Learning Together, Learning for Life

Reed First school Mathematics 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

Aims

At Reed First School, our mathematics curriculum follows the Programme of Study and Aims of the National Curriculum and The Early Years Foundation Stage framework 2021.

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 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.

Our Vision

Our vision for mathematics ensures every pupil is given a broad, balanced, engaging and relevant curriculum that takes into account the requirements of the National Curriculum, the EYFS Framework and other guidance documents.

The basic skills of mathematics are vital for the life opportunities of our children. We aim to offer a creative and inclusive curriculum which inspires, engages and challenges all children to think mathematically, enabling them to reason and solve problems in a range of contexts and broaden their knowledge and understanding of how mathematics is used in the wider world by making rich and varied real life connections.

At Reed First School we empower our children with a 'CAN DO' or 'I CAN'T DO IT YET ' attitude, embracing our values of 'Developing Independent, Aspirational and Resilient Learners.' We encourage children to develop their knowledge and understanding of mathematics and aim for all pupils to enjoy and achieve in mathematics and become confident mathematicians. We believe that ability within Mathematics is not fixed. We are developing the mindsets of children and adults alike to develop a Growth Mindset and a 'We Can' attitude to Mathematics in a safe environment, where children understand that being wrong is ok, this is how we learn.

We believe that this is achieved through:

- quality first teaching
- children learning together, discussion and a well-developed vocabulary
- using and exploring a wide range of models, manipulatives and concrete, abstract and pictorial resources
- immediate intervention

All children have the potential to 'go deeper' and broaden their understanding of mathematical concepts and develop positive attitudes, fascination and excitement for mathematics.

Skills for learning are a high priority. For example, being able to explain ideas and respond to feedback from teachers and peers are crucial to our curriculum. Being confident, resilient, able to persevere and show determination is at the core of what we want to achieve.

Teaching and Learning - A 'Mastery' Approach

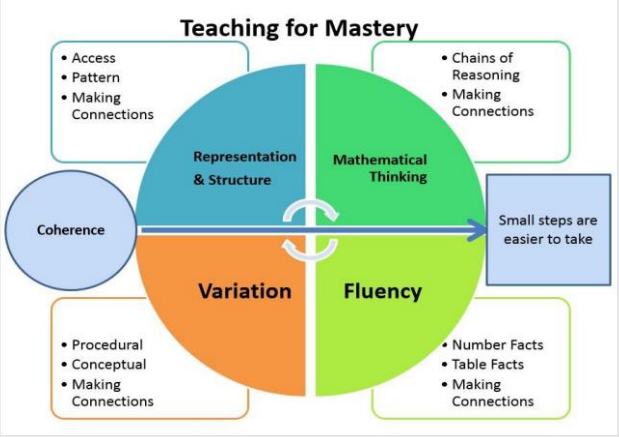
At Reed First school we are on a journey towards Mastery and are taking part in the NCETM Primary teaching for Mastery Development Programme. The school began its first year of the Maths Mastery working group in September 2021.

The teaching and learning of mathematics at Reed First School should include aspects of the following Mastery approach strategies:

CONCRETE Concrete is the "doing" stage, using concrete objects to model problems.

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 concrete object and abstract levels of understanding.

ABSTRACT Abstract is the "symbolic" stage, where pupils are able to use only numbers and mathematical symbols, for example +, –, x, / to indicate addition, subtraction, multiplication, or division.



Aspects of Teaching for Mastery

To encourage talk in mathematics, teachers should 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. Stem Sentences will be displayed in the classroom alongside key vocabulary. By displaying the vocabulary during the lesson, pupils should be able to use this independently.

Teachers will maintain a high expectation upon pupils to repeat and use the correct mathematical vocabulary to explain their understanding verbally and in their reflection comments.

What is Problem Solving? Mathematical problem solving is at the heart of the Mastery Approach. 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.

Planning

Early Years follow the Mastering Number Planning for their daily adult led lesson and use the White Rose Planning, Development Matters and Birth to 5 Matters to supplement and enrich the curriculum. Much of the Maths learning comes during Child Initiated Learning (C.I.L), through both careful planning of continuous and enhanced provision, and 'in the moment' opportunities.

