

**Broadbent Fold Primary School
and Nursery**



**Mathematics Policy
Teaching for Mastery**

April 2020

Broadbent Fold Primary School and Nursery

Mathematics Policy: Teaching for Mastery

In line with the Equalities Act (2010) we aim to ensure that any child, irrespective of protected characteristics (age, gender including intersex and transgender, ethnicity or sexuality including gay, lesbian, bisexual, transsexual and transvestite) is treated fairly and with respect. The law states that the public sector equality duty includes a general duty to, "Foster good relations between people who share a protected characteristic and those who do not."

Our School Vision

At Broadbent Fold we enable each child to unlock their talents and celebrate their individual successes. We are preparing our children for the opportunities and challenges they will encounter in our community and the wider world.

We aim to achieve this by:

- Fostering **positive relationships** striving for empathetic, tolerant and respectful children.
- Equipping our children with essential, practical skills to enable them to flourish, develop and **succeed in the future**.
- Teaching through our creative curriculum encouraging children to take ownership of their learning in order to develop enquiry, interest and **confidence**.
- Encouraging our children to develop **independence**, so they become global thinkers and aspire for excellence.
- Nurturing their physical and emotional wellbeing to develop well-rounded, **happy**, resilient children.
- Working **collaboratively** with our families to ensure all children reach their full potential.

Overarching Vision for Mathematics

Our aim at Broadbent Fold 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 secondary school. We want children to see the mathematics that surrounds them every day and enjoy **developing vital life skills** in this subject. This will be evident across all curriculum areas, where teachers will take opportunities to expand and consolidate mathematical concepts. Using maths in a purposeful way, in everyday contexts, will help the children to realise that mathematics is important in the real world.

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 2019, Broadbent Fold Primary School and Nursery began its transition 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 National Curriculum, which states:

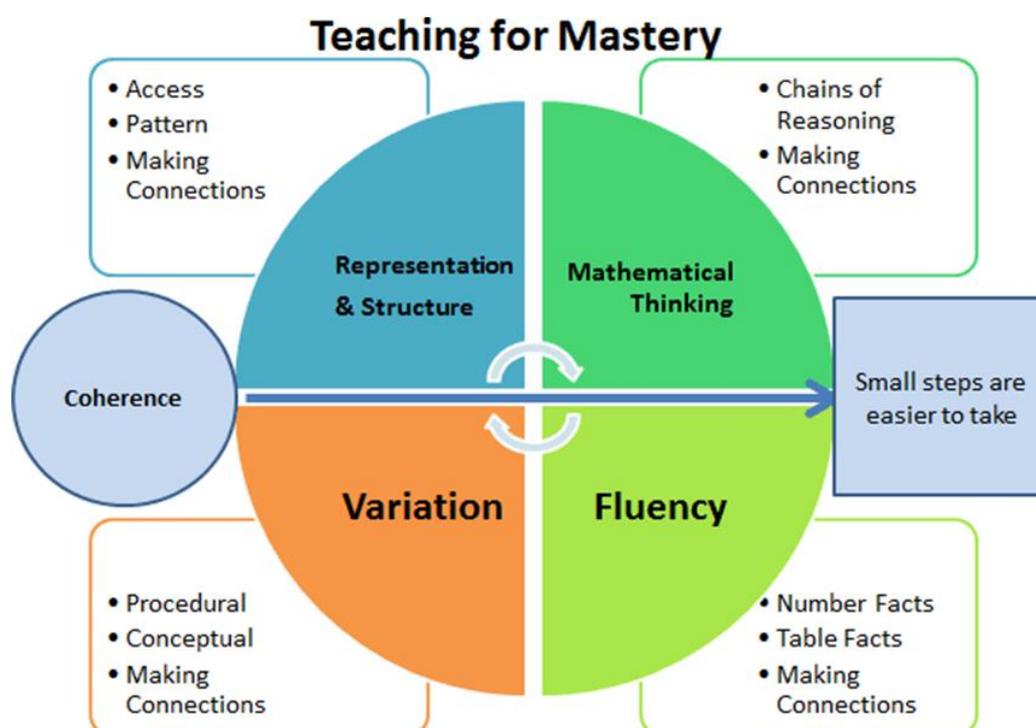
- The expectation is that most pupils will move through the programmes of study at broadly the same pace.
- Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content.
- Those who are not sufficiently fluent 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 of learning.

