Year 2

Year 2 - Autumn 1

Milestone LO:
NUMBER
Counting
Count in steps of 2, 3 and 5 from 0, and in tens from any number, forward and backwards

Representation of Number
Recognise the place value of each digit in a two-digit number (tens and ones)
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
Use place value and number facts to solve problems

Comparison
Compare and order numbers from 0 up to 100: use <, > and = signs

Milestone LO:
SHAPE
2D Shape
Identify and describe the properties of 2D shapes, including the number of sides and line symmetry in a vertical line
Compare and sort common 2D shapes.

3D Shape
Identify and describe the properties of 2D and 3-D shapes, including the number of edges, vertices and faces
Identify 2D shapes on the surface of 3D shapes (for example a circle on a cylinder and a triangle on a pyramid)
Compare and sort common 2D and 3D shapes and everyday objects

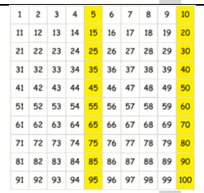
Revisited Knowledge
New knowledge

Domains	Declarative Knowledge (Substantive Knowledge)	Procedural Knowledge (Disciplinary Knowledge)	Conditional Knowledge (Knowing the when and the why)
Number and Place Value	**Counting** Children need to know that… • *All numbers have meaning. (Year R)* • *The value and names of numbers 1 – 100. (Year 1)* • *Numbers increase as they go up in the number system and decrease as we count backwards. (Year 1)* • *When we count forwards in ones, we say the next number in the number system; when we count backwards in ones we say the previous number in the number system. (Year 1)* • *One to one correspondence is when we count a group of objects, actions or sounds by assigning one number to each object and only counting each object once. (Year R)* • *When we count in 2s from 0, it means we add two each time.* • *When you count in 2s, you say all even numbers.* • *The number sequence from counting in 2s from 0 to 24 is 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20, 22, 24. (Year 1)* • *When we count in 5s, it means we add five each time. (Year 1)* • *When you count in 5s, the number in the one column is 5 or 0. (Year 1)*	**Counting** Children need to know how… • *To verbally count to 100, forwards and backwards in ones. (Year 1)* • *To count objects accurately using one to one correspondence. (Year R)* • *To count in multiples of tens, forwards and backwards from 0 to 100. (Year 1)* • *To count in multiples of two, forwards and backwards,* from 0 to 100. (Year 1 – extended) • *To count in multiples of five, forwards and backwards,* from 0 to 100. (Year 1 – extended) • To count in multiples of three, forwards and backwards, from 0 to 100. • To solve problems using their understanding of place value and number.	Children need to know when… • Numbers sequences are going up in 2s, 5s, 10s or 3s. • It may be sensible to make an estimation of a number. • When compare means ‘say what is the same and what is different’ and when compare means ‘compare mathematically, saying which number is smaller’. • Different manipulatives may be most useful to help them solve a problem. Children need to know why… • **Mathematicians use a hundred square to help them learn counting sequences.** Hundred squares help to visualise the underlying structure of different sequences which builds

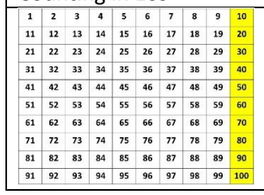
- *The number sequence from counting in 5s to 60 is 0, 5, 10, 15, 20, 25, 30, 35, 40, 45, 50, 55, 60. (Year 1)*
- *When we count in 10s, it means we add ten each time. (Year 1)*
- *When you count in 10s, the numbers in the one column is always 0. (Year 1)*
- *The number sequence for counting in 10s from 0 (0, 10, 20, 30, 40, 50, 60, 70, 80, 90, 100) (Year 1)*
- When we count in 3s, it means we add three each time.
- The counting sequence when we count in 3s from 0 – 36 is 0, 3, 6, 9, 12, 15, 18, 21, 24, 27, 30, 33, 36
- Different counting sequences make very different patterns when represented on a hundred square.

Counting in 2s

Counting in 5s



Counting in 10s



Counting in 3s

Representation of Number

Children need to know that…

- *Subitising means looking at a collecting of things and being able to say how many are there, without counting individually. (Year R)*
- *Numbers can be represented by numerals. (Year R)*
- *A digit is a written symbol. (Year R)*
- *Numbers can be represented by words. (Year 1)*
- *The difference between single digit, two-digit and three-digit numbers. (Year 1)*
- *In 2-digit numbers the first digit tells us how many tens there are, and the second digit tells us how many ones there are (Year 1)*
- *In 3-digit numbers the first digit tells us how many hundreds there are, the second how many tens there are and the third how many ones there are (Year 1)*
- *Numbers can be represented in different ways, e.g. using resources, pictorial representations and abstract representations. (Year 1)*
- Mathematicians use a place value chart to represent the place value of numbers.

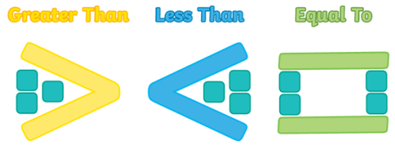
Representation of Number

Children need to know how…

- *To subitise (Year R)*
- *To read and write the numbers to 100 as numerals (with accurate digit formation, digits the right way around and tens and ones in the correct columns). (Year 1)*
- *To read and write the numbers to 100 as words (spelled correctly, or using a word mat). (Year 1)*
- *To identify and represent numbers using concrete and pictorial representations by linking the number symbol (numeral) with its cardinal value for numbers up to and including 100, by*
  - *counting/subitising and finding or recording the matching numeral*
  - *recognising a numeral and making/ drawing a corresponding amount. (Year 1)*
- *To build a 2-digit number using tens and ones (e.g. diennes, counters, pictures). (Year 1)*
- To estimate a number shown in a concrete or pictorial representation (including on a number line).
- To represent numbers up to 100 on a place value chart and explain this representation.
- To solve problems using their understanding of place value and number.

their understanding. Understanding why a number sequence occurs helps us to remember it for longer.

- **Estimation is useful.** Sometimes we will not have the time or ability to count carefully. Our mathematical understanding helps us to make sensible guesses (estimations) which can allow us to work efficiently. Estimation can also allow us to check our answers to complex problems are sensible.
- **We use place value charts and squared paper for representing number in maths.** Our maths system has a base 10 structure. Each column represents a different place value. Using columns to lay out our digits allows us to represent numbers efficiently.
- **The < = and > are written the way they are.** The wide side of the symbol represents a greater quantity (you could physically fit more counters on that side of the sign). An equals sign consists of two parallel lines because you can fit the same quantity either side.



- Estimate means to make a 'sensible guess' using your knowledge of number.
- We can estimate what number a collection of objects represents by using our experience of grouping and representing numbers.

Comparison

Children need to know that…

- *Compare means to look at what is the same and different. (Year R)*
- *Greater than means there are more. Less than means there are fewer (Year R)*
- *'The same as' means neither has more or less, because the amount is identical, even if the objects are arranged differently, or are different colours, shapes and sizes. (Year R)*
- *Equal means the same. (Year 1)*
- *Most means the set with the greatest amount. (Year 1)*
- *Least means the set with the smallest amount. (Year 1)*
- *One more means the amount plus (add) one. The answer will increase by one. (Year 1)*
- *One less means the amount minus (subtract) one. The answer will decrease by one. (Year 1)*
- In mathematics, when we compare numbers, we are stating which one is larger and which one is smaller.
- < is a mathematical symbol that means less than.
- > is a mathematical symbol that means greater than the small side of the symbol faces the smaller number; the large side of the symbol faces the larger number.

- Order means to arrange numbers by their numerical value.
- We can arrange numbers in ascending order (from smallest to largest)
- We can arrange numbers in descending order (from largest to smallest)

Comparison

Children need to know how…

- *To use language of more than, greater than, equal to, the same as, less than, fewer, most and least. (Year 1)*
- *To identify one more than a number within 100. (Year 1)*
- *To identify one less than a number within 100. (Year 1)*
- To compare numbers from 0 up to 100 using the mathematical symbols <, > and =.
- To order numbers from 0 up to 100 in ascending and descending order.
- To solve problems using their understanding of place value and number.