Years 1 – 4 follow the White Rose Planning, NCETM mastery number materials and NCETM curriculum priority mastery materials. This provides the yearly long-term overview and Medium-Term planning for each year group separately and mixed Y1/2 Y3/4 classes. The schemes support teachers to stay within the required key stage so that children acquire depth of knowledge in each topic. Rapid graspers should not be accelerated through concepts, instead they should complete challenge questions which will encourage them to access concepts at a deeper level.

Calculations Policy

We have adopted the Calculations Progression followed by White Rose which indicates the progression through Addition, Subtraction, Multiplication and Division. We use consistent strategies and mathematical language throughout the school.

Ready to Progress Criteria

This non-statutory guidance from the Department for Education identifies the most important conceptual knowledge and understanding that pupils need as they progress from year 1 to year 6. The ready-to-progress criteria outline intended goals for the end of the year.

Lessons

We teach National Curriculum Maths using The White Rose Scheme and NCETM materials and planning. This enables teachers to deliver carefully planned progression and ensures consistency across the school. The White Rose scheme of learning is designed to support the development of reasoning and problem solving alongside fluency to ensure challenge and ambition for all pupils.

In addition to Child Initiated Learning, pupils in the Foundation Stage are taught through short adult led sessions and adult led provision. Reception children take part in adult led sessions using the NCETM Mastering Number project materials.

In KS1, the children will have daily Maths lessons. In addition to this, they will have regular fluency teaching sessions for all children of 10 to 15 minutes using the resources, materials and lesson plans provided by the NCETM Mastering Number project.

In KS2, the children will have daily Maths lessons. In addition to this, they will have a daily fluency teaching session for all children of 10 to 15 minutes using The White Rose Flashback 4 materials.

If required, teachers may choose to include additional mathematics lessons in their weekly timetable.

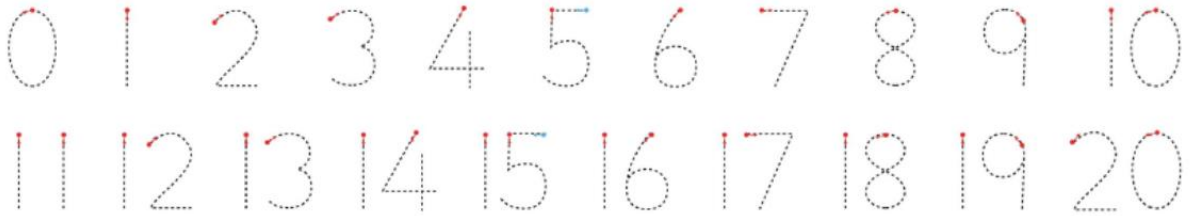
Recording of Learning

Evidence could be recorded through photographs, work in books or teacher notes against planning. Presentation of mathematics books is to be consistent, age appropriate and show that pupils take pride in the appearance of their work and follow our presentation policy.

- All maths work will be completed in pencil.
- The short date will be recorded at the top of each new piece of work e.g., 05.07.22.
- The learning objective will be either written underneath or stuck in underneath on a prepared sticker.
- The date and LO must be underlined with a ruler and a pencil.
- When sticking in question sheets/resources, these have to be trimmed to ensure they fit onto the page.
- Numbers and symbols should be placed carefully one per box. If words or sentences are being used to explain or record, the base line of the squares should be used as a guideline. A gap of one square should be maintained between question numbers and answers.
- Following feedback and/or marking a ruled line will be used to show where a piece of work has ended so that the rest of the page can be used for the next task.
- Tables, charts and diagrams should be drawn using a pencil and ruler and where applicable coloured in using coloured pencils
- Rubbers will only be used if the teacher deems it necessary. We believe that being able to see what has been corrected by a child is crucial in all subjects including maths to see thought processes and self-editing. Where mistakes are made or finding and fixing is taking place, children should take care to keep their corrections neat. One neat ruled line should go through what is being changed and the correction written above where possible.

