



Merton Abbey Primary School

Maths Policy

This policy will be reviewed in full on an annual basis.

This policy was reviewed and updated in September 2025

Next review date: September 2026

Member of staff responsible for monitoring and reviewing the policy: Lynsey Eversden

Intent (what is meant to be learnt and what do we aspire for our children)

Rationale for maths

"Pure mathematics is, in its way, the poetry of logical ideas" Albert Einstein

"The only way to learn mathematics is to do mathematics." Paul Halmos

Our high-quality curriculum allows mathematics to be accessible to all and aims to ensure that all pupils learn to feel confident in their mathematical ability. We believe that Mathematics is a creative and highly interconnected discipline that is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy. We want children to feel that they can access all areas of mathematics and feel confident to make rich connections across these areas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. We aim to foster a sense of enjoyment and curiosity in maths and to develop an appreciation of the links to many other subjects across the curriculum.

Aims (from the National Curriculum)

- 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;
- **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.

We aim to include these three aims within every maths lesson at Merton Abbey.

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. For more detailed information about individual strategies see the Merton Abbey Calculation Policy.

Implementation (how we teach our curriculum)

Teaching for maths mastery principles:

At Merton Abbey Primary we follow a maths mastery approach. We believe:

- that all children can achieve mastery in maths;
- that children should be encouraged by the belief that by working hard at maths they can succeed. We remind children that mistakes help them learn. If errors arise in class, we do not ignore them. Instead, we talk about mistakes and explore them together. This approach helps to develop the children's resilience.
- that children should be taught through whole-class interactive teaching, where the focus is on all pupils working together on the same lesson content at the same time;
- that lesson design should focus on small steps of learning to ensure that all children keep up with their learning and links are made to prior learning;
- that typical lessons will be led by the teacher in back and forth interactions, including questioning, short tasks, explanations, demonstrations and discussions;
- that procedural fluency and conceptual understanding are developed in tandem because each supports the development of the other,
- that key facts such as multiplication tables and addition facts within 10 should be learnt to automaticity to avoid cognitive overload in the working memory. This will enable pupils to focus on new concepts.

Concrete, Pictorial and Abstract approach

In order to develop conceptual understanding of an idea, procedure or technique, firstly we should use concrete materials (e.g. ten frames and bead strings) to represent it. When this is understood we should move on to a pictorial representation (e.g. bar model) before we eventually extend our understanding to include abstract forms. Most importantly, representing ideas in different forms help to deepen our understanding and so enable us to apply ideas and skills in different contexts.

Agreed procedure

1. Planning:

- Planning in years 1 to 6 follows the 'White Rose maths' small steps structure. These are supplemented by the 'NCETM spine materials', 'Nrich' and 'Third Space' resources;
- EYFS use White Rose Maths alongside Mastering Number resources in Reception and Nursery use the NCETM 'Numberblocks' resources.
- All teachers should refer to the school's calculation policy to ensure consistency across the school;
- Teachers will use the White Rose Premium resources. This can be we either a personalized version of the PowerPoint presentation or a Smart Notebook.
- Lesson objectives are shared with the children using 'child-friendly' language, which takes the form of a 'We are learning to' statement. *This does not have to be shared at the beginning of the lesson.*
- Every lesson begins with a daily review session (Get Ready). This is where previously taught maths should be practiced to ensure that it moves into their long-term memory (retrieval practice).
- The school subscribes to the White Rose Maths Premium resources which provide a bank of fluency, reasoning and problem solving questions for each year group.

2. Lesson structure:

Most maths lessons should follow a 4-part structure after the 'Get Ready' retrieval part of the lesson. This is the 'Let's Learn' part of the lesson.

1. **Anchor task:** A problem is posed to the whole class. This could be contextualised (e.g. capacity in a football stadium to engage or cakes in a box) and help children see links to the real world or could be a mistake that the children have got to explain or correct. Children share methods after paired discussion. They may record on whiteboards or use concrete resources. This is a key assessment activity as it will help teachers to adapt the learning to their class. Teachers need to be secure on the methods they might expect to see and if they are going to introduce a new method.
New learning is scaffolded through the following teaching approach.
2. **Teaching of new learning (I do):** This part of the lesson will involve the teacher explaining (ensuring links to prior learning are used to minimize the impact on working memory), modelling and lots of active questioning (Ping Pong teaching: activities going back and forth between pupils and the teacher)
3. **Guided practice (We do):** After teaching (explaining and modelling), children practice new ideas in pairs/whiteboards/concrete resources before independent work to ensure children have a method. This section of the lesson will still contain lots of talking and sharing ideas.
4. **Independent practice (You do):** practice independently selecting appropriate methods. This is the tasks that the children are given after the input section of the lesson.

At Merton Abbey Primary, independent practice should:

- Deepen understanding through the dimensions of depth so that both procedural and conceptual understanding are developed in tandem. Tasks should also be varied to help children deepen their understanding; reveal misconceptions and develop their reasoning and explanation skills;
- Use varied representations to help children understand the concepts that underpin procedures.

The 5 dimensions of depth:

1. Factual knowledge
2. Procedural fluency
3. Conceptual Understanding
4. Language and communication
5. Mathematical thinking

Drury, 2014

In addition, a plenary may be appropriate to consolidate or extend learning.

Formative assessment should be ongoing throughout the lesson to ensure that misconceptions are addressed and that lessons can be adapted, if needed.

3. Mathematical language:

- The National Curriculum is explicit in articulating the importance of children using the correct mathematical language as a central part of their learning. Indeed, in certain year groups, the non-statutory guidance highlights the requirement for children to extend their language around certain concepts.

