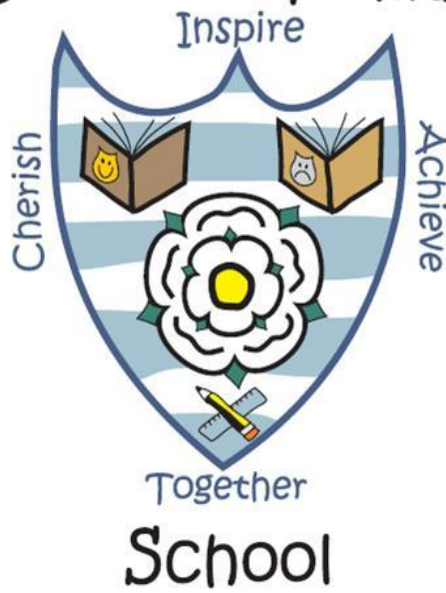


Birkwood Primary



MATHS MASTERY POLICY

UPDATED SEPTEMBER 2023

National Curriculum (2014):

‘Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content.’

At Birkwood Primary School, we strive to promote a **life-long love** for mathematics; we believe that **enjoyment** is paramount. Equally, we believe that this is promoted by providing a high-quality and varied curriculum packed with meaningful opportunities. We aim to bring the curriculum to life in order to develop **fluent mathematicians** and **resilient learners** who can problem solve, using mathematical reasoning, with unconscious competence. We have adopted this ethos and subsequently our teaching of mathematics promotes the belief that all of our children have the potential to **succeed and exceed at all levels**.

In brief, these values are underpinned within our approach to the delivery of maths. Maths lessons at Birkwood Primary follow the NCETM guidance, from Foundation through to Year 6. This is a carefully designed, logical and systematic sequence to teaching mathematics which is implemented based on the needs of our pupils. It is based on small step learning targets and allows children to build on previous learning and enables them to become natural problem solvers. Our delivery is rich in variation, and values the importance of the balance between the development of procedural fluency and conceptual understanding. This is enhanced through our use of meaningful concrete and pictorial representations of mathematical structures, and provides regular opportunities to ‘dive deeper’ through targeted, low floor-high ceiling problem solving tasks which stimulate high-quality mathematical talk and reasoning.

In order to ensure that our children’s needs are met and exceeded at all levels with a mastery approach, we work closely maths specialists (South Yorkshire MathsHub) and have invested, and continue to invest, in high-quality staff CPD. To add to this, we have invested significantly in a wide range of maths resources, both virtual and concrete to support a CPA approach to mastery (See below).

However, we are very aware that there are many other factors that contribute to high-quality teaching and learning with a mastery approach. Below are our key principles to our approach to teaching with a mastery approach.

Mathematical talk and Vocabulary

At Birkwood Primary School, we ensure that our children are constantly exposed to mathematical language and use it consistently throughout school. We also have displays which link the written words to mathematical symbols; we believe exposure to these is vitally important. All classrooms have current, age appropriate vocabulary lists that children are encouraged to use. We provide opportunities for our children to talk about mathematics and apply a range of new and previously acquired vocabulary. To support this, we implement STEM sentences to promote mathematical communication. We also use these sentence stems as a tool for teachers to formatively assess understanding. We have high expectations and consistently reinforce that our children are able to use correct mathematical terminology, as we believe this is one of the main contributors to our children’s development of reasoning (Maths Talk).

Concrete, Pictorial, Abstract

At Birkwood Primary School, we have adopted a CPA approach to the teaching of mathematics. We believe it is important that children understand what they are doing and why. Therefore, we initially explore a new concept with the use of concrete manipulatives. Alongside these, we use pictorial representations of the concrete to allow children to experience varied fluency, ultimately internalising the concept being taught. We aim to provide a range of representations of the mathematical concept being taught promoting deeper understanding. During the abstract stage, once children developed a solid understanding, achieved through the concrete and pictorial stages, they will move to the abstract concept. We provide opportunities throughout this stage for children to explore, combining problem solving

