

Curriculum policy: Mathematics

Subject definition

"Mathematics is a creative and highly interconnected 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." (The New national curriculum in England framework document, Sept 2021)

As outlined in the above statement Mathematics plays a key role in everyday society and at Mosspsits we acknowledge that Mathematics is something that pervades everyday life, therefore it is crucial that children have opportunities to learn these vital skills in order to apply them and make better sense of the world around them. We also believe that children need to see the value of Mathematics and its relevance, therefore opportunities to teach Mathematics within a real-life context are important to help children make links between their learning and the need for these skills in their everyday life. Whilst teaching these skills it is important that the teaching and learning of Mathematics is approached in a creative way so that an enjoyment of learning is instilled and levels of engagement are improved. As a result children will build upon their existing skills, to help them develop the ability to think mathematically and critically apply the correct tools that they have been exposed to in a variety of ways. As well as skills within Mathematics we encourage children to develop skills of perseverance and resilience by acknowledging that we may not always correctly solve problems on our first attempt, highlighting the importance of being able to check and critically analyse our methods.

Intent

Key Stage 1 and Key Stage 2

At Mosspsits our aim is to achieve the following as outlined in the National Curriculum:

- Become fluent in the fundamentals of Mathematics through varied and frequent practice with complexity increasing over time.
- Develop conceptual understanding and ability to recall and apply knowledge rapidly and accurately.
- Reason mathematically; follow a line of enquiry, conjecture relationships and generalisations.
- Develop an argument, justification and proof by using mathematical language.
- Problem solve by applying knowledge to a variety of routine and non-routine problems. Breaking down problems into simpler steps and persevering in answering.

EYFS

The first few years of a child's life are especially important for mathematics development. Our intent in EYFS, is to ensure that all children develop firm mathematical foundations in a way that is engaging, and appropriate for their age. We use materials from White Rose Maths and the NCETM that are based on international research. The materials are organised into key concepts which underpin many early mathematical curriculum concepts. The typical progression highlights the range of experiences, and the activities and opportunities are developed across the Reception provision. There are six key areas of early mathematics learning, which collectively provide a platform for everything the children will encounter as they progress through their maths learning in primary school and beyond. These are:

- Cardinality and counting
- Comparison
- Composition
- Pattern
- Shape and space
- Measures

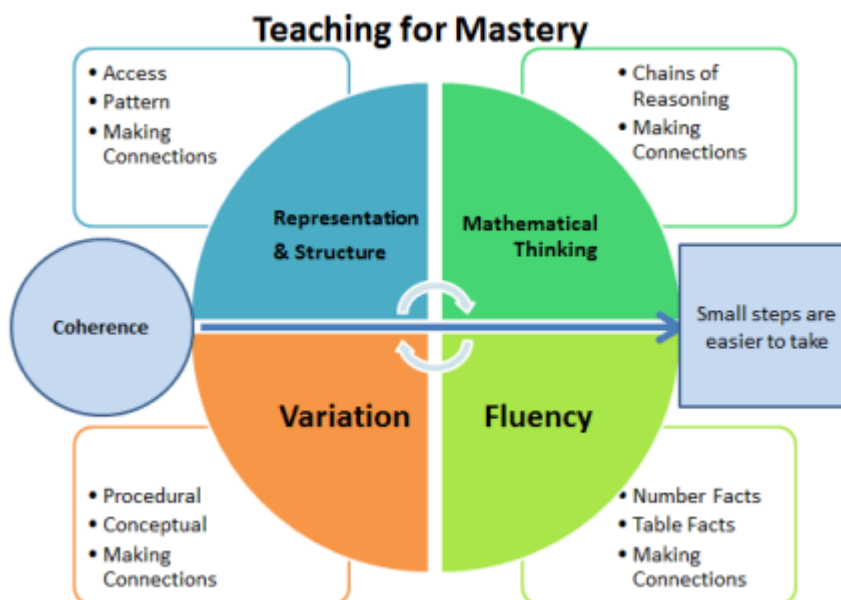
By the end of the Reception year, our intent is to ensure that all children make at least good progress from their starting points and are equipped with the skills and knowledge to have a smooth transition into Year 1.

