**Maths Policy**

**‘Together we unlock potential and learn for life’**



**This policy was approved by the Governing Body of Moor First School at their meeting on:**

**Signed …………………………………….. Chair of Governors**

**Signed ……………………………………….. Co-Head Teacher**

**Signed ……………………………………….. Co-Head Teacher**

**Signed …………………………………….. Curriculum Leader**

Review Frequency Next review

Every 3 years October 2024

**Moor First School**

**Maths Policy**

**Mathematics is both a *key* skill within school, and a *life skill* to be utilised throughout every person’s day to day experiences.**

**Introduction**

Mathematics is a core subject within the National Curriculum. This policy outlines the teaching, organisation and management of mathematics taught and learnt at Moor First. The policy is based on the 2014 expectations and aims of the ‘National Curriculum’ for mathematics and the EYFS framework 2021.

The school policy for mathematics reflects the consensus of opinion of the whole

teaching staff. It has been drawn up as a result of staff discussion. Governors will be consulted at the next termly meeting.

The implementation of this policy is the responsibility of all staff.

**Aims and Objectives**

At Moor First School, we believe mathematics is an important part of children’s development throughout school, right from an early age. We intend on delivering a curriculum which:

* Allows children to be a part of creative and engaging lessons that will give them a range of opportunities to EXPLORE mathematics following a mastery curriculum approach.
* Gives each pupil a chance to BELIEVE in themselves as mathematicians and develop the power of resilience and perseverance when faced with mathematical challenges.
* Recognises that mathematics underpins much of our daily lives and therefore is of paramount importance in order that children ASPIRE and become successful in the next stages of their learning.
* Engages all children and entitles them to the same quality of teaching and learning opportunities, striving to ACHIEVE their potential, as they belong to our school community.
* Makes rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems.
* Provides equal opportunities for children to apply their mathematical knowledge to other subjects (cross-curricular links).
* Is in line with the expectations in the National Curriculum 2014.

**Entitlement**

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

* Become fluent in the fundamentals of mathematics, including through varied and frequent practise with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately;
* 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.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects. The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils’ understanding and their readiness to progress to the next stage. 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.

**Information Communication and Technology (ICT)**

At Moor First, ICT is used to enhance the learning experiences of children. From FS1 to Year 4, children regularly use ICT hardware (including laptops, IPads, IWB, light shape box and Beebots) to further their understanding and application of mathematical concepts. Calculators should not be used as a substitute for good written and mental arithmetic. Teachers should use their judgement about when ICT tools should be used.

**Early Years Foundation Stage**

The EYFS framework 2021 explains that 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. At Moor First we follow this philosophy, nursery and reception children experience mathematics on a daily basis. This is done indoors and outdoors through games, role-play and teacher directed tasks. This early introduction to mathematics involves many oral and practical activities. The children have the opportunities to explore all areas of mathematics through well-resourced and imaginative activities.

**Implementation**

* Our mastery approach to the curriculum is designed to develop children's knowledge and understanding of mathematical concepts from the Early Years through to the end of Y4. Teaching and Learning, Content and Sequence
* In school, we follow the national curriculum and use White Rose Mixed Age/Year groups Schemes of Work, as a guide to support teachers with their planning and assessment.
* The calculation policy is used within school to ensure a consistent approach to teaching the four operations over time.
* In the foundation stage the children access maths daily. In Garnet class they receive 2 full mornings and daily flashback 4, this changes once the Year ones are ready and it becomes daily maths lessons. From Years 2-4 the children have daily 60 minute sessions and daily flashback 4.
* At the start of each new topic, key vocabulary is introduced and revisited regularly to develop language acquisition, embedding as the topic progresses.
* All lessons begin with a short assessment to support retrieval practice and develop long-term memory.
* Children are taught through clear modelling and have the opportunity to develop their knowledge and understanding of mathematical concepts. The mastery approach incorporates using objects, pictures, words and numbers to help children explore and demonstrate mathematical ideas, enrich their learning experience and deepen understanding at all levels.
* Children work on the objective at whatever entrance stage they are assessed as being at. Children can ACQUIRE the skill, APPLY the skill or DEEPEN the skill within the lesson.
* Children move through the different stages of their learning at their own pace.
* Children who have shown their understanding at a deep level within the unit, will have opportunities to apply these skills in a GREATER DEPTH activity. This should be challenging and ensure that children are using more than just one skill to be able to answer the mathematical problems.
* Reasoning and problem solving are integral to the activities children are given to develop their mathematical thinking.
* Resources are readily available to assist demonstration of securing a conceptual understanding of the different skills appropriate for each year group.
* Children are encouraged to explore, apply and evaluate their mathematical approach during investigations to develop a deeper understanding when solving different problems / puzzles.
* A love of maths is encouraged throughout school via links with others subjects, applying an ever growing range of skills with growing independence.
* Children with additional needs are included in whole class lessons and teachers provide scaffolding and relevant support as necessary. For those children who are working outside of the year group curriculum, individual learning activities are provided to ensure their progress.
* The children are assessed using our maths skills grids in Years 1- 4. We are aiming for each child to be secure within their own colour band/year group by the end of the academic year. The skills sheets are shared with children and parents and displayed in the front of maths books in order to ensure every child is clear on how they can achieve their next section.
* In Years 2 and above, children are sent home times tables half termly and these are tested every week. Mathematics is also incorporated in learning enrichments and through cross-curricular links in topic work.

