

Developing a strong grounding in number is essential. Children should be able to count confidently, develop a deep understanding of numbers, the relationships between numbers and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their reasoning skills across all areas of mathematics. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

'Pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems.'

The aims of the National Curriculum are to ensure that all children:

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

Progression in reasoning & problem solving

Step one: Describing: simply tells what they did.

Step two: Explaining: offers some reasons for what they did. These may or may not be correct. The argument may yet not hang together coherently. This is the beginning of inductive reasoning.

Step three: Convincing: confident that their chain of reasoning is right and may use words such as, 'I think' or 'without doubt'. The underlying mathematical argument may or may not be accurate yet is likely to have more coherence and completeness than the explaining stage. This is called inductive reasoning.

Step four: Justifying: a correct logical argument that has a complete chain of reasoning to it and uses words such as 'because', 'therefore', 'and so', 'that leads to'...

Step five: Proving: a watertight argument that is mathematically sound, often based on generalisations and underlying structure. This is also called deductive reasoning.

Nursery

Autumn	Spring	Summer	Magic Ten
Develop fast recognition of one object, without having to count them individually ('subitising') Begin to recite numbers to 5	Develop fast recognition of up to 2 objects, without having to count them individually ('subitising') Recite numbers to 5 consistently and independently	Develop fast recognition of up to 3 objects, without having to count them individually ('subitising') Recite numbers past 5	Autumn: Use showing fingers up to 3.

<p>Say one number for each item in order 1,2,3 Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle') 3 objects Show 'finger numbers' up to 3 Link numerals and amounts, for example, showing the right number of objects to match the numeral, up to 3. Experiment with their own symbols and marks Solve real world mathematical problems with numbers up to 3 Compare quantities using language: 'more than', 'fewer than' Talk about and explore 2D shapes (for example, circles, rectangles, triangles) using informal and mathematical language: 'sides', 'corners', 'straight', 'round', 'flat'. Understand position through pictures- for example, "The bag is under the table," - with pointing/gestures Use stories and pictures to discuss routes and locations Make comparisons between objects relating to size Exploring shapes in construction activities Talk about the patterns around them e.g. "lines" for stripes Extend ABAB patterns- stick, leaf, stick, leaf. Begin to describe a sequence of events, based on their experiences</p>	<p>Say one number for each item in order 1,2,3,4 Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle') 4 objects Show 'finger numbers' up to 4 Link numerals and amounts, for example, showing the right number of objects to match the numeral, up to 4. Experiment with their own symbols and marks as well as numerals Solve real world mathematical problems with numbers up to 4 Compare quantities using language: 'more than', 'fewer than' Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners', 'straight', 'round', 'flat', 'round'. Understand position through words alone- for example, "The bag is under the table," - with pointing Describe a familiar route. Discuss routes and locations Bear Hunt topic Make comparisons between objects relating to size and length Select shapes appropriately: flat surfaces for building, a triangular prism for a roof etc. Begin to identify some patterns around them correctly e.g stripes Extend and create ABAB patterns- stick, leaf, stick, leaf. Begin to describe a sequence of events, real or fictional</p>	<p>Say one number for each item in order 1,2,3,4,5 Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle') Show 'finger numbers' up to 5. Link numerals and amounts, for example, showing the right number of objects to match the numeral, up to 5. Experiment with their own symbols and marks as well as numerals Solve real world mathematical problems with numbers up to 5. Compare quantities using language: 'more than', 'fewer than'. Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: 'sides', 'corners', 'straight', 'round', 'flat', 'round'. Understand position through words alone- for example, "The bag is under the table," - with no pointing. Describe a familiar route. Discuss routes and locations, using words like 'in front of' and 'behind' Make comparisons between objects relating to size, length, weight and capacity Select shapes appropriately: flat surfaces for building, a triangular prism for a roof etc. Combine shapes to make new ones- an arch, a bigger triangle etc Talk about and identify the patterns around them. For example: stripes on clothes, designs on rugs and wallpaper. Use informal language like 'pointy', 'spotty', 'blobs' etc. Extend and create ABAB patterns- stick, leaf, stick, leaf. Notice and correct an error in a repeating pattern. Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'</p>	<p>Fast recognition of numbers up to 3 without counting</p> <p>Count to 5 in order</p> <p>Identify numerals to 4</p> <p>Spring: Use showing fingers up to 4.</p> <p>Fast recognition of up to 2 objects, without having to count them.</p> <p>Count to 5 in order</p> <p>Identify numerals to 4</p> <p>Summer: Use showing fingers up to 5.</p> <p>Fast recognition of up to 3 objects, without having to count them.</p> <p>Count past 5 in order</p>
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Reception			
Autumn	Spring	Summer	Magic Ten
<p>Count objects, actions and sounds to 5 Subitise to 3 Link the number symbol (numeral) with its cardinal number value to 5 Count to 5 Matching and sorting objects</p>	<p>Count objects, actions and sounds to 10 Subitise to 5 Link the number symbol (numeral) with its cardinal number value to 10 Count to 10 Comparing objects</p>	<p>Count objects, actions and sounds Subitise to 10 Link the number symbol (numeral) with its cardinal number value. Count beyond 10. Compare numbers.</p>	<p>Autumn: Subitise to 3 Count to 5 Explore the composition of numbers to 5</p>

