

Maths Rationale

National Curriculum Aims for Maths

- 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 nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

National Curriculum Purpose for Maths

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.

Mathematical Literacy- Progression from EYFS to Year 6

At the core of all our mathematical teaching is understanding the way that children learn mathematical knowledge and skills.

Therefore our teaching is structured around our belief that children learn through using concrete objects then progressing to using pictures and finally to abstract representations of mathematics such as calculations. We refer to this progression as concrete, pictorial and abstract.

Throughout our teaching we encourage the pupils to make connections with their learning.

EYFS

Our ambition for all pupils is high and this begins with maths being taught from the outset in EYFS. It is divided into the following two areas:

Early Learning Goal -Number -Children at the expected level of development will: - 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.

Early Learning Goal -Numerical Patterns Children at the expected level of development will: - 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.

These two areas are implemented through a mixture of direct teaching and learning opportunities that are embedded in continuous provision. Our specialist and dedicated early years environment (both indoors and out) is full of meaningful and well planned mathematical opportunities and has exciting things for children to explore, sort, compare, count, calculate and describe. This supports them to be creative, critical thinkers and problem solvers.

Key Stage One

The focus of maths teaching in Key Stage 1 is to ensure that pupils develop confidence, mental fluency and efficiency with whole numbers, counting and place value. They should also be developing their ability to recognise, describe, draw, compare and sort different shapes, using the related vocabulary. Teaching will also involve using a range of measures to describe and compare different quantities such as length, mass, capacity, volume, time and money. Security in these core concepts is an essential foundation so that children leave KS1 with these facts embedded in their long term memories which will facilitate efficient working during KS2.

Key Stage Two

By the end of year 6, children will have developed their ability to solve a wider range of word problems, including those with increasingly complex properties of numbers and arithmetic and problems demanding efficient written and mental methods of calculation. Through repeated practice and well-crafted fluency exercises, children will have embedded core number facts, freeing up capacity in their working memories to tackle new, more difficult problems and concepts. They will be able to classify shapes with complex geometric properties and be fluent in working with fractions, decimals and percentages.

The opportunity to use concrete objects to support learning is embedded within the whole school teaching.

Maths Rationale

The purpose of mathematics in our federation is to equip children with the knowledge, skills and understanding to be able to understand the world around them. This includes maths skills for functional aspects of life, for example telling the time and handling money. A solid understanding of maths and good calculation skills equip adults with the ability to become more financially literate. Furthermore, maths skills which facilitate the learning of other subjects, for example geometry skills in design or using logarithms in computing. This means ensuring we have a curriculum that is fully inclusive for all children which:

- Develops children's fluency, reasoning and problem solving skills – all of which are inextricably linked.
- Develops children's knowledge and understanding of mathematical concepts whilst enabling them to practise and hone skills and methods.
- Enables them to think critically and communicate their understanding to others. Ensures that children have the essential mathematical vocabulary to do this.
- Gives them opportunities to apply learned mathematical skills, in different contexts, across the curriculum.

Mastering Number

Mastering Number NCETM is used in EYFS and KS1 to help children in EYFS, Year 1 and Year 2 to embed good number sense including fluency and flexibility with number facts. This is done through daily short burst lessons.

Intent	Implementation	Impact To be reviewed at the end of each year.
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<p>The mathematics curriculum is planned in a sequenced way to build knowledge, skills, understanding and mathematical vocabulary from Early Years to Year 6.</p> <p>Teachers use the planning flow chart.</p> <p>The mathematics curriculum will follow a mastery approach and equip children with a deep and embedded understanding of mathematical components.</p> <p>The five 'ingredients' of mastery are: Small steps, variation, mathematical vocabulary, problem solving and representation and structure.</p> <p>The school's Calculations Policy provides a guide to how calculations using the four rules of number should be taught within each group. This includes using a range of resources moving through from concrete, pictorial and abstract.</p>	<p>Teachers plan using White Rose Maths (Small steps) for each unit ensuring sequences of units build on prior knowledge, using the mastery approach of small steps. This ensures consistency across the federation.</p> <p>Teachers plan lessons to create deeper understanding rather than accelerate children to new content. This is done through providing children with a range of problem solving and reasoning tasks to do. Concrete, visual and abstract resources will support children's learning ensuring components are embedded. Variation will be planned into the lessons to develop children's confidence when reasoning.</p> <p>Teaching of calculations will be consistent and progressive so that children build each year on a secure base.</p>	
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Knowledge and enquiry in Maths

Substantive knowledge concerns the key facts, concepts, principles and explanatory frameworks in a subject. Disciplinary knowledge needed in order to think, process and understand the subject.

Knowledge and enquiry in maths are divided into distinct areas and children need to be able to move fluidly between these and be able to make connections when solving sophisticated problems. These areas are:

- Number
- Measurement
- Geometry
- Statistics

In early years foundation stage are:

- Number
- Numerical pattern

Children need substantive knowledge such as knowing their number bonds and multiplication facts in order to be able to successfully tackle more challenging concepts and ideas. Deliberate repeated practice helps children to build confidence, fluency and efficiency in order to secure this substantive knowledge into their long-term memories. Children are also taught to make links across different mathematical components to build this substantive knowledge in their long term memory. Our federation follows a mastery approach and the use of White Rose Maths as a basis for sequencing units to ensure continuity and progression and as a way of ensuring children are able to build this substantive knowledge.

Creativity in Maths

Creativity is a strong thread that permeates our mathematics curriculum. Opportunities for children to approach mathematics in different ways and to solve problems are carefully planned into each unit of work. Mathematics problem solving is a creative process and children are encouraged to show their thinking and mistakes are embraced as a part of the problem solving journey. By using this approach, children become empowered and they learn what can be possible with a strong mathematical understanding. Mathematical creativity allows children the opportunity for collaborative learning and communication through carefully planned learning activities. Children can investigate, pose questions and become creative decision makers and mathematical risk takers in an environment where it is ok to make mistakes, developing resilience and confidence.

Assessment in Maths

Tracking children's progress throughout their school life is vital in order to establish their acquisition of knowledge and skills. At the Federation of Follifoot & Spofforth, learning always starts with the children's prior knowledge and any misconceptions they may have. Class teachers decide upon the most appropriate age related way of obtaining the children's prior knowledge. Units of work are then personalised to the children.

Misconceptions that arise throughout the unit are identified and addressed appropriately by the teacher. As a Federation we are currently trialing exploring and trialing approaches to assessing children's recall of their learning to assess how effectively knowledge and skills have been embedded and mastered.

In Early Years, assessment happens continually to collect consistent and varied evidence of mastery. This then feeds into the continuous cycle of Observation, Assessment and Planning. In addition, each half term every child is assessed on Number recognition and formation 10, Rote Counting to 10 and Number Formation.

Summative assessment will be in the form of termly progress White Rose tests. In addition these tests provide detailed analysis of where the children may be exceeding or where teachers may need to put in more deliberate practice of a concept. Catch up suggestions are embedded within these results. They will also allow teachers to make adjustments to their provision where needed.

In years 2 and 6, children will be given practice SATs papers at various intervals during the school year to ensure familiarity with test style and to reduce anxiety.

In Year 2, these are typically used in the spring term.

In Year 6, these are typically used in December, February and April.

In year 4, progress towards the multiplication check test will be measured by completing practice checks in January, April and June.