



Appleton Wiske Community Primary School

Mathematics – A Whole School Approach



Early Years Foundation Stage

In the Early Years, pupils develop their mathematical skills in areas of learning through opportunities which are both child initiated and adult supported. Maths is underpinned by the *Characteristics of Effective Learning*: playing and exploring (engagement), active learning (motivation) and creating and thinking critically (thinking), which is how children learn within the EYFS. Adult-led activities take account of the children’s interests and learning styles, maximising the use of areas of provision within the environment, both indoors and out. The learning leads on to children developing and practising skills in their own way and provides further learning possibilities. We embed mathematical opportunities within daily routines to make them real and purposeful.

We use the NCETM White Rose planning guidance to support teaching and learning in EYFS maths. This supports the delivery of the maths curriculum through embedding mathematical thinking and talk. Key mathematical concepts are built upon and developed throughout the year to develop skills for a broad early maths curriculum.

EYFS maths is taught through a progression of Phases which have a focus on building a deep understanding of number with additional opportunities for consolidation and ‘real life’ problems. Key vocabulary is used throughout and links are made through stories, rhymes and talking with adults. Numberblocks are used to introduce number concepts and support early mathematical understanding. Key representations linked to the five counting principles are used to support children when subitising, counting and comparing ‘real life’ objects.

Mathematics in the Early Years Curriculum is split into two areas: ‘Number’ and ‘Numerical Patterns’, where pupils work towards achieving the Early Learning Goals (ELGs) for each of these areas.

ELG for ‘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 for ‘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 to 10, including evens and odds, double facts and how quantities can be distributed equally

Pupils will be assessed as ‘emerging’ or ‘expected’ for each Early Learning Goal at the end of the Foundation Stage.

KS1 and KS2

Throughout KS1 and KS2, our approach to mathematics involves extending children’s mathematical understanding through reasoning, using a structured programme which provides appropriate differentiation and challenge to all. Our long term plans are adapted from the North Yorkshire Local Authority’s mixed age planning guidance. We have based our maths curriculum on these long term plans because the sequencing of topics has been written to help ensure that any pre-requisite knowledge needed for a unit can be taught in the preceding units. We have chosen to adapt the ‘long block’ approach as this best meets the needs of our learners in mixed age classes across the school. Overviews for each topic allow teachers to see the content for each year group, providing continuity and understanding of progression (preceding and following year groups) in the topics.

We cover all aspects of mathematics as outlined in the National Curriculum:

Year 1	Number and Place Value; Calculations; Fractions; Measurement; Geometry
Year 2	Number and Place Value; Calculations; Fractions; Measurement; Geometry; Statistics
Year 3	Number and Place Value; Calculations; Fractions; Measurement; Geometry; Statistics
Year 4	Number and Place Value; Calculations; Fractions and Decimals; Measurement; Geometry; Statistics
Year 5	Number and PV; Calculations; Fractions, Decimals and Percentages; Measurement; Geometry; Statistics
Year 6	Number and PV; Calculations; Fractions, Decimals and Percentages; Ratio and Proportion; Algebra; Measurement; Geometry; Statistics

We teach each mathematics unit in the same sequence across the school:

Step 1 – Vocabulary

In KS1, new key mathematical vocabulary is introduced at the appropriate time, specifically matched to small steps in learning during each session. In KS2 previously learned vocabulary is recapped and the children are introduced to new key mathematical vocabulary linked to the topic during the first lesson. This is essential to allow the children to access the whole of the topic.

Step 2 – Show (concrete, pictorial and abstract)

In KS1, children are encouraged to explore the topic using concrete resources that they can handle e.g. counters, cubes, beads etc. They are then encouraged to develop this further into a pictorial representation, where they use diagrams to show their understanding visually. Following on from this, the abstract teaches the children the appropriate mathematical symbols and representations for the specific area of learning e.g. + addition, - subtraction. In KS2, concrete and pictorial representations are encouraged throughout Steps 3-6 and are children explore with increased independence.

Step 3 – Fluency

This is the teacher-led input where the children learn new skills in order to later apply what they have learned. It is important that children succeed in the fluency stage before they move on. Examples include number facts, times tables facts and making connections.

Step 4 – Variation

Once children have a sound knowledge of the mathematical skills, they move on to apply their understanding. This stage is designed to encourage the children to reason – explaining how they found their answer and how they know it is correct. Here, pupils must explain their thought processes. Variation in procedures and concepts enables pupils to make connections with previous learning and knowledge.

Step 5 – Representation and Structure

After the Variation stage has been successfully completed and understood, the children can move on to the Representation and Structure stage. This is designed to allow the children to demonstrate their understanding of the skills being taught, applying their learning, looking for patterns, making connections and using appropriate mathematical vocabulary.

Step 6 – Mathematical Thinking

The final stage, which is the mastery stage, is Mathematical Thinking. This is where the children are given more difficult investigations to explore the skills further. They apply all of the previously used skills to gain a deeper level of understanding, and they develop chains of reasoning. Tasks begin with, 'Is it always, sometimes or never true that...'

Our approach to mathematics encourages and expects children to become more independent and responsible for their own learning. In KS1, mathematics is more teacher-led, and develops in smaller steps within each topic, as the children are being introduced to the school's approach to mathematics. Vocabulary is introduced regularly at the appropriate time to match small steps in learning. In Lower KS2, children are more independent, with some teacher-led sessions. In Upper KS2, the fluency sessions are teacher-led; beyond that, the children work independently and receive regular feedback before moving onto the next step. In KS2, identified children may require additional adult support.

Concrete resources are always readily available to the children to be used at any time, during any of the steps. The children are free to choose which methods and resources work best to develop their understanding. A range of teaching resources are used to expose *all* pupils to a range of fluency, mastery and problem-solving questions.

At the end of each unit, pupils in Years 2 to 6 self-assess their learning based on how well they feel they have achieved against the criteria. The teacher then assesses each pupil's progress using the same criteria. Each year group has the same structure of units. Therefore, before each unit is taught, previous learning will be reviewed and revisited.