Maths at Rumboldswhyke Primary School

2022-2023

Every student at Rumboldswhyke Church of England Primary School should experience what "life in all its fullness" means.'

Our Vision

At Rumboldswhyke we believe that every child can master an understanding and love of mathematics. We want our children to develop a 'can do' attitude towards mathematics, instil a deep conceptual understanding and be able to apply this knowledge to solve real life problems and make sense of the world around them. Here at Rumboldswhyke children can experience a sense of awe and wonder as they solve problems and discover different solutions through our mastery approach to mathematics. We use a wide range of models, visual manipulatives and practical resources alongside procedural fluency practice to deliver all areas of the mathematics curriculum. Alongside this we want to ensure that all pupils obtain a suitable range of mathematical language to support their reasoning ability, communicate their ideas and demonstrate deeper thinking across the mathematics curriculum.

Intent

Through working with the NCETM Sussex Maths Hub, we have adopted a mastery approach in order to deliver the three aims of the National Curriculum, fluency, reasoning and problem solving. Underpinning this pedagogy is a belief that all children can achieve in maths. We believe in promoting sustained and deepening understanding by employing a variety of mastery strategies, with teaching for conceptual understanding at the heart of everything we do. Our approach aims to provide all children with full access to the curriculum, enabling them to develop independence, confidence and competence – 'mastery' in mathematics in order to be independent mathematicians who are well equipped to apply their learning to the wider world.

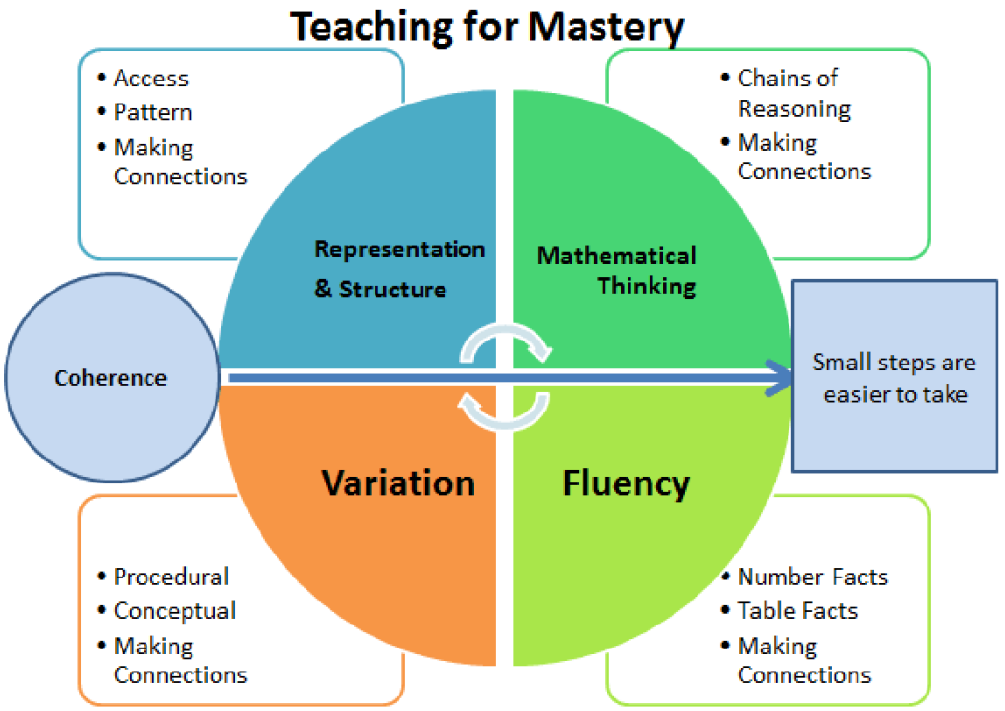
The national curriculum for mathematics aims to ensure that all pupils:

- 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 nonroutine 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 apparently 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.

Central to our approach are the 5 Big Ideas (NCETM) which underpin mastery in mathematics.



Key features of our Maths Mastery curriculum:

- High expectations for every child
- Fewer topics, greater depth
- Number sense and place value come first
- Patterns and deep connections made between areas of learning
- The teaching of fluency – calculate in confidence
- Research - based curriculum
- Vocabulary rich environment
- Modelling skills by using concrete and pictorial representations
- Problem solving and reasoning at the centre

Mathematics Mastery places emphasis on the cumulative mastery of essential knowledge and skills in mathematics. A mathematical concept or skill has been *mastered* when a child can show it in multiple ways, using the mathematical language to explain their ideas, and can independently apply the concept to new problems in unfamiliar situations. It embeds a deeper understanding of maths by utilising a concrete, pictorial, abstract approach so that pupils understand what they are doing rather than just learning to repeat routines without grasping what is happening.

In line with our School-wide focus of Oracy, we also expect and encourage children to use **mathematical language** to **describe, discuss, examine, explain, justify and synthesise**. Through co-operative learning strategies including **Think, Pair, Share, Tell Your Partner and Random Reporter,** we allow all children to discuss mathematical concepts and approaches and to share their ideas and approaches while using the correct terminology.

Implementation

At Rumboldswhyke. children study mathematics daily following our school progression document created using the NCETM five big ideas. This also incorporates the use of ready to progress criteria and problem solving and reason activities from NRICH and white rose. Each mathematical concept is taught in a block, which allows for depth and breadth of learning within each strand of mathematics. (refer to class long term plans). Within the long-term plan there is room for flexibility. This allows teachers to stay with a concept or area of learning longer if needed without impacting on the coverage of the curriculum. To implement our intent, we ensure that our children are invested in their learning and are making a positive contribution to their lessons.