<p>Understand the 'one more than/ one less than'</p> <p>Explore the composition of numbers to 5</p> <p>Select, rotate and manipulate shape- 2D</p> <p>Spatial awareness</p> <p>Continue, copy and create repeating patterns.</p> <p>ABAB patterns</p> <p>length, weight and capacity.</p> <p>Light and dark</p>	<p>Applying understanding of 'one more than/ one less than' with objects</p> <p>Explore the composition of numbers to 10</p> <p>Select, rotate and manipulate shape- 3D</p> <p>Continue, copy and create repeating patterns.</p> <p>AAB patterns</p> <p>Compare length, height</p> <p>Time- then first, now</p>	<p>Understand the 'one more than/ one less than' relationship between consecutive numbers.</p> <p>Explore the composition of numbers to 10.</p> <p>Automatically recall number bonds for numbers 0-5 and some to 10.</p> <p>Select, rotate and manipulate shapes so that children recognise a shape can have other shapes within it, just as numbers can.</p> <p>Continue, copy and create repeating patterns.</p> <p>Compare length, weight and capacity.</p>	<p>Spring:</p> <p>Subitise to 5</p> <p>Count to 10</p> <p>Pairs</p> <p>Explore the composition of numbers to 10</p> <p>Summer:</p> <p>Subitise to 10</p> <p>Count beyond 10.</p> <p>Compare numbers.</p>
Year 1			
Autumn	Spring	Summer	Magic Ten
Number: Place Value within 10	<p style="text-align: center;">Number: Place Value within 20</p> <p>Count to twenty, forwards and backwards, beginning with 0 or 1, from any given number.</p> <p>Count, read and write numbers to 20 in numerals and words.</p> <p>Given a number, identify one more or one less.</p> <p>Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least.</p>	Number: Multiplication and Division	
<p>Count to ten, forwards and backwards, beginning with 0 or 1, or from any given number.</p> <p>Count, read and write numbers to 10 in numerals and words.</p> <p>Given a number, identify one more or one less.</p> <p>Identify and represent numbers using objects and pictorial representations including the number line up to 20, and use the language of: equal to, more than, less than (fewer), most, least.</p>	<p style="text-align: center;">Number: Addition and Subtraction within 20</p> <p>Represent and use number bonds and related subtraction facts within 20</p> <p>Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs.</p> <p>Add and subtract one-digit and two-digit numbers to 20, including zero.</p> <p>Solve one step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = \square - 9$</p>	<p>Count in multiples of twos, fives and tens.</p> <p>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.</p>	<p>Representing number</p> <p>Autumn:</p> <p>Subitise to 10</p> <p>Compose numbers to 10 from 2 parts, and partition numbers to 10 into parts, including recognising odd and even numbers.</p>
Number: Addition and Subtraction within 10	Number: Place Value within 50	Number: Fractions	
<p>Represent and use number bonds and related subtraction facts within 10.</p> <p>Read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs.</p> <p>Add and subtract one digit numbers to 10, including zero.</p> <p>Solve one step problems that involve addition and subtraction, using concrete objects and pictorial representations and missing number problems.</p>	<p>Count to 50 forwards and backwards, beginning with 0 or 1, or from any number.</p> <p>Count, read and write numbers to 50 in numerals.</p> <p>Given a number, identify one more or one less.</p> <p>Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least.</p>	<p>Recognise, find and name a half as one of two equal parts of an object, shape or quantity.</p> <p>Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.</p> <p>Compare, describe and solve practical problems for: lengths and heights (for example, long/short, longer/shorter, tall/short, double/half)</p> <p>Compare, describe and solve practical problems for: mass/weight [for example, heavy/light, heavier than, lighter than]; capacity and volume [for example, full/empty, more than, less than, half, half full, quarter]</p>	<p>Spring:</p> <p>Subitise to 20</p>

