Maths in the early years

MRS HALL

FOUNDATION STAGE LEADER

How is maths taught in the early years?

- We follow the white Rose mastery programme; https://whiterosemaths.com/
- Children are taught through play.

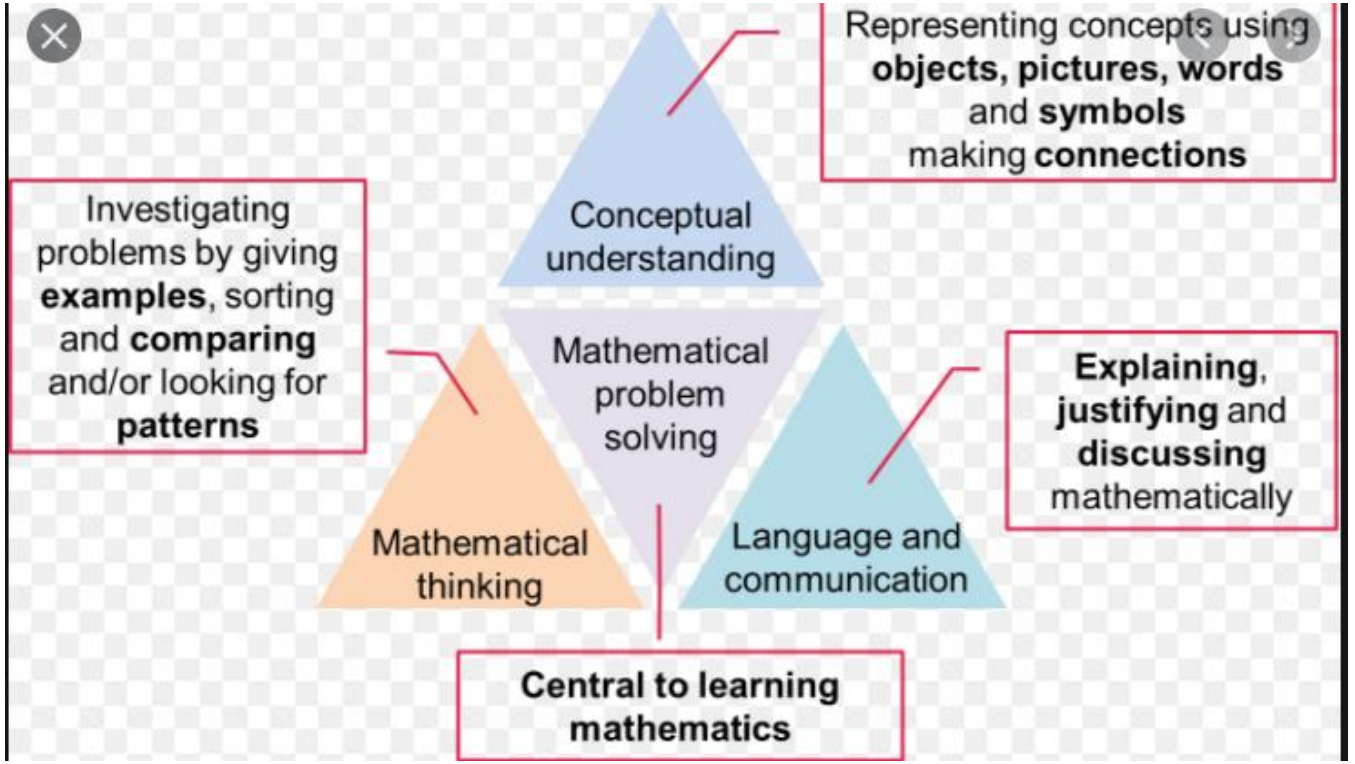
What is mastery?

There are three levels of learning:

- Shallow learning: surface, temporary, often lost
- Deep learning: it sticks, can be recalled and used.
- Deepest learning: can be transferred and applied in different context.
- The deep and deepest levels are what we are aiming for by teaching maths using the Mastery approach. A mathematical concept or skill has been mastered when a child can show it in multiple ways, using the mathematical language to explain their ideas, and can independently apply the concept to new problems in unfamiliar situations.
- Mastery is a journey and long-term goal, achieved through exploration, clarification, practice and application over time. At each stage of learning, children should be able to demonstrate a deep, conceptual understanding of the topic and be able to build on this over time.

- Traditionally, Maths has been taught by memorising key facts and procedures, which tends to lead to superficial understanding that can easily be forgotten.
- Children should be able to select which mathematical approach is most effective in different scenarios.
- All pupils can achieve in mathematics! There is no such thing as a ‘Maths person’, that is the belief that some pupils can do maths and others cannot. Teaching for Mastery involves:

Key Principles



Teaching for Mastery involves:

- High expectations for all children
- Fewer topics covered in greater depth over a longer time
- Number sense and place value coming first
- Problem solving is central, ensuring an understanding of why it works so that children understand what they are doing rather than just learning to repeat routines without grasping what is happening
- Challenge being provided through greater depth, rather than accelerated content (moving into next year's concepts) – this allows children to deepen their knowledge and improve their reasoning skills rather than accelerating on to new curriculum
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Concrete, Pictorial, Abstract

- Multiple Representations For All Concrete, pictorial, abstract Objects, pictures, words, numbers and symbols are everywhere. The mastery approach incorporates all of these to help children explore and demonstrate mathematical ideas, enrich their learning experience and deepen understanding. Together, these elements help cement knowledge so pupils truly understand what they've learnt. All pupils, when introduced to a key new concept, should have the opportunity to build competency in this topic by taking this approach.
- Pupils are encouraged to physically represent mathematical concepts. Objects and pictures are used to demonstrate and visualise abstract ideas, alongside numbers and symbols. Concrete – children have the opportunity to use concrete objects and manipulate them to help them understand and explain what they are doing. Pictorial – children then build on this concrete approach by using pictorial representations, which can then be used to reason and solve problems.
- Abstract – with the foundations firmly laid, children can move to an abstract approach using numbers and key concepts with confidence.