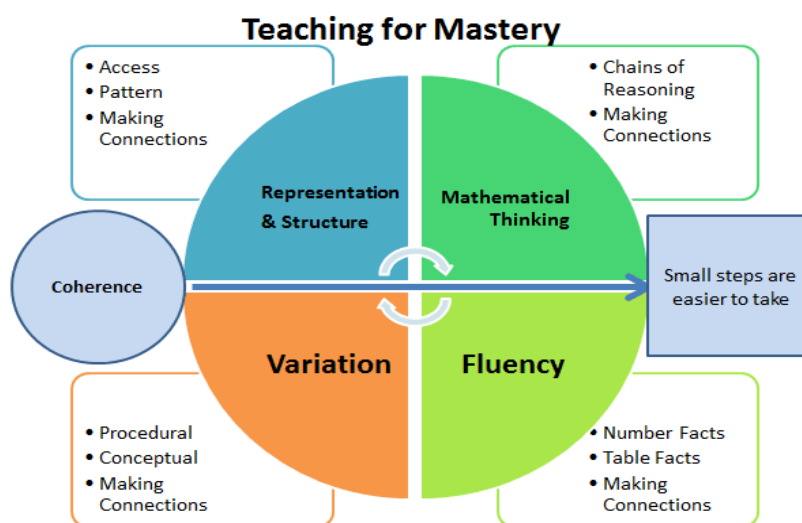
with mathematical symbols/ vocabulary, ultimately providing opportunities for children to reason and 'dive deeper'.

We understand that not all children work at the same pace and level and it may take some children to reach the abstract than others. We also recognise that this process is adaptable dependent on the needs of the children.

A Clear Rationale

Our teaching for mastery is underpinned by the NCTEM's 5 BIG IDEAS, consistently promoting:

- Coherence
- Representation and Structure
- Mathematical Thinking
- Fluency
- Variation



COHERENCE – Our lessons are broken down into small connected steps that gradually unfold a concept. Our aim is that, through our use of a CPA approach, children will develop a generalisation of the concept and ultimately apply the concept to a range of contexts.

REPRESENTATION AND STRUCTURE – Representations (Both concrete and pictorial) are used in our lessons to expose the mathematical structure being taught. We aim that ALL children progress to abstract, which is applying their new learning without recourse to the representations.

MATHEMATICAL THINKING – In order to promote, 'greater depth' in understanding, we promote the use of mathematical talk (linked with vocabulary and sentence STEMS) to allow children to think, reason and discuss their approach to a mathematical problem together.

FLUENCY – This is all based on the fundamentals of quick and efficient recall of facts and procedures, allowing children to move between different context and representations.

VARIATION – Our teaching provides variation in representation of the concept being taught. This is often in more than one way, to draw attention to critical aspects, and to develop deep and holistic understanding. Equally, specific sequencing allows children to understand what is kept the same and what changes, to connect the mathematics and draw attention to mathematical relationships and structure.

Mathematical Fluency

To compliment our approach, we have prioritised and invested in the development and retention of fluency throughout school, promoting the early acquisition of the fundamental building blocks of number facts and their interconnections to mathematical concepts. To support our approach to teaching and learning, to allow our children to know more and remember more, core skills are practised daily through the NCETM Mastering Number Programme (FS2 to Y2), and through 'Fluent in Five' Daily Practice (Y3-Y6).

We have a whole school systematic approach to teaching times tables (outlined in our Times table Policy). This incorporates the use of concrete, pictorial and abstract approaches making conceptual links to the real world. We introduce a new times table by building it around facts already known. Then we deepen learning and make links through exploring patterns, reasoning and investigation.

Through our expansive range of manipulatives and resources, used to complement our approach, we are committed to developing a strong link between acquiring fundamental facts and developing procedural fluency, in conjunction with opportunities to develop conceptual understanding of mathematical ideas that underpin these. We believe that the development of fluency will work to reduce cognitive overload when working coherently between the 5 BIG IDEAS.

Summary

We recognise, and are committed to, ensuring that our children have an early mathematical fluency that is consistently rehearsed, revisited and applied before deepening their understanding through tackling varied and challenging problems in classrooms. We value that children must obtain mathematical fluency early, be exposed to, and experience regularly, a range of representations/ structure of mathematical concepts in order to 'see the maths', and then have the opportunity problem solve and reason without recourse to representations.

In addition, we believe that by focusing on bringing the curriculum to life through our CPA technique, our delivery through the '5 BIG IDEAS' and creating classrooms that are rich in mathematical vocabulary and talk, we are providing the best possible opportunity for our children to become immersed in our 'Maths mastery' approach.

Most importantly, we are committed to consistently providing this high- quality mathematics education and truly believe that, by implementing the above, we can instil in our children a life-long love of mathematics.

At Birkwood Primary School, we believe that all children can succeed in maths, and we hope to instil in them a life-long love of mathematics.