The Why, How and What of Mastery at St Mark's

Our Aim: To develop our forward thinking, dynamic and systematic teaching of Mathematics at St Mark's

Why are we using a Mastery approach to teaching Mathematics?

As a school over the past three years (2016, 2017, 2018), we were in the bottom 20% for progress in Maths for our middle prior attainers and our attainment in Maths had been the lowest of the core subjects at the end of KS2 for these past three years. Therefore, we began looking into effective ways of raising not only these attainment and progress scores but also the true understanding of mathematics, giving a secure building block for all concepts as children move into their secondary maths career. In 2019, we saw positive progress (1.73) and above average attainment in maths (89% EXP+). Within this, 88% of prior middle attainers met the expected standard or better of which 18% met the higher standard.

The 2014 curriculum encourages a mastery approach and introduction of the 'Expected Standard' for each year group emphasises the importance of children achieving sets of key skills and knowledge. This approach dictates that children, once meeting the objectives, are extended through questioning, deep analysis and exploration to broaden their knowledge, thus ensuring that concepts are fully and securely understood before moving onto new objectives.

The benefit of this approach is it caters for all styles of learners, ensures secure learning for higher attaining children and time and support for children that find Maths more challenging to keep up with their peers.

How will children achieve mastery in Mathematics?

The Mastery approach to Maths has 5 key features (Big Ideas) that work together to ensure children make links across and within maths concepts and therefore developing their deeper understanding of mathematics.

Representation and Structure

It is important that children see maths represented in a variety of ways to ensure they see links between the areas and are able to develop a secure understanding. This builds on the CPA approach (Concrete, Pictorial and Abstract). By using concrete objects children can play, explore, move and rearrange representations of real life objects e.g. 6 counters represent 6 cars. They then move to representing this as drawings, circles, cars, part-part-whole or bar modelling. Ultimately we want children to be fluent with using and understanding abstract number and concepts. Through exploring maths with objects and pictures first the abstract takes on more meaning for children and they have a secure base on which to build more complicated concepts. This approach enables less confident mathematicians to build and develop new knowledge securely. For more confident mathematicians who may say 'I just know the answer' it gives them the tools to explain their reasoning.

Mathematical thinking

Through developing children's mathematical vocabulary they are better able to talk about their ideas and processes. They can 'prove' how they know they are correct or reason why an answer is incorrect. Having the language in their artillery and being able to use it with further confidence empowers children to think more deeply about the concept.

Fluency

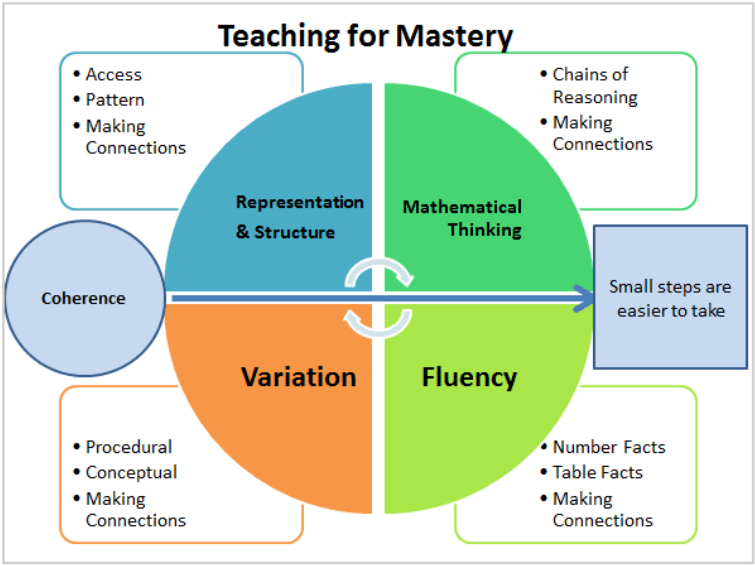
Greater emphasis is placed on learning number facts by wrote including number bonds and all multiplication and related division facts. Once these facts are known automatically it releases the brain to use and apply them to a variety of mathematical concepts.

Variation

This is multiple representations of what a concept is as well as what it is not. It is a carefully constructed small-step journey through the learning, paying attention to what is kept the same and what changes in order that pupils might reason, make connections and build deep, conceptual knowledge. Careful attention is paid to the selection and order of the examples and questions, often changing just one aspect while keeping the others the same.

Coherence

These four ideas all feed in to the final big idea of Coherence. This is where the above skills contribute to a true understanding of mathematics through making connections and promoting thinking. This deep understanding leads to the ability to apply learning to multiples contexts and solve problems. It develops an understanding of how and why mathematics works. In terms of procedural fluency and conceptual understanding, one should not be prioritised over the other but learning is most effective when the two are fully integrated.



Taken from: https://www.ncetm.org.uk/resources/50042

What does it look like in the classroom?

You will find the teacher engaging in whole class teaching, developing carefully scaffolded examples to build knowledge through small steps. As part of the learning sequence, children will be using manipulatives, drawings, diagrams and models as well as calculations to explore concepts and secure their knowledge and understanding.

Children spend much longer than previously on core concepts to ensure that they are secure and embedded before moving onto new learning. Children who grasp concepts quickly will be encouraged to explore their learning to a deeper level through mathematical thinking, reasoning and problem solving. This could be through explanation, applying their knowledge to different situations, solving problems and completing investigations. They will not necessarily be doing a different task to their peer group but instead will be deepening their understanding and encouraged not to 'rush ahead' with new tasks. Children who are

struggling to grasp concepts are not given easier work to do but are supported through targeted and immediate intervention or use of resources.

Further Reading:

www.ncetm.org.uk/resources/45776

www.ncetm.org.uk/public/files/19990433/Developing_mastery_in_mathematics_october_2014.pdf