Maths Curriculum at Millfield Primary

Aims

At Millfield, we are committed to delivering a high-quality, engaging mathematics curriculum for all children. We aim to provide a range of mathematical opportunities and activities to explore and enquire in a safe and supportive environment, where misconceptions are used as an essential part of learning. We want children to experience enjoyment and success in each lesson, leading to a positive, enthusiastic and confident attitude to maths with a deep, secure understanding of each concept. We aim for children to have the ability to be resilient and to persevere when facing mathematical challenges in real-life contexts and across the curriculum. We aim to ensure that children are competent in mental calculations and can undertake written procedures efficiently, fluently and accurately.

As stated in the National Curriculum, we aim for all children to:

- Become fluent in the fundamentals of mathematics so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- Reason mathematically by following a line of enquiry and develop and present a justification, argument or proof using mathematical language.
- Be able to solve problems by applying mathematics to a variety of problems with increasing sophistication, including in unfamiliar contexts and real-life scenarios.
- Make rich connections across mathematical ideas, and apply this knowledge to other subjects and in their outdoor learning.

The Teaching of Maths in EYFS at Millfield

Early number work, and simple mathematical experiences, is essential in the early years. Early mathematical understanding is not only fundamental to a child's achievement and success in maths, but is also strongly associated with their later school achievement, educational progress and life outcomes.

Children in Millfield Nursery and Reception have a daily Maths teaching session, during which time they begin to develop their understanding of six simple mathematical concepts:

- Cardinality and Counting
- Comparison
- Composition
- Pattern
- Shape and Space
- Measures.

Children are given the opportunities to explore these concepts through a range of different contexts and practical situations, including books, songs, games, rhymes, puppets and role play.

In addition to their maths sessions, children are also encouraged to develop their understanding during their exploring and learning time. Such activities are provided in both the inside and outside environment. During learning walks, all adults in the setting seize opportunities to reinforce mathematical vocabulary, even for activities that are not necessarily maths based, e.g. thinking about which shapes they are painting at the creative table.

Manipulatives are readily available for the children to consolidate their learning during child initiated activities. The children are taught to understand the links between the manipulatives and the ideas they represent. They are encouraged to represent problems in their own way using these practical resources, drawings and marks.

Learning is shared and recorded through the use of floor books and observations, where examples of children's work and quotes from the children are displayed. These are used to make assessments about each child using the curriculum guidance, 'Development Matters' with the aim of reaching 'Early Learning Goals' by the end of Reception. Regular observations and assessments help to ensure that children who need additional interventions to consolidate their understanding are identified and supported in a timely manner.

<u>The Teaching of Maths at Millfield</u>

Maths is usually taught daily at Millfield Primary. Following the Maths National Curriculum, children are taught specific content in each year group, and are given time and opportunities to embed and master these concepts.

The majority of children progress through the curriculum at the same pace. Within lessons differentiation is achieved by demonstrating deep understanding and through individual support and intervention. Planning is completed collaboratively in PPA sessions and

consideration is given to the access arrangements and adaptations necessary to allow all children to continue to develop their mathematical skills and knowledge.

In KS1 and KS2, the White Rose Maths scheme is used to ensure whole school consistency and a clear progression of the acquisition of mathematical concepts and skills. The scheme ensures that there is a detailed, structured curriculum mapped out across all year groups with each block of lessons sequenced in small steps. Each step has opportunities for all children to practise their fluency, to reason about their maths work and to apply their knowledge and skills to problem solving, although not always in a linear order. As well as the main lesson, teachers will also practise the recall of key number facts, such as number bonds and times tables, throughout the day.

White Rose uses a CPA model - concrete, pictorial, abstract - to introduce children to mathematical skills and concepts using manipulatives, images and models to help deepen understanding. In class, we encourage children to 'Build it, Say it, Draw it, Write it' to fully understand a concept. Our Maths Calculation Policy shows the progression of teaching and learning calculation methods throughout our school for the 'Write it' part of our learning.

