

Mundeford Community Infants School



SUBJECT MAPPING - MATHS

The National Curriculum says:

All pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- 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.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. Pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

By the end of Key stage 1 children will:

- read scales* in divisions of ones, twos, fives and tens
- partition any two-digit number into different combinations of tens and ones, explaining their thinking verbally, in pictures or using apparatus
- add and subtract any 2 two-digit numbers using an efficient strategy, explaining their method verbally, in pictures or using apparatus (e.g. $48 + 35$; $72 - 17$)
- 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 (e.g. If $7 + 3 = 10$, then $17 + 3 = 20$; if $7 - 3 = 4$, then $17 - 3 = 14$; leading to if $14 + 3 = 17$, then $3 + 14 = 17$, $17 - 14 = 3$ and $17 - 3 = 14$)
- recall multiplication and division facts for 2, 5 and 10 and use them to solve simple problems, demonstrating an understanding of commutativity as necessary
- identify 14, 13, 12, 24, 34, of a number or shape, and know that all parts must be equal parts of the whole
- use different coins to make the same amount
- read the time on a clock to the nearest 15 minutes
- name and describe properties of 2-D and 3-D shapes, including number of sides, vertices, edges, faces and lines of symmetry.

How do we bring this to life?

- Use a HAPPY MATHS approach (hardwire, active, purposeful, positive, yet) so children feel confident with a positive growth mind set
- Big Maths jingles, rhymes and songs allow children to be highly engaged and motivated
- Active learning opportunities including the outdoor environment
- Providing opportunities for children to rehearse their mathematical skills through investigative play and Plan, Work, Recall opportunities
- Role play and real life scenarios
- Cooking

Knowledge Acquiring – explore, find out, discover, research, understand

Number

Children will acquire a secure understanding of number through place value activities such as counting, ordering and recognising patterns in the number system. Children will learn a range of strategies to answer questions involving all 4 operations through a systematic and progressive approach. Children will learn how to memorise and reason with number bonds and multiplication facts, and will deepen their understanding through problem solving activities.

Children will be able to recognise, find and name fractions of shapes, objects and quantities including recognising equivalent fractions.

Measure

Children will acquire a secure understanding of measure from non-standard to standard units to describe and compare different quantities such as length, mass, capacity/volume, time and money. Appropriate language will be used confidently to support learning.

Geometry

Children will acquire a secure understanding of 2D and 3D shape using appropriate language to describe their properties.

Children will understand how to describe position and direction using the appropriate vocabulary.

Skills Development – problem solve, justify, reason, evaluate, practise

- Use a progressive approach to demonstrate understanding of key concepts from using concrete resources, to pictorial representation through to abstract application.
- Develop skills in measuring beginning with early comparative language, moving to non-standard measures through to standard measures including reading scales and understanding units.
- Children will be able to justify maths by using developing vocabulary and reasoning skills. They will be able to explain their answers in “how do you know?” and give examples to demonstrate their understanding through proving it.
- Maths lessons will follow a sequence of learning through counting, learn its, It’s nothing new and calculation to enable children to continually practise their skills and deepen their understanding of number. Plan work recall opportunities will allow children to problem solve and practise their skills through a range of contexts.

Sequence of Learning – When and how do we facilitate this learning for mathematicians in our school?

The national curriculum objectives for each year group (as highlighted below) are delivered in a progressive way throughout the year. Medium term plans support teachers to plan and assess using the Big Maths progress drives to develop appropriate personalised provision. Projects will be used as a purposeful context to support maths learning through CLIC lessons and plan work recall opportunities.

Reception	Year 1	Year 2
<p>The 2020 (Early Adopter) Early Learning goals are used as the assessment tool for the end of EYFS attainment. Teachers follow progression checkpoints outlined in project overviews that are derived from development matters and pedagogical understanding of early child development in mathematics.</p> <p><u>Number:</u></p> <ul style="list-style-type: none"> • Have a deep understanding of number to 10, including the composition of each number. • Subitise (recognise quantities without counting) up to 5 • Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts. <p><u>Numerical Patterns:</u></p> <ul style="list-style-type: none"> • Verbally count beyond 20, recognising the pattern of the counting system. • Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity. • Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally. 	<p><u>Number</u></p> <ul style="list-style-type: none"> •count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number •count, read and write numbers to 100 in numerals; count in multiples of 2s, 5s and 10s •given a number, identify 1 more and 1 less •identify and represent numbers using objects and pictorial representations including the number line, and use the language of: equal to, more than, less than (fewer), most, least •read and write numbers from 1 to 20 in numerals and words •read, write and interpret mathematical statements involving addition (+), subtraction (–) and equals (=) signs •represent and use number bonds and related subtraction facts within 20 •add and subtract one-digit and two-digit numbers to 20, including 0 •solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as $7 = ? - 9$ •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 •recognise, find and name a half as 1 of 2 equal parts of an object, shape or quantity •recognise, find and name a quarter as 1 of 4 equal parts of an object, shape or quantity 	<p><u>Number</u></p> <ul style="list-style-type: none"> •count in steps of 2, 3, and 5 from 0, and in 10s from any number, forward and backward •recognise the place value of each digit in a two-digit number (10s, 1s) •identify, represent and estimate numbers using different representations, including the number line •compare and order numbers from 0 up to 100; use $<$, $>$ and $=$ signs •read and write numbers to at least 100 in numerals and in words •use place value and number facts to solve problems •solve problems with addition and subtraction: <ul style="list-style-type: none"> •using concrete objects and pictorial representations, including those involving numbers, quantities and measures •applying their increasing knowledge of mental and written methods •recall and use addition and subtraction facts to 20 fluently, and derive and use related facts up to 100 •add and subtract numbers using concrete objects, pictorial representations, and mentally, including: <ul style="list-style-type: none"> •a two-digit number and 1s •a two-digit number and 10s •2 two-digit numbers •adding 3 one-digit numbers •show that addition of 2 numbers can be done in any order (commutative) and subtraction of 1 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

