



# Milecastle Primary School

## Mathematics Policy



Review Date: May 2020



## MILECASTLE PRIMARY SCHOOL

### MATHEMATICS POLICY

#### RATIONALE

The ethos at Milecastle Primary School is for all children to enjoy mathematics and have a **secure** and **deep** understanding of fundamental mathematical concepts and procedures. We want children to see the mathematics that surrounds them every day and enjoy **developing vital life skills** in this subject.

#### AIMS

The aims of teaching mathematics at Milecastle Primary are:

- 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.

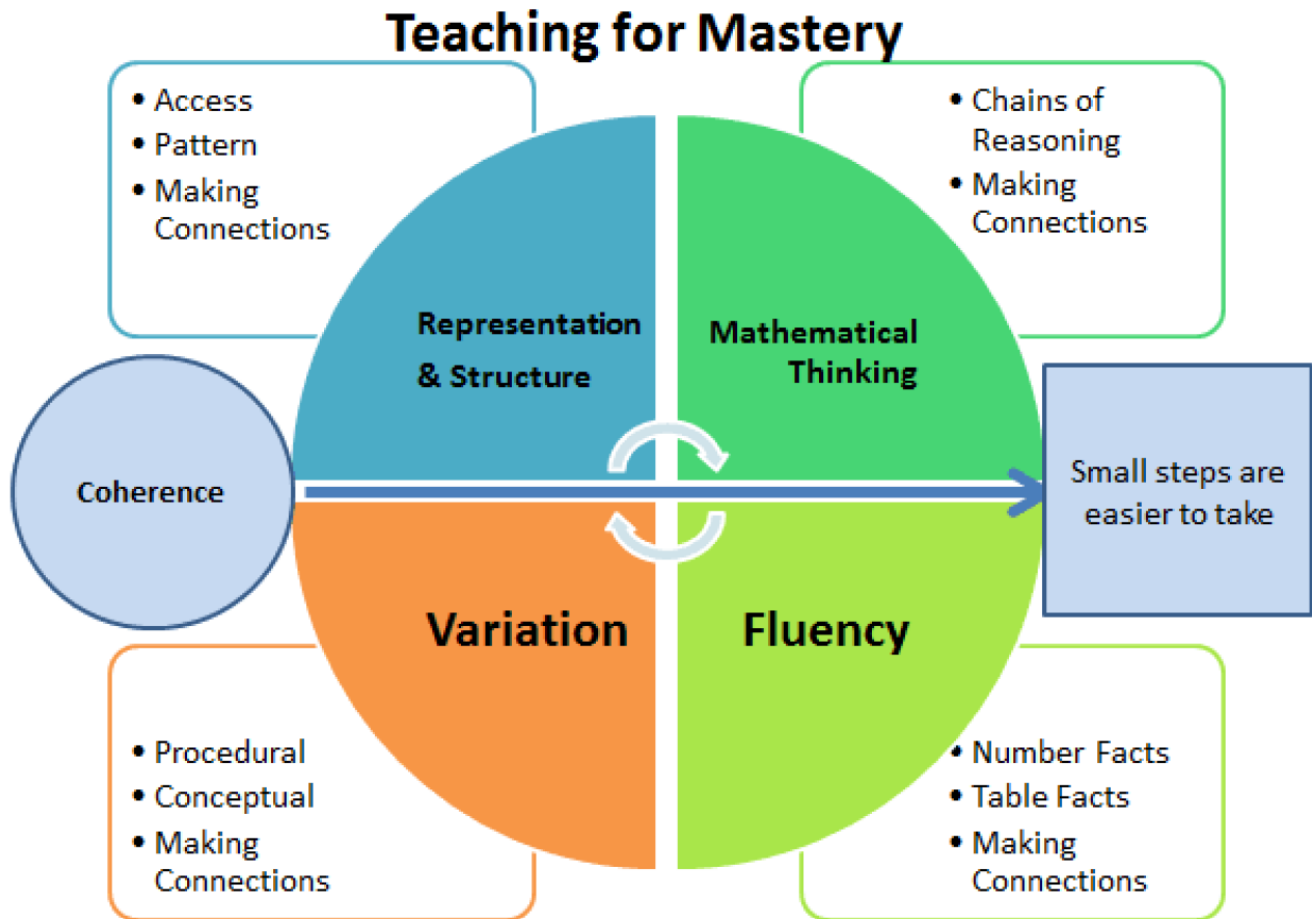
#### INTRODUCTION

In September 2019, Milecastle Primary 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.

