



MATHEMATICS: Progression from Nursery to Year 2

Development Matters 2020	Nursery (Class 1)	• Begin to develop a strong grounding in number through counting and the use of everyday objects and language. • Begin to develop spatial reasoning skills, looking for patterns and spotting connections. • Develop a positive attitude towards, and interest in, mathematics and be willing to 'have a go'.
	Reception (Classes 2-4)	• Develop a strong grounding in number and be able to count confidently. • Develop a deep understanding of the numbers to 10. • Use mathematical manipulatives as well as everyday objects. • Begin to use mathematical vocabulary. • Further develop spatial reasoning skills across all areas of mathematics. • Further develop their positive attitude towards, and interest in, mathematics, by being willing to 'have a go', talking about what they notice and not being afraid to make mistakes.
Early Learning Goals	Reception (Classes 2-4)	<u>Number</u> • Have a deep understanding of numbers to 10, including the composition of each number. • Subitise (recognise quantities without counting) up to 5. • 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. <u>Numerical Patterns</u> • Verbally count beyond 20, recognising the pattern of the number 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. • Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.
National Curriculum	Key Stage 1 (Classes 5-10)	The national curriculum for mathematics aims to ensure that all pupils: • become fluent in the fundamentals of mathematics for their key stage, so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately; • reason mathematically and develop an argument, justification or proof using mathematical language; • can solve problems by applying their mathematics to a variety of routine and nonroutine problems with increasing complexity, including breaking down problems into a series of simpler steps and persevering in seeking solutions. 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. 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.

Area	Year Group	Substantive knowledge Key vocabulary is in bold
Number and Place Value	Nursery	- Verbally count to 5 (and beyond 5) in sequence (stable order principle). - Say one number name for each item in order: one, two, three, four, five (one-to-one correspondence principle). - Know that the last number reached when counting a small set of objects tells you how many there are in total (cardinal principle). - Know that objects can still be counted as a set regardless of colour, shape, size etc (abstraction principle). - Know that the order objects are counted in is irrelevant as long as each object gets one count (order irrelevance principle). Subitise (recognise quantities without counting) up to 3 objects. - Show 'finger numbers' up to 5. - Begin to link numerals and quantities up to 5, for example, showing the right number of objects to match the numeral. - Experiment with their own symbols and marks as well as numerals. - Compare quantities using mathematical language of more and less.
	Reception	- Verbally count to 10, then 20 (and beyond) in sequence (stable order principle) Count objects, actions and sounds to 10 (and beyond 10) (one-to-one correspondence principle). Subitise (recognise quantities without counting) up to 5 objects and/or pictorial representations. - Link numerals and counted quantities up to 10 (cardinal principle). Compare quantities and numbers using mathematical language of more, greater, less, fewer. - Recognise numbers presented as numerical patterns. - Recognise and understand the numerical patterns related to the 'one more than/one less than' relationship between consecutive numbers. - Explore the composition of numbers to 10, using the language of whole and parts.
	Year 1	Count to and across 100, forwards and backwards, beginning / ending with 0 or 1, or any given number. - Count, read and write numbers to 100 in numerals; count in multiples of twos, fives and tens. - Given a number to 100, identify one more and one less. - Use the mathematical language of: equal to, more than, less than, most and least. - Identify and represent numbers using objects and pictorial representations including the number line. - Read and write numbers from 1 to 20 in words.
	Year 2	- Count in multiples of 2, 5 and 10 from 0, and in tens from any number, forwards and backwards. Compare and order numbers from 0 up to 100; use mathematical language of: equal to, greater than, less than and use the <, > and = signs. - Identify, represent and estimate numbers using different representations, including the number line. - Read and write numbers to at least 100 in numerals and in words. - Recognise the place value of each digit in a two-digit number (tens and ones). - Use place value and number facts to solve problems.
Addition and Subtraction	Reception	Partition and combine numbers to 5 (and some to 10) in different ways. - Apply number bonds for numbers 0-5 (and some to 10). - Automatically recall number bonds for numbers 0-5, and some to 10.
	Year 1	- Represent and use number bonds and related subtraction facts within 10 then 20. 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. - Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$.