	Count in multiples of twos, fives and tens beginning with any multiple, and count forwards and backwards through the odd numbers.		Summer: Number fluency to 50
Geometry: Shape	Measurement: Length and Height	Geometry: position and direction	(Including all numbers in between)
Recognise and name common 2-D shapes, including: (for example, rectangles (including squares), circles and triangles) Recognise and name common 3-D shapes, including: (for example, cuboids (including cubes), pyramids and spheres.) Patterns with 2D and 3D shapes	Measure and begin to record lengths and heights. Compare, describe and solve practical problems for: lengths and heights (for example, long/short, longer/shorter, tall/short, double/half)	Describe position, direction and movement, including whole, half, quarter and three quarter turns	
	Measurement: Mass and Volume	Number: Place Value within 100	
	Measure and begin to record mass/weight, capacity and volume. Compare, describe and solve practical problems for mass/weight: [for example, heavy/light, heavier than, lighter than]; capacity and volume [for example, full/empty, more than, less than, half, half full, quarter]	Count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. Count, read and write numbers to 100 in numerals. Given a number, identify one more and one less. Identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than, most, least.	
		Measurement: Money	
		Measurement: Time	
	Recognise and know the value of different denominations of coins and notes.	Sequence events in chronological order using language [for example, before and after, next, first, today, yesterday, tomorrow, morning, afternoon and evening. Recognise and use language relating to dates, including days of the week, weeks, months and years. Tell the time to the hour and half past the hour and draw the hands on a clock face to show these times. Compare, describe and solve practical problems for time [for example, quicker, slower, earlier, later] Measure and begin to record time.	
Year 2			
Autumn	Spring	Summer	Magic Ten
Number – Place Value	Measurement: Money	Number – fractions	
Read and write numbers to at least 100 in numerals and in words. Recognise the place value of each digit in a two digit number (tens, ones) Decompose two-digit numbers using standard and nonstandard partitioning. Identify, represent and estimate numbers using different representations including the number line. Compare and order numbers from 0 up to 100; use <, > and = signs.	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.	Recognise, find, name and write fractions $1/3$, $1/4$, $2/4$ and $3/4$ of a length, shape, set of objects or quantity. Write simple fractions for example, $1/2$ of $6 = 3$ and recognise the equivalence of $2/4$ and $1/2$.	Autumn: Secure fluency in addition and subtraction facts within 10, through continued practice.

<p>Use place value and number facts to solve problems. Count in steps of 2, 3 and 5 from 0, and in tens from any number, forward and backward.</p>			<p>Spring: Number fluency to 100 Reason about the location of any two digit number in the linear number system, including identifying the previous and next multiple of 10.</p>
<p>Number – Addition and Subtraction</p>	<p>Multiplication and Division</p>	<p>Measurement: Time</p>	
<p>Recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100. Add and subtract numbers using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones; a two-digit number and tens; two two-digit numbers; adding three one-digit numbers. Show that the 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. Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.</p>	<p>Recognise repeated addition contexts, representing them with multiplication equations and calculating the product, within the 2, 5 and 10 multiplication tables. Relate grouping problems where the number of groups is unknown to multiplication equations with a missing factor, and to division equations (quotative division). Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs. Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in contexts. Show that the multiplication of two numbers can be done in any order (commutative) and division of one number</p>	<p>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. Compare and sequence intervals of time.</p>	<p>Summer: 2, 5 10 facts (KS2 examples)</p>
<p>Geometry- properties of shape</p>	<p>Measurement: length and height</p>	<p>Statistics</p>	
<p>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.</p>	<p>Choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature ($^{\circ}$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 $=$</p>	<p>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.</p>	
<p>Multiplication and Division</p>	<p>Measurement: Mass, Capacity and Temperature</p>	<p>Position and Direction</p>	

