

Cranmore Infant School

**Maths**

**PROGRESSION**

**FRAMEWORK**

**2021-2022**

# Maths whole school Progression

	Nursery	Reception	Year 1	Year 2	Year 3
Counting	<ul style="list-style-type: none"> <li>* Recite numbers past 5.</li> <li>* Say one number for each item in order: 1,2,3,4,5.</li> <li>* Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').</li> </ul>	<ul style="list-style-type: none"> <li>* Count objects, actions and sounds.</li> <li>* Count beyond ten.</li> <li>* Verbally count beyond 20, recognising the pattern of the counting system.</li> </ul>	<ul style="list-style-type: none"> <li>• count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number</li> <li>• count, read and write numbers to 100 in numerals</li> <li>• Count in multiples of twos, fives and tens</li> </ul>	<ul style="list-style-type: none"> <li>• count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward</li> </ul>	<ul style="list-style-type: none"> <li>• count from 0 in multiples of 4, 8, 50 and 100;</li> <li>* find 10 or 100 more or less than a given number.</li> </ul>
Place Value		<ul style="list-style-type: none"> <li>* Understand the 'one more than/one less than' relationship between consecutive numbers.</li> <li>• Explore the composition of numbers to 10.</li> <li>* Have a deep understanding of numbers to 10, including the composition of each number.</li> </ul>		<ul style="list-style-type: none"> <li>• recognise the place value of each digit in a two-digit number</li> <li>• compare and order numbers from 0 up to 100; use &lt;, &gt; and = signs</li> <li>* To begin to understand zero as a place holder.</li> </ul>	<ul style="list-style-type: none"> <li>• recognise the place value of each digit in a three-digit number</li> <li>• compare and order numbers up to 1000</li> </ul>
Representing Number	<ul style="list-style-type: none"> <li>* Develop fast recognition of up to 3 objects, without having to count them individually ('subitising').</li> <li>* 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.</li> <li>* Experiment with their own symbols and marks as well as numerals.</li> </ul>	<ul style="list-style-type: none"> <li>* Subitise.</li> <li>* Link the number symbol (numeral) with its cardinal number value.</li> <li>* Subitise (recognise quantities without counting) up to 5.</li> <li>* Link the number symbol (numeral) with its cardinal value.</li> </ul>	<ul style="list-style-type: none"> <li>• identify and represent numbers using objects and pictorial representations including the number line, &amp; use language of: equal to, more than, less than (fewer), most, least</li> <li>• read and write numbers from 1 to 20 in numerals and words</li> <li>• read, write and interpret mathematical statements involving addition (+), subtraction (-) and equals (=) signs</li> </ul>	<ul style="list-style-type: none"> <li>• identify, represent and estimate numbers using different representations, including the number line</li> <li>• read and write numbers to at least 100 in numerals and in words</li> </ul>	<ul style="list-style-type: none"> <li>• identify, represent and estimate numbers using different representations</li> <li>• read and write numbers up to 1000 in numerals and in words</li> </ul>
Compare and Order Numbers	<ul style="list-style-type: none"> <li>* Compare quantities using language: 'more than', 'fewer than'.</li> <li>* Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'</li> </ul>	<ul style="list-style-type: none"> <li>* Compare numbers.</li> <li>* Understand the 'one more than/one less than' relationship between consecutive numbers.</li> <li>* Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.</li> </ul>		<ul style="list-style-type: none"> <li>To compare and order numbers from 0 up to 100; use &lt;, &gt; and = signs.</li> </ul>	<ul style="list-style-type: none"> <li>To compare and order numbers up to 1000.</li> </ul>

