



Developing Mathematical Mastery in the Early Years Foundation Stage

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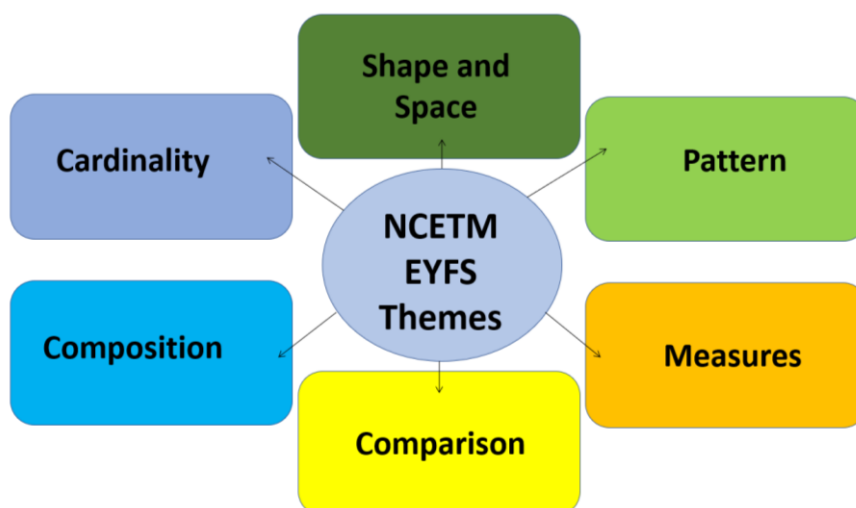
Developing Mathematical Mastery in the Early Years Foundation Stage

Aims:

Development Matters (Early Education, 2102, p. 2) states:

Children are born ready, able and eager to learn. They actively reach out to interact with other people, and in the world around them. Development is not an automatic process, however. It depends on each unique child having opportunities to interact in positive relationships and enabling environments.

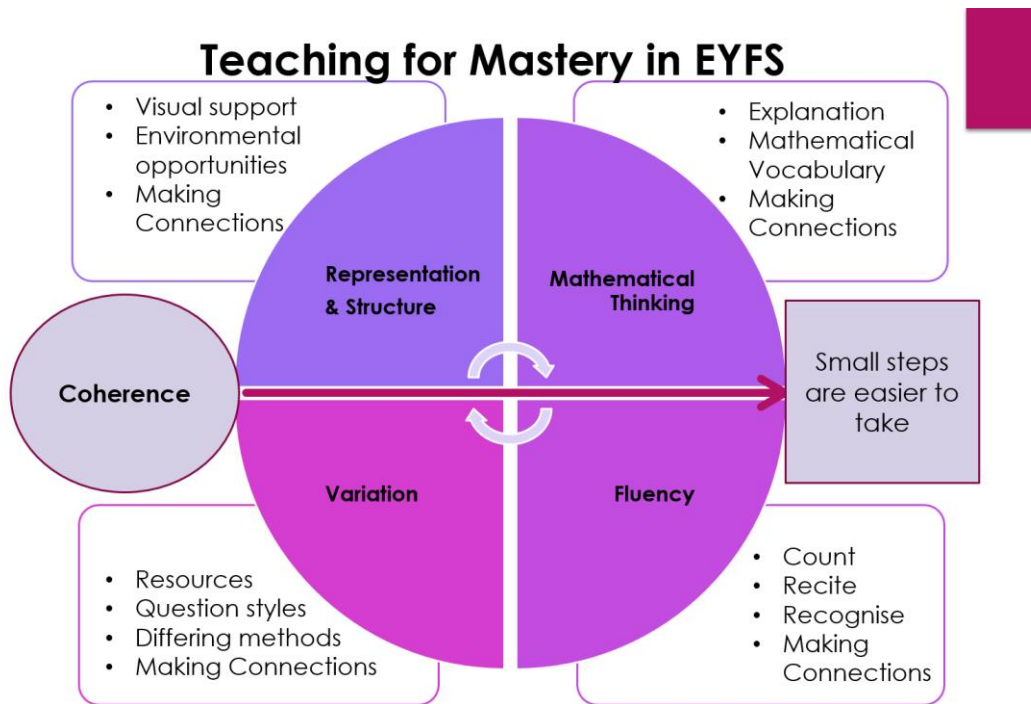
Our aim is to ensure that all children in the foundation stage develop firm mathematical foundations in a way that is developmentally and age appropriate and engaging. In FS1 and FS2 at Tinsley Meadows, we use the six areas of early mathematics learning defined by the NCETM to guide our teaching and learning for mathematical mastery.



We ensure that the experiences and opportunities provided for the children are aligned with the themes and principles of the Early Years Foundation Stage. All learning experiences acknowledge the importance of play-based practice and pedagogy as the means through which children can practise and consolidate learning and understanding through play and in relation to their own current interests and fascinations, to lay the bedrock of foundations upon which further maths learning and teaching can be built as they move into Y1. We regularly consult the progression documents for the six areas of early years maths learning on the NCETM website as an extremely informative source of mathematical teaching, progression and learning in the early years.

The five big ideas

We draw on the NCETM's five big ideas to consider how teaching for mastery looks in an early years context when supporting children to develop their mathematical thinking and understanding.



Coherence

In helping children to develop mathematical coherence we understand that:

- Small steps are easier to take
- Focussing on one key point each lesson allows for deep and sustainable learning
- Certain images, techniques and concepts are important pre-cursors to later ideas
- Sequencing is an important skill in planning and teaching for mastery
- When something has been deeply understood and mastered, it can and should be used in the next steps of learning

Representation and structure

Children are encouraged to understand mathematical representation and visualising structures by:

- Representing concepts visually and exposing structures explicitly (e.g. of numbers, amounts or shapes)
- Aspiring that children will be capable of deep mathematical thinkers without the need of visual structures or representation.

