



BROOK INFANT SCHOOL
AND NURSERY

Our Journey to become a mastery school

Overarching Vision

At Brook Infant School, our teaching of mathematics is based on a mastery approach in the belief that every child is capable of success.

We believe that every child can achieve in maths and it is our responsibility as teachers to provide the environment and experiences to make this possible. As teachers, we know that every child is a capable mathematician with the ability to reason and problem solve. Problem solving and reasoning are at the heart of our curriculum, built on foundations of exploration and discovery in early years. Children make links between old and new learning experiences in order to develop fluency and build a deeper understanding of their maths. Opportunities for reasoning, exploration and clarification are provided through talk and problem solving. At Brook Infant School, every child in every classroom is encouraged and supported to have an “I can solve anything” attitude and to develop perseverance and resilience through the philosophy of ‘learning tools’.

We will endeavour to achieve this by:

- Constantly striving to find and create better ways of pursuing our goals
- Providing a happy, supportive and safe environment in which everyone can achieve their full potential
- Being truly inclusive and giving every child the opportunity to develop talents
- Encouraging everyone to become creative, motivated and life-long learners prepared for an ever-changing, global community
- Valuing and respecting every member of the school community
- Recognising and celebrating success

Brook Infant School Teaching for Mastery

Our aim at Brook Infant School is for all children to enjoy mathematics and have a secure and deep understanding of fundamental mathematical concepts and procedures when they leave us to go to Junior School. We want children to see the mathematics that surrounds them every day and enjoy developing vital life skills in this subject.

Aims for our pupils

- To develop a growth mindset and positive attitude towards mathematics.
- To become confident and proficient with number, including fluency with mental calculation and look for connections between numbers.
- To become problem solvers, who can reason, think logically, work systematically and apply their knowledge of mathematics.
- To develop their use of mathematical language.
- To become independent learners and to work co-operatively with others.
- To appreciate real life contexts to learning in mathematics.

Introduction In September 2018, Brook Infant School began transitioning towards a mastery approach to the teaching and learning of mathematics. We understood that this would be a gradual process and take several years to embed. The rationale behind changing our approach to teaching mathematics lay within the NCETM Maths Hub Programme as well as the 2014 National Curriculum, which states:

- The expectation is that most pupils will move through the programmes of study at broadly the same pace.
- Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content.
- Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

