Maths Learning Progression for F2, Y1 and Y2

Difference Communication Creativity Kindness

	F2	Y1	Y2
NC Programme of study:	Maths 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	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.	
I know:			
Number: Number and Place Value	Pupils count reliably with numbers from 1 to 20, place them in order and say which number is one more or one less than a given number. • String counting • The one to one principle – developing 1 to 1 correspondence. • Stable order principle- numbers have to be said in a certain order. • Breakable counting- start counting at different numbers. • Cardinal principle- Understands the final number said is the total number in a group without recounting. • Says one more/ less than a given value. • Abstract principle- anything can be counted including movements and sounds. • The order-irrelevance principle- that objects can be counted in any order but the total will still be the same. • Perceptually subitise up to 6 objects. • Conceptually subitise to find totals of number of objects. • Heirarchical inclusion- understands that each number includes every number before it. • Number conservation understands size, arrangement colour etc does not affect the number of objects there are. • Unitising can put small numbers of objects into groups to count.	• Count to ten, forwards and backwards, beginning with 0 or 1, or from any given number. • Count read and write numbers to 10 in numeral and words. • Given a number, identify one more or 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 and least. • Repeat the above steps to 20 and then to 50. • Count in multipules of twos, fives and tens. They practise counting as reciting numbers and counting as enumerating objects, and counting in twos, fives and tens from different multiples to develop their recognition of patterns in the number system (for example, odd and even numbers), including varied and frequent practice through increasingly complex questions. • Repeat the above steps to 100. • Pupils practise counting (1, 2, 3…), ordering (for example, first, second, third…), and to indicate a quantity (for example, 3 apples, 2 centimetres), including solving simple concrete problems, until they are fluent. • Pupils begin to recognise place value in numbers beyond 20 by reading, writing, counting and comparing numbers up to 100, supported by objects and pictorial representations.	• Read and write numbers to at least 100 in numerals and words. • Recognise the place value of each digit in a two digit number (tens, ones). • Identify represent and estimate numbers using different representations including a number line. • Compare and order numbers from 0 up to 100: use <,> and = signs. • Use place value and number facts solve problems. • Count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backwards. • They count in multiples of three to support their later understanding of a third. • As they become more confident with numbers up to 100, pupils are introduced to larger numbers to develop further their recognition of patterns within the number system and represent them in different ways, including spatial representations. • Pupils should partition numbers in different ways (for example, 23 = 20 + 3 and 23 = 10 + 13) to support subtraction. • They become fluent and apply their knowledge of numbers to reason with, discuss and solve problems that emphasise the value of each digit in two-digit numbers. • They begin to understand zero as a place holder.

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Number: Addition and Subtraction	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. • Perceptual subitising to find the total number of objects in a group. • Says 1 more/ less than a given amount using equipment if needed. • Uses models to recognise the part whole relationship between numbers. • Explores the conservation of number within a part whole relationship. • Solve everyday problems involving addition and subtraction. • Uses equipment and markings to add and subtract single digit numbers. • Counts on and back to add / subtract single digit numbers. • Unitises groups of objects to create doubles. • Shares groups of objects into two groups and recognises when this is fair. • Shares objects into more than 2 groups.	1. Read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs represent and use number bonds and related subtraction facts within 10 2. Pupils memorise and reason with number bonds to 10 in several forms (for example fact families, 3 + 4 = 7; 7 – 3 = 4; 4 = 7 – 3). 3. Add and subtract one-digit numbers to 10 and realise the effect of adding or subtracting zero. 4. Represent and use number bonds and related subtraction facts with in 10. 5. Add and subtract 1 digit numbers to 10, including 0. 6. Solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = □ – 9. 7. Compare addition and subtraction statements:- a+b>c or a+b>c+d 8. Repeat steps1-7 with numbers to 20 9. This establishes addition and subtraction as related operations. Pupils combine and increase numbers, counting forwards and backwards. They discuss and solve problems in familiar practical contexts, including using quantities. Problems should include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are enabled to use these operations flexibly.	• 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 - two-digit number and tens -two two-digit numbers -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. • 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. -derive and use related facts up to 100 • Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems. • Pupils extend their understanding of the language of addition and subtraction to include sum and difference. • Pupils practise addition and subtraction to 20 to become increasingly fluent in deriving facts such as using 3 + 7 = 10; 10 – 7 = 3 and 7 = 10 – 3 to calculate 30 + 70 = 100; 100 – 70 = 30 and 70 = 100 – 30. • They check their calculations, including by adding to check subtraction and adding numbers in a different order to check addition (for example, 5 + 2 + 1 = 1 + 5 + 2 = 1 + 2 + 5). This establishes commutativity and associativity of addition. • Recording addition and subtraction in columns supports place value and prepares for formal written methods with larger numbers