# Maths whole school Progression

	Nursery	Reception	Year 1	Year 2	Year 3
Number Facts (Addition and Subtraction)	<ul style="list-style-type: none"> <li>* Develop fast recognition of up to 3 objects, without having to count them individually ('subitising').</li> <li>* Show 'finger numbers' up to 5.</li> </ul>	<ul style="list-style-type: none"> <li>* Subitise.</li> <li>* Explore the composition of numbers to 10.</li> <li>* Automatically recall number bonds for numbers 0-10.</li> <li>* Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.</li> <li>* Have a deep understanding of numbers to 10, including the composition of each number.</li> <li>* Subitise (recognise quantities without counting) up to 5.</li> </ul>	<ul style="list-style-type: none"> <li>* To identify one more and one less when given a number.</li> <li>* To <i>memorise</i>, represent and use number bonds and related subtraction facts within 20.</li> </ul>	<ul style="list-style-type: none"> <li>* To recall all number bonds to and within 10 and use these to reason with and calculate bonds to and within 20, recognising other associated additive relationships. To recall and use addition and subtraction facts to 20 <i>to become fluent in deriving associative facts</i> (e.g. <math>10 - 7 = 3</math>, <math>100 - 70 = 30</math>) and derive and use related facts up to 100.</li> </ul>	
Mental Calculations (Addition and Subtraction)	<ul style="list-style-type: none"> <li>* Develop fast recognition of up to 3 objects, without having to count them individually ('subitising').</li> <li>* Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').</li> <li>* Show 'finger numbers' up to 5.</li> </ul>	<ul style="list-style-type: none"> <li>* Subitise.</li> <li>* Explore the composition of numbers to 10.</li> <li>* Automatically recall number bonds for numbers 0-10.</li> <li>* Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.</li> </ul>	<ul style="list-style-type: none"> <li>*To add and subtract one digit and two-digit numbers to 20, including zero.</li> <li>* To realise the effect of adding or subtracting zero.</li> </ul>	<ul style="list-style-type: none"> <li>* To extend the language of addition and subtraction to include sum and difference.</li> <li>* To show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot.                             <ul style="list-style-type: none"> <li>• add and subtract numbers using an efficient strategy, explaining their method verbally using concrete objects, pictorial representations, and mentally, including: a two-digit number and ones, a two-digit number and tens, two two-digit numbers, add three one-digit numbers.</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>*To add and subtract numbers mentally, including: <i>two-digit numbers, where the answers could exceed 100</i>, a three-digit number and ones, a three-digit number and tens and a three-digit number and hundreds.</li> </ul>

# Maths whole school Progression

	Nursery	Reception	Year 1	Year 2	Year 3
Solve Problems (Addition and Subtraction)	<p>* Solve real world mathematical problems with numbers up to 5. *Begin to describe a sequence of events, real or fictional, using words such as 'first', 'then...'</p>	<p>*Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly.</p>	<p>* To practise ordinal numbers and solve simple concrete problems. • To discuss and solve one-step problems (in familiar practical contexts) that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as <math>7 = \square - 9</math>. *Problems include the terms: put together, add, altogether, total, take away, distance between, difference between, more than and less than, so that pupils develop the concept of addition and subtraction and are able to use these operations flexibly.</p>	<p>*To use place value and number facts to solve <i>related</i> problems to <i>develop fluency</i>. • solve problems with addition and subtraction, using concrete, pictorial and abstract 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>* To solve number problems and practical problems involving these ideas. • estimate the answer to a calculation and use inverse operations to check answers • solve problems, including missing number problems, using number facts, place value, and more complex addition and subtraction</p>
Multiplication and Division Facts		<p>* Explore the composition of numbers to 10. *Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly. *Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.</p>	<p>* To make connections between arrays, number patterns, and counting in twos, fives and tens. * Through grouping and sharing small quantities, pupils begin to understand: multiplication and division; doubling numbers and quantities; and finding simple fractions of objects, numbers and quantities.</p>	<p>* To use a variety of language to describe multiplication and division. To count from 0 in multiples of 4, 8, 50 and 100. * To recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers and use them to solve simple problems, demonstrating an understanding of commutativity as necessary. * To connect the 10 multiplication table to place value, and the 5 multiplication table to the divisions on the clock face.</p>	<p>* To recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables when they are calculating mathematical statements in order to improve fluency. * To connect the 2, 4 and 8 multiplication tables through doubling.</p>