Fluency, Reasoning and Problem Solving: Every learning session includes the opportunity to develop fluency skills, construct chains of reasoning using relevant knowledge alongside relevant terminology and solve increasingly complex problems in a systematic and coherent way.

Mathematical Vocabulary: Sessions include explicit reference to vital **mathematical vocabulary** and the use of **stem sentences** (both of which are included in our maths progression document) to support and encourage all children to communicate their ideas with mathematical precision and clarity. These sentence structures often express key conceptual ideas or generalities and provide a framework to embed conceptual knowledge and build understanding.

Concrete, Pictorial and Abstract Learning: Children engage with a wide and varied range of concrete manipulatives, pictorial representations and abstract methodologies within each session. **Cohesive** use of CPA is a fundamental part of mastery in mathematics for all learners, not just those pupils with SEND. Concrete and pictorial references scaffold and strengthen understanding and are widely used as a teaching and learning tool from Foundation Stage to Year 6.

Fluent Recall: We are committed to ensuring that pupils secure their knowledge of Times Tables and Related Divisional Facts by the end of Year 4. Our pupils engage in regular low stakes testing through weekly quizzes to practise fluent recall and are also taught strategies to help identify relationships between these facts.

Questioning: all lessons are driven through intelligent practice questioning. Through variation and question structure children become confident in tackling familiar and unfamiliar problems. Children are given the opportunity to explain their reasoning and are taught to use modelling to support their explanations.

Early Years Foundation Stage: The teaching of maths in our Early Years stage class focuses primarily on mastering number. The Early Years framework outlines: -

- 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.

- The curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures.

Using the NCETM Numberblocks resources and progression charts, our Early Years class move through cardinality and counting, comparison, composition, measure, patterns and shape and space. This ensures all children have the skills and knowledge to transition smoothly into accessing the key stage one national curriculum.

Assessment

Through our teaching we continuously monitor pupils' progress against expected attainment for their age, making formative assessment notes where appropriate and using these to inform our teaching. 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 are challenged through rich and sophisticated problems before any acceleration through new content.

Formative Assessment: Teachers carry out formative assessment through AfL in each session and feedback is given to children verbally, through self/peer assessment and through marking in line with our feedback policy. Teachers then use this assessment to influence their planning. Children are rapidly identified as needing further challenge or additional support, and we ensure that this is provided in a timely manner.

Timely Interventions: Teachers believe that all children can achieve in maths, and focus on whole class teaching. Where **prerequisites** are not secure, timely interventions will be carried out. We understand that catch-up does not work, and as a consequence our interventions are focused on **Pre-Teaching** and **Same Day Interventions** provided either in class or as an additional small group session.

Low Stakes Quizzing and Fluent Recall: We use a range of low stakes testing throughout the teaching cycle to assess attainment and progress. From Year 2 to Year 6, children complete regular quizzes in number facts, arithmetic and times tables.

Summative Assessments: Summative assessments using the NFER assessments are completed in Autumn 1 and Summer 2. The results from all assessments along with book scrutiny and moderation form the basis for discussions in termly Pupil Progress Meetings and update our summative school tracker (INSIGHT). The main purpose of all assessments is to always ensure that we are providing excellent provision for every child.

Subject Monitoring: We regularly monitor the quality and impact of our mathematics curriculum through targeted learning walks, book scrutiny and pupil interviews. In addition to this, we survey our staff and pupils to identify their perception of mathematics and identify CPD needs.

Continuing Professional Development (CPD)
We continuously strive to better ourselves and frequently share ideas and things that have been particularly effective. We take part in training opportunities and regional networking events, such as the NCETM work groups. As part of the NCETM SussexHub Sustain programme we have the opportunity to participate in subject knowledge development training, mixed year planning, observe other practitioners and collaboratively plan with other schools within the Hub. This gives us an opportunity to stay up to date with changes in the curriculum and ensures we are always providing the best for our children.

Impact

PUPIL VOICE
Through discussion and feedback children express a positive attitude towards maths and describe it as a life skill that is both fun and challenging. They can articulate that they find the small step mastery approach to learning supports them and this leads to a feeling of success in maths.
Children show confidence and believe they can learn about new maths areas through collaborative activities and discussion. Children feel encouraged to succeed and progress and can apply the knowledge and skills they already have to real life problems.

EVIDENCE IN KNOWLEDGE
Pupils know how and why maths is used in the outside world and in the workplace. They know about different ways that maths can be used to support their future potential.
Mathematical concepts or skills are mastered when a child can show it in multiple ways, using the mathematical language to explain their ideas, and can independently apply the concept to new problems in unfamiliar situations.
Children demonstrate a quick recall of facts and procedures. This includes the recollection of the times table.

EVIDENCE IN SKILLS
Pupils use acquired vocabulary in maths lessons. They have the skills to use methods independently and show resilience when tackling problems.
The flexibility and fluidity to move between different contexts and representations of maths.
Children show a high level of pride in the presentation and understanding of the work.
The chance to develop the ability to recognise relationships and make connections in maths lessons.
Teachers plan a range of opportunities to use maths inside and outside school.

OUTCOMES
At the end of each year we expect the children to have achieved Age Related Expectations (ARE) for their year group. Some children will have progressed further and achieved greater depth (GD).
Children who have gaps in their knowledge receive appropriate support and intervention.

Mastery
All children secure long-term, deep and adaptable understanding of maths which they can apply in different contexts.