<p>Recall and use multiplication and division facts for the 2, 5 and 10 times tables, including recognising odd and even numbers.</p> <p>Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (x), division (÷) and equals (=) sign. Solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods and multiplication and division facts, including problems in contexts.</p> <p>Show that the multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.</p>	<p>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</p> <p>Compare and order lengths, mass, volume/capacity and record the results using >, < and =</p>	<p>Use mathematical vocabulary to describe position, direction and movement including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise).</p> <p>Order and arrange combinations of mathematical objects in patterns and sequences</p>	
Year 3			
Autumn	Spring	Summer	Magic Ten
Number – Place Value	Number – multiplication and division	Number – fractions	
<p>Identify, represent and estimate numbers using different representations.</p> <p>Reason about the location of any three digit number in the linear number system, including identifying the previous and next multiple of 10.</p> <p>Find 10 or 100 more or less than a given number</p> <p>Recognise the place value of each digit in a three-digit number (hundreds, tens, ones) and compose and decompose three-digit numbers using standard and nonstandard partitioning.</p> <p>Compare and order numbers up to 1000</p> <p>Read and write numbers up to 1000 in numerals and in words. Solve number problems and practical problems involving these ideas.</p> <p>Know that 10 tens are equivalent to 1 hundred, and that 100 is 10 times the size of 10; apply this to identify and work out how many 10s there are in other three digit multiples of 10.</p> <p>Count from 0 in multiples of 4, 8, 50 and 100</p>	<p>Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables.</p> <p>Write and calculate mathematical statements for multiplication and division using the multiplication tables they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods.</p> <p>Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objectives.</p> <p>Divide 100 into 2, 4, 5 and 10 equal parts</p>	<p>Interpret and write proper fractions to represent 1 or several parts of a whole that is divided into equal parts.</p> <p>Recognise and show, using diagrams, equivalent fractions with small denominators.</p> <p>Compare and order unit fractions, and fractions with the same denominators.</p> <p>Add and subtract fractions with the same denominator within one whole</p> <p>Solve problems that involve all of the above.</p>	<p>Autumn</p> <p>Secure fluency in addition and subtraction facts that bridge 10, through continued practice.</p> <p>Understand the inverse relationship between addition and subtraction - how both relate to the part-part-whole structure.</p>
Number – Addition and Subtraction	Measurement – length and perimeter	Measurement – money	
<p>Add and subtract numbers mentally, including: a three-digit number and ones; a three-digit number and tens; a three digit number and hundreds.</p> <p>Add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction.</p> <p>Estimate the answer to a calculation and use inverse operations to check answers.</p>	<p>Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).</p> <p>Measure the perimeter of simple 2D shapes.</p>	<p>Add and subtract amounts of money to give change, using both £ and p in practical contexts.</p>	<p>Understand and use the commutative property of addition, and understand the related property for subtraction.</p> <p>Spring</p>

Solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction.			<p>Multiplication facts 2, 5, 10, 4 & 8 Division facts</p> <p>Spring Multiplication facts 2, 3, 5, 10, 4 & 8 Division facts</p>
Number – Multiplication and Division	Number – fractions	Measurement – time	Varied fluency
<p>Count from 0 in multiples of 4, 8, 50 and 100 Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. Write and calculate mathematical statements for multiplication and division using the multiplication tables they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. Solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objectives.</p>	<p>Reason about the location of any fraction within 1 in the linear number system. Count up and down in tenths; recognise that tenths arise from dividing an object into 10 equal parts and in dividing one-digit numbers or quantities by 10 Recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators. Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators. Solve problems that involve all of the above.</p>	<p>Tell and write the time from an analogue clock, including using Roman numerals from I to XII and 12-hour and 24-hour clocks. Estimate and read time with increasing accuracy to the nearest minute. Record and compare time in terms of seconds, minutes and hours. Use vocabulary such as o'clock, a.m./p.m., morning, afternoon, noon and midnight. Know the number of seconds in a minute and the number of days in each month, year and leap year. Compare durations of events [for example to calculate the time taken by particular events or tasks]</p>	
	Measurement – mass and capacity	Geometry – properties of shape	
	<p>Measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).</p>	<p>Recognise angles as a property of shape or a description of a turn. Identify right angles, recognise that two right angles make a half-turn, three make three quarters of a turn and four a complete turn Identify whether angles are greater than or less than a right angle. Draw polygons by joining marked points, and identify parallel and perpendicular sides. Draw 2-D shapes and make 3-D shapes using modelling materials. Recognise 3-D shapes in different orientations and describe them.</p>	
		Statistics	
		<p>Interpret and present data using bar charts, pictograms and tables. Solve one-step and two-step questions [for example, 'How many more?' and 'How many fewer?'] using information presented in scaled bar charts and pictograms and tables.</p>	