**Teaching and Learning - A ‘Mastery’ Approach**

The teaching and learning of mathematics at Moor First should include aspects of the following Mastery approach strategies in every lesson and/or over a series of lessons.

**CONCRETE** Concrete is the “doing” stage, using concrete objects to model problems. Instead of the traditional method of mathematics teaching, where a teacher demonstrates how to solve a problem, the CPA approach brings concepts to life by allowing pupils to experience and handle physical objects themselves. Every new abstract concept is learned first with a “concrete” or physical experience. For example, if a problem is about adding up four baskets of fruit, the pupils might first handle actual fruit before progressing to handling counters or cubes which are used to represent the fruit.

**PICTORIAL** Pictorial is the “seeing” stage, using representations of the objects to model problems. This stage encourages pupils to make a mental connection between the physical object and abstract levels of understanding by drawing or looking at pictures, circles, diagrams or models which represent the objects in the problem. Building or drawing a model makes it easier for pupils to grasp concepts they traditionally find more difficult, such as fractions, as it helps them visualise the problem and make it more accessible.

**ABSTRACT** Abstract is the “symbolic” stage, where pupils are able to use abstract symbols to model problems (Hauser). Only once a child has demonstrated that they have a solid understanding of the “concrete” and “pictorial” representations of the problem, can the teacher introduce the more “abstract” concept, such as mathematical symbols. Pupils are introduced to the concept at a symbolic level, using only numbers, notation, and mathematical symbols, for example +, –, x, / to indicate addition, subtraction,

multiplication, or division.

**What is Fluency?**

Fluency comes from deep knowledge and practice. This is the first stage of pupils’ understanding. Fluency includes: conceptual understanding, accuracy, rapid recall, retention and practice. Accuracy – Pupils carefully completing calculations with no or few careless errors. Pace – Pupils are able to quickly recall the appropriate strategy to solve the calculation and progress through a number of questions at an age appropriate pace. Retention – Pupils will be able to retain their knowledge and understanding on a separate occasion to when the concept was first introduced. The key to fluency is deep knowledge and practice and making connections at the right time for a child.

**What is Reasoning?**

Verbal reasoning demonstrates that pupils understand the mathematics. Talk is an integral part of mastery as it encourages students to reason, justify and explain their thinking. This is tricky for many teachers who are not used to focusing on verbal reasoning in their mathematics lessons. You might, for example, get young learners to voice their thought processes. Older students could take part in class debates, giving them the space to challenge their peers using logical reasoning.

**Mathematical Talk**

A mastery classroom should never be a quiet classroom. The way pupils speak and write about mathematics transforms their learning. Mastery approaches use a carefully sequenced, structured approach to introduce and reinforce mathematical vocabulary. To encourage talk in mathematics, teachers may introduce concepts by including sentence structures (stem sentences). Pupils should be able to say not just what the answer is, but how they know it’s right. This is key to building mathematical language and reasoning skills. This gives pupils the confidence to communicate their ideas clearly, before writing them down.

Example Stem Sentences: The denominator is 5 because the whole has been divided into 5 equal parts. The numerator is 3 because 3 equal parts have been shaded/circled.

Teachers then maintain a high expectation upon pupils to repeat and use the correct mathematical vocabulary to explain their understanding verbally and in their reflection comments. By also displaying the vocabulary during the lesson, pupils will be able to use this independently.

When questioning and encouraging mathematical talk, teachers should provide regular, purposeful opportunities. For example:

- Show me how to complete the calculation

- Teach your friend how to complete the calculation

- How do you know which operation to use?

- Why have you chosen this method?

- How else can you represent this number?

- What have you learnt today?

- True or False

- Odd one out

- Sometimes, always, Never

**What is Problem Solving?**

Mathematical problem solving is at the heart of the Mastery Approach. Pupils are encouraged to identify, understand and apply relevant mathematical principles and make connections between different ideas. This builds the skills needed to tackle new problems, rather than simply repeating routines without a secure understanding. Mathematical concepts are explored in a variety of representations and problem-solving contexts to give pupils a richer and deeper learning experience. Pupils combine different concepts to solve complex problems, and apply knowledge to real-life situations. Through problem solving, pupils are required to select their mathematical knowledge and apply this to a new concept.

Problem solving is more than just word problems but the RUCSAC approach can be applied to this style of question:

1) Read / look at the problem

2) Understand the problem by underlining or discussing: What is the problem about?

3) Choose – Choose the operation required, the number facts or the approach.

4) Solve – Solve the problem by completing jottings on the page

5) Answer – complete the answer to the problem

6) Check – have I correctly answered the given problem or is there another step?