Engaging children in a new maths topic begins with ensuring the learning is pitched accurately. This happens using a pre-learn activity to find out what children already know. It is important to assess what children do, and do not, know in order to extend learning for all children. Teachers have a good understanding of the progression of maths knowledge and skill, so to understand existing knowledge and misconceptions, allows teachers to plan appropriately for starting points and to allocate any gap-filling activities the children may require.

Lessons begin with a counting focus. These range from counting forwards and backwards in 1s, to counting forwards and backwards in fractions and decimals. The counting focus may also be used as an opportunity to chant times tables. Following this, the main lesson starts with 'White Rose's Flashback Four', giving children the chance to revise previously taught concepts from the previous day, the previous week, the previous topic and the previous year.

During the input, teachers will recap any misconceptions from previous learning, and introduce the new learning objective. They will share any key vocabulary or sentence stems that will be used in the lesson, and will model calculation methods and strategies that are needed. Children will be presented with varied similar problems, which they may solve independently or with a talking partner. Some children may record their learning on a whiteboard. The teacher uses this part of the lesson to address and initial misconceptions and celebrate successes. When the teacher feels the children are ready, they will begin their independent learning.

During independent lesson activities, concrete manipulatives and representations (such as number lines) are readily available for all children to use as a scaffold with their learning. These are then removed when the children become more confident and independent with the concept. Children record their work in their individual maths books, and are encouraged to use jottings when needed. Maths books are marked by teachers in line with the school's marking and feedback policy in a timely manner. Lessons usually end with a problem for the children to discuss.

Teachers supplement the White Rose scheme with activities from high quality research websites, such as Nrich and NCETM (National Centre for Excellence in the Teaching of Mathematics), to give our children a variety of opportunities for using their mathematical knowledge and skills. We want our children to enjoy these rich tasks, working independently or collaboratively.

Assessment

Teachers use formative assessments (questioning, mini plenaries, feedback) to identify the learning needs of children for the next lesson. Children self assess at the end of each lesson to show their teachers how confident they are feeling about their maths that day. Teachers also assess each lesson objective using Curriculum Maestro.

Children who grasp concepts readily are challenged through rich problems to ensure a deep understanding before being taught new concepts. Children that are not fluent are given support to consolidate their understanding, through additional practice, before moving on. At the end of each block of learning children complete a 'Hot Task' to show the progress made since the 'Cold Task' at the beginning. At the end of each half term, data is recorded for each child's individual attainment.

Mathematical Language

The national curriculum for mathematics reflects the importance of spoken language in pupils' development across the whole curriculum. In maths, time is spent ensuring that children understand and develop the correct mathematical vocabulary, so that they have the ability to reason and explain their thinking clearly. Subject specific vocabulary, and sentence stems, are shared with the children during lessons, and displayed on the maths working wall in class. Children are expected to answer using correct vocabulary and the sentence stem, when appropriate.

Problem Solving Skills

At Millfield, we believe that children need to be equipped with problem solving skills, so that they are able to make sense of unfamiliar problems. These skills need to be specifically taught, modelled and practised. There are nine key skills that we focus on:

- Trial and improvement
- Working systematically
- Pattern spotting
- Working backwards
- Reasoning logically
- Visualising
- Conjecturing
- Generalising
- Proving

Teachers select problem solving tasks where children have the opportunities to practise these skills. They are taught to compare different approaches and know how to use their existing knowledge to solve problems. Children are given the opportunities to reflect and share on their problem solving.

Homework

For maths homework, we use online platforms to support fluency. In Key Stage 1, we use Numbots to help the children with basic number facts. In Key Stage 2, we use Times Tables Rock Stars to help children recall their multiplication and division facts quickly and accurately. Children are able to access these online learning platforms at home using their usernames and passwords.

Support

Where a small group of children have been identified as needing extra support due to their assessments, staff at Millfield recognise that high quality targeted support can provide effective extra support for children. Many of our teaching assistants have received training in:

- First Class @ Number
- First Class @ Number 2
- Five Minute Box Number
- Precision Teach

For each of these interventions, sessions are regular and connections are made between support and teaching as much as possible. They are carefully planned and engaging for the children.