Year 4			
Autumn	Spring	Summer	Magic Ten
<p>Number – Place Value</p> <p>Recognise the place value of each digit in a four digit number (thousands, hundreds, tens and ones) compose and decompose four-digit numbers using standard and nonstandard partitioning.</p> <p>Find 1000 more or less than a given number.</p> <p>Order and compare numbers beyond 1000</p> <p>Identify, represent and estimate numbers using different representations.</p> <p>Know that 10 hundreds are equivalent to 1 thousand, and that 1,000 is 10 times the size of 100; apply this to identify and work out how many 100s there are in other four-digit multiples of 100.</p> <p>Round any number to the nearest 10, 100 or 1000</p> <p>Divide 1,000 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in multiples of 1,000 with 2, 4, 5 and 10 equal parts.</p> <p>Solve number and practical problems that involve all of the above and with increasingly large positive numbers.</p> <p>Count backwards through zero to include negative numbers.</p> <p>Read Roman numerals to 100 (I to C) and know that over time, the numeral system changed to include the concept of zero and place value.</p>	<p>Number – multiplication and division</p> <p>Recall and use multiplication and division facts for multiplication tables up to 12×12.</p> <p>Multiplying & Dividing by 10/ 100</p> <p>Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers.</p> <p>Recognise and use factor pairs and commutativity in mental calculations.</p> <p>Multiply two digit and three digit numbers by a one digit number using formal written layout.</p> <p>Solve division problems, with two-digit dividends and one-digit divisors, that involve remainders, and interpret remainders appropriately according to the context.</p> <p>Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.</p>	<p>Decimals</p> <p>Compare numbers with the same number of decimal places up to two decimal places.</p> <p>Round decimals with one decimal place to the nearest whole number.</p> <p>Recognise and write decimal equivalents to $\frac{1}{4}$, $\frac{1}{2}$ and $\frac{3}{4}$</p> <p>Find the effect of dividing a one or two digit number by 10 or 100, identifying the value of the digits in the answer as ones, tenths and hundredths</p>	<p>Autumn:</p> <p>Count in multiples of 6, 7, 9. 25 and 1000.</p> <p>Multiplication facts 6, 7, 9.</p> <p>Division facts</p> <p>Understand and apply the commutative property of multiplication.</p> <p>Spring:</p> <p>Recall and use multiplication and division facts for multiplication tables up to 12×12.</p> <p>Summer:</p> <p>Recall and use multiplication and division facts for multiplication tables up to 12×12.</p>
<p>Number- Addition and Subtraction</p>	<p>Geometry- Measurement: Length and Perimeter</p>	<p>Measurement- Money</p>	
<p>Add and subtract numbers with up to 4 digits using the formal written methods of columnar addition and subtraction where appropriate.</p> <p>Estimate and use inverse operations to check answers to a calculation.</p> <p>Solve addition and subtraction two step problems in contexts, deciding which operations and methods to use and why.</p>	<p>Identify regular polygons, including equilateral triangles and squares, as those in which the side-lengths are equal and the angles are equal. Find the perimeter of regular and irregular polygons</p> <p>Measure and calculate the perimeter of a rectilinear figure (including squares) in centimetres and metres</p> <p>Convert between different units of measure [for example, kilometre to metre]</p>	<p>Estimate, compare and calculate different measures, including money in pounds and pence.</p> <p>Solve simple measure and money problems involving fractions and decimals to two decimal places.</p>	
<p>Measurement- Area</p>	<p>Fractions</p>	<p>Time</p>	
<p>Find the area of rectilinear shapes by counting squares.</p>	<p>Reason about the location of mixed numbers in the linear number system.</p> <p>Recognise and show, using diagrams, families of common equivalent fractions.</p> <p>Count up and down in hundredths; recognise that hundredths arise when dividing an object by one hundred and dividing tenths by ten.</p> <p>Convert mixed numbers to improper fractions and vice versa.</p>	<p>Convert between different units of measure [for example, kilometre to metre; hour to minute]</p> <p>Read, write and convert time between analogue and digital 12- and 24-hour clocks.</p> <p>Solve problems involving converting from hours to minutes; minutes to seconds; years to months; weeks to days.</p>	