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Number: Multiplication and Division	They solve problems, including doubling, halving and sharing. • Recognises when two groups contain the same amount- even when 1 has small objects and the other large. • Unitises groups of objects to create doubles. • Shares groups of objects into two groups and recognises when this is fair/ unfair. • Shares objects into more than 2 groups.	• Count in multiples of twos, fives and tens. • Recognise unitised groups and create unitised groups of twos, fives and tens. • Recognise equal groups and use repeated addition to find totals. • They make connections between arrays, number patterns, and counting in twos, fives and tens. • Recognise doubling as 2 equal groups of the same number. • Pupils recognise equal and unequal groups represented in a wide variety of ways. • Pupils solve problems involving equal groups using repeated addition. • Pupils make arrays by making equal groups and building them up in columns and rows. • Pupils start with a total and make groups of an equal amount. • Pupils explore sharing as a model for division. They use 1 to 1 correspondence to share concrete objects into equal groups. • Pupils 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 times tables, including recognising odd and even numbers. • Calculate mathematical statements for multiplications and division within the multiplication tables and write them using the multiplication (x) and division (÷)and equals (=) signs. • Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication/ division facts. This should include problems in contexts. • They connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face. • They begin to use other multiplication tables and recall multiplication facts, including using related division facts to perform written and mental calculations. • Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot. • Pupils work with a range of materials and contexts in which multiplication and division relate to grouping and sharing discrete and continuous quantities, to arrays and to repeated addition. • They begin to relate these to fractions and measures (for example, 40 ÷ 2 = 20, 20 is a half of 40). • They use commutativity and inverse relations to develop multiplicative reasoning (for example, 4 × 5 = 20 and 20 ÷ 5 = 4).

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Number - Fractions:	• They solve problems, including doubling, halving and sharing. • Cuts everyday objects in half and recognises that both parts must be the same size to be a half. (eg shares playdough / cut bread in half/ cut play food) • Recognises when two piece are not the same so are not shared fairly. • Recognises when two piece are put together it makes the whole again. (eg two halves of a cut a play toy make a whole) • Shares groups of objects into two groups and recognises when this is fair/ unfair.	• 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. • Pupils are taught half and quarter as 'fractions of' discrete and continuous quantities by solving problems using shapes, objects and quantities. For example, they could recognise and find half a length, quantity, set of objects or shape. • Pupils connect halves and quarters to the equal sharing and grouping of sets of objects and to measures, as well as recognising and combining halves and quarters as parts of a whole.	• Recognise, find, name and write fractions 1/3 ¼ , 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 . • Pupils use fractions as 'fractions of' discrete and continuous quantities by solving problems using shapes, objects and quantities. • They connect unit fractions to equal sharing and grouping, to numbers when they can be calculated, and to measures, finding fractions of lengths, quantities, sets of objects or shapes. • They meet 3/4 as the first example of a non-unit fraction. • Pupils should count in fractions up to 10, starting from any number and using the ½ and 2/4 equivalence on the number line (for example, 1 1/4 , 1 2/4 (or 1 ½), 1 ¾ , 2). This reinforces the concept of fractions as numbers and that they can add up to more than one.

