

Curriculum Policy -

Mathematics



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Belong. Believe. Become.

“Mathematics is a more powerful instrument of knowledge than any other that has been bequeathed to us by human agency.” Descartes

The primary intent for our Mathematics Curriculum:

At Mandale Mill, we know that the basic skills of mathematics are vital for the life opportunities of our children. Our aim is for all children to think mathematically, enabling them to reason, solve problems and assess risk in a range of contexts. We want our children to use and understand mathematical language and recognise its importance as a language for communicating and thinking. We want children to have a positive and resilient attitude towards mathematics and an awareness of the fascination that mathematics can provide.

We intend for all children to be secure in the key age-related content and reach the expected standards at EYFS, Key Stages 1 and 2, and exceed them where they can. It is our intention that pupils build their learning progressively from year to year. This document has been designed to assist teachers and leaders to ensure progression from Nursery to Y6. From Year 1 onwards, individual strands of national curriculum mathematics are mapped across the year groups, so teachers can see prior learning expectations and the foundations of their current curricula.

We want our children to be fluent mathematicians. Procedural fluency and conceptual understanding are developed in tandem because each supports the development of the other. Understanding the relative size of numbers at all levels and being able to move fluently between operations and representations is key to success.

We want our children to be ‘brave mathematicians’ – knowing that there is often more than one way to solve a problem and that having a try, playing with numbers and gaining a sense of an ‘appropriate answer’ are key qualities of a mathematician. We aim for our children to develop a real love for mathematics and understand that it underpins all subjects and opportunities in life.

The implementation of this intent is based on:

- A daily maths lesson which follow the curriculum plans (long and medium term plans) with key understanding of place value, number operations and related problem solving, reasoning and justification taking priority.
- There will be several variations of the same and related content to facilitate children’s overlearning, varied fluency and confidence in mathematical concepts. We will ‘over-teach’ concepts, in the core areas of: number and place value, the four operations, times table and division facts.
- Our pupils are taught through whole-class interactive teaching, where the focus is on all pupils working together on the same lesson content at the same time. This ensures that all can master concepts before moving to the next part of the curriculum sequence, allowing no pupil to be left behind. As much of the learning happens through talk,

working in mixed ability groups is a key expectation at our school. More importantly, as all children work on the same task, children are not categorised as being lower or higher ability. Pupil confidence and a joy of mathematics will grow.

- If a pupil fails to grasp a concept or procedure, this is identified quickly and early same day intervention ensures the pupil is ready to move forward with the whole class in the next lesson. Intervention will be in the form of pre-teaching and catch up sessions, based on specific issues and content.
- Key facts such as multiplication tables and addition facts within 10 are learnt to ensure automaticity to avoid cognitive overload in the working memory and enable pupils to focus on new concepts.
- In addition to the daily maths lesson, children from YR also experience a daily short mental fluency lesson – based on counting, number facts, relationships and calculations. Key facts such as multiplication tables and addition facts within 10 are learnt until automaticity has been achieved to avoid cognitive overload in the working memory and enable all pupils to focus on new concepts.
- We believe that daily retrieval practice of taught concepts will strengthen the neural pathways and aid retention of learning. The prior learning will come from yesterday, last week, last term, last year and in preparation for maths in another subject e.g. data handling in a science lesson. A short daily retrieval session for Y1 to Y6 occurs in addition to the maths lesson.
- Through teacher facilitation, expert questioning, deepening challenges and peer discussions, all children are challenged at their level. Communication is a vital part of this process. It is through peer discussion, and the proving and disproving of ideas, that metacognition happens (being aware of one's thought processes). This enables greater depth of understanding.
- Challenge is something which is key to all children being successful in mathematics and this is central to our vision. Children are challenged in a variety of ways and are exposed to a wide variety of manipulatives and representations based on the same concept.
- Together, we are building a whole culture of deep understanding, confidence and competence in mathematics. A culture that produces strong, secure learning and real progress. The movement towards a mastery vision includes regular and robust assessment which gives clear indicators as to what progress children have made, the concepts children have mastered and what the next steps of learning will be.

Our approach to teaching mathematics enables children to develop their key learning behaviours:

- Develop a positive attitude towards mathematics with *determination* to succeed, whilst building up a wide range of mathematical vocabulary to use across all subject areas.
- Develop their *resilience* when faced with the unknown, developing a growth mindset to find the most efficient way of solving a problem.
- Be *curious*, explore patterns and explain their reasoning through rich mathematical discussion with their peers.
- Develop *respect* for others' methods and explanations.

- Increase their confidence to attempt challenges *independently* by making rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence.



Planning for retention and recall opportunities

- Each year group's curriculum has built in opportunities for revisiting key concepts (number, place value, calculation and fractions).
- Each year group's planning will highlight prior learning expectation from the previous year in relation to the topic being taught. This is taken from the EYFS expectations, the National Curriculum and our progression documents.
- All year groups from YR – Y6 will access a daily arithmetic session to develop mental fluency. This may be a verbal number session or a written arithmetic test.
- Mathematics will be used and applied within other areas of the curriculum. See paragraph below Mathematics across the curriculum.
- From Y1, we use assessments at the end of a unit to allow children to apply their knowledge and skills of what has just been taught. End of term assessments are then completed, based on prior learning. Y6 complete previous SATs papers every half term.