	Year 2	- Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100. 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. - 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. - Solve problems with addition and subtraction: using concrete objects and pictorial representations, including those involving numbers, quantities and measures applying an increasing knowledge of mental and written methods.
Multiplication and Division	Year 1	- Count in multiples of 2, 5 and 10 from 0. - 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.
	Year 2	- Count in multiples of 2, 5 and 10 from 0, and in tens from any number, forwards or backwards. - Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers to 100. - Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot. - Calculate mathematical statements for multiplication and division within the 2, 5 and 10 multiplication tables and write them using the multiplication ($\times$), division ($\div$) and equals (=) signs. - Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.
Fractions	Nursery Reception	Understand and use the language of whole and parts.
	Year 1	- 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.
	Year 2	- Recognise, find, name and write fractions $\frac{1}{2}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity. - Write simple fractions e.g. $\frac{1}{2}$ of 6 = 3 and recognise the equivalence of $\frac{1}{2}$ and $\frac{2}{4}$.
Measurement	Nursery	- Make comparisons between objects relating to size, length, weight and capacity using words such as larger, smaller, longer, shorter, heavier, lighter, full, empty. - Begin to describe a sequence of events, real or fictional, using words, such as first, then, morning, afternoon, earlier, later.
	Reception	Compare length, weight and capacity using vocabulary such as shorter than, longer than, taller than, heavier than, lighter than
	Year 1	- Compare, describe and solve practical problems for: length/height (long/short, longer/shorter) ; mass/weight (heavy/light, heavier than/lighter than); capacity/volume (full/empty, more than, less than, half, half full, quarter); time (quicker/slower, earlier/later). - Sequence events in chronological order using time language [e.g. before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening]. - Use language relating to dates, including days of the week, weeks, months and years. - Measure and begin to record: lengths and heights, mass/weight, capacity and volume, time (hours, minutes, seconds). - 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	• Compare and order lengths, mass, volume/capacity and record the results using >, < and = • Choose and use appropriate standard units to estimate and measure length/height (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit. • 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 amount. • Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change. • Tell and write the time to 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. • Compare and sequence intervals of time.
Geometry	Nursery	• Talk about & explore 2D/3D shapes through play (eg. circles, rectangles, triangles, cuboids) using language: 'sides', 'corners', 'straight', 'flat', 'round'. • Select shapes appropriately: flat surfaces for building, circular surfaces for rolling etc. • Combine shapes to make new ones – an arch, a bigger triangle etc. • Understand position through words alone (no pointing), for example, "The bag is under the table," "The book is behind the box." • Describe a familiar route and discuss routes and locations, using words like 'in front of' and 'behind'. • Talk about and identify patterns eg. stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs', etc. • Extend and create ABAB patterns – stick, leaf, stick, leaf and notice and correct an error in a repeating pattern.
	Reception	• Select, rotate and manipulate shapes in order to develop spatial reasoning skills. • Compose and decompose shapes so that children recognise that a shape can have other shapes within it, just as numbers can. • Continue, copy and create repeating patterns (beyond ABAB), being able to spot mistakes in patterns and being able to talk about how to fix them.
	Year 1	• Recognise, name and describe common 2D and 3D shapes, including: rectangles (including squares), circles, triangles, pentagons and hexagons and cuboids (including cubes), pyramids, cones, cylinders and spheres. • Describe position, direction and movement, including half, quarter and three-quarter turns.
	Year 2	• Identify and describe the properties of 2-D shapes, including the number of sides and lines of symmetry in a vertical line. • Identify and describe the properties of 3-D shapes, including the number of edges, vertices and faces. • 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. • 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). • Order and arrange combinations of mathematical objects in patterns and sequences.
Statistics	Reception Year 1	• Begin to be aware of data handling through real-life situations e.g. class votes, preferences.
	Year 2	• Interpret and construct simple pictograms, tally charts, block diagrams and simple tables. • 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 data.