Number at the Heart

- A large proportion of time is spent reinforcing number to build competency and fluency.
- Number is at the heart of Mastery, with more time devoted to this than other areas of mathematics. It is important that pupils secure these key foundations of Maths before being introduced to more difficult concepts. This increased focus on number will allow pupils to explore the concepts in more detail and secure a deeper understanding.
- Focus on Depth; Deepen understanding before accelerating content coverage. All pupils benefit from deepening their conceptual understanding of mathematics, regardless of whether they've previously struggled or excelled.
- Pupils must be given time to fully understand, explore and apply ideas, rather than accelerate through new topics. This approach enables children to truly grasp a concept, and the challenge comes from investigating it in new, alternative and more complex ways.

- Fluency; Involves Quick recall of facts and procedures. The flexibility and fluidity to move between different contexts and representations of mathematics. The ability to recognise relationships and make connections in mathematics Fluency (arithmetic) often gets confused for just memorisation – it is far more than this. Children need to be able to apply their fluency of facts and procedures into new contexts and representations, recognise relationships and make connections in mathematics. This should help pupils develop a deep conceptual understanding of the subject.
- Reasoning; The way pupils speak and write about mathematics transforms their learning. Teaching for Mastery involves carefully designed questions to enable pupils to explain the maths in full sentences with the correct vocabulary. They should be able to say not just what the answer is, but how they know it is correct. This is key to building mathematical language and reasoning skills.
- Problem Solving; Mathematical problem solving is at the heart of the Mastery approach. Pupils apply their skills of fluency to solve complex problems and real-life situations.

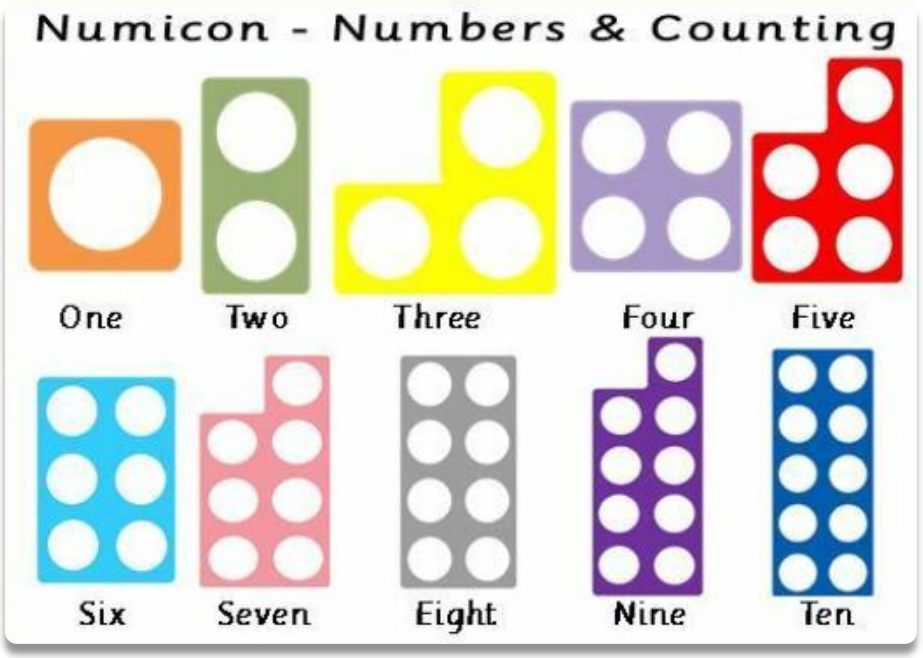
Effective Questioning

Teachers promote reasoning through carefully chosen questions, such as:

- _____ thinks that..... . Do you agree? Explain your answer.
- Is it always, sometimes or never true that _____?
- Can you spot the mistake? Explain how you know they are wrong.
- True or false?
- Spot the odd one out.
- Why?

Teachers will ensure fluency skills are secure and then facilitate deeper learning by using reasoning and problem solving. For example, if the learning intention is to add two number together those that secure this concept quicky could be given the problem where they are given the answer and they have to find the sum.

Other methods and manipulates



- We have discussed pictorial, part whole models, ten frames.
- Other manipulatives that we use in class are numicon, number lines (summer term/Year 1)

How can you help your child at home?

Maths learning can take place anywhere!

- Maths is all around us, so look for opportunities for you to do some problem solving together.
- Follow a recipe: work together to find the quantities needed.
- Talk about the weather forecast: is the temperature today higher or lower than yesterday's? What do the numbers mean?
- Talk about the day, date, month, season. What month were they born? What month is their sister born? How many months in a year?
- Shopping: discuss the cost of items. Let your child count out the coins when paying and discuss the change you should get back. Coins can be used to explore addition, subtraction, multiplication and division.
- Time; what time is it? What time do they get up/ go to school/ have tea? Read the time to the hour. Problem solve; it is 2 oclock, in one hour the time will be?

Useful websites

- https://www.ncetm.org.uk/teaching-for-mastery/
- https://www.ncetm.org.uk/classroom-resources/ey-numberblocks-series-1-episodes-1-15/
- https://whiterosemaths.com/
- https://www.ictgames.com/mobilePage/index.html