Children with SEND within the Maths Curriculum

Our Maths Curriculum is designed to give all learners, particularly the most disadvantaged and those with special educational needs and/or disabilities (SEND) or high needs, the knowledge and cultural capital they need to succeed in life. We believe that everyone, no matter what their starting point is, can learn and improve at maths. This will clearly depend on individuals' needs. We need to remember also that children with SEND are not always low attainers, so for some it will be the usual curriculum with additional resources suitable for meeting their particular needs. If some other pupils are working significantly below the expectations for their year group (which is not accessing their current year group's curriculum at all), then our school will consider what is realistic for these pupils, given their needs, in terms of catching up and keeping up. Therefore, we ensure that if a SEND pupil is

working below, at or above the expected standard, they are given the appropriate support and resources needed to ensure they reach their full learning potential, and wherever possible, catch up to their peers over time. A curriculum for all.

Progression in Mathematics

Mathematics is progressive across the curriculum, from an exemplification of the Early Learning Goals through to Year 6 expectations. From Year 1 onwards, individual strands of national curriculum mathematics are mapped across the year groups, so teachers can see prior learning expectations and the foundations of their current curricula. This enables teachers to see what has been retained or any gaps in learning. The 'Ready-to-progress' criteria for all groups produced by the DFE summarises the most important knowledge and understanding within each year group and the important connections between the mathematical topics. Teachers will use the document to bring greater coherence to the National Curriculum by exposing core concepts and demonstrating progression from Y1 to Y6 thus closing the gaps in learning. It must be noted that the document does not address the whole of the mathematics primary curriculum but only areas that have been identified as a priority.

Early Mathematics

We believe that all children 'can do' mathematics and developing a sound understanding of mathematics when young is essential. EYFS staff will nurture positive attitudes and help children to build confidence. Self-regulation and metacognitive skills are seen to be crucial for success therefore the development of these skills will be paramount in Autumn term. We want all of our children to develop a growth mindset from an early age as opposed to a fixed mindset. It is important to remember that children's early mathematical understanding is strongly associated with their later school achievement. The teaching of mathematics will build upon what children already know and can do. Young children learn best when they are interested, therefore, we will teach maths through stories, songs, rhymes, board games and carefully chosen computer programmes such as Ten Town, Numberblocks. Developmental progressions will be used in-line with the Early Learning Goals and the EYFS curriculum.

Carefully chosen manipulatives and representations will be used to teach all mathematic concepts. Discussion will be encouraged through talk partners and age appropriate mathematical vocabulary will be expected. We will insist upon the accurate pronunciation of number names as well as accurate number formation. The classroom will provide many opportunities for the children to play with and secure their understanding of number, shapes and measures not forgetting to provide both challenge and support as required.

Mathematics Across the Curriculum

Mathematics at Mandale Mill will ensure that our children are 'ready for life'. Throughout the primary years, children will be given the opportunity to use and apply mathematical skills in other areas of the curriculum. This will enable them to see how maths is used in the real world. Teachers will carefully identify where prior learning (previous year, term, week) can be practised e.g data handling in science, measures in DT, PE and so on. It is important to remember that new skills are learned in a mathematics lesson and practised in other areas of the curriculum.

Outdoor Learning

Teachers are encouraged to take maths outdoors wherever possible. In addition to making the subject fun and real, outdoor learning also provides opportunities to:

- *Access concrete materials* – children need to feel and move around objects to help develop mathematical concepts. Natural treasures such as sticks, stones, seed pods and so on are brilliant materials to support counting, measurement, comparison and so on.
- *Develop pictorial understanding* – This involves being able to represent concepts through drawing pictures, diagrams, charts and more. Learning outside means that children can experience this in 3D and from all angles, which promotes their pictorial representation and the spatial imagery needed for geometry.
- *Understand language and mathematical symbols* – concepts such as bigger, smaller, longer, shorter, deeper, shallower, more, less, fewer etc can be practised and better understood with real life experience. Climbing a tree and looking down helps to develop a child's sense of scale and finding something longer than, shorter than, heavier than helps to develop a deep understanding of size and unit.

Vocabulary Expectations

We believe that the understanding and use of mathematical vocabulary is key to success. The vocabulary that the children are expected to understand and use is progressive across the mathematics curriculum. This is identified at the beginning of a lesson and children practise using the vocabulary in context. The key vocabulary for the day and the unit being taught will be displayed on the working wall. Staff are aware of key vocabulary in terms of that expected of the children and also mathematical terms.

The Maths Environment

A consistent maths environment is vital to ensure that in every classroom, our children have access to what they need to help them learn and retain learning. These expectations are a minimum and teachers are of course free to design their classroom environments to meet the needs of their children.

Our classrooms will have the following age appropriate learning prompts to support learning:

- Base 10
- Appropriate number facts (number bonds / times tables / division facts etc)
- Place value counters
- Key vocabulary
- Working wall – showing models and methods, current vocabulary
- A working clock

Cultural Capital

We will promote a positive message – all children ‘can do’ mathematics. There is no such thing as being bad at maths!

We will send leaflets of yearly expectations in Autumn Term.

We will invite parents into school for Stay and Count sessions.

We will always make time to show parents how we do maths.

Famous/important mathematicians are taught at the beginning of a unit, linked to the purpose of why the unit is being taught. This informs children how they impacted upon the way we know maths today or how they use (or used) their mathematical knowledge in their everyday work to achieve brilliance.

We will provide engagement activities for parents – Celebration of Learning events, workshops to demonstrate how we use resources and to share our methods of calculation.

This policy will be monitored by the Maths Lead. They will also ensure that the policy is working in practice and review it every two years.

This policy should be read in conjunction with the Teaching and Learning policy.

With thanks to Lingfield Education Trust.



Article 28: Every child has the right to a good education.

Article 29: Your education should help you use and develop your talents and abilities.

It should also help you learn to live peacefully, protect the environment and respect other people.