	Solve problems involving increasingly harder fractions to calculate quantities, and fractions to divide quantities, including non-unit fractions where the answer is a whole number. Add and subtract improper and mixed fractions with the same denominator, including bridging whole numbers		
Number – Multiplication and Division	Decimals	Geometry: Properties of shape	
<p>Count in multiples of 6, 7, 9, 25 and 1000 Use place value, known and derived facts to multiply and divide mentally, including: multiplying by 0 and 1; dividing by 1; multiplying together three numbers. Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.</p>	<p>Recognise and write decimal equivalents of any number of tenths or hundredths. Find the effect of dividing a one or two digit number by 10 or 100, identifying the value of the digits in the answer as ones, tenths and hundredths Solve simple measure and money problems involving fractions and decimals to two decimal places. Convert between different units of measure [for example, kilometre to metre]</p>	<p>Identify acute and obtuse angles and compare and order angles up to two right angles by size. Compare and classify geometric shapes, including quadrilaterals and triangles, based on their properties and sizes. Identify lines of symmetry in 2-D shapes presented in different orientations. Complete a simple symmetric figure with respect to a specific line of symmetry.</p>	
		Statistics	
		<p>Interpret and present discrete and continuous data using appropriate graphical methods, including bar charts and time graphs. Solve comparison, sum and difference problems using information presented in bar charts, pictograms, tables and other graphs.</p>	
		Geometry- Position and Direction	
		<p>Draw polygons, specified by coordinates in the first quadrant, and translate within the first quadrant. Describe positions on a 2-D grid as coordinates in the first quadrant. Describe movements between positions as translations of a given unit to the left/ right and up/ down.</p>	
Year 5			
Autumn	Spring	Summer	Magic Ten
Number – Place Value	Number – Multiplication and Division	Geometry- Properties of Shapes and Angles	
<p>Know that 10 tenths are equivalent to 1 one, and that 1 is 10 times the size of 0.1. Know that 100 hundredths are equivalent to 1 one, and that 1 is 100 times the size of 0.01. Know that 10 hundredths are equivalent to 1 tenth, and that 0.1 is 10 times the size of 0.01 Read, write, order and compare numbers to at least 1000000 and determine the value of each digit. Count forwards or backwards in steps of powers of 10 for any given number up to 1000000. Recognise the place value of each digit in numbers with up to 2 decimal places, and compose and decompose numbers with up to 2 decimal places using standard and nonstandard partitioning.</p>	<p>Divide 1 into 2, 4, 5 and 10 equal parts, and read scales/number lines marked in units of 1 with 2, 4, 5 and 10 equal parts. Multiply and divide numbers mentally drawing upon known facts. Multiply numbers up to 4 digits by a one or two digit number using a formal written method, including long multiplication for 2 digit numbers. Divide numbers up to 4 digits by a one digit number using the formal written method of short division and interpret remainders appropriately for the context.</p>	<p>Identify 3D shapes, including cubes and other cuboids, from 2D representations. Use the properties of rectangles to deduce related facts and find missing lengths and angles. Distinguish between regular and irregular polygons based on reasoning about equal sides and angles. Know angles are measured in degrees: estimate and compare acute, obtuse and reflex angles. Compare, draw given angles, and measure them in degrees (o) Identify: angles at a point and one whole turn (total 360o), angles at a point on a straight line and ½ a turn (total 180o) other multiples of 90o</p>	<p>Autumn: Recall and use multiplication and division facts for multiplication tables up to 12 × 12. Dividing by 10/ 100/1000 Spring:</p>

