5s and 10s.	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 3, 4, 6 and 8 times tables.	Recall and use all multiplication and division facts up to 12 x 12.		

Written Multiplication and Division	To use concrete objects, pictorial representations and arrays.	To calculate using arrays and distributive law.	Short multiplication with regrouping. Long division of tens and ones with regrouping	Multiply 2-digit and 3-digit numbers by a one-digit number using formal written layout (short multiplication) Introducing formal short division.	Multiply numbers up to 4 digits using a formal written method, including long multiplication for two-digit numbers. Short division for numbers up to 4-digits.	Long division for numbers up to 4 digits.

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Fractions	Recognise, find and name a half as one of two equal parts of an object, shape or quantity	Recognise, find, name and write fractions 1 / 3 , 1 / 4 , 2 / 4 and 3 / 4 of a length, shape, set of objects or quantity	Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. Recognise and use fractions with numbers. Recognise that tenths arise from dividing an object into 10 equal parts and in dividing one – digit numbers or quantities by 10.	Recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten	Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.	*use common factors to simplify fractions; use common multiples to express fractions in the same denomination* *• compare and order fractions, including fractions > 1*
Decimals			Place value of decimals up to tenths to compare and recognise.	Compare numbers with the same number of decimal places up to two decimal places. Round decimals with one decimal place to the nearest whole number.	Read, write, order and compare numbers with up to three decimal places. Round decimals with two decimal places to the nearest whole number and to one decimal place.	Identify the value of each digit in numbers given to three decimal places. Solve problems which require answers to be rounded to specified degrees of accuracy.

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Equivalence (Including Fractions, Decimals and Percentages)		Write simple fractions e.g. 1 / 2 of 6 = 3 and recognise the equivalence of 2 / 4 and 1 / 2 .	Recognise and show, using diagrams, equivalent fractions with small denominators.	Recognise and show, using diagrams, families of common equivalent fractions. Write decimal equivalents of any number of tenths or hundredths	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 the % sign.	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.
Measurement Comparing and Estimating	Compare, describe and solve practical problems for: lengths, heights, mass, weight, capacity and volume. Sequence events in chronological order using language.	Compare and order lengths, mass, volume/capacity and record the results using >, < and = Compare and sequence intervals of time.	Compare durations of events, for example to calculate the time taken by particular events or tasks	Estimate, compare and calculate different measures, including money in pounds and pence.	Estimate volume (e.g. using 1 cm 3 blocks to build cubes and cuboids) and capacity (e.g. using water)	Calculate, estimate and compare volume of cubes and cuboids using standard units, including centimetre cubed (cm 3) and cubic metres (m 3), and extending to other units such as mm 3 and km 3.

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Measurement Measuring and Calculating	Measure and begin to record 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 (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels	Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)	Estimate, compare and calculate different measures, including money in pounds and pence	Use all four operations to solve problems involving measure (e.g. 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.

Measurement Perimeter and 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 and compare the area of squares and rectangles including using standard units, square centimetres (cm 2) and square metres (m 2) and estimate the area of irregular shapes (also included in measuring).	Calculate the area of parallelograms and triangles. Calculate, estimate and compare volume of cubes and cuboids using standard units. Recognise when it is possible to use formulae for area and volume of shapes. Recognise that shapes with the same areas can have different perimeters and vice versa.
Measurement Telling the Time	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.	Tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks	Read, write and convert time between analogue and digital 12 and 24-hour clocks.		
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.			

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Geometry Shapes	Recognise and name common 2-D and 3-D shapes, including: 2-D shapes, circles and 3-D shapes.	Identify and describe properties of 2D and 3D shapes. Identify 2-D shapes on the radius surface of 3-D shapes.		Identify lines of symmetry in 2-D shapes presented in different orientations.	Identify 3-D shapes, including cubes and other cuboids, from 2-D representations.	Recognise, describe and build simple 3-D shapes, including making nets. Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice identified 2-D shapes on the radius.
Geometry Angles			Recognise angles as a property of shape or a description of a turn. Identify right angles. 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	Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles. Identify: angles at a point and one whole turn, angles at a point on a straight line and ½ a turn, 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.
Statistics	Interpret and construct simple pictograms, tally charts, block diagrams and simple tables.	Interpret and construct simple pictograms, tally charts, block diagrams and simple tables. Ask and answer simple questions.	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.
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 missing number problems.	Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction, multiplication and division.	Perimeter can be expressed algebraically as $2(a + b)$ where a and b are the dimensions in the same unit.	Use the properties of rectangles to deduce related facts and find missing lengths and angles.	Express missing number problems algebraically. Find pairs of numbers that satisfy number sentences involving two unknowns. Enumerate all possibilities of combinations of two variables Use simple formulae.