		<ul style="list-style-type: none"> •recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers •calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs •show that multiplication of 2 numbers can be done in any order (commutative) and division of 1 number by another cannot •solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts •recognise, find, name and write fractions $\frac{1}{3}$, $\frac{1}{4}$, $\frac{2}{4}$ and $\frac{3}{4}$ of a length, shape, set of objects or quantity •write simple fractions, for example $\frac{1}{2}$ of $6 = 3$ and recognise the equivalence of $\frac{2}{4}$ and $\frac{1}{2}$
	<p><u>Measurement</u></p> <ul style="list-style-type: none"> •compare, describe and solve practical problems for: •lengths and heights [for example, long/short, longer/shorter, tall/short, double/half] •mass/weight [for example, heavy/light, heavier than, lighter than] •capacity and volume [for example, full/empty, more than, less than, half, half full, quarter] •time [for example, quicker, slower, earlier, later] <p>•measure and begin to record the following:</p> <ul style="list-style-type: none"> •lengths and heights •mass/weight •capacity and volume •time (hours, minutes, seconds) 	<p><u>Measurement</u></p> <ul style="list-style-type: none"> •choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature ($^{\circ}\text{C}$); 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 $=$ •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

	<ul style="list-style-type: none"> •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 	<ul style="list-style-type: none"> •compare and sequence intervals of time •tell and write the time to five minutes, including quarter past/to the hour and draw the hands on a clock face to show these times •know the number of minutes in an hour and the number of hours in a day
	<p><u>Geometry</u></p> <ul style="list-style-type: none"> •Properties of shapes •recognise and name common 2-D and 3-D shapes, including: 2-D shapes [for example, rectangles (including squares), circles and triangles] 3-D shapes [for example, cuboids (including cubes), pyramids and spheres] • Position and direction describe position, direction and movement, including whole, half, quarter and three-quarter turns 	<p><u>Geometry</u></p> <ul style="list-style-type: none"> •Properties of shapes •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 • 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 terms of right angles for quarter, half and three-quarter turns (clockwise and anti-clockwise) •interpret and construct simple pictograms, tally charts, block diagrams and tables •ask and answer simple questions by counting the number of objects in each category and sorting the categories by quantity

		<p>•ask-and-answer questions about totalling and comparing categorical data</p>
<p>1 + 1 = 2 2 + 2 = 4 3 + 3 = 6 4 + 4 = 8 5 + 5 = 10 2 + 1 = 3 + 2 =</p>	<p>Revisit: all doubles to 5 Revisit: 2+1=3, 2 + 3 = 5 2 + 8 = 10 3 + 7 = 10 4 + 6 = 10 Revisit all jigsaw numbers to 10 2 + 4 = 6 2 + 5 = 7 2 + 6 = 8 2 + 7 = 9 2 + 9 = 11 3 + 4 = 7 3 + 5 = 8 3 + 6 = 9 Spring 1 STEP 6 6 + 6 = 12 * use language of double and halve 7 + 7 = 14 * use language of double and halve 8 + 8 = 16 * use language of double and halve 9 + 9 = 18 * use language of double and halve Spring 2 STEP 7 3 + 8 = 11 3 + 9 = 12 4 + 7 = 11 4 + 8 = 12 4 + 9 = 13 4 + 5 = 9 (STEP 8) Summer 1 STEP 8 5 + 6 = 11 6 + 7 = 13 7 + 8 = 15 8 + 9 = 17 *strategy of add 10 subtract 1 also to be taught 5 + 9 = 14 (STEP 9) *strategy of add 10 subtract 1 also to be taught 6 + 9 = 15 (STEP 9) *strategy of add 10 subtract 1 also to be taught Summer 2 STEP 9 7 + 9 = 16 *strategy of add 10 subtract 1 also to be taught 5 + 7 = 12 5 + 8 = 13 6 + 8 = 14</p>	<p>10 x tables 5 x tables 2 x tables</p>

Aims of a mathematician leaving our school

Children will leave Mudeford Infants School with a positive attitude towards maths so they are confident and can demonstrate mental fluency with whole numbers, counting and place value. The children will be able to work with numerals, words and the four operations, including with practical resources (for example, concrete objects and measuring tools)

Children will demonstrate their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary.

Children will know the number bonds to 20 with fluency and be precise in using and understanding place value. They will be able to reason and explain mathematical understanding and be able to apply skills in problem solving contexts.