Vocabulary						
	NUMBER	An abstract way of representing a quantity (e.g. 2, 26, fifty-nine, $\frac{1}{2}$, 0.322)	**NUMERAL**	Words or symbols used to represent numbers, made up of digits.	**DIGIT**	The ten single symbols 0-9, used to represent numbers when placed in sequence.
	VALUE	How much something is worth. In representation of	**PLACE VALUE CHART**	A picture/diagram used to help represent the value of digits in numbers.	**ESTIMATE**	To make a 'sensible guess' based on your knowledge of and experience with number.

		number, the position of a digit in a numeral determines its value.				
	ONE DIGIT NUMBER	A numeral which only contains one digit.	**TWO DIGIT NUMBER**	A numeral which contains two digits. The first digit has a value of tens.	**THREE DIGIT NUMBER**	A numeral which contains three digits. The first numeral has a value of hundreds.
	ONES	Where the digit represents the quantity exactly.	**TENS**	A digit value where the digit represents ten-times the quantity. There are 10 ones in a ten.	**HUNDREDS**	A digit value where the digit represents one-hundred-times the quantity. There are 10 tens in a hundred; there are 100 ones in a hundred.
	COMPARE	Two meanings: a) to say what is the same or what is different. b) to identify the mathematical difference between numbers.	**EQUAL**	The same as.	**NUMBER LINE**	A picture used to represent numbers and calculations where numbers are shown on a regular scale.
	GREATER THAN >	When the first number is more than the second number. Can be shown by the greater than symbol >	**LESS THAN <**	When the first number is less than the second number. Can be shown by the less than symbol.	**ORDER**	To arrange numbers by their numerical value.
	ASCENDING ORDER	Arranging numbers from smallest to largest.	**DESCENDING ORDER**	Arranging numbers from largest to smallest.		

Shape

2D Shape

Children need to know that…

- *Equal means the same. (Year R & Year 1)*
- *Length is the measurement of distance from one point to another. We can measure this in cm and m (Year 1)*
- *A 2D shape is a shape that has 2 dimensions (width and height). It is flat and can only ever be drawn, not held. (Year 1)*
- *2D shapes have sides. (Year 1)*
- *A side is a line that forms part of the outline of a 2D shape. It connects two vertices (corners). (Year 1)*
- *Sides can be straight, and they can be curved. (Year 1)*
- *A vertex (when referring to 2D shapes) is the point at which two sides meet (corner). (Year 1)*
- *Properties of 2D shapes (Year 1)*

Name	***Number of sides***	***Number of Vertices***
Circle	*1 (curved, continuous)*	*0*
Triangle	*3 (straight)*	*3*
Square	*4 (straight, equal length)*	*4*
Rectangle	*4 (straight, opposite sides equal)*	*4*
Pentagon	*5 (straight)*	*5*
Hexagon	*6 (straight)*	*6*
Octagon	*8 (straight)*	*8*

- *There are many types of triangles. (Year 1)*
- *A horizontal line goes across. (Year 1)*
- *A vertical line goes up and down. (Year 1)*
- Symmetry means when something is exactly the same on either side.
- A line of symmetry is always straight.

2D Shape

Children need to know how…

- *To recognise and identify each of the 2D shapes, based on their properties. (Year 1)*
- *To recognise 2D shapes in different orientations and sizes (including irregular shapes). (Year 1)*
- *To recognise 2D shapes in everyday life. (Year 1)*
- To identify a line of symmetry in a shape.
- To recognise and describe a 2D shape by its lines of symmetry.

3D Shape

Children need to know how…

- *To recognise and identify each of the 3D shapes, based on their properties. (Year 1)*
- *To recognise 3D shapes in different orientations and sizes (including irregular shapes). (Year 1)*
- *To recognise 3D shapes in everyday life (Year 1)*
- To identify the 2-D shapes on the surface of 3D shapes (faces) by their properties.
- To compare 2D and 3D shapes using everyday objects.
- To sort 2D and 3D shapes using everyday objects.

Children need to know when…

- *We see a shape, we can identify it by its properties. (Year 1)*
- We see symmetry in real life.

Children need to know why…

- ***We identify shapes.*** *We identify shapes because we can use 3D shapes to build. Different shapes have different properties so are useful for different things. (Year 1)*

- A line of symmetry can be vertical, horizontal or diagonal.
- Diagonal means a straight line joining two non-adjacent vertices in a shape.

3D Shape

Children need to know that…

- *Equal means the same. (Year R & Year 1)*
  Length is the measurement of distance from one point to another. We can measure this in cm and m (Year 1)
- *A 3D shape has three dimensions (width, height and depth). It can be held. (Year 1)*
- *3D shapes have faces, which are 2D (Year 1)*
- *A face is a surface of a 3D shape. (Year 1)*
- *Some faces are flat (Year 1)*
- *Some faces are curved. (Year 1)*
- *3D shapes have edges. (Year 1)*
- *An edge is where two faces meet. (Year 1)*
- *3D shapes, similarly to 2D shapes, also have vertices (corners). On a 3D shape, this is where two or more edges meet. (Year 1)*
- *Properties of 3D shapes (Year 1)*

Name	***Number of edges***	***Number of Vertices***	***Number of faces***
Sphere	*0*	*0*	*1 continuous, curved*
Pyramid	*6*	*4*	*Triangular base: 4 flat triangles (inc. base)*
	8	*5*	*Square base: 1 flat square 4 flat triangles*
Cone	*1*	*1*	*1 flat, circle 1 curved*
Cylinder	*2*	*0*	*2 flat circles 1 curved rectangle*
Triangular prism	*9*	*6*	*2 flat triangles 3 flat squares*
Cube	*12 (equal length)*	*8*	*6 flat squares*
Cuboid	*12 (parallel are equal length)*	*8*	*6 flat faces - some squares, some rectangles*

Vocabulary						
	EQUAL	The same as.	**2D Shape**	A shape with 2 dimensions (flat). They have width and height. They can only be drawn, not held.	**3D SHAPE**	A shape with 3 dimensions (height, width and depth). These can be held as well as drawn.
	SIDES	The lines which define the outside of a shape.	**VERTEX (2D)**	The points at which two sides of a shape meet.	**VERTEX (3D)**	The point at which three or more edges meet.
	EDGE	The line where two faces meet.	**FACE**	The flat surfaces of a 3D shape.	**SURFACE**	The outside layer of something.
	HORIZONTAL	A straight line which goes from left to right/right to left.	**VERTICAL**	A straight line which goes up and down.	**DIAGONAL**	A straight line which joins non-adjacent corners of a straight-sided shape.

	STRAIGHT	A line which does not curve. These are drawn with a ruler.	**CURVED**	A line that is bent. Usually this is smooth and continuous.	**LINE OF SYMMETRY**	A line that cuts a shape exactly in half, so the two sides are mirror images of one another.
	SYMMETRICAL	A shape with at least one line of symmetry.	**MIRROR IMAGE**	An image of object which is identical to another, but with the structure reversed (like your reflection in a mirror or either side of a symmetrical shape)		
Enrichment	Shape Day					

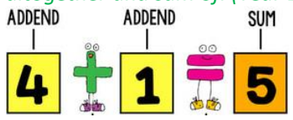
Year 2 - Autumn 2

Milestone LO:

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 to 100
Add and subtract number using concrete objects, pictorial representations and mentally
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

Revisited Knowledge
New knowledge

Domains	Declarative Knowledge (Substantive Knowledge)	Procedural Knowledge (Disciplinary Knowledge)	Conditional Knowledge (Knowing the when and the why)
Addition & Subtraction	**Partitioning** Children need to know that… • *Partition means to split an amount (a whole or total) into smaller parts. (Year R)* • *A whole is the total amount, which will always be greater than the parts. (Year R)* • *Parts are a section of the whole. The parts will always be fewer (less than) the whole. (Year R)* • *A number bond is a pair of numbers that totals a given amount. (Revisiting from Year R)* • *Number bonds to and within 20 and their related subtraction facts (Year 1; see number mapping).* **Addition** Children need to know that… • *Addition is finding the total or two or more sets of objects or numbers. (Year R)* • *+ is a symbol that means add (Year 1).* • *= is a symbol that means 'is equal to' (the same as) (Year 1).* • *Words that suggest we may need to carry out an addition are: add, plus, total, altogether and sum of. (Year 1)*  • *Adding numbers together will result in a greater amount. (Year 1)* • *Greater means a larger quantity. (Year 1)* • *Addition is commutative. (Year 1)* • *Commutative means you can do it in any order. (Year 1)* • *Addition number bonds are commutative. (Year R)* • When we know both parts (addends) but not the whole (sum), we are being asked to do addition. • Inverse is the opposite calculation, the operation that undoes what was done by a previous operation.	**Partitioning** Children need to know how… • *Number bonds can be found by: taking a total amount of resources (within 20) and splitting them into two parts or groups. Sometimes these groups may be equal, but often there will be a different amount in each part. (Year 1)* • *Mathematicians use models to represent (show) concepts in maths. E.g. Part-part-whole models, bar models, tens frames and bead strings can be used to show number bonds. (Year R & 1)* • *Mathematicians also represent their ideas pictorially. We can draw the models we know how to use, so that other people can see our understanding. (Year R & 1)* • To identify the wholes and parts in a problem. **Addition** Children need to know how… • *Mathematicians can represent calculations by writing number sentences. (Year R)* • *Mathematicians can add numbers together by pushing objects together or counting how many they have drawn altogether. (Year 1)* • To add a two-digit number and ones within 100. • To add a two-digit number and tens within 100. • To add a two-digit number and two-digit within 100. • To add three one-digit numbers. • To show addition is commutative. • To know when a question is asking them to do addition. • To use the inverse relationship between addition and subtraction. • To solve missing number problems using the inverse relationship. • To check their calculations using the inverse relationship.	Children need to know when… • A calculation is commutative based on the operation being used. • A specific calculation strategy may be most useful (e.g. number line, mental strategies, use of manipulatives, pictorial representations) Children need to know why… • ***We need to know whether we are looking at a part or a whole.*** *Knowing whether we are looking at a part or a whole helps us to know whether we need addition or subtraction.* • ***Mathematicians need to learn lots of ways of representing addition/subtraction problems and solving these.*** *Having varied and flexible calculation strategies helps mathematicians to lean the best (most efficient) strategies to solve problems* • **We learn to manipulate numbers mentally first.** It is often most efficient to use a mental method. The best mathematicians use the most efficient method to solve a problem.