<p>Reason about the location of any number with up to 2 decimal places in the linear number system, including identifying the previous and next multiple of 1 and 0.1 and rounding to the nearest of each.</p> <p>Round any number up to 1000000 to the nearest 10, 100, 1000, 10000 and 100000</p> <p>Solve number problems and practical problems that involve all of the above.</p> <p>Read Roman numerals to 1000 (M) and recognise years written in Roman numerals.</p>	<p>Solve problems involving addition and subtraction, multiplication and division and a combination of these, including understanding the use of the equals sign.</p>		<p>Multiplying/ dividing with decimals (6 x7 = 49 so what is 0.6 x 7=?)</p> <p>Summer: Factors/ multiples based fluency</p>
<p>Number- Addition and Subtraction</p> <p>Add and subtract numbers mentally with increasingly large numbers.</p> <p>Add and subtract whole numbers with more than 4 digits, including using formal written methods (columnar addition and subtraction) Use rounding to check answers to calculations and determine, in the context of a problem, levels of accuracy.</p> <p>Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.</p>	<p>Fractions</p> <p>Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.</p> <p>Recall decimal fraction equivalents for $\frac{1}{2}$, $\frac{1}{4}$, $\frac{1}{5}$ and $\frac{1}{10}$ and for multiples of these proper fractions.</p> <p>Solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates</p>	<p>Geometry- position and direction</p> <p>Identify, describe and represent the position of a shape following a reflection or translation, using the appropriate language, and know that the shape has not changed.</p>	
<p>Number – multiplication and division</p> <p>Multiply and divide numbers mentally drawing upon known facts.</p> <p>Multiply and divide whole numbers by 10, 100 and 1000. Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers.</p> <p>Recognise and use square numbers and cube numbers and the notation for squared (2) and cubed (3)</p> <p>Solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes.</p> <p>Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.</p> <p>Establish whether a number up to 100 is prime and recall prime numbers up to 19</p>	<p>Number: Decimals and Percentages</p> <p>Read, write, order and compare numbers with up to three decimal places.</p> <p>Recognise and use thousandths and relate them to tenths, hundredths and decimal equivalents.</p> <p>Round decimals with two decimal places to the nearest whole number and to one decimal place.</p> <p>Solve problems involving number up to three decimal places.</p> <p>Recognise the per cent symbol (%) and understand that per cent relates to 'number of parts per hundred', and write percentages as a fraction with denominator 100, and as a decimal.</p> <p>Solve problems which require knowing percentage and decimal equivalents of 12, 14, 15, 25, 45 and those fractions with a denominator of a multiple of 10 or 25.</p>	<p>Number: Decimals</p> <p>Solve problems involving number up to three decimal places.</p> <p>Multiply and divide whole numbers and those involving decimals by 10, 100 and 1000.</p> <p>Use all four operations to solve problems involving measure [for example, length, mass, volume, money] using decimal notation, including scaling.</p> <p>Convert between units of measure, including using common decimals and fractions.</p>	
		<p>Negative numbers</p>	
		<p>Interpret negative numbers in context, count forwards and backwards with positive and negative whole numbers including through zero.</p>	
<p>Number: Fractions</p>	<p>Perimeter and Area</p>	<p>Measurement- converting units</p>	

<p>Find non-unit fractions of quantities. Compare and order fractions whose denominators are multiples of the same number. Identify, name and write equivalent fractions of a given fraction, represented visually including tenths and hundredths. Recognise mixed numbers and improper fractions and convert from one form to the other and write mathematical statements >1 as a mixed number [for example $25 \div 45 = 65 \div 115$] Add and subtract fractions with the same denominator and denominators that are multiples of the same number.</p>	<p>Measure and calculate the perimeter of composite rectilinear shapes in cm and m. Calculate and compare the area of rectangles (including squares), and including using standard units, cm², m² estimate the area of irregular shapes.</p>	<p>Convert between different units of metric measure [for example, km and m; cm and m; cm and mm; g and kg; l and ml] Understand and use approximate equivalences between metric units and common imperial units such as inches, pounds and pints. Solve problems involving converting between units of time.</p>	
	Statistics	Measures Volume	
	<p>Solve comparison, sum and difference problems using information presented in a line graph. Complete, read and interpret information in tables including timetables.</p>	<p>Estimate volume [for example using 1cm³ blocks to build cuboids (including cubes)] and capacity [for example, using water] Use all four operations to solve problems involving measure.</p>	

Year 6

Autumn	Spring	Summer	Magic Ten
Number: Place Value	Number: Ratio	Geometry: Properties of Shapes	
<p>Read, write, order and compare numbers up to 10,000,000 and determine the value of each digit. Round any whole number to a required degree of accuracy. Use negative numbers in context, and calculate intervals across zero. Solve number and practical problems that involve all of the above. Understand the relationship between powers of 10 from 1 hundredth to 10 million, and use this to make a given number 10, 100, 1,000, 1 tenth, 1 hundredth or 1 thousandth times the size (multiply and divide by 10, 100 and 1,000). Reason about the location of any number up to 10 million, including decimal fractions, in the linear number system, and round numbers, as appropriate, including in contexts. Divide powers of 10, from 1 hundredth to 10 million, into 2, 4, 5 and 10 equal parts, and read scales/number lines with labelled intervals divided into 2, 4, 5 and 10 equal parts.</p>	<p>Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts. Solve problems involving similar shapes where the scale factor is known or can be found. Solve problems involving unequal sharing and grouping using knowledge of fractions and multiples.</p>	<p>Draw 2-D shapes using given dimensions and angles. Compare and classify geometric shapes based on their properties and sizes and find unknown angles in any triangles, quadrilaterals and regular polygons. Recognise angles where they meet at a point, are on a straight line, or are vertically opposite, and find missing angles.</p>	<p>Recall and use multiplication and division facts for multiplication tables up to 12 × 12. Dividing by 10/100/1000 Multiplying/dividing with decimals (6 × 7 = 49 so what is 0.6 × 7=?) Factors/multiples based fluency</p>
Number- addition subtraction, multiplication + division	Number: Algebra	Geometry- Position and Direction	