# Maths whole school Progression

	Nursery	Reception	Year 1	Year 2	Year 3
Mental Calculations (Multiplication and Division)				<ul style="list-style-type: none"> <li>calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (<math>\times</math>), division (<math>\div</math>) and equals (=) signs</li> <li>show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot</li> </ul>	<ul style="list-style-type: none"> <li>write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental methods</li> </ul>
Solve Problems (Multiplication and Division)		<p>* Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed evenly.</p>	<p>* To 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>* To solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.</p>	<p>* To solve <i>simple</i> problems in contexts, deciding which of the four operations to use and why. These include missing number problems, involving multiplication and division, including <i>measuring</i> and positive integer scaling problems and correspondence problems in which n objects are connected to m objects.</p>
Recognising Fractions			<p>* To recognise, find and name a half as one of two equal parts of an object, shape or quantity by solving problems.</p> <p>* To recognise, find and name a quarter as one of four equal parts of an object, shape or quantity by solving problems.</p> <p>* To connect halves and quarters to the equal sharing and grouping of sets of objects and to measures, as well as recognising and combining halves and quarters as parts of a whole.</p>	<p>* To recognise, find, name, identify and write fractions <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math>, and <math>\frac{3}{4}</math> of a length, number, shape, set of objects or quantity and know that all parts must be equal parts of the whole.</p> <p>* To connect unit fractions to equal sharing and grouping, to numbers when they can be calculated, and to measures, finding fractions of lengths, quantities, sets of objects or shapes. They meet <math>\frac{1}{2}</math> as the first example of a non-unit fraction.</p>	<p>* To understand the relation between unit fractions as operators (fractions of), and division by integers.</p> <p>* To recognise, understand and use fractions as numbers: unit fractions and non-unit fractions with small denominators as numbers on the number line (going beyond 0 -1 and relating this to measure), and deduce relations between them, such as size and equivalence.</p> <p>* To recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.</p>

# Maths whole school Progression

	Nursery	Reception	Year 1	Year 2	Year 3
2D and 3D Shapes	<p>* Talk about and explore 2D and 3D shapes (for example, circles, rectangles, triangles and cuboids) using informal and mathematical language: ‘sides’, ‘corners’; ‘straight’, ‘flat’, ‘round’.</p>	<p>* Select, rotate and manipulate shapes in order to develop spatial reasoning skills.</p> <p>* Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.</p>	<ul style="list-style-type: none"> <li>Recognise and name common 2-D shapes (e.g. Square, circle, triangle)</li> <li>Recognise and name common 3-D shapes (e.g. Cubes, cuboids, pyramids &amp; spheres)</li> </ul> <p>*To recognise, handle and name common 2D and 3D shapes in different orientations/sizes and relate everyday objects fluently.</p> <p>* To recognise that rectangles, triangles, cuboids and pyramids are not always similar to each other.</p> <ul style="list-style-type: none"> <li>identify and describe the properties of 2-D shapes, including the number of sides and line symmetry in a vertical line.</li> </ul> <p>*Identify 2D shapes on the surface of 3D shapes.</p> <ul style="list-style-type: none"> <li>compare and sort common 2-D and 3-D shapes and everyday objects.</li> </ul>	<p>* Pupils read and write names for shapes that are appropriate for their word reading and spelling.</p> <p>*To handle, identify and describe the properties of 2D shapes, including the number of sides and line symmetry in a vertical line.</p> <p>* To handle, identify and describe the properties of 3D shapes, including the number of edges, vertices and faces.</p> <p>* To identify 2D shapes on the surface of 3D shapes.</p> <p>* To draw 2D shapes.</p> <p>*Make 3D shapes using modelling materials.</p> <p>* Recognise 3D shapes in different orientations and describe them.</p>	<p>* To describe the properties of 2D and 3D shapes using accurate language.</p> <p>* To extend knowledge of the properties of shapes is extended at this stage to symmetrical and non-symmetrical polygon and polyhedron.</p> <p>*To recognise 3D shapes in different orientations and describe them.</p> <ul style="list-style-type: none"> <li>compare and classify geometric shapes, including quadrilaterals and triangles, based on properties and sizes</li> <li>identify lines of symmetry in 2-D shapes presented in different orientations</li> <li>complete a simple symmetric figure with respect to a specific line of symmetry.</li> </ul>
Time	<p>* Begin to describe a sequence of events, real or fictional, using words, such as ‘first’, ‘then...’</p>		<p>* To sequence events in chronological order using language.</p> <p>* To recognise and use language relating to dates, including days of the week, weeks, months and years.</p> <p>* To tell the time to the hour and half past the hour and draw the hands on a clock face to show these times.</p>	<p>*To read, tell and write the time to five minutes, including quarter past/to the hour/half hour and draw the hands on a clock face to show these times.</p> <p>* To become fluent in telling the time on analogue clocks and recording it.</p> <p>* To know the number of minutes in an hour and the number of hours in a day.</p> <p>*To compare and sequence intervals of time.</p>	<p>*To tell and write the time from an analogue clock, including using Roman numerals from I to XII, and 12-hour and 24-hour clocks.</p> <p>*To begin to use digital 12-hour clocks and record their times in preparation for using digital 24-hour clocks in year 4.</p> <p>* To estimate and read time with increasing accuracy to the nearest minute; record and compare time in terms of seconds, minutes and hours.</p> <p>* To use vocabulary such as o’clock, a.m./p.m., morning, afternoon, noon and midnight.</p> <p>* To know the number of seconds in a minute and the number of days in each month, year and leap year.</p> <p>* To compare durations of events.</p>

