Barnett Wood Infant School
Progression of Knowledge and Skills Document

Mathematics

Declarative/substantive knowledge - Facts, concepts and formulae (mathematical rules)
Procedural knowledge - methods, procedures and algorithms
Conditional/disciplinary knowledge - strategies formed from combinations of facts and methods to enable reasoning and problem solving

EYFS

	Early Learning Goal Number Children at the expected level of development will: - Have a deep understanding of number 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. NB. Fluency is also part of the progression in mathematics in EYFS	**Early learning Goal** Numerical Patterns Children at the expected level of development will: 12 - Verbally count beyond 20, recognising 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; - Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally. NB. Fluency is also part of the progression in mathematics in EYFS

Key Stage 1

	Fluency	**Reasoning mathematically**	**Solve problems**
	Pupils become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately	Pupils can reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language	Pupils can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions
Concepts	**Reception**	**Year 1**	**Year 2**

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Number and Place Value	• To recognise numbers 1-3 • To begin to subitise to 3 • To subitise objects and sounds to 2,3 and 4 • To begin to subitise to 5 • To represent numbers on fingers • To subitise different arrangements, both unstructured and structured, including using the Hungarian number frame (dice patterns) • Count each thing once to find out how many • Know that each number is one more than the previous number when counting (connect this to the staircase pattern) • Spot smaller numbers hiding inside larger numbers • Explore the composition of 3 and 4 • To explore the five-ness of 5 • To make 5 in different ways (fingers, objects, counters etc) • To recognise numerals to 5 • To know that anything can be counted, including actions and sounds. • To identify when a set can be subitised and when counting is needed.	• 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; count in multiples of twos, fives and tens • When given a number, identify one more and one less • 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 • Read and write numbers from 1 to 20 in numerals and words.	• Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward • Recognise the place value of each digit in a two-digit number (tens, ones) • Identify, represent and estimate numbers using different representations, including the number line • Compare and order numbers from 0 up to 100; use <, > and = signs • Read and write numbers to at least 100 in numerals and in words • Use place value and number facts to solve problems.

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	• To begin to develop the language of 'whole' when talking about objects that have 'parts'. • To focus on the composition of 3 and 4. • To match numerals to quantities within 5 • To continue to develop subitising skills for numbers within and beyond 5. • To subitise to 5 focussing on dice patterns • To explore the composition of 5. • To begin to identify missing parts for numbers within 5. • To explore the composition of 6 and 7 as '5 and a bit'. • To explore 6 and 7 as finger patterns. • To understand that 2 equal groups can be called a double and connect this to finger patterns • To see how doubles can be arranged in a ten frame. • To understand the composition of 7 and represent this in different ways. • To order numbers to 8 • To sort odd and even amounts according to their shape. • To subitise to 6.		

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	• To continue to understand the composition of '5 and a bit' (including 10 frames) • To explore the composition of 10 in a range of representations (e.g. ten frames) • To generalise about 1 more than and one less than to numbers within 10. • To identify when sets can be subitised and when counting is necessary. • To begin to develop conceptual subitising skills including when using a rekenrek. • To automatically recall number bonds to 5. • To add more and take away. • To recall double facts		
Numerical pattern	• To say which group has more • To say which group has less • To compare sets of objects by matching • To compare quantities to 3 • To count to 4 • To hear and join in with the counting sequence. • To develop counting skills and know that the last number counted shows us how many. • To use 'more than', 'fewer than' and 'equal' to compare sets.		

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	• To verbally count beyond 20. • To continue to develop their understanding of the counting sequence and link cardinality and ordinality through the staircase pattern. • To compare sets and use language of comparison: more than, fewer than, and equal number to. • To focus on equal and unequal groups when comparing numbers. • To use language of 'less than' • To continue to develop counting skills, counting larger sets as well as counting actions and sounds. • To continue to develop a sense of magnitude, knowing that 8 is quite a lot more than 2, but 4 is only a little bit more than 2. • To compare and sort quantities and numbers including sets of objects that have different attributes. • To order numbers • To play track games to understand ordinality (1st, 2nd, 3rd) • To count in 2s. • To apply double fact knowledge when counting larger amounts. • To count 5 and 5 to make 10 altogether		

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Number - Addition and Subtraction	• To explore the composition of numbers • To add more and take away. • To recall double facts • To begin to identify missing parts for numbers within 5.	• Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs • Represent and use number bonds and related subtraction facts within 20 • Add and subtract one-digit and two-digit numbers to 20, including zero • 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 • 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: - 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

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Number - Multiplication and division	• To count in twos • To recall and use double facts	• 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	• Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers • Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (×), division (÷) 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 materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts
Number - Fractions	N/A	• 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 1/3 , 1/4 , 2/4 and 3/4 of a length, shape, set of objects or quantity • Write simple fractions, for example 1/2 of 6 = 3 and recognise the equivalence of 2/4 and 1/2
Measurement	• To match objects • To sort objects • To compare and explore size, mass and capacity • To compare and explore mass	• Compare, describe and solve practical problems for: - lengths and heights [for example, long/short, longer/shorter, tall/short, double/half]	• 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

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	• To compare and explore capacity • To find a balance • To explore and compare length • To explore and compare height • To order and sequence time • To talk about time	- 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) - money, recognise and know the value of different denominations of coins and notes • 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	unit, using rulers, scales, thermometers and measuring vessels • Compare and order lengths, mass, volume/capacity and record the results using >, < and = • 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 • 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

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Geometry – Properties of shape	There is no Early Learning Goal for shape, however shape is taught in relation to number • To recognise and name circles and triangles • To recognise and name squares and rectangles • To explore simple patterns • To copy simple repeating patterns • To continue simple repeating patterns • To create simple repeating patterns	• Recognise and name common 2-D and 3-D shapes, including: • 2-D shapes [for example, rectangles (including squares), circles and triangles] • 3-D shapes [for example, cuboids (including cubes), pyramids and spheres]	• Identify and describe the properties of 2-D shapes, including the number of sides and line 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
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 anti-clockwise)
Statistics	N/A	N/A Some knowledge learnt as part of the computing curriculum.	• 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

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			category and sorting the categories by quantity • Ask and answer questions about totalling and comparing categorical data.