	• Addition is the inverse to subtraction. **Subtraction** Children need to know that… • *Subtraction is taking one quantity, and removing a part of it, to find out how much is left. (Revisiting from Year R)* • *- is a symbol that means subtract. (Revisiting from Year R)* • *Words that mean we need to carry out a subtraction are: subtract, minus and take away. (Revisiting from Year R)* 8 - 6 = 2 (Minuend, Subtrahend, Difference) • When we know one parts (subtrahend) and the whole (minuend) but not the other part (difference), we are being asked to do subtraction. • In mathematics, difference means the 'gap' between two numbers. This is also the answer to a subtraction question. • Inverse is the opposite calculation, the operation that undoes what was done by a previous operation. • Addition is the inverse to subtraction. • Subtraction is not commutative.	**Subtraction** Children need to know how… • *To represent calculations by writing number sentences. (Year R)* • *To subtract by counting out the total amount and then taking away (crossing out when drawing). (Year 1)* • To subtract a one-digit number and one within 100. • To subtract a two-digit number by ones within 100. • To subtract a two-digit number by tens within 100. • To subtract a two-digit number from a two-digit number. • To know when a question is asking them to do subtraction. • To use the inverse relationship between addition and subtraction. • To solve missing number problems using the inverse relationship. • To check their calculations using the inverse relationship.	

Vocabulary

PARTITION	To split a whole into parts.	**EQUAL**	The same as.	**PART**	A section of the whole.
WHOLE	A total amount. This is always the sum of the parts.	**REPRESENTATION**	A way of showing a mathematical idea using objects, pictures or numerals.	**MANIPULATIVE**	A physical object used to help represent mathematics (e.g. beadstring, Base 10).
CONCRETE	A representation of a mathematical idea using manipulatives or real-life objects.	**PICTORIAL**	A representation of a mathematical idea using pictures.	**ABSTRACT**	A representation of a mathematical idea using symbols (e.g. numerals)
PART-PART WHOLE MODEL	A pictorial representation of number showing the relationship between parts and wholes.	**BAR MODEL**	A form of part-part whole model where the parts are represented by adjacent bars.	**BEADSTRING**	A manipulative where coloured beads are placed on a string in alternating colours (10 red, 10 white, 10 red…) to support counting in ones and tens.
BASE 10	A manipulative used to show the value of a digit based on the column in which it is placed.	**NUMBER LINE**	A picture used to represent numbers and calculations where numbers are shown on a regular scale.	**NUMBER BOND**	Addition and subtraction number facts which we memorise to support efficient calculation
ADDITION	Combining parts.	**SYMBOL**	An abstract image used to represent an idea (e.g. digits, +, =)	**COMMUTATIVE**	A calculation which will give the same answer, regardless of the order in which it is performed. Addition and multiplication are commutative.
COUNTING ON	Starting from a number and counting forwards in the number system. This can be used as a strategy to solve addition and subtraction problems.	**COUNTING BACK**	Starting from a number and counting backwards. This can be used as a strategy for solving subtraction problems.	**NUMBER SENTENCE**	A way of representing a mathematical operation using symbols (+,-,x,÷,= etc)
ADDEND	The numbers which are being added. These are parts of the whole.	**SUM**	The answer to an addition. This is the whole.	**INVERSE**	The opposite calculation. This undoes what was done by the previous calculation. Addition and subtraction are inverse.
SUBTRATION	Removing a part from the whole.				
MINUEND	The whole in a subtraction problem. This is the amount you subtract from and must always come first.	**SUBTRAHEND**	The part which you are taking away from the whole. This always comes after the minuend.	**DIFFERENCE**	The answer to a subtraction question. This shows the remaining part (the gap between the part and the whole)

Enrichment	Winter Gift Shop. Creating Christmas crafts for Winter Fayre using shape knowledge.

Year 2 - Spring 1

Milestone LO:

MULTIPLICATION AND DIVISION

Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables

Recognise odd and even numbers

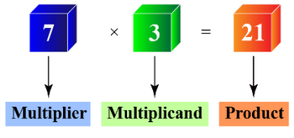
Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) signs

Show that multiplication of two number 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 context

Revisited Knowledge

New knowledge

Domains	Declarative Knowledge (Substantive Knowledge)	Procedural Knowledge (Disciplinary Knowledge)	Conditional Knowledge (Knowing the when and the why)
Multiplication & Division	**Counting and number patterns** Children need to know that… • *We can count in multiples (adding the same amount each time). (Year 1)* • *When we count in multiples of 2 from 0 we add 2 each time. (Year 1)* • *Multiples of 2 end in 0, 2, 4, 6 or 8. (Year 1)* • *The number sequence from counting in 2s to 100 (Year 2 Autumn 1).* • *When we count in multiples of 5 from 0 the ones column will always be a 5 or a 0.* • *The number sequence from counting in 5s to 100 (Year 2 Autumn 1).* • *When we count in multiples of 10 from 0 the ones column will always be a 0.* • *The number sequence for counting in 10s to 100 (Year 1)* • *When we count in 3s, it means we add three each time. (Year 2)* • *The counting sequence when we count in 3s to 100 (Year 2 Autumn 1)* • When we count in multiples of 2 from 0 we always say an even number. • An even number is a number that is divisible by 2. • Even numbers end in 0, 2, 4, 6 or 8 ones. • An odd number is a number that is not divisible by 2. • Odd numbers end in 1, 3, 5, 7 or 9 ones. **Multiplication** Children need to know that… • *Equal means the same and is shown by the symbol = (Year 1)* • *'Equal groups' means you have the same number of objects in each group. (Year 1)* • *Multiplication describes having lots of copies of the same 'group' or number. (Year 1)* • *x is a symbol that means multiplication. (Year 1)*  *(Year 1)* • *Words that suggest we may need to carry out multiplication are times, multiply, lots of, groups of, double. (Year 1)* • *Multiplication is commutative. (Year 1)* • *Commutative means it can be done in any order (Year 1)* • *Multiplication can be worked out/written as repeated addition. (Year 1)* ○ *Repeated addition is adding equal groups over and over again.*	**Counting and number patterns** Children need to know how… • *To count in multiples of 2 from 0 to 100. (Year 2)* • *To count in multiples of 5 from 0 to 100. (Year 2)* • *To count in multiples of 10 from 0 to 100. (Year 2)* • *To count in multiples of 3 from 0 to 100 (Year 2)* • To identify odd and even numbers. **Multiplication** Children need to know how… • *To identify equal groups (Year 1)* • *To justify how they know a group is equal. (Year 1)* • *To write multiplication number sentences using x and = symbol. (Year 1)* • *To recognise and represent multiplication as repeated addition. (Year 1)* • *To recognise and represent multiplication in an array. (Year 1)* • *To interpret the multiplication language and symbol as multiplication to solve the problem using an efficient method (counting, repeated addition mentally or on a number line, array). (Year 1)* • To identify whether a problem requires multiplication or division using more advanced mathematical language and reasoning (e.g. part, whole, multiplier, multiplicand, product, dividend, divisor, quotient) • To solve multiplication problems by recalling multiplication number facts which they have learned. • To choose the most efficient method for solving a multiplication problem from the methods they have learned. • To use the inverse relationship between multiplication and division. • To solve missing number problems using the inverse relationship. • To check their calculations using the inverse relationship.	Children need to know when… • *Different strategies for multiplication and division may be most appropriate. (Year 1)* • *A question is asking them to multiply or divide, based on the language within the question. (Year 1)* • A number can be divided by 2 based on whether it is odd or even. • A multiplication or division problem can be solved mentally using a known fact. • A question requires multiplication or division based on their knowledge of the structure of these number sentences. Children need to know why… • ***Learning to skip-count in multiples is important.*** *This is the precursor to times tables learning later in school. Knowing number sequences supports efficient multiplication by repeated addition (and later on efficient division by repeated subtraction). (Year 1)* • ***There are a range of ways of solving multiplication and division problems.*** *Different problems may be visualised better using different representations. (Year 1)* • ***You get the same quotient regardless of whether you solve a division problem by grouping or sharing.*** *We can rotate our array to show the commutative nature of multiplication. (Year 1)* • **We need to develop rapid recall of key multiplication and division number facts.** Having fluent and automatic recall of number facts allows us to 'know' the answer rather than working it out each time. This makes it easier for

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This can be shown on a number line.