As well as this Mosspsits also aims to:

- Develop confident, competent mathematicians who are able to apply mathematical knowledge, concepts and skills
- Develop skills of resilience and perseverance with an ability to solve problems, to reason, to think logically and to work systematically and accurately
- Develop an understanding of Mathematics through a process of enquiry and investigation, providing a challenging and engaging curriculum that stretches the children's knowledge and allows them to take risks
- Encourage children to use `maths specific` vocabulary to reason and explain
- Develop positive attitudes towards Mathematics and promote a love of learning
- Promote confident communication of Mathematics where pupils ask and answer questions, openly share work and learn from mistakes
- An ability to use and apply Mathematics across the curriculum and in real life
- Encourage a positive mindset- `You 'can't do it yet' when finding something tricky

Implementation

At Mosspsits we have adopted a Mastery approach which enables pupils to acquire a deep, long-term, secure and adaptable understanding of the subject. The phrase 'teaching for mastery' describes the elements of classroom practice and school organisation that combine to give pupils the best chances of mastering maths. Achieving mastery means acquiring a solid enough understanding of the Mathematics that's been taught to enable pupils to move on to more advanced material.

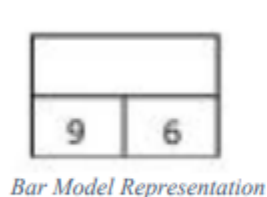
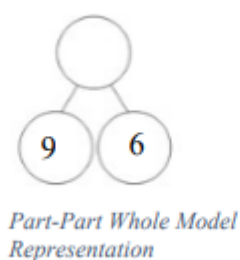


Five Big Ideas in Teaching for Mastery | NCETM

Teaching for Mastery is underpinned by four areas, these include:

- Representation and Structure
- Mathematical Thinking
- Variation
- Fluency

Representation and Structure focuses on how concepts in Mathematics are presented in different ways and forms for example when adding 2 numbers together it could be presented in many different ways:



$$9 + 6 = \underline{\quad}$$

Number Sentence Representation

Nines ones add 6 ones is equal to

Place Value Representation

At Mosspsits we believe that it is important to expose children to many different representations and structures. This will enable a child to demonstrate mastery in a particular area of Mathematics if they are able to apply this within a range of different situations.

Mathematical Thinking requires children to be able to work through problems systematically rather than through `trial and error`. Children should be able to look for patterns and relationships and make connections. Children are able to demonstrate their mathematical thinking by explaining their methods and thought process when solving a mathematical problem.

Fluency is split into two areas:

- Procedural fluency
- Conceptual fluency

Procedural fluency is the ability to apply procedures accurately, efficiently, and flexibly; to transfer procedures to different problems and contexts; to build or modify procedures from other procedures; and to recognise when one strategy or procedure is more appropriate to apply than another.

Conceptual understanding is knowing the procedural steps to solving a problem and understanding why those algorithms and approaches work. This level of understanding has students reaching higher depths of knowledge because they are making connections from one skill to another.

Fluency relies on the quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of Mathematics.

Variation is also split into two areas like fluency:

- Procedural variation
- Conceptual variation

Procedural variation - This is a deliberate change in the type of examples used and questions set, to draw attention to certain features.

Conceptual variation - When a concept is presented in different ways, to show what a concept is, in all of its different forms.

Long Term Planning

As mentioned above, in the EYFS, the `Statutory Framework for the Early Years Foundation Stage` and the non-statutory guidance of `Development Matters`, White Rose Maths' and NCETM provides the long term planning in EYFS.

The 'National Curriculum 2021' provides the long term planning for Key Stage 1 and Key Stage 2 (Year 1 - Year 6). This ensures a consistent approach across the school and allows Mathematics to be taught progressively.