# Maths whole school Progression

	Nursery	Reception	Year 1	Year 2	Year 3
Money			<ul style="list-style-type: none"> <li>* Recognise and know the value of different denominations of coins and notes</li> </ul>	<ul style="list-style-type: none"> <li>• Recognise and use symbols for pounds (£) and pence (p); combine amounts to make a particular value</li> <li>• find different combinations of coins that equal the same amounts of money</li> <li>• solve simple problems in a practical context involving addition and subtraction of money of the same unit, including giving change</li> </ul>	
Measures Problem Solving	<ul style="list-style-type: none"> <li>* Make comparisons between objects relating to size, length, weight and capacity.</li> </ul>	<ul style="list-style-type: none"> <li>* Compare length, weight and capacity.</li> </ul>	<ul style="list-style-type: none"> <li>* To compare, describe and solve practical problems for: lengths and heights, mass/weight, capacity and volume, time.</li> <li>* To measure and begin to record the following: lengths and heights, mass/weight, capacity and volume, time.</li> <li>* To move from using and comparing different types of quantities and measures using non-standard units, including discrete (for example, counting) and continuous (for example, liquid) measurement, to using manageable common standard units using measuring tools, such as a ruler, weighing scales and containers.</li> </ul>	<ul style="list-style-type: none"> <li>* To choose and use appropriate standard units with increasing accuracy using their knowledge of the number system 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.</li> <li>* To use the appropriate language and record using standard abbreviations.</li> <li>* To compare and order lengths, mass, volume/capacity and record the results using &gt;, &lt; and =.</li> <li>* To compare measures including simple multiples such as 'half as high'; 'twice as wide'.</li> </ul>	<ul style="list-style-type: none"> <li>*To measure using the appropriate tools and units, compare (including simple scaling by integers) add and subtract using mixed units: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml).</li> </ul>

# Maths whole school Progression

	Nursery	Reception	Year 1	Year 2	Year 3
Position, Direction and Movement	<p>*Understand position through words alone - for example, “The bag is under the table,” - with no pointing.</p> <p>*Describe a familiar route.</p> <p>* Discuss routes and locations, using words like ‘in front of’ and ‘behind’.</p>	<p>*Draw information from a simple map.</p>	<p>* To describe position, direction and movement, including whole, half, quarter and three-quarter turns in both directions and connect clockwise with the movement on a clock face.</p> <p>* To use the language of position, direction and motion, including: left and right, top, middle and bottom, on top of, in front of, above, between, around, near, close and far, up and down, forwards and backwards, inside and outside.</p>	<p>*To use mathematical vocabulary to describe position, direction and movement, including movement in a straight line and distinguishing between rotation as a turn and in terms of right angles for quarter, half and three-quarter turns (clockwise and anticlockwise).</p>	
Patterns	<p>*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.</p> <p>* Extend and create ABAB patterns - stick, leaf, stick, leaf.</p> <p>* Notice and correct an error in a repeating pattern.</p>	<p>* Continue, copy and create repeating patterns.</p>		<p>* To order and arrange combinations of mathematical objects and shapes, including those in different orientations, in patterns and sequences.</p>	
Interpret Data				<p>* To record, interpret, collate, organise and compare information.</p> <p>* To interpret and construct simple pictograms, tally charts, block diagrams and simple tables (e.g. many-to-one correspondence in pictograms with simple ratios 2, 5, 10 scales).</p> <p>* To ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity.</p> <p>* To ask and answer questions about totalling and comparing categorical data.</p>	<p>To interpret and present data using bar charts, pictograms and tables and use simple scales with increasing accuracy.</p> <ul style="list-style-type: none"> <li>• 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</li> </ul>