Multiplication can be displayed/solved as an array. (Year 1)

An array is a way of showing multiplication by arranging ‘counters’ or dots into rows and columns.

A row is a horizontal arrangement of objects.
A column is a vertical arrangement of objects

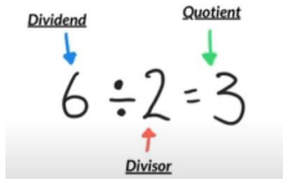
Double means to multiply by two. (Year 1)
Inverse is the opposite calculation, the operation that undoes what was done by a previous operation. (Year 2 Autumn 2).
Multiplication is the inverse of division

Division
Children need to know that…

Equal means the same and is shown by the symbol = (Year 1)
‘Equal groups’ means you have the same number of objects in each group. (Year 1)
Division can be seen in two ways: (Year 1)

Division as sharing: sharing the dividend into a specific number of groups (e.g. 12 ÷ 2 → share 12 equally between two groups. How many counters are in each group?).
Division as grouping: is sharing the dividend into equal size groups. (e.g. 12 ÷ 2 → group the 12 counters into lots of groups of two. How many groups are there?)

÷ is a symbol that means division. (Year 1)



(Year 1)
Words that suggest we may need to carry out division are: share, group, divide, split, half (Year 1).
Half means dividing something by 2 (Year 1)
Inverse is the opposite calculation, the operation that undoes what was done by a previous operation. (Year 2 Autumn 2).
Division is not commutative.
In division, the whole (dividend) must always be before the divisor
Multiplication is the inverse of division.

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Division
Children need to know how…

To identify equal groups (Year 1)
To justify how they know a group is equal. (Year 1)
To write division number sentences using the ÷ symbol. (Year 1)
To represent division as sharing, using concrete or pictorial resources to support. (Year 1)
To represent division as grouping concrete or pictorial resources to support. (Year 1)
To interpret the division language and symbol as division to solve the problem using an efficient method (sharing or grouping). (Year 1)
To identify whether a problem requires multiplication or division using more advanced mathematical language and reasoning (e.g. part, whole, multiplier, multiplicand, product, dividend, divisor, quotient)
To solve division problems using repeated subtraction mentally or on a number line.
To solve division problems by recalling multiplication and division number facts which they have learned.
To choose the most efficient method for solving a multiplication problem from the methods they have learned.
To use the inverse relationship between multiplication and division.
To solve missing number problems using the inverse relationship.
To check their calculations using the inverse relationship.

</td>
<td>our brains (reducing cognitive load) which helps us to solve trickier problems.</td>
</tr>
<tr>
<td>Vocabulary</td>
<td>EQUAL</td>
<td>The same as.</td>
<td>EQUAL GROUPS</td>
<td>The same quantity in each group.</td>
<td>MULTIPLICATION</td>
<td>When you have lots of copies of the same group or number.</td>
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<tr>
<td></td>
<td>MULTIPLIER</td>
<td>The number you are multiplying by.</td>
<td>MULTIPLICAND</td>
<td>The number which is being multiplied</td>
<td>PRODUCT</td>
<td>A result of multiplying two or more numbers together.</td>
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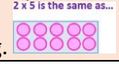
<td></td>
<td>COMMUTATIVE</td>
<td>A calculation which will give the same answer, regardless of the order in which it is performed. Addition and multiplication are commutative.</td>
<td>REPEATED ADDITION</td>
<td>A way of solving multiplication problems where the multiplicand is added repeatedly using a number line or number sentences.
E.g. 7 x 2 = 14 = 2 +2+2+2+2+2+2
  </td>
<td>ARRAY</td>
<td>A way of showing (and solving) multiplication problems where groups are arranged systematically in rows and columns.
Multiplier = rows.
Multiplicand = columns.
e.g. 
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	DOUBLE	Multiplied by 2.	**INVERSE**	The opposite calculation. This undoes what was done by the previous calculation. Multiplication and division are inverse operations.	**DIVISION**	Where a whole is split into two or more equal groups.
	DIVISION AS SHARING	The divisor tells you the number of groups to share the dividend between. E.g. 10÷2=5 	**DIVISION AS GROUPING**	The divisor tells you the number in each group. E.g. 10÷2=5 	**HALF**	Divided by 2
	DIVIDEND	A number to be divided by another number (the whole)	**DIVISOR**	The number which the dividend is being divided by. Tells you either the number of parts or the size of each part.	**QUOTIENT**	A result of dividing one number by another. Depending on the role of the divisor, this either tells you the number of parts or the size of each equal part.
Enrichment	Rockers Launch Day NSPCC Number Day					

Year 2 - Spring 2

Milestone LO:

FRACTIONS

Recognise, find, name and write fractions $\frac{1}{2}$, $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity

Write simple fractions for example $\frac{1}{2}$ of 6 = 3

Recognise the equivalence of $\frac{1}{2}$ and $\frac{2}{4}$

Milestone LO:

POSITION AND DIRECTION

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 term of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise)

Revisited Knowledge

New knowledge

Domains	Declarative Knowledge (Substantive Knowledge)	Procedural Knowledge (Disciplinary Knowledge)	Conditional Knowledge (Knowing the when and the why)
Fractions	Children need to know that… • *A fraction represents equal parts of a whole. (Year 1)* • *A whole is your total amount/shape. (Year 1)* • *A part is an **equal** section of your total amount/ shape. (Year 1)* • *A half is one part when a whole is split into 2 equal parts. (Year 1)* • *A quarter is one part when a whole is split into 4 equal parts. (Year 1)* • The number 1 represents 1 whole • When we write a fraction, the bottom number describes the total number of **equal** parts that the whole has been split into. This is called the denominator • When we write a fraction, the top number describes the number of parts you have. This is called the numerator. • The straight line between the numerator and the denominator is called the dividing line. • One half is written as $\frac{1}{2}$ because the whole is split into two equal parts, and you have one part. • One quarter is written $\frac{1}{4}$ because the whole is split into four equal parts, and you have one part. • Two quarters written $\frac{2}{4}$ because the whole is split into 4 equal parts, and you have 2 parts. • $\frac{2}{4}$ is equivalent to $\frac{1}{2}$. • Equivalent means equal to/the same as. • Three quarters is written $\frac{3}{4}$ because the whole is split into four equal parts, and you have 3 parts. • One third is written $\frac{1}{3}$ because the whole is split into three equal parts, and you have 1 part.	Children need to know how… • *To identify when you have equal parts/groups (Year 1)* • *To identify a half of a shape, object or quantity by splitting it into 2 equal parts. (Year 1)* • *To identify a quarter of a shape, object or quantity by splitting it into 4 equal parts. (Year 1)* • To identify one third of a shape, object or quantity by splitting the whole into 3 equal parts. • To identify two quarters of a shape, object or quantity by splitting the whole into 4 equal parts and selecting two of the parts. • To identify three quarters of a shape, object or quantity by splitting the whole into 4 equal parts and selecting three of the parts. • To show that $\frac{2}{4}$ is equivalent to $\frac{1}{2}$. • To write number sentences to describe fractions of quantities (including lengths) – e.g. $\frac{1}{2}$ of 6 = 3.	Children need to know when… • *To use the language of half and quarter.* • *A part is equal or unequal.* • Fractions which look different are describing the same thing (equivalent fractions $\frac{2}{4}$ and $\frac{1}{2}$). • To use the simpler fraction to solve the problem (e.g. finding $\frac{1}{2}$ rather than $\frac{2}{4}$) Children need to know why… • ***Recognising equal parts is so important.*** *Recognising equality of parts is the fundamental knowledge required for multiplication, division and fractional reasoning.* • **Fractions may look different but be describing the same amount.** Some fractions are equivalent. This means that they describe the same amount. They have been split into a different number of parts.

