

# Mathematics Intent

## Marlborough Road Academy

### Intent

**Entitlement:** We want all pupils to enjoy learning and exploring mathematics, become confident mathematicians, who can use the skills that they learn in the next stage of the education and future employment, as well as developing an understanding of financial literacy. We deliver this through a carefully structured mastery approach to the subject.

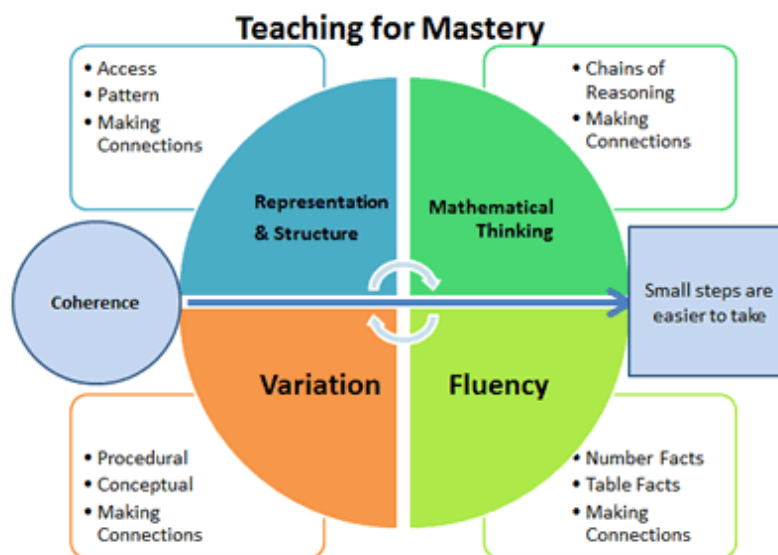
**Coherence:** Taking the Statutory Framework for the EYFS and the National Curriculum as its starting points, our curriculum is carefully sequenced so that powerful knowledge builds term by term and year by year. We make meaningful connections within subjects and between subjects, such as science and geography.

This is delivered using Maths No Problem in KS1 and 2 and following the EYFS Framework and Development Matters through the UL Maths Curriculum. 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.

**Mastery:** we follow a mastery approach to the teaching of mathematics.



This approach focuses on the belief that all pupils can understand and do maths, given enough time. With good teaching, appropriate resources, and a 'can do' attitude, all children can enjoy and achieve in maths.

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A mastery approach ensures that procedural fluency and conceptual understanding are developed in tandem, as each support the development of the other. Pupil's re-visit prior learning regularly and apply it in different contexts.

Significant time is spent developing deep knowledge of the key ideas that are needed to underpin future learning. The structure and connections within the mathematics are emphasised, so that pupils develop deep learning that can be sustained. This results in the children being ready for the next stage in their learning and ensures that Year 6 have mastered the mathematics that they will need to confidently succeed when they move to Year 7.

**Education with Character:** Pupils are encouraged to persevere with learning that they might find difficult at first and learn that, with persistence and support from various scaffolds, they can succeed in mathematics. They experience guided practice to ensure that they have the skills necessary for successful independent work.

**Cultural Capital:** Problems are set in real life contexts, so that pupils understand how mathematics is crucial to day-to-day life. Pupils also learn about the importance of maths in different jobs during Aspiration Week. We participate in national and world maths days and learn about local mathematicians, such as Alan Turing.

### Implementation

At Marlborough Road Academy, we introduced Maths No Problem (MNP) in November 2018. This was to support the continuing development of staff subject knowledge and mathematical pedagogy. MNP is one of the NCETM's recommended textbooks for the teaching of mastery in mathematics. It is fully aligned with the 2014 National Curriculum and the Ready to Progress Criteria.

To further support our development of teaching for mastery, we enrolled on the NCETM Mastery Readiness programme in September 2019. Following this, we moved onto the Teaching for Mastery programme and have successfully completed our first year. We completed the Embedding Mastery year in 2021/22 and will continue with the Sustaining Workgroup to ensure continued professional development for all our staff.

Maths No Problem adopts a spiral approach to the teaching of mathematics and is based on the Singapore approach to teaching mathematics. It is based upon the theories of Piaget, Dienes, Bruner, Skemp and Vygotsky. The spiral approach develops pupils understanding of concepts and mathematical fluency in a carefully structured progression, which is detailed in the Scheme of Work. through whole class, small step, interactive teaching, where the teaching develops understanding.

Lessons are built up in small steps, with teachers modelling with metacognition and opportunities are provided for guided and independent learning. It uses the concrete – pictorial – abstract model of developing understanding. The aim is to ensure that pupils master concepts before moving onto the next part of the curriculum sequence. The use of CPA ensures that all pupils, including those new to English, can access the curriculum and develop a deep understanding of the concepts taught. Mathematical reasoning is modelled by teachers and pupils are expected to explain their thinking using the correct vocabulary, thereby demonstrating their understanding.