- Using stem sentence to describe representation to help children move to working in the abstract
- Introducing children to key representations systematically to demonstrate their importance
- Showing that 'pattern' and 'structure' are related but different concepts
- Understanding that children may have seen a pattern without yet understanding the structure which causes that pattern.

In the EYFS this involves the provision of visual support and learning opportunities in both the indoor and outside environment to support children to make connections.

Variation

Teaching with variation is to highlight the essential features of a concept or idea in a range of different ways. This helps children to understand:

- What the concept is (as varied as possible), and what it is not
- How the examples are connected and the mathematical structures that are being highlighted.

In the EYFS this involves careful consideration of the resources that are provided, the use of different question styles or methods of teaching and learning.

Fluency

Children are supported and encouraged to develop fluency through their mathematical thinking and explorations. Fluency demands:

- The flexibility to move between different contexts and representations of mathematics
- The ability to recognise relationships and make connections and to make appropriate choices from a whole toolkit of methods, strategies and approaches
- More of learners than memorisation of a single procedure or collection of facts. It encompasses a mixture of efficiency, accuracy and flexibility

In the EYFS this involves supporting children to learn how to count accurately and confidently, and to recognise patterns, relationships, similarities or differences.

Mathematical thinking

The development of mathematical thinking is central to deep and sustainable learning of mathematics. We aspire that our children:

- Deeply understand and enjoy experiencing mathematics learning and teaching

- Take ownership of ideas and concepts and use them in their own contexts, rather than passively 'receiving' them
- Develop thinking, reasoning and discussion skills
- Can reason logically, using skills of explaining, estimating and proving
- Use their mathematical thinking skills to:
 - Look for 'patterns' in order to determine 'structures'
 - Look for relationships and connecting ideas

In the EYFS this involves being able to provide explanations and having a wealth of mathematical vocabulary.

Principles:

We understand that children's mathematical mastery and mastery orientation is most regularly securely demonstrated (and appreciated by adults) in the depth of children's involved play, which is supported by adults who are also confident in the open-endedness of mathematical exploration and discovery. To encourage and nurture true mathematical mastery in the EYFS, the staff team are supported to tune in to children's interests and fascinations, give them time and space to explore through play, be genuinely fascinated and engage sensitively with them when 'teachable moments' are possible.

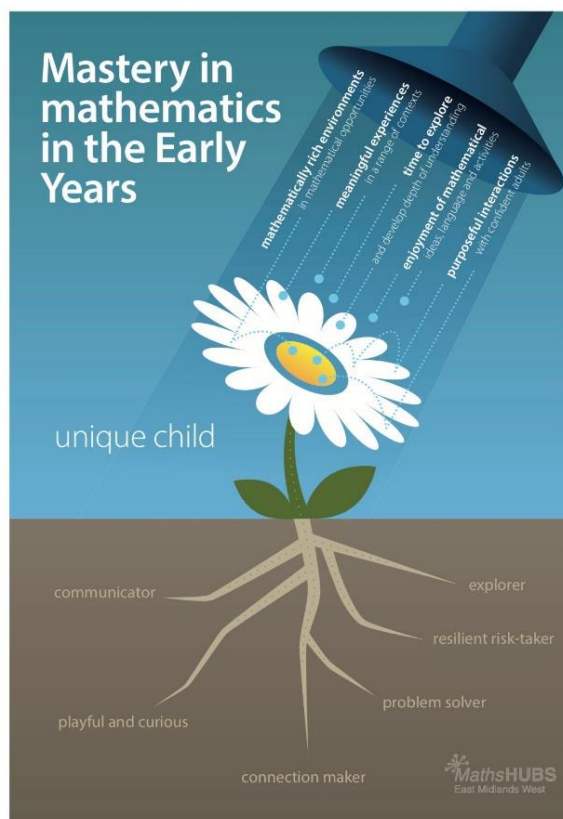
The team understand that there is mathematical learning potential in every area of provision and in any interaction across the foundation stage. Asking open-ended questions and encouraging children to set and solve their own problems through sustained, shared thinking ensures that interactions are genuinely interesting and supportive. Encouraging children to explain their thinking and actions in greater detail supports and develops their thinking and understanding of concepts that may be newer to them.

Children are encouraged to make links between previous learning and new learning to develop their understanding. This meta-cognitive process gives children a greater awareness of their own thought processes. The environment is key to allowing children to revisit mathematical concepts introduced during whole-class teaching sessions in their own contexts and by following their own interests. Children need time to explore their ideas on their own and with others in continuous provision.

We use the characteristics of effective learning to recognise mathematical mastery and support children's development of mastery dispositions and skills. Children are supported to develop 'mastery orientation' by *playing and exploring (engagement)* and putting their learning into practice. They use *active learning (motivation)* to engage their brain and body in deep and meaningful ways linked to their interests and fascinations, which leads to *creating and thinking critically*

(**thinking**) as they understand and master the concepts, skills and knowledge they have learnt in meaningful ways.

This is illustrated in the diagram below:



Short- and long-term priorities:

Following a two year participation with the SSELP cluster of schools in the ‘Talk for Maths Mastery’ initiative, which recognises the importance of children’s conversational talk in their understanding of mathematics, the early years maths subject lead maintains an action plan which details the current focus for the team during the year. Each sub-team (those working with 2 year olds, 3-4 year olds, and 4-5 year olds in Reception) agree and work on a range of action points, chosen to develop our work in supporting children, families and our own work as practitioners. These action points are reviewed and modified as necessary throughout the year during discussion at FS team meetings.