Vocabulary						
	FRACTION	A way of representing mathematically how many equal parts of a whole you have.	**PART**	A section of the whole. In fractions, parts must always be equal.	**WHOLE**	A total amount. This is the sum of all the parts. In fractions, the number 1 represents 1 whole.

	DENOMINATOR	The bottom number in a fraction. This describes the number of equal parts the whole has been split into.	**DIVIDING LINE**	The horizontal line which separates the numerator from the denominator.	**NUMERATOR**	The top number in a fraction. This describes the number of parts you have.
	HALF	When a whole has been split into two equal parts.	**QUARTER**	When a whole has been split into four equal parts.	**THIRD**	When a whole has been split into three equal parts.
	QUANTITY	A numerical amount.	**EQUAL**	The same as.	**EQUIVALENT**	The same as.

Position & Direction

Children need to know that…

- *Position describes where something or someone is. (Year 1)*
- *Direction means the line along which something moves, lies or points. (Year 1)*
- *Movement means a change of position or direction. (Year 1)*
- *Objects can face forwards, backwards, left or right.*

(Year 1)

- *A whole or full turn means turning a full circle: starting and finishing in the same position.*

(Year 1)

- *When an object does a full turn, it will face in the same direction at the end of the turn. (Year 1)*
- *A half-turn is half the size of a full turn.*

(Year 1)

- *When an object does a half-turn, it will face in the opposite direction at the end of the turn. (Year 1)*
- *A quarter-turn is quarter the size of a full turn.*

(Year 1)

- *When an object does a quarter-turn, it will face to the right or left of the starting direction. (Year 1)*
- *A three-quarter turn is three-quarters the size of a full turn.*

(Year 1)

- *When an object does a three-quarter-turn, it will face to the right or left of the starting direction. (Year 1)*
- A quarter turn can also be called a right-angled turn.
- A half turn is 2 right-angled turns in the same direction.
- A three-quarter turn three right-angled turns in the same direction
- A pattern is something that happens or appears in a regular, repeated way.
- A sequence is when a set of shapes, numbers or mathematical objects are ordered according to a rule.
- A line is a long, narrow mark.
- A straight line is a line with no bends or curves.
- Straight lines can be drawn with a ruler.
- A curved line bends and changes direction.
- Rotation is when something turns or spins around a point. Sometimes, this point is located at the centre.
- Clockwise is the direction in which the hands of a clock turn. It is a turn to the right.
- Anti-clockwise is a turn to the left, opposite to the direction of the clock hands.

Children need to know how…

- *To describe the position of an object using the directional language of near to, far from, left, right, in front of, behind. (Year 1)*
- *To describe the direction an object is facing or moving using the directional language of forwards, backwards, left, right. (Year 1)*
  To describe the moment of an object using the language of full-turns/whole-turn, half turn, quarter turn, three-quarter turn. (Year 1)
- To describe whether a rotation is clockwise or anticlockwise.
- To describe the rotation of an object in terms of right angles (e.g. 3 right angles for a three-quarter turn).
- To describe the movement path of an object using the language of line (e.g. straight, curved).
- To order/arrange mathematical objects in a pattern/ sequence.

Children need to know when…

- *An object is moving (Year 1)*
- *To use specific positional language to describe position, direction and movement (Year 1).*
- We describe rotation, we need to know the point an object is rotating around.

Children need to know why…

- ***We learn to describe movement.*** *Sometimes we will need to explain where/how something is moving to someone who is not there. Having the language of position and direction allows us to do this. (Year 1)*
- **We use the language of clockwise and anticlockwise to describe rotation.** This language helps us to know whether a rotation is leftwards or rightwards.
- **We use the language right angle to describe a quarter turn.** There are many other types of rotations we can do. This precise language helps us to communicate more complex turns when we get to Key Stage 2.

Vocabulary	**POSITION**	Where something or someone is	**DIRECTION**	The line along which something moves, lies or points.	**MOVEMENT**	A change of position or direction.

	FORWARDS	In the direction the object is facing	**BACKWARDS**	Away from where the object is facing	**FULL TURN**	Turning a full circle: starting and finishing in the same position.
	HALF TURN	Half the size of a full turn. The object will face the opposite direction at the end of the turn.	**QUARTER TURN**	Quarter the size of a full turn. The object will be facing to the left or right of its starting direction.	**RIGHT ANGLED TURN**	Another way of describing a quarter turn.
	LINE	A narrow mark.	**STRAIGHT LINE**	A line which does not curve. These are drawn with a ruler.	**CURVED LINE**	A line that is bent. Usually this is smooth and continuous.
	ROTATION	When something turns or spins around a point.	**CLOCKWISE**	The direction in which the hands of a clock turn. A turn to the right.	**ANTICLOCKWISE**	Opposite to the direction in which the hands of the clock move. A turn to the left.
Enrichment	Easter Bunny Problem					

Year 2 - Summer 1

Milestone LO :

TIME

Compare and sequence intervals of time
Tell and write the time to five minutes including quarter past/ to the hour
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

Milestone LO:

MONEY

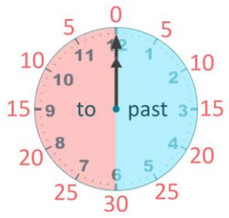
Recognise and use symbols for pounds (£) and pence (p)
Combine amounts to make a particular value
Find different combinations of coins that equal the same amount of money
Solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change

Revisited Knowledge
New knowledge

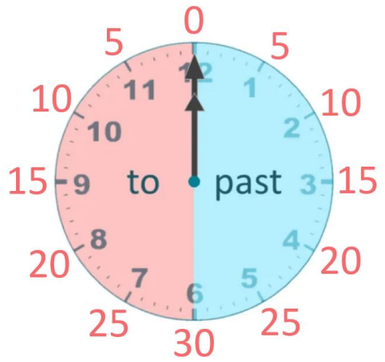
Domains	Declarative Knowledge (Substantive Knowledge)	Procedural Knowledge (Disciplinary Knowledge)	Conditional Knowledge (Knowing the when and the why)

Time	**Describing Time**
	Children need to know that…
	• *Time is a measurement for how long it takes for things to happen. (Year 1)*
	• *When we describe time, we use comparative language, such as before, after, next, first, today, yesterday, tomorrow, quicker, slower, earlier, later. (Year 1)*
	• *Early means during the first part of something (the beginning). (Year 1)*
	• *Late means during the latter parts of something (the end). (Year 1)*
	• *Chronological order means listing events in order from earliest to latest. (Year 1)*
	• *A date is a way of describing when something happened, by stating the day, month (and sometimes year) it happened. (Year 1)*
	• *There are 24 hours in a day. 12 in the morning and 12 in the evening. (Year 1)*
	• *The day is often split into four parts: morning, afternoon, evening and night. (Year 1)*
	• *There are 7 days in a week: Monday, Tuesday, Wednesday, Thursday, Friday, Saturday and Sunday. (Year 1)*
	• *In England, we often describe weeks as starting on Monday and ending on Sunday. (Year 1)*
	• *There are twelve months in a year. (Year 1)*
	• *Each month is based on the movement/cycle of the moon. (Year 1)*
	• *There are about 365 and one quarter days in a year. Therefore, most years have 365; every fourth year has 366 days. This is the time it takes earth to orbit the sun. (Year 1)*
	
	Telling the Time
	Children need to know that…
	• *Time can be measured in seconds, minutes and hours (these are called units of time). (Year 1)*
	• *There are 60 seconds in a minute. (Year 1)*
	• *There are 60 minutes in an hour. (Year 1)*
	• *Time is shown on a clock. (Year 1)*
	• *We have analogue and digital clocks. (Year 1)*
		Describing Time
		Children need to know how…
		• *To compare the duration of events using the language quicker, slower (Year 1)*
		• *To describe the sequence of events using the language earlier, later. (Year 1)*
		• *To sequence events in chronological order and verbalise their justification using the language before, after, next, first, today, yesterday, tomorrow, morning, after and evening. (Year 1)*
		• *To use language relating to dates including*
		  ○ *days of the week,*
		  ○ *weeks*
		  ○ *months of the year*
		  ○ *years. (Year 1)*
		
		Telling the Time
		Children need to know how…
		• *To measure and record time in hours, minutes and seconds. (Year 1)*
		• *To tell the time to the hour using o'clock. (Year 1)*
		• *To show the time on a clock face to the hour. (Year 1)*
		• *To tell the time to half past the hour. (Year 1)*
		• *To show the time on a clock face to half past the hour (Year 1)*
			Children need to know when…
			• *To use language such as fast or slow. (Year 1)*
			• *Someone asks 'What time is it?' to look at a clock to find the answer. (Year 1)*
			• *'Today' is using precise language. (Year 1)*
			• To read the numbers on the outside of the clock face and when to count in 5s.
			• To look at the minute hand and when to look at the hour hand.
			