**Lesson Structure**

All mathematics lessons at Moor First follow the following structure:

• Starter Activity – to promote fluency of arithmetic and the Non-negotiable concepts

• Introduce New Learning using the Mastery Approach – See ‘Planning’

• Reflective Plenary (A Pictorial reflection e.g. drawings of a problem – KS1)

Starter Activity – to promote fluency of arithmetic The purpose of this activity is to promote fluency of arithmetic and enable pupils to recap on the ‘Non-Negotiable’ aspects of mathematics. The starter activity should be up to 10 minutes and could include: Timetables Paper based 3 minute practice

My MiniMaths questions Verbal Mental Maths games/competitions

Quick Fire questions on mini whiteboards Times Table chanting

Reflective Plenary

At the end of each lesson, all pupils should have made progress by learning a new technique, gaining an improved understanding of a concept or being able to complete a new activity. This new learning/progress should be evidenced by drawing a self-assessment image (Year 1,2,3,4).

**Calculation Policy**

Moor First’s Calculation Policy is saved on staff shared. The policy should be displayed in the classroom and followed when teaching written methods. The policy demonstrates our Mastery Approach and shows progression through each operation for each stage of learning.

**Times Tables**

Times Tables are a mathematics ‘Non-negotiable’ and must be taught and then practised. ‘Percy Parker’ songs are saved on staff shared. We also use ‘Hit the button’ and other games to help speed and fluency.

We teach times tables using the following progression:

Year 1 – Be able to count in multiples of twos, fives and tens

Year 2 - Be able to recall 2, 5 and 10 multiplication and division facts

Year 3 - Be able to recall 3, 4 and 8 multiplication and division facts

Year 4 - Be able to recall 6, 7 and 9 multiplication and division facts to 12 x 12

Year 4 pupils will take an online Times Table test\* which will be a timed assessment testing their speed of recall for multiplication and division facts.

**Curriculum Planning**

Teachers use the National Curriculum to plan teaching sequences that build on

knowledge and understanding over time. Teachers follow the White Rose long term and medium term plans and personalise these to suit the needs of their class. They also have access to White Rose Premium resources that can be used to access high quality worksheets, editable reasoning and problem solving questions and end of block assessment. Teacher’s then follow the cycle of assess, plan, teach, practise, apply and review. A strong emphasis on knowledge, reasoning and problem solving is embedded within the curriculum.

 Teachers carry out daily planning of mathematics, which is informed by daily

assessment against learning goals. Weekly plans highlight the differentiated groups, the learning goal, key vocabulary, the starter, the main activities and the plenary (which are all differentiated) and the teacher’s assessment for each lesson. Teachers use the school’s calculation policy when planning. Teachers also use Flashback 4 each day to support the children’s fluency of all areas of mathematics.

**Resources**

When resourcing and planning using the White Rose Planning, teachers to also choose resources which complement it and follow the Mastery Approach: Concrete, Pictorial and Abstract. Teachers have the flexibility to choose resources they feel are most effective to support the needs of all learners (differentiation) and ensure they achieve the aims of fluency, reasoning and problem solving. Resources are kept online, in classrooms and in the mathematics cupboard –

* A range of ‘Concrete’ manipulates e.g. fraction walls, counting beads, place value counters etc.
* White Rose Premium resources
* Abacus mathematics Textbooks
* NCETM website
* MyMiniMaths website
* NRich
* Twinkl website

**Recording of Learning**

All learning (every lesson) to be evidenced. Children complete work in their maths books or practically this must be recorded on Seesaw (Tapestry in Foundation Stage) in photo or video. If using a worksheet from White Rose please shrink to either 2 pages to an A4 or 4 pages to an A4. This will help to keep books smart. The learning objective needs to have the date written in figures e.g. 31.08.21

**Assessment and Recording**

 Teachers write their assessment onto their weekly plans after each lesson which is used to inform daily planning. Children use the learning journey sheets to show their prior learning and to assess their own progress towards the learning goal. Teachers refer to the learning goal at regular points throughout the lesson and then use the plenary to assess children’s understanding against the learning goal.

 When marking children’s work, teachers use an ‘objective achieved’ stamp if the child has met the learning goal for that lesson. An independent, TA or Teacher assisted stamp is used to show the level of support during the lesson. Children are given time to respond to their teacher’s marking and make any corrections in green pen.

 **The Role of the maths leader**

The role of the maths leader includes:

* monitoring planning
* monitoring pupils’ work
* monitoring maths on Seesaw and Tapestry.
* lesson observations throughout the school
* attending Maths Updates
* attending cluster meetings
* reporting progress to Head teacher and Governors.
* reporting to staff following book and planning scrutinies.
* planning and delivering maths workshops for parents.
* carrying out judgement moderations with all staff.
* creating and updating skills grids.
* training
* arranging workshops and maths days for the school.
* Strengthening mathematical links in the community.
* Updating the maths area on the school website.

**Background Documentation**

This policy was informed by reference to the ‘National Curriculum’ for mathematics and the statutory framework for the Early Years 2021

**Review**

 The Head and staff will review this policy as required as part of the school’s

 rolling programme of policy review every three years.