- It is therefore essential that teaching using the strategies outlined in this policy is accompanied by the use of appropriate mathematical vocabulary. New vocabulary should be introduced in a suitable context (for example, with relevant real objects, apparatus, pictures or diagrams) and explained carefully.
- High expectations of the mathematical language used are essential, with teachers only accepting what is correct.

4. Display:

- Every classroom should have a maths working wall which reflects current learning. This section contains a range of tools to help children with their current learning such as key vocabulary, models and images, problem solving and reasoning questions and steps to success;
- 100 squares, ten frames and number lines (including negative numbers, where appropriate) should be visible in classes;
- Key 2D and 3D shapes, dependent on age;
- Vocabulary for the four calculations should be prominently displayed to ensure that children are familiar with a range of vocabulary.

5. Resources:

Key resources for the teaching and learning of maths at Merton Abbey:

Bead strings	Numicon	Trundle wheels
Counting sticks	Digit cards	Unifix and Multilink
Blank number lines	Protractors	Egg boxes
Place value counters	Pattern blocks	Ten frames
Base 10 (Dienes)	Compasses	Metre sticks

Impact

6. Feedback and marking:

- Where possible verbal feedback is most effective;
- Tick pupils' responses to show if they have answered questions correctly. We use a dot or C to indicate a correction is required;
- Identify and address misconceptions and keep a record to inform teaching. Children's feedback will be focused around these errors and misconceptions. It could involve help to overcome a misconception or recurring error or involve refining a method or reasoning;
- If the vast majority of children have made the same error, this is best addressed with the whole class rather than through individual comments for each child;
- Where appropriate, children are encouraged to self-mark their work.

7. Monitoring and review:

- The Mathematics subject leader has responsibility for supporting colleagues in the teaching of Mathematics, keeping informed about current developments in the subject, monitoring standards within the subject and providing a strategic lead and direction for the subject;
- Monitoring of the standards of children's work is completed once a term through various activities including: book looks, learning walks and pupil book studies.

Appendix 4: Key conceptual understanding and *mental fluency* by year group

Year 1

- (a) Understand and use various concrete and pictorial representations of numbers up to 100 (including all of cubes, dienes, place value counters and number lines)**
- (b) Understand and use bar models and part-part-whole diagrams as representations of number bonds inside 20; use these to know whether an unknown is the part or whole in equations such as $? - 8 = 4$ and $5 + ? = 11$.**
- (c) Recall number bonds up to 10 (i.e. without a counting strategy)**
- (d) Find half of even numbers up to 20 and double of integers up to 10**
- (e) Count up to 20 in 2s, up to 50 in 5s and up to 100 in 10s**

Year 2

- (f) Understand different interpretations of addition (collecting similar objects, counting on and extending) and subtraction (removing objects, counting back, shortening and finding a difference)**
- (g) Understand rules of commutativity for addition, subtraction, multiplication and division (i.e. addition and multiplication – order doesn't matter; subtraction and division – order matters)**
- (h) Recall addition and subtraction facts inside 20 (i.e. not using a counting strategy; e.g. $7 + 6 \rightarrow$ double 6 then add 1 = 13 **or** $7 + 6 \rightarrow 7 + 3 + 3 \rightarrow 10 + 3 = 13$; ideally, pure recall from practice)**
- (i) Use recall of addition and subtraction facts inside 20 to calculate mentally $TO + O$ and $TO - O$ (i.e. without a counting strategy)**
- (j) Using note-taking (without counting) calculate $U + U + U$**
- (k) Use concrete objects, pictures or mental strategies to calculate $T + T$ (e.g. $70 + 20 = 90$), $T - T$ (e.g. $90 - 30 = 60$), $TO + T$ (e.g. $56 + 40 = 96$) and $TU - T$ (e.g. $89 - 40 = 49$)**
- (l) Recall (i.e. not count up) multiplication and division facts for 2x, 5x and 10x including missing number questions (e.g. $5 \times \underline{\quad} = 35$)**

Year 3

- (m) Understand different interpretations of multiplication (repeated addition, increase in dimension, change in the counting unit and the scaling of a value) and division (sharing and grouping)**
- (n) Understand and use various concrete and pictorial representations of numbers up to 1000 (including all of dienes, place value counters and number line)**
- (o) Calculate mentally (without a counting strategy) $HTO + O$ and $HTO - O$**

(p) Count in 10s up to 200 and count in 100s up to 2000

(q) Recall (without counting) multiplication and division facts for 3x, 4x and 8x, including missing numbers (e.g. $8 \times \underline{\quad} = 56$)

Year 4

(r) Use number bonds inside 20 knowledge to calculate addition and subtraction facts for tenths inside 2.0 (e.g. $0.8 + 0.7 = 1.5$)

(s) Use place value knowledge (not adding/subtracting zeros) to mentally multiply and divide by 10 and 100

(t) Recall all multiplication facts up to 12×12

(u) Round numbers to the nearest ten and hundred using number line representation.

(v) Recognise the decimal equivalents of tenths up to and hundredths up to , and vice versa.

Year 5

- **Understand and use various concrete and pictorial representations of numbers including up to 1 000 000 and numbers including tenths, hundredths and thousandths (including all of dienes, place value counters and number line)**

(x) Mentally multiply multiples of 10, 100 and 1000 by other multiples of 10 and 100 (e.g. $400 \times 80 = 32\ 000$)

(y) Mentally divide multiples of 10, 100 and 1000 by single digit numbers (e.g. $3200 \div 8 = 400$)

(z) Calculate equivalent fractions using all multiplication facts