Medium Term Planning

Reception (EYFS) and Years 1-6 all follow the White Rose Maths and NCETM schemes of learning. The schemes of learning are used to breakdown the larger curriculum statements (taken from the long term planning documents) into smaller progressive steps that build upon one another. As well as this the statements are broken into areas of fluency, problem solving and reasoning. Within the White Rose Maths scheme, mastery is at the centre of the scheme and it supports teachers in providing pupils with opportunities to deepen their thinking and understanding to ensure they have 'mastered' that concept within their year group.

In Reception the 'Development Matters' statements are used to track progress and are then revisited regularly throughout the year. Where possible cross-curricular links will be adopted to support the children in making links through their learning, therefore making Mathematics relevant and meaningful.

Short Term Planning and lesson structure

Key Stage 1 and Key Stage 2

Using the White Rose Maths materials, teachers will plan as necessary for the needs of their class. Children have approximately 5 lessons of explicit maths teaching/learning per week; lessons vary in length from 45-60 minutes each day. Teachers are encouraged to use other Maths resources available to help supplement their planning and teaching, for example NRICH, NCETM, Twinkl etc. The children also have regular basic maths skills sessions for 5-10 minutes at the start of the day. This ensures that pupils have the opportunity to revisit previous learning and concepts taught earlier in the year in order to help support retention, retrieval and consolidation of core maths knowledge.

The emphasis in lessons is to make teaching interactive and lively, to engage all children, encouraging them to talk about Mathematics. Potential misconceptions are identified in advance and strategies to address them planned. Key questions are planned, to challenge thinking and develop learning for all pupils. Within the session children will be exposed to problems to solve, resulting in mathematical discussions about key ideas. Throughout, there should be a balance of teacher talk and pupil led discussion. Children will have the opportunity to use concrete resources to support their understanding of mathematical concepts as well as using pictorial methods.

In Key Stage 1, the teacher plans a Mastering Number session (around 10 minutes) for the start of each Maths lesson to help consolidate the core maths knowledge. In Key Stage 2, have a similar 5-10 minute session to start lesson with consolidating multiplication tables knowledge. This can involve songs, ICT games and counting games.

EYFS

In Reception, the Development Matters, White Rose Maths and NCETM documents are used to develop and plan lessons around a selected objective. During daily, whole class 15 minute taught sessions, previous learning will be revisited and new concepts introduced. Children will learn through a mixture of adult led activities and child initiated activities both inside and outside of the classroom. Where possible links are made to other areas within the curriculum to make learning relevant and meaningful.

In Reception, a daily 15 minute whole class taught session will take place focusing on revisiting previous taught concepts and introduce new content that will be taught that week. During these sessions there is a different focus each day to ensure that existing skills are revisited frequently to help children retain their knowledge. It also supports filling gaps in knowledge that have been identified previously. After these sessions children have access to continuous provision activities with a mathematics focus.

As well as the opportunity to work in an adult led group with focused teaching and learning, adaptive teaching and where applicable further interventions will be put into place to assist children who require further support.

Mathematics is also taught beyond allocated Mathematics sessions. Independent Mathematics activities are provided to consolidate the adult led session so children can demonstrate their learning using different resources.

Marking

At Mosspsits we believe marking and feedback is essential to ensuring that children continue to make further progress. Work is marked against the learning objective, in line with the schools marking policy (see Mosspsits Marking and Feedback Policy for further information).

Throughout Mathematics sessions children are provided with live feedback to address misconceptions, support the children's learning and extend learning further. Children are encouraged to look back and check their work, as well as providing an opportunity for children to read and respond to marking. Responses to marking are made as close to the work as possible, ideally at the start of the next lesson. On some occasions, some pieces of work in Mathematics are marked by children themselves during the lesson.