			Children need to know why…
			• ***Clocks have two hands and two sets of numbers around the outside.*** *Each hand points at a different scale and helps us to work out how many hours and minutes there are. (Year 1)*
			• ***We normally describe events in chronological order.*** *It is useful to recount events in chronological order because that is often the way our memories store episodic information. (Year 1)*
			• **Sometimes we describe time using 'past' and sometimes we describe time using 'to'.** The half hour mark is really important to us. This separates when we use past and to. Times which are 'past' are closer to the current hour. Times which are 'to' are closer to the next hour. It helps us to understand how far through the hour we are.

- *An analogue clock has two hands which move around a number line on the outside to show the time. (Year 1)*
  - *Long hand – minutes. This moves quickly.*
  - *Short hand – hours. This moves slowly.*
- *We need to look at both hands to tell the time. (Year 1)*
- *O'clock describes what hour we are on. We say it after the hour number. (e.g. three o'clock) (Year 1)*
- *Half-past describes being half-way (30 minutes) through an hour. (Year 1)*
- *Clockwise describes a movement to the right (Year 2 Spring 2)*
- Times starting with '…past' mean you have not yet gone past 'half-past' the hour. You describe how many minutes you are past (after) the current hour.
- Times starting with '…to' mean you have gone past 'half-past' and are now going towards the next hour. You describe how many minutes left until you reach the next hour.
- Quarter past means you have gone 15 minutes past (after) the current hour. The minute hand points at the 3 (hours)/15(minutes).
- Quarter to means there are 15 minutes to the next hour. The minute hand points at the 9 (hours)/45 (minutes).
- The longer lines on an analogue clock with the numbers 1-12 show five-minute intervals (minute hand) or hour intervals (hour hand).
- Some clocks show the numbers for both minutes and hours. Some clocks just show the numbers for minutes.
- When the minute hand is on the right of the clock, we give our times as 'past'; when the minute hand is on the left of the clock, we give our times as 'to'.



- To tell the time to the nearest quarter (quarter to, quarter past, half past and o'clock).
- To show the time on a clock face to the nearest quarter (quarter to, quarter past, half past and o'clock).
- To tell the time to the nearest five minutes.
- To show the time on a clock face to the nearest five minutes.



Vocabulary	**TIME**	A measurement of how long things take to happen.	**BEFORE**	Something that has already happened.	**AFTER**	Something that happens next.
	NEXT	Something that will follow immediately	**FIRST**	The initial event in a sequence.	**TODAY**	Happening this day.
	YESTERDAY	Happened the previous day.	**TOMORROW**	Happens the next day.	**QUICKER**	Something that took less time.
	SLOWER	Something that took more time.	**EARLIER**	Something that happened before	**LATER**	Something that happened after,
	CHRONOLOGICAL ORDER	Listing events in order from the earliest to the latest.	**DATE**	A formal way of describing when something happened (including date, month and year)	**MORNING**	The first part of the day, from when the sun rises to the middle of the day.
	AFTERNOON	The time between the middle of the day and when it starts to get darker.	**EVENING**	The later part of the day, when it tends to be dark outside, but people are still awake.	**NIGHT**	The part of the day from when people go to sleep to when the sun rises in the morning.
	DAYS	A 24 hour period, starting at midnight. There are 7 days in a week.	**WEEKEND**	Saturday and Sunday.	**WEEK**	The 7 days (normally seen as starting with Monday and ending with Sunday)
	MONTHS	Approximately 4 weeks. There are 12 months in a year. Based on the movement of the moon.	**YEAR**	365 days. Based on the movement of the Earth around the sun.	**SECONDS**	A unit of measure for time. The smallest common unit of measure. There are 60 seconds in a minute.
	MINUTE	A unit of measure for time. There are 60 minutes in an hour.	**HOUR**	A unit of measure for time. There are 24 hours in a day.	**ANALOGUE CLOCK**	A clock with a circle face and 2 hands which move around clockwise to show the time.
	DIGITAL CLOCK	A clock which is usually rectangular and shows time in numbers.	**MINUTE HAND**	Longer thinner hand on the analogue clock which moves quicker.	**HOUR HAND**	Shorter, thicker hand of the analogue clock which moves slower.

<table>
<tr><td></td><td>O'CLOCK</td><td>Describes the hour of the day we are currently on.</td><td>HALF-PAST</td><td>Suggests we are half-way through the current hour (30 minutes)</td><td>INTERVAL</td><td>The gap between two points on a number line.</td></tr>
<tr><td>Money</td>
<td colspan="3">Children need to know that…
Calculation
Children need to know that…
• + means add, - means subtract, = means 'is equal to'. (Year 1)
• Words that suggest we may need to carry out an addition are: add, plus, total, altogether and sum of. (Year 1)
• Words that mean we need to carry out a subtraction are: subtract, minus and take away. (Year 1)
• Partition means to split a whole into smaller parts. (Year R)
• A whole is the total amount, which will always be greater than the parts. (Year R)
• We have a range of strategies we can use to add and subtract numbers (Year 1 & Year 2)
• Change is the amount we have left when we have bought something with coins/notes.
• We describe amounts of money as £_ and __p.
• £ sign formation:
 
Currency
Children need to know that…
• 'Money' describes a currency used to pay. (Year 1)
• In the UK, our currency uses pounds/pence. (Year 1)
• Pence is the plural of penny and is used when referring to 2 or more pennies. (Year 1)
• £ is a symbol which means pounds. (Year 1)
• p is a symbol which means pence. (Year 1)

Equivalences
Children need to know that…
• £1 = 100 p (Year 1)

Coins and Notes
Children need to know that…
• In the UK, money can be made up of coins and notes that have a value. (Year 1)
• There isn't a coin/note for every number of the number system. (Year 1)
• The size of a coin/note does not relate to its quantitative value. (Year 1)
• We have 8 different coins: 1p, 2p, 5p, 10p, 20p, 50p, £1 and £2 (shown from smallest to largest value) (Year 1)
<table>
<tr><th>Coin</th><th>Picture</th><th>Description</th></tr>
<tr><td>1p</td><td>  </td><td>= 1 penny</td></tr>
<tr><td>2p</td><td>  </td><td>= 2 pennies</td></tr>
<tr><td>5p</td><td>  </td><td>= 5 pennies</td></tr>
<tr><td>10p</td><td>  </td><td>= 10 pennies</td></tr>
<tr><td>20p</td><td>  </td><td>= 20 pennies</td></tr>
<tr><td>50p</td><td>  </td><td>= 50 pennies</td></tr>
<tr><td>£1</td><td>  </td><td>= 100 pennies</td></tr>
<tr><td>£2</td><td>  </td><td>= 200 pennies</td></tr>
</table>
• We have 4 different notes: £5, £10, £20, and £50 (Year 1)</td>
<td colspan="2">Children need to know how…
• To recognise the value of each coin and note in British currency. (Year 1)
• To describe money as £____ and ____ p
• To find different combinations of coins that total the same amount.
• To solve problems by adding amounts (of the same unit) together, giving their answer in one unit (not converting between £ and p).
• To solve problems by subtracting amounts of the same unit to find change.</td>
<td>Children need to know when…
• They may see and need to use notes in real life (Year 1)
• Why they may not see them as much today. (Year 1)
• To use certain coins to make an amount.
Children need to know why…
• Recognising currency is important. They may need to use coins and notes to pay for things when they are older. Electronic money still uses the same system of £
• We need to add money together in real life situations. We will often want to buy more than one thing, or we will want to spend money with a friend to buy something bigger.
• We need to subtract money in real life situations. We will often need to work out whether we have enough money to buy the thing that we want to buy.
We learn to calculate change. It is unfair for a shop to keep more of your money than is needed for the thing that you are buying. If the coins you have do not make the perfect amount for the item you want, change allows you to buy it and get the extra money back.</td></tr>
</table>

