**MATHS PROGRESSION OF KNOWLEDGE & SKILLS EYFS to Year 3**

This document aims to track expectations for Maths at Marsh Gibbon CE School.

**What the EYFS says:**

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of numbers to 10, the relationships between them and the patterns within those numbers.

By providing frequent and varied opportunities to build and apply this understanding (such as using manipulatives, including small pebbles and tens frames for organising counting) 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 provides rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics, including shape, space and measures. 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.

**What the National Curriculum says:**

**KS1:**

Purpose of study

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history’s most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. Aims The national curriculum for mathematics aims to ensure that 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

| **Objective** | **EYFS** | **Year 1** | **Year 2** | **Year 3** |
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|  | Please refer to Maths Vocabulary Booklet for information on Vocabulary that should be taught in each year group |
| **Number –** **Number & Place Value** | * Develop fast recognition of up to 3 objects, without having to count them individually (‘subitising’).
* Recite numbers past 5.
* 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.
* Count objects, actions and sounds.
* Subitise.
* Link the number symbol (numeral) with its cardinal number value.
* Count beyond ten.
* Compare numbers.
* Understand the ‘one more than/one less than’ relationship between consecutive numbers.

ELG: Number* 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.

ELG: Numerical patterns* 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.
 | * 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 twos, fives and tens
* identify one more and one less than a given number,
* 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.
 | * count in steps of 2, 3, and 5 from 0, and in tens from any number, forward and backward
* recognise the place value of each digit in a two-digit number (tens, ones)
* 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.
 | * count from 0 in multiples of 4, 8, 50 and 100; find 10 or 100 more or less than a given number
* recognise the place value of each digit in a three-digit number (hundreds, tens, ones)
* compare and order numbers up to 1000
* identify, represent and estimate numbers using different representations
* read and write numbers up to 1000 in numerals and in words
* solve number problems and practical problems involving these ideas.
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| **Number –** **Addition and** **Subtraction** | * Experiment with their own symbols and marks as well as numerals.
* Compare quantities using language: ‘more than’, ‘fewer than’
* Explore the composition of numbers to 10.
* Automatically recall number bonds for numbers 0–5 and some to 10.

ELG Number* Have a deep understanding of numbers 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.

ELG:Numerical Patterns* 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.
 | * 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 zero
* solve one-step problems that involve addition and subtraction, using concrete objects and pictorial representations, and missing number problems such as 7 = – 9.
 | * 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
* 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 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.
 | * add and subtract numbers mentally, including: a three-digit number and ones a three-digit number and tens
* a three-digit number and hundreds
* add and subtract numbers with up to three digits, using formal written methods of columnar addition and subtraction
* 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.
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| **Number –** **Multiplication and** **Division** | * Solve real world mathematical problems with numbers up to 5.

ELG:Numerical patterns* Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.
 | * solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.
 | * recall and use multiplication and division facts for the 2, 5 and 10 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 (×), division (÷) and equals (=) signs
* show that multiplication of two numbers 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 contexts.
 | * 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 that 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 objects.
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| **Number –** **Fractions** |  | * recognise, find and name a half as one of two equal parts of an object, shape or quantity
* recognise, find and name a quarter as one of four equal parts of an object, shape or quantity
 | * recognise, find, name and write fractions 3 1 , 4 1 , 4 2 and 4 3 of a length, shape, set of objects or quantity
* write simple fractions for example, 2 1 of 6 = 3 and recognise the equivalence of 4 2 and 2 1 .
 | * 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, find and write fractions of a discrete set of objects: unit fractions and non unit fractions with small denominators
* recognise and use fractions as numbers: unit fractions and non-unit fractions with small denominators
* recognise and show, using diagrams, equivalent fractions with small denominators
* add and subtract fractions with the same denominator within one whole [for example, 7 5 + 7 1 = 7 6 ]
* compare and order unit fractions, and fractions with the same denominators
* solve problems that involve all of the above.
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| **Objective** | **Foundation Stage** | **Year 1** | **Year 2** | **Year 3** |
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| **Measures** | * Make comparisons between objects relating to size, length, weight and capacity.
* Compare length, weight and capacity.
 | * 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]
* measure and begin to record lengths, heights mass & weight
* capacity and volume
* time (hours, minutes, seconds)
* 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.
 | * choose and use appropriate standard units to estimate and measure length/height in any direction (m/cm); mass (kg/g); temperature (°C); capacity (litres/ml) to the nearest appropriate unit, using rulers, scales, thermometers and measuring vessels
* compare and order lengths, mass, volume/capacity and record the results using >, < and =
* 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
* 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.
 | * measure, compare, add and subtract: lengths (m/cm/mm); mass (kg/g); volume/capacity (l/ml)
* measure the perimeter of simple 2-D shapes
* add and subtract amounts of money to give change, using both £ and p in practical contexts
* 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].
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| **Objective** | **EYFS** | **Year 1** | **Year 2** | **Year 3** |
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| **Geometry –** **Properties of shape** | * 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’.
* 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.
* Select, rotate and manipulate shapes in order to develop spatial reasoning skills.
* Compose and decompose shapes so that children recognise a shape can have other shapes within it, just as numbers can.
* 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.
* Continue, copy and create repeating patterns.
* Begin to describe a sequence of events, real or fictional, using words such as ‘first’, ‘then...’
 | * 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].
 | * 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.
 | * draw 2-D shapes and make 3-D shapes using modelling materials; recognise 3-D shapes in different orientations and describe them
* 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
* identify horizontal and vertical lines and pairs of perpendicular and parallel lines.
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| **Geometry –** **Position and** **Direction** | * 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’
* Can describe their relative position such as ‘behind’ or ‘next to’.
 | * describe position, direction and movement, including whole, half, quarter and three quarter turns.
 | * 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 anticlockwise)
 | * 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.
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