Our teaching for mastery is underpinned by the NCETM's 5 big Ideas.

- Opportunities for **Mathematical Thinking** allow children to make chains of reasoning connected with the other areas of their mathematics.
- A focus on **Representation and Structure** ensures concepts are explored using concrete, pictorial and abstract representations; the children actively look for patterns and generalise whilst problem solving.
- **Coherence** is achieved through the planning of small, connected steps to link every question and lesson within a topic.
- Teachers use both procedural and conceptual **Variation** within their lessons and there remains an emphasis on **Fluency** with a relentless focus on number and times table facts.



8 Classroom Norms to Establish:

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.

(This document has been created using content provided by the NCETM/Maths Hub Mastery Specialist Programme).

Teaching for Mastery Principles

- **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.

Curriculum design and planning

- Staff use **White Rose Maths Schemes of Learning** as a starting point in order to develop a coherent and comprehensive conceptual pathway through the mathematics. The focus is on the **whole class progressing together**. Collaborative planning with year group colleagues is encouraged to ensure consistency.
- Learning is broken down into small, connected steps, building from what pupils already know. The lesson journey should be detailed and evident on flipcharts (Smart Notebook or PowerPoint) as there is no requirement for teachers to produce detailed paper plans.
- Difficult points and potential misconceptions are identified in advance and strategies to address them planned.

- Key questions are planned, to challenge thinking and develop learning for all pupils.
- Contexts and representations are carefully chosen to develop reasoning skills and to help pupils link concrete ideas to abstract mathematical concepts.
- The use of high quality materials and tasks to support learning and provide access to the mathematics, is integrated into lessons. These may include *White Rose Maths Schemes of Learning and Assessment Materials*, *NCETM Mastery Assessment* materials, visual images and concrete resources.
- Opportunities for extra fluency practice (*instant recall of key facts, such as number bonds, times tables, division facts, addition and subtraction facts*) should be provided outside mathematics lessons (morning starters or post- lunch).

Lesson Structure

- Lessons are sharply focused; digression is generally avoided.
- Key new learning points are identified explicitly.
- There is regular interchange between concrete/contextual ideas, pictorial representations and their abstract/symbolic representation.
- Mathematical generalisations are emphasised as they emerge from underlying mathematics, which is thoroughly explored within contexts that make sense to pupils.
- Making comparisons is an important feature of developing deep knowledge. The questions “What’s the same? What’s different?” are often used to draw attention to essential features of concepts.
- Repetition of key ideas (for example, in the form of whole class recitation, repeating to talk partners etc) is used frequently. This helps to verbalise and embed mathematical ideas and provides pupils with a shared language to think about and communicate mathematics.
- Teacher-led discussion is interspersed with short tasks involving pupil to pupil discussion and completion of short activities.
- Formative assessment is carried out throughout the lesson; the teacher regularly checks pupils’ knowledge and understanding and adjusts the lesson accordingly.
- Gaps in pupils’ knowledge and understanding are identified early by in-class questioning. They are addressed rapidly through individual or small group intervention, either on the same day or the next day, which may be separate from the main mathematics lesson, to ensure all pupils are ready for the next lesson.
- Teachers discuss their mathematics teaching regularly with colleagues, sharing teaching ideas and classroom experiences in detail and working together to improve their practice.

Pupil's Records of Work

- The children use books, paper, worksheets and floor books for mathematics. They will be encouraged to have good work habits; to set work out neatly and to show their method of working out (algorithm) so that the work can be talked through easily. Children can be rewarded with star points for good work or effort, with a Mathematician certificate, for one pupil, being awarded on a fortnightly basis in KS1 and KS2.
- Mental work does not exclude a written record of methods or results. It should be noted that jottings and rough workings do not need to be set out with the same formality as standard written methods. However - children should always be encouraged to form numerals correctly and legibly.
- As the children move through KS2, they will be taught to record their work in a variety of forms, including standard written algorithms. The children's books/folders will demonstrate the wide variety of mathematics work undertaken throughout the year. These may contain examples of symbolic, graphical, diagrammatic, pictorial, written and group (photocopied) work. They may also contain a teacher's note about oral work, or photograph of examples of construction work, mathematical models and maths games played and any assessment tests or check-ups the child may have completed and displayed on the wall, floor books or in the pupils’ Maths books.
- Teachers' observation records will show the results of tests and assessments.