<table>
<tr><td></td><td colspan="5"><table>
<tr><th>Note</th><th>Picture</th><th>Description</th></tr>
<tr><td>£5</td><td>  </td><td>=500p or 5 x £1</td></tr>
<tr><td>£10</td><td>  </td><td>=10 x £1</td></tr>
<tr><td>£20</td><td>  </td><td>=20 x £1</td></tr>
<tr><td>£50</td><td>  </td><td>=50 x £1</td></tr>
</table></td><td colspan="2"></td></tr>
<tr><td rowspan="5">Vocabulary</td><td>CURRENCY</td><td>The name for the specific system of money used in a particular country. Different countries have different currencies.</td><td>MONEY</td><td>The objects used to pay for items. In the UK, we use pounds and pennies (which can be found in coins and notes or electronically).</td><td>PAY</td><td>To provide money in exchange for something.</td></tr>
<tr><td>COST</td><td>How much money you have to pay to buy the item.</td><td>AFFORD</td><td>Whether you have enough money to pay the full cost of the item.</td><td>CHANGE</td><td>The money a seller has to give you back if the coins you give have a higher value than the cost of the item.</td></tr>
<tr><td>COIN</td><td>A small, flat piece of metal which represents a particular amount of money.</td><td>NOTE</td><td>A thin paper-like plastic rectangle sheet which represents a particular amount of money.</td><td>POUND</td><td>The larger ‘unit’ of money in the GBP currency. Represented by £. £1 = 100p</td></tr>
<tr><td>PENCE</td><td>The smaller ‘unit’ of money in the GBP. Represented by p. 100p = £1</td><td></td><td></td><td></td><td></td></tr>
<tr><td colspan="6"></td></tr>
<tr><td>Enrichment</td><td colspan="5">HSBC financial services outreach</td></tr>
</table>

Year 2 - Summer 2

Milestone LO:
STATISTICS
Interpret and construct simple pictograms, tally charts, clock 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

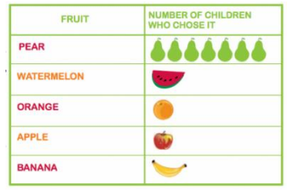
Milestone LO:
MEASUREMENT
Choose and use appropriate standard units to estimate and measure length/ height in any direction (m/cm), mass (kg/g), temperature (degrees Celsius °C), capacity (litres/ ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels
Compare and order lengths, mass, volume/ capacity and record the results using <, > and =

Revisited Knowledge
New knowledge

Domains	Declarative Knowledge (Substantive Knowledge)	Procedural Knowledge (Disciplinary Knowledge)	Conditional Knowledge (Knowing the when and the why)

Statistics	**Understanding Statistics**
	Children need to know that…
	• *To compare has two different meanings:*
	  ○ *to say how something is like or unlike something else.*
	  ○ *To describe which is larger and which is smaller (and by how many) (Year 2 Autumn 1)*
	• *Total is another word used to describe the 'sum' of numbers. (Year 1)*
	• Data is the word used to describe information. This information could include facts, observations, numbers or measurements.
	• Data can be presented in different types of charts and diagrams to make it easy to understand.
	• A question is a type of sentence. It begins with a question word, ends with a ? and normally requires an answer.
	• To categorise is to group things that share some commonality.
	• Categorical data is when you count the number of data points in a category (e.g. the number of children with blue, green and brown eyes).
	
	Pictograms
	Children need to know that…
	• *The value and names of numbers 1 – 100. (Year 1)*
	• *When we count forwards in ones, we say the next number in the number system (Year 1)*
	• *When we count in multiples of 5 from 0 the ones column will always be a 5 or a 0. (Year 1)*
	• *The number sequence from counting in 5s to 100 (Year 2 Autumn 1).*
	• *The number sequence from counting in 2s from 0 to 100 (Year 2 Autumn 1)*
	• *The number sequence from counting in 10s from 0 to 100 (Year 2 Autumn 1)*
	• *The number sequence from counting in 3s from 0 to 100 (Year 2 Autumn 1)*
	• A pictogram is a chart that uses picture or symbols to represent data.
		Children need to know how…
		• To ask and answer simple questions about categorical data.
		• To calculate the total of different categories within categorical datasets shown in different ways (pictogram, tally chart, block diagram and table)
		• To compare different categories within categorical datasets shown in different ways (pictogram, tally chart, block diagram and table)
		• To sort categories within categorical datasets by quantity.
		• To interpret the data shown in different ways (pictograms, tally charts, block diagrams and tables)
		• To construct pictograms, tally charts, block diagrams and tables.
		• To use and interpret a simple key.
			Children need to know when…
			• To use different charts to represent data (pictograms, tally charts, block diagrams, tables)
			• Why these charts are good for showing categorical data.
			Children need to know why…
			• **There are lots of different styles of chart.** Different charts represent different types of data better. For example, categorical data is represented well by the charts we have learned in year 2 because these charts help us to 'count' the numbers in each category.
			• **We need to use charts to represent data.** Data can be very complicated. Charts make it easier for people to look out the data and understand what it is teaching us.

- Sometimes a picture in a pictogram may represent more than one. Then we need to use our knowledge of counting number sequences.
- Sometimes we may see half a picture. That means we have half the amount the picture is worth.



Tally Charts

Children need to know that…

- *The value and names of numbers 1 – 100. (Year 1)*
- *When we count forwards in ones, we say the next number in the number system (Year 1)*
- *When we count in multiples of 5 from 0 the ones column will always be a 5 or a 0. (Year 1)*
- *The number sequence from counting in 5s to 100 (Year 2 Autumn 1).*
- A tally chart is used to collect data quickly and efficiently.
- Each line drawn adds one.
- The first four lines are drawn as short vertical lines next to one another.
- Every fifth line is drawn diagonally across 4 vertical lines to create a group of 5 lines.

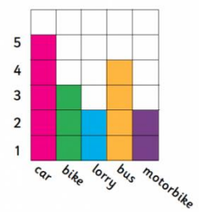
1	I	6	𝍸 I
2	II	7	𝍸 II
3	III	8	𝍸 III
4	IIII	9	𝍸 IIII
5	𝍸	10	𝍸 𝍸

- You can work out how many tally marks you have by counting your ‘groups’ by using your multiples of 5, then counting on in ones to finish.

Block Diagrams

Children need to know that…

- A Block diagram is a simple chart which displays units of data with blocks.
- Each block represents one.
- Categories are written along the X axis (horizontal line)
- Blocks are placed on top of each category to show how many are in each group.
- Sometimes the number of blocks is recorded on the Y axis (vertical line)



Tables

Children need to know that…

- A table is a way of presenting data using rows and columns.

	<table><tr><th colspan="2">Favorite Sports</th></tr><tr><td>Baseball</td><td>9</td></tr><tr><td>Basketball</td><td>6</td></tr><tr><td>Tennis</td><td>8</td></tr><tr><td>Soccer</td><td>5</td></tr><tr><td>Swimming</td><td>2</td></tr><tr><td>Skating</td><td>3</td></tr></table>					
Vocabulary	**DATA**	Information.	**CHART/DIAGRAM**	A visual way of presenting data to make it easier to understand.	**QUESTION**	A type of sentence which requires an answer. It usually starts with a question word and ends with a ?
	KEY	A small picture to the side of a chart which tells the reader how to interpret the chart. For example, it may tell you how many data points a picture in a pictogram is worth.	**TALLY MARK**	The small lines used in a tally chart to record individual data points.	**CATEGORICAL DATA**	Data which counts the number of things (e.g. people) in each category.
	Category	Group				

Measurement	**General Language of Measure**
	Children need to know that…
	• *To compare has two different meanings:*
	  ○ *to say how something is like or unlike something else.*
	  ○ *To describe which is larger and which is smaller (and by how many) (Year 2 Autumn 1)*
	• *Measurement is a precise way to describe the quantity of something (e.g. length, height, weight or capacity). (Year 1)*
	• *Measurements are always expressed in 2 parts, the quantity and the specific unit of measure. (Year 1)*
	• *In measurement, double compares two amounts - meaning twice the size. (Year 1)*
	• *In measurement, half compares two amounts - meaning half the size. (Year 1)*
	• *Estimate means to make a 'sensible guess' using your knowledge of number. This can be based on logical reasoning and rounding. (Year 2 Autumn 1)*
	• *We can estimate what number a collection of objects represents by using our experience of grouping and representing numbers. (Year 2 Autumn 1)*
	• *< is a symbol that means less than (Year 2 Autumn 1)*
	• *> is a symbol that means greater than (Year 2 Autumn 1)*
	• *= means equals (the same as). (Year 2 Autumn 1).*
	
	Length and Height
	Children need to know that…
	• *Length and height are measures of distance. (Year 1)*
	• *Length is the distance between two points. It usually describes horizontal distances. (Year 1)*
	• *Long and short are opposites (Year 1)*
	• *Height is the distance between two points (measured from bottom to top when something is standing upright). This usually describes vertical distances. (Year 1)*
	• *Tall and short are opposites (Year 1)*
	• *Metres are the base unit of length and height in the UK. This means the most commonly used (where appropriate.) (Year 1)*
	• *Amounts measured in metres are written as Xm. (Year 1)*
	• *Centimetres is a unit of measure for both length and height (Year 1)*
	• *Amounts measured in centimetres are written as Xcm. (Year 1)*
	• *There are 100cm in 1m. (Year 1)*
	• *A ruler is a tool used to measure height and length (in cm). (Year 1)*
			General language of measures
			Children need to know how…
			
