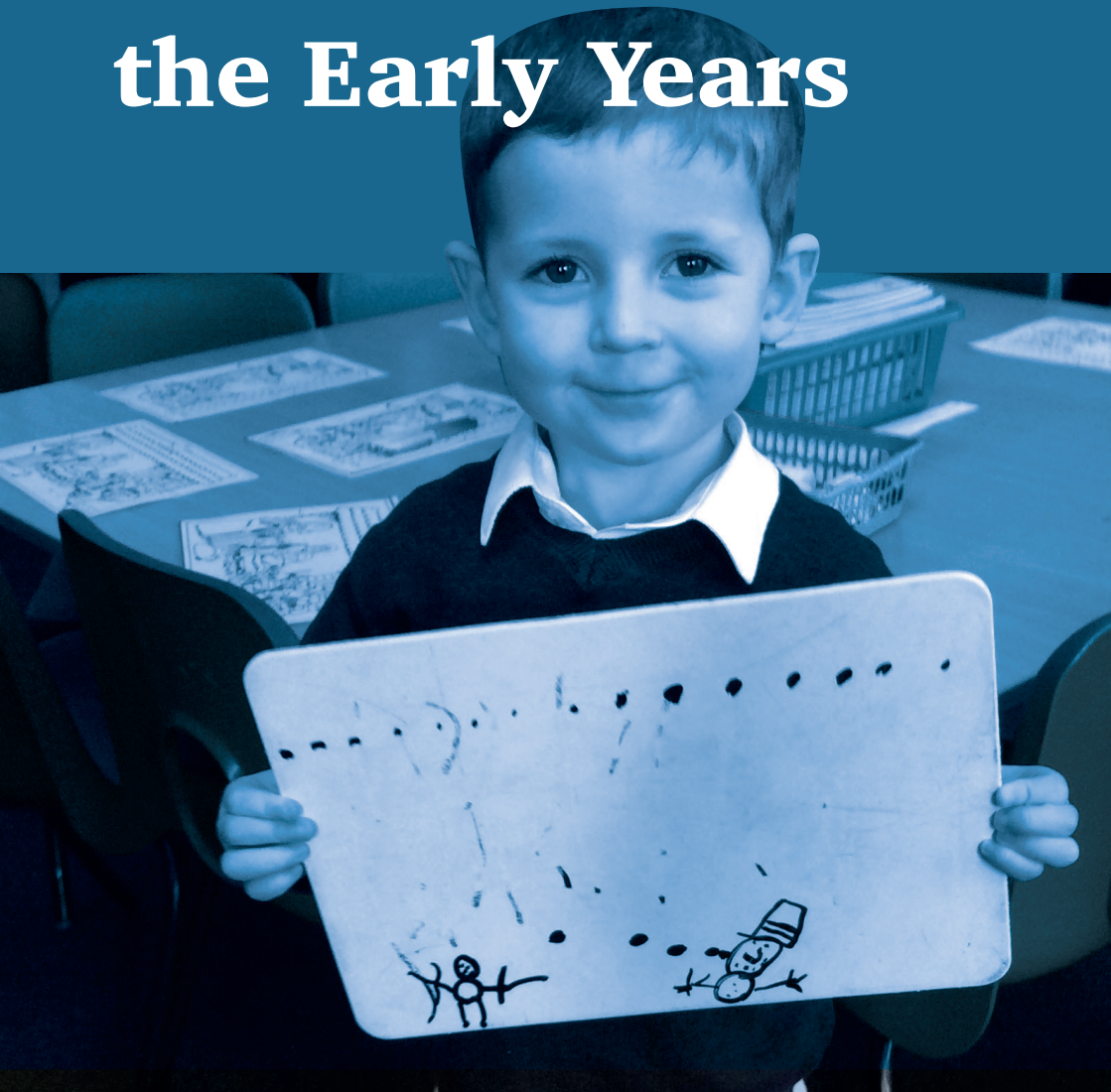


Mastery in Mathematics in the Early Years



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Principles of nurturing mastery in mathematics in the Early Years

- The characteristics of effective learning are essential to learning and development within mathematics
- Practitioners enact the belief that all children are effective, competent and secure mathematicians.
- Quality play is essential within a mastery approach in early years
- In addition to mathematics throughout all areas of provision, all children experience the same shared mathematics together in short daily focussed sessions.

- Differentiation is achieved by emphasising deep knowledge and through individual support and intervention.
- Communication (verbal and nonverbal) is modelled and encouraged in a variety of ways including the careful and precise use of mathematical vocabulary
- Reasoning mathematically is modelled, planned for and assessed within the child's holistic mathematical development
- Mathematical thinking is highly valued with an emphasis upon the child's process within activities
- Concrete, practical experiences underpin mathematical learning
- Engagement with a range of resources and representations support children to think flexibly and to see multiple ways to approach and solve problems
- Mastery is achieved through quality time, repetition and extended periods on an aspect of mathematics to enable deeper and more connected thinking (both provided by the practitioners and self-selected by the children)
- Children are provided with carefully chosen examples and problems that help them to see connections and relationships
- Children are encouraged to approach mathematical challenges with positivity and confidence.





What do I need to do?