Inclusion

In line with the School's Inclusion Policy each child will have an equal entitlement to all aspects of the Mathematics curriculum and to experience the full range of Mathematical activities. Therefore, in delivering Maths, care will be taken to ensure that a variety of learning styles are accessed and teaching methods adopted. The aim is to ensure that every pupil makes progress and gains positively from lessons and for teachers to plan inclusive lessons. Teachers plan accordingly for those children who have a Pupil Profile and have a Maths target. These targets may be worked upon within the lesson as well as on a 1:1 basis outside the Mathematics lesson.

Learning Environment

At Mosspsits we like to create a stimulating and engaging environment for the children that we teach. In each classroom there is a display board dedicated to Mathematics. This board should be clearly labelled. This board should be used as part of a working wall to show the current learning within the class showing strategies and methods that could be used, therefore creating a point of reference for the children. Vocabulary applicable to the current topic within Mathematics should be evident and referred to during Mathematics lessons.

Home Learning

In all year groups, weekly Mathematical tasks are set focusing on key mathematical knowledge that has been taught in school. In the EYFS, this involves a fun practical task on the weekly learning log. Parents are invited to share their observations of mathematical learning via the class dojo app. In ks1, this may also involve a practical task, a worksheet or further up the school, using the site MyMaths to complete the task online. As well as this, in KS2, children have access to Times tables Rockstars which supports children in their recall of multiplication and related division facts. Every half term, certificates are given out in assembly to the top 3 children in each class who have earned the most coins for that half term.

Community links/enrichment

We celebrate various Maths days during the year like NSPCC Number Day in February and Liverpool Maths Party Day in September. We also take part in online competitions through Times Tables Rockstars.

On several yearly occasions, we have had parents come into school to share how they use Maths in their jobs which gives the children an awareness of how Maths is important in society as a whole.

Impact

Formative Assessment

Assessment is regarded as an integral part of teaching and learning and is a continuous process as teachers monitor progress and adjust their teaching accordingly on a daily basis. Children will be provided with feedback either verbally or through written marking. Within Reception, observations of the children's learning within continuous provision and discussions with the children support teachers' judgements. Throughout lessons live feedback plays a key role in identifying children who require further support and those that require further extension.

Before beginning a new unit of work, children will complete a pre-teaching assessment, with some questions based on the next unit of work/concept taught in Mathematics from the previous year. This allows teachers to assess the children's current knowledge and provide an insight on where to take the learning next. After the completion of each unit of work, the children will complete a post-teaching assessment which will show the progress the children have made from the beginning of the unit to the end.

Teachers will also continue to monitor and assess children's progress through 'check-its' in which teachers can check on learning and application of core concepts are still being retained.

Summative Assessment

Termly assessments are carried out across the school using the assessment materials for each year group provided by White Rose Maths, in line with the schemes of learning. These materials used alongside judgements made from class work support teachers in making assessment judgements for each child which in line with the Assessment Policy, they enter onto O Track. As well as this teachers will use this information to identify gaps in knowledge that remain, in order to provide further support in future planning to fill these gaps.

At regular points in the year staff meet with both year group and phase group colleagues to moderate and standardise pupils' work and evaluate next steps for them. This is also done externally with other schools in the local authority.

Towards the end of the school year, EYFS teachers and Year 1 teachers will continue to look at maths evidence from EYFS children to ensure an accurate baseline is established for Key Stage 1. For Mathematics, EYFS staff will formally report on the two mathematical Early Learning Goals - Number, and Numerical Patterns. These will also be shared with Year 1 staff. Children will either meet the expected standard (expected) or will not yet have reached the expected standard (emerging). This will ensure that the children's strengths and future learning needs are clearly identified.

Pupil Progress meetings are timetabled each term for all classes. Progress of pupils is discussed and appropriate intervention considered and put in place where appropriate.

Year 2 and Year 6 complete the national tests (SATs) in May which support teachers in making their summative judgements in the summer term. Year 4 also complete the national 'Multiplication Tables Check' to ensure that our pupils are able to recall their times tables facts up to 12x12 by the end of Year 4.