Less confident and SEND children are scaffolded in different ways to ensure that they can the concepts being taught. This can include more time spent on developing and deepening an understanding of concepts through concrete and pictorial representations, before moving onto abstract work, extra

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guided practice, TA/teacher support in class and models displayed on working walls to support learning.

Kagan structures are used in lessons to ensure that all pupils actively participate in all aspects of their learning. They provide pupils with the opportunity to recall facts, practice concepts and explain their understanding and thinking to others.

Each lesson starts with a review of prior learning. This can be learning related to the day's lesson, as well as learning over time. Low stakes quizzes take place in the form of a weekly Flash Test and times tables or number bonds test. Fluent in Five is used to develop the use of efficient strategies. Instant recall is crucial for children to gain automaticity. Fluency is a part of the daily review and times tables or number bonds are practiced daily.

Key learning from the current and previous year group is organised into Knowledge Organisers, which children have access to during lessons.

### EYFS

The EYFS uses the EYFS Framework and Development matters with the aim of developing a secure understanding of early number, which will underpin future learning. The EYFS learning environment is carefully planned, both inside and outside, to provide children with opportunities to explore mathematical concepts practically, explaining their understanding and thinking to others. This provides children with the opportunity to practice and improve their skills in counting, understanding numbers, calculating with simple, practical problems, and shape, space, and measure. There is a focus on securing early mathematical skills and concepts to ensure that children are school ready. Children are observed and then next steps planned for their mathematical development. As well as planned activities, the learning environment is enhanced to provide children with the opportunities to practice their maths skills through self-selected activities and resources. Children in EYFS become confident using practical versions of the representations used in KS1. This includes five and ten frames, number lines and the part whole model. Children develop a deep understanding of number, which they then develop in KS1.

Subitising, where children instantly recognise the number of objects in a small set, without the need to count them, is crucial to understand conservation of number in the EYFS. By looking at groups of dots or objects, children develop an understanding of how each number is made up. For example, 8 dots could be a set of 5 dots and a set of 3 dots, or as two sets of 4 dots. This develops the understanding of the part whole model and helps children to partition and recombine numbers. Conceptual subitising is the foundation to understanding addition and subtraction. We continue subsisting into KS1, where it supports the recall of number bonds.

### A typical lesson

In line with Rosenshine's Principals of Instruction, a typical lesson consists of:

A review of previous learning, which includes fluency. This review is also used to recap previous learning which is related to the day's lesson.

Teacher modelling is set around an Explore problem This is followed by teacher modelling in the Mastery section of the lesson. Here the C-P-A approach is used to model and develop understanding

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of new concepts. Learning is presented in small steps to ensure that pupils understand the concept being taught.

Guided practice ensures that children understand their learning before moving onto independent work. Further guided practice is provided for those who need it following AFL. These children will then move onto independent practice.

Challenges are provided to deepen understanding and provide opportunities for children to develop their reasoning skills and ability to explain their thinking in different situations. These can include the DFE's Ready to Progress assessment questions.

Review of learning can occur at any point during the lesson through questioning and the use of hinge point questions and guided practice assesses who might need further support.

### Homework

Children are expected to practise either number bonds in KS1 (which moves onto times tables in Year 2) or times tables and related facts in KS2. This is supported with subscriptions to Times Tables Rock Stars (Year's 2-6) and Numbots (EYFS-Y2) to develop fluency and recall. EYFS use Numbots to develop subitising. KS1 and 2 are expected to practice these facts on the apps 3 to 4 times a week. Teachers can track who is completing their homework and progress made. This helps to shape review in lessons. In 2021 we introduced the online platform Mathletics, where teachers set homework for children to practice and recall previously learnt concepts in different situations, therefore helping to develop understanding through variation.

### Impact

The teaching of mathematics at Marlborough Road ensures that skills, knowledge and understanding are built up year upon year and gives pupils the opportunity to apply their skills and knowledge in different situations through variation. Through our maths curriculum, we hope that children develop as confident mathematicians, who have a positive approach to learning maths and who gain a sense of achievement as they progress through each year.

Regular assessments in class, such as flash tests, hinge point questions and review of previous learning enables teachers to assess each pupil's understanding of the curriculum. This is supported by termly

PUMA tests are used to make termly judgments as to where each child is working. These judgements are moderated internally.

Detailed question level analysis of PUMA tests is used to ensure that any misconceptions in taught content is addressed, and progress accelerated where necessary.

Termly book looks with pupil conferencing give children the opportunity to explain their learning and leaders to check for understanding and that children are remembering more over time.

End of Key Stage assessments take place in the summer term and judgements are moderated both internally and externally.