Early Years practitioners need to:

- ✓ Portray confidence, enjoyment and positivity in sharing mathematics with children
- ✓ See and explore mathematical opportunities everywhere
- ✓ Encourage, listen and engage with children's mathematical talk
- ✓ Recognise and celebrate mathematics as a fundamental aspect of child development and a child's understanding of the world around them

- ✓ Assess children's mathematics continually to collect consistent and varied evidence of mastery over time in a variety of experiences and contexts.
- ✓ Create opportunities for children to succeed within memorable mathematical experiences
- ✓ Provide enabling environments where opportunities for problem solving are deeply embedded
- ✓ Provide challenge through low threshold/high ceiling¹ activities, resources and experiences which can be simultaneously accessed by all children
- ✓ Plan and adapt continuous provision to meet the children's developing mathematical understanding
- ✓ Support children to make connections in mathematics including application to a range of contexts and experiences relevant to the child
- ✓ Encourage depth in mathematical understanding through sustained exploration of key mathematical ideas which children can revisit regularly to encourage fluency and embed understanding
- ✓ Model a 'can-do' attitude towards problems solving and encourage resilience when challenges occur
- ✓ Effectively scaffold mathematical learning through modelling mathematical thinking as a varied process, following a range of strategies and directions to deepen understanding.

¹ *Low threshold/high ceiling activities are accessible to all (including those with limited or no prior experience) but contain sufficient scope to provide significant challenge even when the activity is very familiar. Read more at: <http://nrich.maths.org>*



Key Features of Mastery in Early Years

A Unique Child

Every child is a unique child who is constantly learning and can be resilient, capable, confident and self-assured.

 Taking a mastery approach, differentiation occurs in the support and intervention provided to each unique child. There is no differentiation in content taught, but the questioning and scaffolding individual pupils are provided with or select in the setting will differ with rapid graspers challenged through more demanding problems which deepen their knowledge of the same content. Children's difficulties and misconceptions are identified through ongoing observation (within holistic assessment) and addressed through opportunities within continuous provision and skilful interaction with practitioners. The unique child is supported to self-select meaningful resources and methods and to communicate mathematically in a variety of ways.

Mastery in mathematics in the early years diagram

Strong dispositions (roots) are developed where practitioners nurture this growth with a range of provision (water) which enable children to demonstrate mastery in mathematics in the early years and beyond.



Mastery in mathematics in the Early Years

unique child

mathematically rich environments
in mathematical opportunities

meaningful experiences
in a range of contexts
and develop depth of understanding

time to explore
enjoyment of mathematical
ideas, language and activities

purposeful interactions
with confident adults

communicator

explorer

resilient risk-taker

playful and curious

problem solver

connection maker

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Positive Relationships

Children learn to be strong and independent through positive relationships

Practitioners are clear that their role is to support children to be confident and independent mathematical thinkers. This makes it possible for all children to engage successfully with a range of challenging tasks. Concepts are often explored together to make mathematical discoveries which make relationships explicit and strengthen children's understanding of connections in mathematics. Collaboration with peers is key within this. Relationships support emotional security and enable mathematical risk taking and resilience. Factual knowledge is developed through conceptual understanding and is rooted within concrete experiences.



Enabling Environments

Children learn and develop well in enabling environments, in which their experiences respond to their individual needs and there is a strong partnership between practitioners and parents and carers.

Within a mathematically rich environment there are mathematical possibilities everywhere. There are timely opportunities to extend, apply and revisit learning in many different contexts and these are regularly selected by the children. Flexibility of approach, location and resources is encouraged. All children have continual access to opportunities to explore mathematical ideas in a concrete, pictorial and abstract way. Children are provided with opportunities for mathematical mark-making and access to a variety of formal and informal representations. Home and out of school mathematical learning is acknowledged and celebrated.



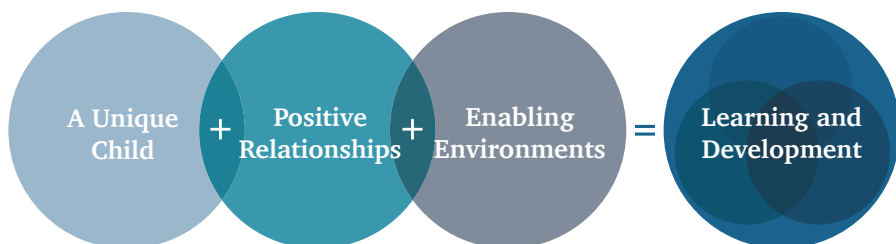


...Leading to Learning and Development

Children develop and learn in different ways. Practitioners teach children by ensuring challenging, playful opportunities.

Children are leaders of their own mathematical learning and are supported by skilled practitioners and an enabling mathematical environment. Children develop mathematical mastery in the context of positive relationships and the environment around them. Mathematical learning is planned for in a range of ways including daily focussed mathematics sessions, continuous provision and focussed interventions. Assessment for mastery includes continual observation and action which is shared regularly through dialogue with practitioners, parents and children. The focus within curriculum design should be upon exploring key content in considerable depth particularly at the earliest stages. The characteristics of effective learning are the characteristics of effective maths learning:

- Playing and exploring
- Active learning
- Creating and thinking critically



Further Reading

This document draws upon the Early Years Foundation Stage framework, including the guiding principles of early years practice and characteristics of effective learning.

This can be accessed:

 <https://www.gov.uk/government/publications/early-years-foundation-stage-framework--2>

For further information or training about mastery in the early years, please contact East Midlands West Maths Hub:

 <http://www.george-spencer.notts.sch.uk/index.php/maths-hub>





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