Mastery in Mathematics at Hipsburn Primary School

What is teaching for mastery?

We use the phrase 'teaching for mastery' to describe a range of elements of classroom practice and school organisation that we combine to give pupils the best chance of mastering mathematics.

So, mastering maths means acquiring a deep, long-term, secure and adaptable understanding of mathematics. At any one point in a pupil's journey through school achieving mastery means acquiring a solid enough understanding of the maths that has been taught so far so that pupils can then apply this understanding to complex problems.

We are embedding and sustaining our mastery approach based on these key principles:

Problem solving

Mathematical problem-solving is at the heart of our approach. Pupils are encouraged to identify, understand and apply relevant mathematical principles and make connections between different ideas. This builds the skills needed to tackle new problems, rather than simply repeating routines without grasping the principles.

High expectations

We believe no child should be left behind. We focus on pupils 'keeping up not catching up'. By making high expectations clear, learners are encouraged to build confidence and resilience.

Concrete, pictorial, abstract

Objects, pictures, words, numbers and symbols are everywhere. Our approach incorporates all of these to help pupils explore and demonstrate mathematical ideas, enrich their learning experience and deepen their understanding. Together, these elements help cement knowledge so pupils truly understand what they have learnt.

Depth before breadth

All learners benefit from deepening their conceptual understanding of mathematics, regardless of whether they have previously struggled or excelled. We believe pupils must be given time to fully understand, explore and apply ideas, rather than accelerate through new topics. This approach enables learners to truly grasp a concept, and the challenge comes from investigating it in new, alternative and more complex ways.

Growth mindset

We believe our 'abilities' are neither fixed nor innate, but can be developed through practice, support, dedication and hard work. 'Natural talent' is just a starting point and does not determine who has more or less potential to achieve. This belief encourages a love of learning and resilience that enables everyone to achieve. Our growth mindset approach empowers pupils to become

resilient as well as to learn from their mistakes and see them as part of the learning process. This is true of all pupils regardless of their starting point or current attainment.

Mathematical language

The way pupils speak and write about mathematics transforms their learning. We use a carefully sequenced, structured approach to introduce and reinforce mathematical vocabulary. We will be asking pupils to explain their mathematics in full sentences. We are not just looking to hear the correct answer, but how they know it is the right answer. This is fundamental to building mathematical language and reasoning skills.

What does a mathematics lesson looks like at Hipsburn Primary?

Whole class together

We teach mathematics to whole classes and do not label children, for example there will be no 'lower' or 'higher' groupings. Lessons are planned based on formative assessment of what pupils already know and include all children in learning mathematical concepts. During the planning stage, teachers consider the scaffolding that may be required for children struggling to grasp concepts in the lesson and suitable challenges for those who may grasp the concepts rapidly.

Exploration

Instead of a 'Let me teach you…' approach or simply giving a learning objective as a starting point, children are encouraged to explore a problem themselves to see what they already know. To develop reasoning and deep understanding, many problems are set in real life contexts and carefully chosen practical resources and pictorial representations are used to explore these concepts. Pictorial representations appear in books as children show their understanding, rather than answers to a series of calculations.

Step by step approach

In order to ensure children have a secure and deep understanding of the content taught, we have previously used and followed the White Rose Maths Hub yearly overviews and plans. Moving on from the pandemic and addressing the needs of our children; we have been working with Maths Hub to introduce and use the NCTEM Prioritisation materials and resources in addition to White Rose resources to plan a step by step approach focusing on smaller steps. This provides an opportunity to recalibrate and prioritise our curriculum. Using the NCTEM Prioritisation we will are currently reviewing your current curriculum and considering: What has been taught? How thoroughly and under what conditions has it been taught? How effectively have children learnt, remembered and been able to apply what they have been taught?

Questions

Questions are used to probe pupils' understanding and responses are expected in full sentences, using precise mathematical vocabulary. Teachers use questioning throughout the lesson to check understanding. A variety of questions are used; however, you will hear the same ones being repeated, for example: How do you know? Can you prove it? Are you sure? Can you represent it

another way? What's the value? What's the same/different about..? Can you explain that? What does your partner think? Can you imagine…?

Discussion and feedback

During lessons pupils are given opportunities to talk to their partners and explain or clarify their thinking. There is more talking and may be less recording in books. We do not want children to attempt independent recording until we believe they are secure with the concept.

Differentiation has not disappeared

Our developing approach to differentiation is that we do not broadly differentiate through content, it is through the use of resources and questioning, as appropriate.

"You know you've mastered something when you can apply it to a totally new problem in an unfamiliar situation or context." Mastering Mathematics, Dr Helen Drury