<p>Understand that 2 numbers can be related additively or multiplicatively, and quantify additive and multiplicative relationships (multiplicative relationships restricted to multiplication by a whole number)</p> <p>Solve addition and subtraction multi step problems in contexts, deciding which operations and methods to use and why.</p> <p>Multiply multi-digit number up to 4 digits by a 2-digit number using the formal written method of long multiplication.</p> <p>Divide numbers up to 4 digits by a 2-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding as appropriate for the context.</p> <p>Divide numbers up to 4 digits by a 2-digit number using the formal written method of short division, interpreting remainders according to the context.</p> <p>Perform mental calculations, including with mixed operations and large numbers.</p> <p>Identify common factors, common multiples and prime numbers.</p> <p>Use their knowledge of the order of operations to carry out calculations involving the four operations.</p> <p>Solve problems involving addition, subtraction, multiplication and division.</p> <p>Use estimation to check answers to calculations and determine in the context of a problem, an appropriate degree of accuracy.</p>	<p>Use simple formulae</p> <p>Generate and describe linear number sequences.</p> <p>Express missing number problems algebraically.</p> <p>Find pairs of numbers that satisfy an equation with two unknowns.</p> <p>Enumerate possibilities of combinations of two variables.</p>	<p>Describe positions on the full coordinate grid (all four quadrants).</p> <p>Draw and translate simple shapes on the coordinate plane, and reflect them in the axes.</p>	
	Number: Decimals	Problem solving and Efficient methods/ SATS	
	<p>Identify the value of each digit in numbers given to 3 decimal places and multiply numbers by 10, 100 and 1,000 giving answers up to 3 decimal places.</p> <p>Multiply one-digit numbers with up to 2 decimal places by whole numbers.</p> <p>Use written division methods in cases where the answer has up to 2 decimal places.</p> <p>Solve problems which require answers to be rounded to specified degrees of accuracy.</p>	<p>Investigations</p> <p>NCTEM</p> <p>Links with Science</p> <p>WR problem of the day</p>	
Fractions	Fractions, decimals, percentages		
<p>Use common factors to simplify fractions; use common multiples to express fractions in the same denomination.</p> <p>Compare and order fractions, including fractions > 1</p> <p>Generate and describe linear number sequences (with fractions)</p> <p>Add and subtract fractions with different denominations and mixed numbers, using the concept of equivalent fractions.</p> <p>Multiply simple pairs of proper fractions, writing the answer in its simplest form [for example $14 \times 12 = 18$]</p> <p>Divide proper fractions by whole numbers [for example $13 \div 2 = 16$]</p>	<p>Associate a fraction with division and calculate decimal fraction equivalents [for example, 0.375] for a simple fraction [for example 38]</p> <p>Recall and use equivalences between simple fractions, decimals and percentages, including in different contexts.</p>		
Measurement Converting Units	Measurement: Perimeter, Area and Volume		
	<p>Recognise that shapes with the same areas can have different perimeters and vice versa.</p>		

<p>Solve problems involving the calculation and conversion of units of measure, using decimal notation up to three decimal places where appropriate.</p> <p>Use, read, write and convert between standard units, converting measurements of length, mass, volume and time from a smaller unit of measure to a larger unit, and vice versa, using decimal notation to up to 3dp.</p> <p>Convert between miles and kilometres.</p>	<p>Recognise when it is possible to use formulae for area and volume of shapes.</p> <p>Calculate the area of parallelograms and triangles.</p> <p>Calculate, estimate and compare volume of cubes and cuboids using standard units, including cm³, m³ and extending to other units (mm³, km³)</p>		
	<p>Statistics</p>		
	<p>Illustrate and name parts of circles, including radius, diameter and circumference and know that the diameter is twice the radius.</p> <p>Interpret and construct pie charts and line graphs and use these to solve problems.</p> <p>Calculate the mean as an average.</p>		

Ready to progress criteria

Year group STEM sentence: [Stem sentences Y1-6.pdf](#)

Vocabulary : [vocabulary-progression-map.pdf](#)