

Maths Mastery at Thornhill Primary School

Rationale

The 2014 changes to the national curriculum in mathematics set out three main aims: to become fluent in the fundamentals of mathematics; to reason mathematically and to solve problems. The rationale for this change is that England is significantly underachieving in terms of developing mathematicians capable of success at GCSE and A-Level. The journey to this success begins at Primary level and recent research suggests that those groups identified as able mathematicians are simply allowed to progress through the curriculum at a faster pace. This promotes procedural learning at the expense of deep understanding.

What is Maths Mastery?

The Mastery-learning model forms the basis of our approach to traditional teaching. This means spending greater time going into depth about a subject as opposed to racing through the things that all children should know. Previously, racing through content led to some children having large gaps in subject knowledge because the concept they had just learnt was either too big or learnt too quickly. As a Primary school, it is our duty to ensure that children have an absolutely solid, concrete understanding of subject knowledge and skills as well as being emotionally resilient for secondary school. It is about deep and sustainable learning for all children.

What Defines Mastery Teaching?

Teaching for mastery is underpinned by 5 key principles:

1. Cohesion: Sufficient time is spent on well planned sequences to ensure that key concepts are developed and deeply embedded before moving on.
2. Representation and structure: Mathematical concepts are explored and understood through strong models and images such as Base 10, 10-grids, Numicon, block modelling, Cuisenaire.
3. Fluency: Factual knowledge (e.g. number bonds and times tables), procedural knowledge (e.g. formal written methods) and conceptual knowledge (e.g. of place value) are taught in a fully integrated way and are all seen as important elements in the learning of mathematics. Children are able to efficiently select the best method from a variety that they have developed to solve problem.
4. Variation: Conceptual variation and procedural variation are used extensively throughout teaching, to present the mathematics in ways that promote deep, sustainable learning. This is especially evident in the practice that children are given in each session.

5. Deep mathematical thinking: The reasoning behind mathematical processes is emphasised. Teacher/pupil interaction explores in detail how answers were obtained, why the method/strategy worked and what might be the most efficient method/strategy.

What does it look like at Thornhill Primary School?

The mastering of mathematical concepts through a curriculum that prioritises deep, sustainable understanding over 'getting the answer right' is achieved in a number of ways.

For example:

As a school, we follow White Rose Maths which breaks down the curriculum into small steps.

In our lessons, all children are working to achieve the same age-related expectation learning objective. They all have the same learning intention and access an active and engaging input that includes a range of concrete, pictorial and abstract representations to enable deeper understanding.

All our lessons begin with children completing a series of fluency questions.

Teacher-led discussion is interspersed with short tasks involving pupil to pupil discussion and completion of short activities.

Children then have the opportunity to engage in discussion, guided learning (where necessary) before participating in independent learning where they can apply their understanding, secure their conceptual understanding and act metacognitively. During this time, adults facilitate learning through questions and sentence stems, as well as live assessment, so that children gain security for themselves in the mathematical learning.

The whole class is taught mathematics together, with no differentiation by acceleration to new content. The learning needs of individual pupils are addressed through careful scaffolding, skilful questioning and appropriate rapid intervention, in order to provide the necessary support and challenge.

Formative assessment is carried out throughout the lesson; the teacher regularly checks pupils' knowledge and understanding and gives verbal feedback accordingly.

Maths in the Early Years

In our Early Years unit, the children follow the EYFS curriculum. This entails a lot of 'hands-on' learning but, most importantly, we also plan carefully to ensure the children have concrete and pictorial experiences of number. Our intent is for children to become experts in the numbers 1-20. We want them to be confident with counting but it is also key for later mathematical development that they are beginning to add and subtract as well as show a deep, conceptual understanding of place value. We do this by following White Rose Maths.