Number formation

By the end of Reception, every child is expected to form numbers correctly. Every number is formed starting from the top.



Feedback and Marking

Feedback and marking is often done while a task is being carried out through discussion between child and teacher. All teachers are to follow our Feedback and Marking Policy. Where appropriate, pupils should have the opportunity to self and peer mark their work. Pupils are given time to read

teachers' comments and make corrections or improvements. Responses to marking are made as close to the work as possible, ideally at the start of the next lesson.

Resources

When using the White Rose Planning, teachers are able to choose resources which complement it and follow the Mastery Approach: Concrete, Pictorial and Abstract.

Teachers should consider consistent use of the same representations across year groups to help connect prior learning to new learning. Resources are kept in each classroom.

Mathematics Classroom Environment

Mathematics should be visible in all classrooms. Each classroom will have a stimulating learning environment which encourages children to be independent.

This could be an interactive display on the wall and/or a Maths table/Maths Stop that has a bank of core resources that are age related. Learning objectives and key vocabulary will be clearly displayed and discussed.

- Relevant concrete apparatus should be readily available for all pupils to refer to
- Key vocabulary, pictorial and abstract representations should be visible for reference.

Assessment

Assessment should be regular and used to inform planning and to make the Teacher Assessment judgements at the end of each term.

Formative Assessment - Mathematics is assessed by the class teacher during lessons, through child-led conversations, observations and questioning during whole class and independent work and marking. The teacher will use immediate feedback to target understanding and misconceptions promptly. These ongoing assessments will inform future planning and teaching. Lessons are adapted and short-term planning evaluated in light of these assessments.

Summative Assessment - White Rose Assessments should be completed at the end of each unit. These materials are used alongside judgements made from class work to support teachers in making an assessment for each pupil.

In the summer term of Year 4 there will be a Multiplication Tables Check.

SEND

Daily mathematics lessons are inclusive to pupils with special educational needs and disabilities. SEND pupils should be accessing the main teaching of Mathematics using scaffolds and manipulatives. They may also have planned adult support or be paired with an appropriate peer. On some occasions it may be felt that pupils would be unable to access this and they may have a bespoke resource planned. Learning should be annotated to show which manipulatives and support were provided.

Differentiation occurs in the support and intervention provided to different pupils, not in the topics taught. There is no differentiation in content taught, but the questioning and scaffolding individual pupils receive in class as they work through problems will differ, and challenge comes through deepening knowledge of the same content. Pupils' difficulties and misconceptions are identified

through immediate formative assessment and addressed with immediate intervention – ideally through individual or small group support.

The small steps structure, the progression documents and the assessments that underpin the White Rose Maths curriculum will help teachers to identify gaps. Teachers can support all pupils to make progress, by using material or structures from earlier year groups.

Times Tables

Times Tables are a mathematics 'Non-negotiable' and must be taught and then practised daily. We use a range of resources, for example TT Rockstars and booklets. Counting sticks of learnt tables are displayed in classrooms. All times tables to be learnt up to 12 x 12 by Year 4. We teach times tables using the following progression:

Year 1 Count in multiples of 2, 5 and 10. Recall and use doubles of all numbers to 10 and corresponding halves. Recognise odd and even numbers.

Year 2 Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables.

In Year 3 and 4, children work through times tables in the following order: 4x and 8x tables; 3x, 6x and 9x tables; and finally, 7x, 11, and 12x tables. Throughout the year, children will be tested on tables that they have already learnt to help retain knowledge and improve fluency.

Home Partnership

An overview of the Maths curriculum is available on the school's website. The half termly curriculum topic letter, sent home by each class, also outlines the Maths topics to be covered.

In KS1 and KS2 children will be supported at home through weekly activities set by the teacher, for example on Mathletics or Purple Mash, and if appropriate in Reception. When ready, times table activities will also be set, based on times tables that have already been learnt.

Pupils from Year 1 to Year 4 have online access to Mathletics, Purple Mash and TT Rockstars. Activities or tasks will be communicated in the Home School Communication book on a sticker. A class teacher may also assign games and activities to support learning at home on the Google Classroom page.