Effective teaching for mastery is underpinned by five big ideas.



### **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.

### **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.

### **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.

## Fluency

Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics.

## 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.

## At Milecastle we follow the 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 built upon year by year across 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 pathway through the mathematics. The focus is on the **whole class progressing together**. Short term planning is completed weekly by staff who follow an agreed school format.
- Learning is broken down into small, connected steps, building from what pupils already know.
- 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 to provide access to the mathematics, is integrated into lessons. These may include **White Rose Maths Schemes of Learning and Assessment Materials**, **Power Maths** textbook activities, **NCETM Mastery Assessment** materials, **NRICH**, 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 also be provided outside mathematics lessons (post-lunch). Times Tables Rock Stars is used in school and at home to promote fluency with times tables facts.

## FOUNDATION STAGE

In the Foundation Stage children are introduced to short daily whole class teaching sessions which also follow the White Rose Schemes of Learning. Key maths skills are then extended through child initiated activities and further small group sessions which are adult led.

## INCLUSION AND SPECIAL NEEDS

Milecastle 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. SEND pupils may be supported by additional adults, different resources, differentiated activities. They may also complete additional

activities outside of the mathematics lesson or be taught in a smaller group size. 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.

## **THE MARKING OF MATHEMATICS WORK**

Children's work is marked according to the school's agreed marking policy. (See also separate mathematics marking codes).

## **PRESENTATION OF WORK**

Children's work is presented according to the school's agreed presentation policy.

## **RESOURCES**

Mathematical materials, equipment and basic resources are stored in each classroom. The mathematics team should be informed when equipment needs replacing or supplementing. The children are shown how to take care of equipment and resources and progressively encouraged to select materials suitable for the task in which they are engaged.

## **ASSESSMENT, RECORDING AND REPORTING**

Assessment takes place in line with the school's agreed assessment policy.

In addition to the formative assessment undertaken in lessons, teachers will use end of unit and termly summative assessments supplied by the **White Rose Maths Hub** to reinforce their judgements and provide further opportunities to identify gaps in pupil learning and tailor future lessons. Times tables tests (Yr 2- Yr 6) and mental maths tests (Yr1 -Yr 6) are also carried out on a weekly basis.

Teacher judgements are entered onto **schools own tracking system** and teachers talk through the progress of their pupils at termly tracking progress meetings: this ensures targeted support can be given to those who need it.

A final assessment is made at the end of the year against national standards for every pupil in each year group.

Assessments are used to assess progress against school and national targets. National tests are used for Y2 and Y6 annually. A summary of each child's attainment and progress is reported to parents following statutory guidance either through parental discussion or end of year reports. Information is also passed onto the next teacher.

Parents/Carers are informed of their child's progress in maths 3 times a year. Should a teacher have any concerns about a child's progress outside of these set times, the parents/carers will either be informed in person or via a telephone call.

## **MONITORING AND EVALUATION**

Teaching staff monitor their pupils through observation, discussion, teacher assessment, marking work and testing.

The teaching of mathematics is monitored through:

- scrutiny of work
- lesson observations
- scrutiny of planning
- discussion during staff meetings and INSET
- tracking
- learning walks
- pupil progress reviews

The headteacher and mathematics curriculum team are responsible for monitoring progress in mathematics.

## **HEALTH AND SAFETY**

Children are made aware of their responsibility regarding safe and sensible use of equipment. All equipment used is of a suitable nature e.g. no glass jars for capacity work. Any equipment such as compasses are stored away safely. A risk assessment is carried out prior to children participating in a mathematical activity outside the classroom.

This policy should be read in conjunction with the following school policies:

- Calculation Policy
- Assessment Policy
- Marking and Feedback Policy
- SEND Policy
- Presentation Policy