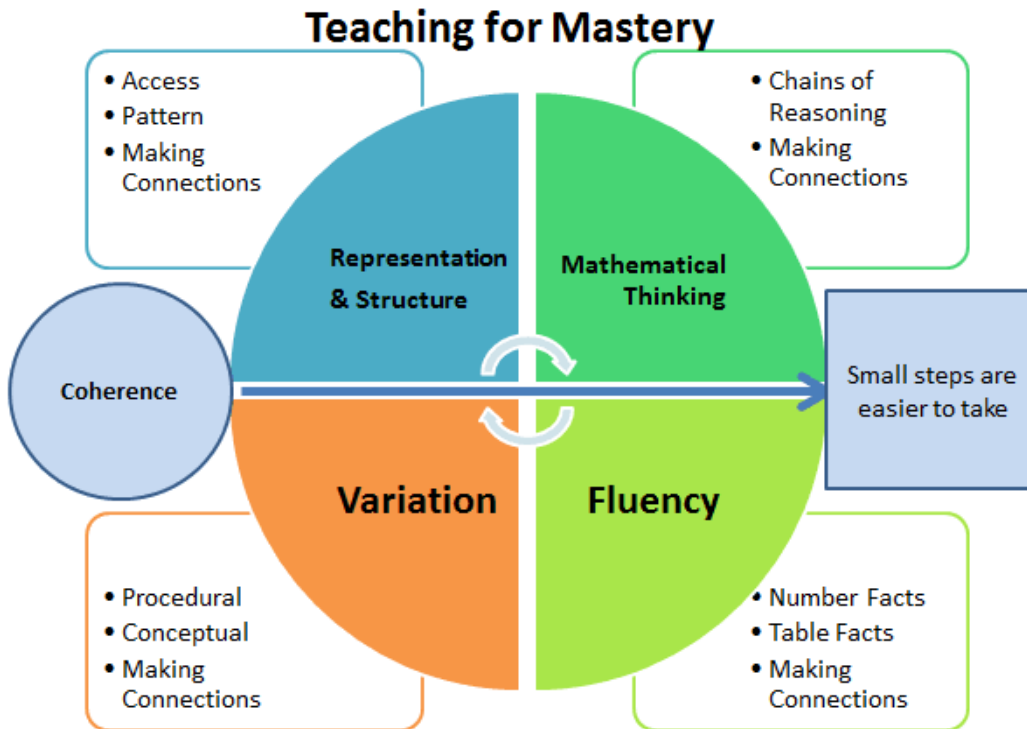
FLUENCY – REASONING – PROBLEM SOLVING

These three key aims of the National Curriculum should be addressed in each sequence.

Our classroom practices

1. Everyone can learn mathematics to the highest levels.
2. If you 'can't do it', you 'can't do it yet'.
3. Mistakes are valuable.
4. Questions are important.
5. Mathematics is about creativity and problem solving.
6. Mathematics is about making connections and communicating what we think.
7. Depth is much more important than speed.
8. Mathematics lessons are about learning, not performing.

Teaching for Mastery Principles (taken from NCTEM)



1. **Coherence.** Lessons are broken down into small connected steps that gradually unfold the concept, providing access for all children and leading to a generalisation of the concept and the ability to apply the concept to a range of contexts.
2. **Representation and Structure**
Representations used in lessons expose the mathematical structure being taught, the aim being that students can do the maths without recourse to the representation
3. **Mathematical Thinking**
If taught ideas are to be understood deeply, they must not merely be passively received but must be worked on by the student: thought about, reasoned with and discussed with others
4. **Fluency**
Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics
5. **Variation**
Variation is twofold. It is firstly about how the teacher represents the concept being taught, often in more than one way, to draw attention to critical aspects, and to develop deep and holistic understanding. It is also about the sequencing of the episodes, activities and exercises used within a lesson and follow up practice, paying attention to what is kept the same and what changes, to connect the mathematics and draw attention to mathematical relationships and structure.

What we believe...

- It is achievable for all – we have high expectations and encourage a positive ‘can do’ mindset towards mathematics in all pupils, creating learning experiences which develop children’s resilience in the face of a challenge and carefully scaffolding learning so everyone can make progress.
- Deep and sustainable learning – lessons are designed with careful small steps, questions and tasks in place to ensure the learning is not superficial.
- The ability to build on something that has already been sufficiently mastered – pupils’ learning of concepts is seen a continuum across the school. The ability to reason about a concept and make connections – pupils are encouraged to make connections and spot patterns between different concepts (E.g. the link between ratio, division and fractions) and use precise mathematical language, which frees up working memory and deepens conceptual understanding.
- Conceptual and procedural fluency – teachers move mathematics from one context to another (using objects, pictorial representations, equations and word problems). There are high expectations for pupils to learn times tables, key number facts (so they are automatic) and have a true sense of number. Pupils are also encouraged to think whether their method for tackling a given calculation or problem is Appropriate, Reliable and Efficient (A.R.E).
- Problem solving is central – this develops pupils’ understanding of why something works so that they truly have an appreciation of what they are doing rather than just learning to repeat routines without grasping what is happening.
- Challenge through greater depth - rather than accelerated content, (moving onto next year’s concepts) teachers set tasks to deepen knowledge and improve reasoning skills within the objectives of their year group.

Early Years Foundation Stage (EYFS)

Children in EYFS explore mathematical concepts through active exploration and their everyday play-based learning. Children are taught key concepts and develop number sense using a hands-on practical approach. EYFS practitioners provide opportunities for children to manipulate a variety of objects which supports their understanding of quantity and number. Pupils explore the ‘story’ of numbers to twenty and the development of models and images for numbers as a solid foundation for further progress. The CPA approach is used when teaching children key mathematical skills. Practitioners allow children time for exploration and the use of concrete objects helps to support children's mathematical understanding. Mathematics in the early years provides children with a solid foundation that will enable them to develop skills as they progress through their schooling and ensures children are ready for the National Curriculum.