			Length and Height
			Children need to know how…
			• *To describe length using the language long and short.*
			• *To compare lengths using comparative language: longer and shorter, longest and shortest. (Year 1)*
			• *To measure length accurately using non-standard units of measure and standard units of measure (to half a cm). (Year 1)*
			• *To describe height using the language tall and short.*
			• *To compare heights using comparative language: taller and shorter, tallest and shortest. (Year 1)*
			• *To measure height accurately using non-standard units of measure and standard unit of measure (to half a cm). (Year 1)*
			• *To measure height and length accurately in cm (to the nearest half cm) using a ruler, starting with the 0 at the tip of the object. (Year 1)*
					Children need to know when…
					• *We use different types of measure in real life. (Year 1)*
					• *They might need different measuring tools to support them. (Year 1)*
					• Measuring temperature may be important
					Children need to know why…
					• **Careful, accurate measurement is important.** To ensure that we use exactly the right amount of something. Getting this wrong can have significant consequences (e.g. baking, medicine, sports). *(Year 1)*
					• **We write the units we have measured in.** Different units of measure are better for measuring small or large amounts. If we didn't record the unit, we would not know if we were looking at a small or large measure. *(Year 1)*
					• **We have different units of measure.** Things can vary in size hugely. If we didn't have units of measure, we would have to measure very large numbers, which would be very difficult. *(Year 1)*
					• **It is important to be able to make sensible estimates of measures.** Sometimes we will not have measuring apparatus available. Being able to estimate allows us to make sensible decisions even if we are missing this equipment.

	• *A ruler has a scale (number line) on either side (one side has mm, one side has cm). There is space before the 0 on the ruler. (Year 1)* • A metre stick is a type of large ruler used for measuring longer distances. It is 1m long. There is sometimes space before the 0. • We can estimate lengths by using our experience of measuring with rulers and metre sticks. • We can use known lengths to estimate the length of an object. **Mass and Weight** Children need to know that… • *Weight is a measure of 'heaviness'. Weight is affected by gravity. (Year 1)* • *Mass is also a measure of 'heaviness'. It measures the specific amount of matter something contains. It is not affected by gravity. (Year 1)* • *Both mass and weight can be measured in grams and kilograms. (Year 1)* • *Grams are a small unit of measure, used to measure light things. (Year 1)* • *Amounts measured in grams are written as Xg. (Year 1)* • *Kilograms are a large unit of measure, used to measure heavy things. (Year 1)* • *Amounts measured in kilograms are written as Xkg. (Year 1)* • *Heavy and light are opposites (Year 1)* • We can estimate mass by using our experience of weighing masses with balance and dial scales. • We can use known weights to estimate the weight of an object. **Capacity and Volume** Children need to know that… • *Capacity describes the container: the amount of something a container can hold. (Year 1)* • *A container with a larger capacity can hold more. (Year 1)* • *Full is when a container cannot hold/contain any more. There is no more **capacity**. (Year 1)* • *Empty is when a container contains nothing. (Year 1)* • *Half-full is when a container holds exactly half of its total capacity. (Year 1)* • *Quarter full is when a container holds exactly a quarter of its total capacity. (Year 1)* • *Volume describes the substance: the amount of space it takes up. (Year 1)* • *Something with a larger volume takes up more space.* • *Litres are a unit of measure used to measure larger amounts of liquids (both capacity and volume). (Year 1)* • *Amounts measured in litres are written Xl. (Year 1)* • *Millilitres is a unit of measure which measures smaller amounts of liquid (both capacity and volume). (Year 1)* • *Amounts measured in millilitres are written Xml. (Year 1)* • We can estimate capacity and volume by using our experience of measuring with different containers. • We can use the capacity of a small container to estimate the capacity of a larger container. **Temperature** Children need to know that… • Heat is a type of energy.	• *To identify which unit of measure is appropriate (metres/centimetres) for measuring specific lengths. (Year 1)* • To compare and order lengths using <, > and =. • To compare and order height using <, > and =. • To estimate lengths/heights using previous experience measuring. • To estimate capacity/volume using objects with a known length. **Mass and Weight** Children need to know how… • *To describe weight using the language heavy or light.* • *To compare weights using comparative language: heavier and lighter, heaviest and lightest. (Year 1)* • *To measure the weight of an object in non-standard units of measure and standard units of measure. (Year 1)* • *To measure accurately with both balance and dial scales by making sure the scales are balancing, or the dial is at 0 to start. (Year 1)* • *To identify what unit of measure is most appropriate to use when measuring objects (grams or kilograms). (Year 1)* • To compare and order weights/masses using <, > and =. • To estimate weights/masses using previous experience measuring. • To estimate weights/masses using weights/masses of known mass. **Capacity and Volume** Children need to know how… • *To describe capacity using the language full, empty, half-full, quarter-full. (Year 1)* • *To compare the capacity of an object using comparative language fuller, emptier, more than or less than. (Year 1)* • *To measure the capacity an object can hold in non-standard units of measure and standard units of measure (l). (Year 1)* • *To measure accurately with a range of different measuring jugs, making sure the full line is clear. (Year 1)* • *To identify what unit of measure is appropriate to use when measuring the capacity of a container or volume a substance (litres or millilitres). (Year 1)* • To compare and order volume/capacity using <, > and =. • To estimate capacity/volume using our experience of measuring. • To estimate capacity/volume using a different container with a known length. **Temperature** Children need to know how… • To describe temperature using the language hot/cold. • To compare temperature using comparative language: hotter and colder, hottest and coldest. • To measure temperature in degrees Celsius °C accurately using a thermometer and record this. To compare and order temperatures using <, > and =.	

	• Temperature is a way of describing the amount of heat energy something has (how hot or cold it is). • Degrees Celsius is the unit of measure used to describe temperature in the UK. • Amounts measured in degrees Celsius are written as _°C. • A thermometer is an instrument used for measuring temperature. • We can estimate temperatures using our experience measuring temperatures with a thermometer.					
Vocabulary	**DESCRIBE**	To say what something is like.	**MESAUREMENT**	A way of precisely describing the quantity of something.	**UNIT OF MEASURE**	Measurements are made by working out 'how many' of something are the same size. A unit of measure tells us what the 'something' is.
	STANDARD UNIT OF MEASURE	A formally recognised and widely used unit of measure which has a consistent size and has measurement tools available for (e.g. cm)	**NON-STANDARD UNIT OF MEASURE**	When other objects in the world are chosen to measure the size of something.	**DOUBLE**	Compares two measurements. One is 2 times the size.
	HALF	Compares two measurements. One is half the size.	**DISTANCE**	How far something is. Length and height are examples of distance.	**HEIGHT**	Vertical distance
	LENGTH	Horizontal distance	**LONG**	Relatively great length	**SHORT**	Relatively little length
	TALL	Relatively great height	**SHORT**	Relatively little height.	**CENTIMETRE**	A small measure of distance.
	METRE	The base unit of measure for distance in the UK. A relatively large unit of measure.	**RULER**	A tool used to measure distance.	**SCALE**	A type of number line, often found on measuring tools.
	WEIGHT	A measure of heaviness affected by gravity.	**MASS**	A measure of heaviness not affected by gravity.	**GRAM**	A small unit of measure for mass/weight
	KILOGRAM	A large unit of measure for mass/weight.	**HEAVY**	Relatively great weight	**LIGHT**	Relatively little weight.
	CAPACITY	The amount of something a container can hold.	**VOLUME**	The amount of something you have.	**FULL**	When a container can hold no more.
	EMPTY	When a container holds nothing	**HALF-FULL**	When the container holds exactly half of its full capacity. It could hold exactly the same again.	**QUARTER FULL**	When a container holds exactly a quarter of its total capacity. It could hold four times the amount.
	MILLILITRE	A small unit of measure for volume and capacity.	**LITRE**	A large unit of measure for volume and capacity.	**ESTIMATE**	To make a 'sensible guess' based on your knowledge of and experience with number.
	TEMPERATURE	The precise way to describe heat (hot or cold)	**THERMOMETER**	A tool used to measure temperature.	**DEGREES CELCIUS**	The unit of measure used most often in the UK to describe temperature.
Enrichment	Updating the attendance graphs using known charts. Dream Jobs Day Attending Y6 Enterprise Fayre.					