

Mastery in Mathematics at Hipsburn Primary School

Hipsburn Primary School has started a new journey with mathematics and, at the end of last term, we became part of the Great North Maths Hub Mastery Workgroup Programme 2017.

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 developing our approach based on these key principles:

Problem solving

Mathematical problem-solving will be at the heart of our approach. Pupils will be 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 are starting to focus on pupils ‘keeping up not catching up’. By making high expectations clear, learners will be encouraged to build confidence and resilience.

Concrete, pictorial, abstract

Objects, pictures, words, numbers and symbols are everywhere. Our developing approach will incorporate 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 will be using a carefully sequenced, structured approach to introduce and reinforce mathematical vocabulary. We will be asking pupils to explain their mathematics in full sentences. We will not just look 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 will a mathematics lesson look like at Hipsburn Primary?

Whole class together

We will be teaching mathematics to whole classes and will not label children, for example there will be no ‘lower’ or ‘higher’ groupings. Lessons will be planned based on formative assessment of what pupils already know and we will include all children in learning mathematical concepts. During the planning stage, teachers will 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 will be encouraged to explore a problem themselves to see what they already know. To develop reasoning and deep understanding, many problems will be set in real life contexts and carefully chosen practical resources and pictorial representations will be used to explore these concepts. Pictorial representations will 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 will be following the White Rose Maths Hub yearly overviews and plans. These plans have been adjusted to allow more time to be spent on topics, and we will make use of small, carefully crafted steps to support deeper understanding.

Questions

Questions will probe pupils' understanding and responses will be expected in full sentences, using precise mathematical vocabulary. Teachers will use questioning throughout the lesson to check understanding. A variety of questions will be 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 will have opportunities to talk to their partners and explain or clarify their thinking. There will be 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