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Measurement:	Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. • Recognising attributes- objects can be sorted but attributes such as colour size and shape. • Compare amounts of continuous quantities. • Showing awareness of comparison in estimating and predicting. • Comparing indirectly- a group of objects can be sorted in different ways- largest to smallest, thinnest to fattest etc • Recognising the relationship between the size and number of units. • Beginning to use units to compare things- Children recognise when two objects/ groups are the same. • Beginning to use time to sequence events. • Beginning to experience specific time durations- timers/ number of sleeps or days till an event.	• Measure and begin to record the following: lengths and heights mass/weight • 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] • Measure and begin to record capacity and volume. • Compare and describe capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] • Recognise and know the value of the UK currency. • Recognise coins. • Recognise notes. • Counting in coins. • 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. • Measure and begin to record time (hours, minutes and seconds). • Pupils move from using and comparing different types of quantities and measures using non-standard units, including discrete (for example, counting) and continuous (for example, liquid) measurement, to using manageable common standard units. • In order to become familiar with standard measures, pupils begin to use measuring tools such as a ruler, weighing scales and containers.	• 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. • 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. • compare and order lengths, mass, volume/capacity and record the results using ≤ ≥ and = . • 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. • Pupils use standard units of measurement with increasing accuracy, using their knowledge of the number system. • They use the appropriate language and record using standard abbreviations. Comparing measures includes simple multiples such as 'half as high'; 'twice as wide'.

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Geometry: Properties of Shape	They recognise, create and describe patterns. They explore characteristics of everyday objects and shapes and use mathematical language to describe them. <u>Shape</u> Children explore 2d/3d shapes through everyday objects. Developing spatial awareness and experiencing shapes from different viewpoints. Shape names are introduced and children select a named shape. Children look for similarities and difference between shapes. Children sort shape by different criteria. Children understand the same shapes can be sorted in more than 1 way. Showing an awareness of properties of shapes through exploring the properties of shapes and select shapes for a purpose based on their properties. (eg- these shapes are good for stacking because they don't roll.) Describing the properties of shapes. Children construct 2d and 3d shapes using different equipment and materials. Developing an awareness of the relationships between shapes. Children explore combining and partitioning shapes to create new shapes. <u>Pattern</u> Continue a AB pattern. Copy an AB pattern. Make their own AB pattern. Spot errors in AB patterns. Identify the unit of repeat. Continue a ABC pattern. Continue a pattern which ends mid unit. Making their own AAB, ABBC patterns. Spots an error in a ABB pattern. Symbolising the unit structure. Generalising structures- use the same rule to create a pattern using different equipment. Make a pattern that repeats around a circle. Make patterns around a border with a fixed number of spaces. Spot	• 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]. • Pupils handle common 2-D and 3-D shapes, naming these and related everyday objects fluently. • They recognise these shapes in different orientations and sizes, and know that rectangles, triangles, cuboids and pyramids are not always similar to each other. • Pupils sort 2d and 3d shapes using the properties of the shape. • Pupils use 2d and 3d shapes to complete and make patterns focusing different shapes, sizes and colours.	• 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. • Pupils handle and name a wide variety of common 2-D and 3-D shapes including: quadrilaterals and polygons, and cuboids, prisms and cones, and identify the properties of each shape (for example, number of sides, number of faces). • Pupils identify, compare and sort shapes on the basis of their properties and use vocabulary precisely, such as sides, edges, vertices and faces. • Pupils draw lines and shapes using a straight edge.

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Geometry: Position and Direction	Children use everyday language to talk about size, weight, capacity, position, distance, time and money to compare quantities and objects and to solve problems. Children hear and use positional language to describe items position in relation to each other. Children describe places they have been and the position of objects in them. Children explore life-sized journeys and travel through them exploring them from different perspectives.	• Describe position, direction and movement, including whole, half, quarter and three quarter turns. • Pupils use the language of position, direction and motion, including: left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside. • Pupils make whole, half, quarter and three-quarter turns in both directions and connect turning clockwise with movement on a clock face.	• 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). • Order and arrange combinations of mathematical objects in patterns and sequences. • Pupils should work with patterns of shapes, including those in different orientations. • Pupils use the concept and language of angles to describe 'turn' by applying rotations, including in practical contexts (for example, pupils themselves moving in turns, giving instructions to other pupils to do so, and programming robots using instructions given in right angles).
Statistics			• 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 categorical data. • Pupils record, interpret, collate, organise and compare information (for example, using many-to-one correspondence in pictograms with simple ratios 2, 5, 10).