



## Maths Policy

“Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history’s most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.” National Curriculum 2014

At Greenbank Primary, we have adopted a mastery approach to the teaching and learning of mathematics in order to deliver the three aims of the National Curriculum, fluency, reasoning and problem solving.

The National Curriculum for mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems
- can reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

The concept of mastery learning was initially developed in the 1960’s, but became more popular in the UK after the successes of East Asian nations. Mastery is underpinned by the Five Big Ideas that allow children to make connections, build on previously taught concepts and develop an ability to reason and problem solve.

“Mastering maths means pupils of all ages acquiring a deep, long-term, secure and adaptable understanding of the subject. The phrase ‘teaching for mastery’ describes the elements of classroom practice and school organisation that combine to give pupils the best chances of mastering maths. Achieving mastery means acquiring a solid enough understanding of the maths that’s been taught to enable pupils to move on to more advanced material.” National Centre for Excellence in Mathematics (NCETM)

## Overall Aims and Objectives

By the end of Year 6, we want all of our pupils to be proficient and confident mathematicians with the ability to confidently manipulate and work with numbers and measures to solve problems in a variety of contexts. We endeavour for children to develop an appreciation and of enjoyment of mathematics and have the ability to communicate mathematically with an awareness of relationships and patterns.





At Greenbank, we believe that every child can master an understanding and love of maths and pupils are taught using a well-designed structured approach endorsed by the NCETM – White Rose. As a school, we have purchased the White Rose premium resources and have mapped out our whole school curriculum based on the White Rose Programme.

### **Teaching and Learning**

The teaching of maths begins from the moment the children arrive in school with Early Morning Maths.

#### **Early Morning Maths**

When the children arrive at 8:45 every class has an Early Morning Maths session (EMM). All children have an EMM book where work is completed. The focus of each session varies between Varied Fluency (VF), Reasoning and Problem Solving (RPS) and recall of facts e.g. multiplication and division. The work completed is a variation of concepts previously taught to encourage retention and concepts that are currently being taught to allow extra practice. Work is marked and discussed with the children to identify any misconceptions that can then be followed up during lessons or as part of smaller intervention groups.

#### **Maths Lessons**

Following on from EMM, all classes then progress into their daily maths lesson. Teachers plan using the White Rose blocks. These blocks are carefully thought out sequences of lessons that progressively build on children's prior learning. These blocks are then broken down into a series of small steps with a mixture of VF and RPS. Mastery aims to embed a deeper understanding of maths by utilising a concrete, pictorial, abstract (CPA) approach so that pupils understand what they are learning rather than just learning to repeat routines. As a school, we have invested in manipulatives to help support a concrete understanding. "With mathematics itself being abstract, concrete maths manipulatives provide the learner a 'window' in, to make sense of the problem at hand by touching them, playing with them, exploring the patterns and relationships which make a huge difference between understanding for depth or just for procedure." Third Space Learning  
Our Calculation Policy has been adapted to support the CPA approach and the schools use of the White Rose documents.

#### **EYFS**

"Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes."





Statutory Framework for the Early Years Foundation Stage 2021

Reception also use the White Rose schemes of work that promote and embed mathematical thinking and talk. The guidance has been divided into 10 phases and provides a variety of opportunities to develop understanding of number, shape, measure and special awareness.

### **Working Walls**

Every classroom has a Maths Working Wall display. This display supports the children's current learning. It is expected that Working Walls are adapted and changed as topics and blocks progress. These displays are consistent throughout school to further support children's learning as they move through the school. Current methods, key vocabulary and knowledge organisers are on display and updated throughout the course of a block of work. There are also stem questions on display to encourage the children to think more deeply about the concept and question their mathematical understanding.

### **Times Tables Rock stars**

To support with the teaching and learning of times tables and division facts we have purchased Times Tables Rock Stars (TTRS). Times Table Rock Stars is a fun and challenging programme designed to help pupils master the times tables. To be a Times Table Rock Star you need to answer any multiplication fact up to  $12 \times 12$  in less than 3 seconds! Children each have their own login and password and progress is monitored by Class Teachers.

### **Assessment**

Children are assessed against the 'Assertive Mentoring' maths criteria from Years One to Six, these statements come directly from the National Curriculum. At the end of each block of work, children complete an assessment that covers all of the elements taught. Children are also assessed termly on the elements that have been covered that year so far. Assessments are recorded on iTrack and discussed at Pupil Progress meetings held termly with members of the Senior Leadership Team (SLT).

- A formal test of multiplication skills takes place in the summer term of Year 4. Primary-school children are expected to know all their times tables up to  $12 \times 12$ . Under the current National Curriculum, children are supposed to know their times tables by the end of Year 4, but until now they were not formally tested on them other than through multiplication questions in the Year 6 maths SATs.
- At the end of Key Stage 2 (KS2) all children take part in Statutory Assessment Tests (SATs). These tests take place in the summer term of Year 6 and are made up of an arithmetic paper (40 marks) and two reasoning and problem solving papers (35 marks each)





## **Parental/Community involvement**

We believe it is vitally important to work together with parents and carers to support their child's development of Maths. We promote a positive home/school partnership in the following ways:

- Producing a Calculation Policy that is sent out to parents, also available on the school website
- Parent workshops – to be held in the summer term Covid permitting.
- Termly Parents' Evenings where progress and attainment is discussed
- Sharing of Knowledge Organisers online

## **Staff Development**

Supported by the Maths team, teachers are expected to keep up to date with subject knowledge and use current materials that are available in school. Training needs are identified as a result of whole school monitoring and evaluation, appraisal and through induction programmes. These will be reflected in the School Development Plan and the Maths Action Plan.

## **Monitoring and Evaluation**

Maths is monitored and evaluated in the following ways:

- The monitoring of teaching and learning by the SLT and Maths team through observations, learning walks, monitoring of planning, monitoring of displays etc.
- Sampling of pupil work and assessments by the Maths team/SLT
- Analysis of data on iTrack

This policy was drafted by the Maths Team:

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