Marking

Marking of mathematics books should be completed in line with the Broadbent Fold marking policy. Next steps are not necessary as the next lesson is normally the next step in learning. However, it is essential that all marking picks up and addresses any misconceptions/mistakes and thorough questioning ensures children have clarified their thinking clearly.

Assessment and Record Keeping

In addition to the formative assessment undertaken in lessons, teachers will use termly summative assessments supplied by **White Rose Maths** to reinforce their judgements and provide further opportunities to identify gaps in pupil learning and tailor future lessons. Teacher judgements will then be entered onto **Otrack** each term when they will report the progress of their pupils at termly tracking progress meetings: this ensures targeted support can be given to those who need it.

Long-term assessments will take place in Spring and towards the end of the school year to assess and review pupils' progress and attainment. These will be made through compulsory National Curriculum mathematics tests for pupils in Years 2 and 6. Children in Years 1, 3, 4 and 5 will complete the optional Nfer tests at the same time. Accurate information will then be reported to parents and the child's next teacher.

Inclusion and Special Needs

Broadbent Fold Primary School and Nursery aims to meet the needs of all, taking into account gender, ethnicity, culture, religion, language, disability, age and social circumstances. The provision for children with special needs is detailed in the SEND Policy. SEN pupils may be supported by additional adults, different resources and or differentiated activities. They may also complete additional activities outside of the mathematics lesson or be taught in a small group. We have high expectations of all children and strongly believe that all children are able to achieve in mathematics. Some may take longer to grasp concepts and may need careful scaffolding or extra time/support.

Home/School Link

At Broadbent Fold Primary School and Nursery we encourage parents to be involved in the mathematics curriculum by:

- Providing parents with guides outlining what mastery teaching involves in EYFS and KS1 & KS2 and how they can support at home.
- Running teaching for mastery curriculum evenings and workshops throughout the year.
- Inviting parents in twice a year for parents evening to discuss their child's progress.
- Reporting on mathematical progress in their child's report.
- Using our mathematics page on the school website to provide information about how we teach the four calculations as pupils move through the school.
- Celebrating success in Mathematics by awarding "Mathematician" certificates on a fortnightly basis and inviting parents to the presentation assemblies.

Pupils are provided with mathematics home-learning on a weekly basis.

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 (Concrete, pictorial and abstract) 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.

The Role of the Subject Leader

The Subject Leader will endeavour to:

- ensure that teachers understand the requirements of the National Curriculum.
- lead by example by setting high standards in their own teaching.
- leads the whole-school monitoring and evaluation of teaching and learning in mathematics by observing teaching and learning in mathematics regularly; analysing assessment data in order to plan whole school improvement in mathematics; conducting work scrutiny to inform evaluation of progress; conducting pupil interviews.
- take responsibility for managing own professional development by participating in external training, independent private study, engaging in educational research and scholarly reading and keeping up-to-date with Teaching for Mastery developments.
- contribute to staff professional development through internal and external training in liaison with senior leaders.
- keep parents informed about mathematics issues.
- ensure that the school's senior leaders and governors are kept informed about the quality of teaching and learning in mathematics.
- work in close partnership with the school's senior leaders to ensure the learning needs of all pupils in mathematics are met effectively.
- keeps the school's policy for mathematics under regular review.

The Role of the Headteacher

The Headteacher has ultimate responsibility for:

- ensuring the place of mathematics within the whole curriculum including the National Curriculum
- providing adequate time and funding for mathematics.
- the professional development of those who teach mathematics.
- creating adequate opportunities for the mathematics leader to carry out his/her duties.
- instigating staff awareness of, and discussion on, good practice in mathematics teaching.
- promoting the idea of Teaching for Mastery in mathematics teaching within the school, with governors, parents and the general public.
- seeking outside advice, when necessary.

Transition to teaching for mastery

Summer Term 2019

- Maths leader involved in NCETM mastery program training.

2019-20 academic year

- Two members of maths team involved in NCETM mastery program TRG, collaborating and developing practice with 5 other schools and a mastery specialist.
- Launch of teaching for mastery across the school, with an introduction to the 5 big ideas, enabling other year groups to apply some Teaching for Mastery principles.
- Regular internal CPD led by the maths leader and external CPD provided by a mastery specialist.

2020-21 academic year

- Ongoing opportunities for internal and external CPD, and to see mastery in action.
- School further developing its approach to mastery across all year groups.

Maths Leader: Patti Blomeley