



MATHEMATICS SUBJECT POLICY

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Our vision

At Marton Manor, we believe that every child is a mathematician.

We have high expectations that all pupils can and will achieve in maths.

Our intent for our mathematics curriculum:

- All children to become fluent mathematicians who understand the relative size of numbers at all levels and are able to move fluently between operations and representations;
- Our children to be confident, resilient mathematicians with a “can do” attitude, who enjoy the subject;
- All children to be secure in the key age-related expectations, building on their learning progressively from year to year;
- We intend for all our children to reach the expected standards at the end of each key stage, and exceed them where possible;
- Children to have the ability to confidently solve problems through decision-making and reasoning in a range of contexts;
- Children to understand the importance of mathematics in everyday life and that it underpins all subjects;
- Children to be equipped for the next stage of education, work and life.

The implementation of this intent is based on:

- The daily maths lesson in KS1, KS2 and Support Base will follow the long and medium term plans (mastery approach alongside the National Curriculum) with key understanding of place value, number operations and related problem solving, reasoning and justification taking priority. These lessons all begin with a Flashback Four which involves retrieval practise of taught concepts to strengthen the neural pathways of prior learning and aid retention of learning (last lesson, last week, last half term, last year).
- 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 pupils can master concepts before moving on to the next part of the curriculum sequence, ensuring no pupil is left behind.
- In KS1, additional daily Mastering Number sessions help secure firm foundations in the development of good number sense for all children.

- Teachers address any gaps in pupils' learning in daily post-teach sessions, future lessons and interventions.
- In KS2, pupils experience a daily, short mental fluency session, based on number facts, relationships and calculations.
- The teaching and learning of Mathematics within EYFS is planned using the Statutory Framework and progress measured towards the Early Learning Goals. There is a continuous provision of hands on, practical Mathematics based activities around the whole foundation stage setting (both indoors and outdoors) and resources can be found in each area. Pupils are given every opportunity to develop their understanding of mathematics through play-based activities which allow them to enjoy, practise and talk confidently about mathematics. As well, each day, maths is incorporated into daily routines e.g. register, snack time and lunch choices, using the tens frame and pictograms.
- Mastering Number from NCETM is taught four days a week in Reception as a whole class, to secure firm foundations in the development of good number sense for all children and aid the transition between EYFS and Y1.
- Pupils in EYFS also access a group adult-led session to consolidate learning.

The impact of our mathematics curriculum:

All pupils

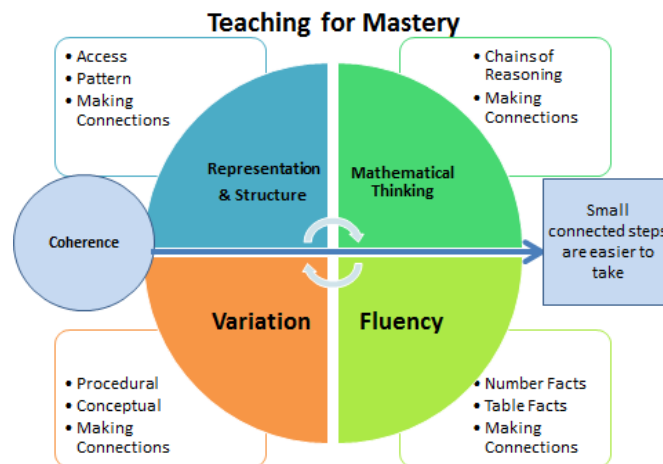
- develop a positive attitude towards mathematics;
- are resilient when faced with the unknown and therefore develop a growth mind-set as opposed to fixed;
- make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems;
- are curious, explore patterns and explain their reasoning through rich mathematical discussion with their peers;
- find more 'elegant' ways of solving problems;
- build up a wide range of mathematical vocabulary to use across all subject areas.

The Maths Mastery Approach

At Marton Manor Primary, we pride ourselves on being an inclusive school, and this is reflected in our philosophy about teaching and learning mathematics. We have high expectations that all pupils can and will achieve, and this has led to us

adopting a 'mastery' approach to planning and teaching maths.

The mastery approach is defined by five key principles, which are illustrated in the diagram, below:



Fluency

This involves:

- quick recall of facts and procedures;
- the flexibility and fluidity to move between different contexts and representations of mathematics;
- the ability to recognise relationships and make connections in mathematics.

Representation and Structure

Mathematical structures are the key patterns and generalisations that underpin sets of numbers – they are the laws and relationships that we want children to spot. Using different representations can help children to 'see' these laws and relationships.

Variation

Procedural variation – This is a deliberate change in the type of examples used and questions set, to draw attention to certain features.

Conceptual variation – This is when a concept is presented in different ways, to show what a concept is, in all of its different forms.

Mathematical Thinking

This involves:

- looking for pattern and relationships;
- logical reasoning;
- making connections.

Coherence

Teachers should develop detailed knowledge of the curriculum in order to break the mathematics down into small steps to develop mastery and address all aspects in a logical progression. This will ensure deep and sustainable learning for all pupils.

The Mastery Approach at Marton Manor

The school uses the concrete - pictorial - abstract approach to help pupils develop a deep understanding of maths. Concrete manipulatives are used throughout the key stages, with all abilities and all ages, so pupils are given the tools to understand the problem in front of them. It helps learners to be more secure in their understanding, they are given the opportunity to discover new ideas and spot the patterns, which will help them reach the answer, and it gives pupils a firm foundation for future learning. Pupils then build on this concrete approach by using pictorial representations. These representations can be used to reason and solve problems. With the foundations firmly laid, pupils can then move to an abstract approach using numbers and key concepts with confidence. There won't necessarily be a linear progression from concrete to pictorial to abstract but instead a cyclical approach will be applied e.g. when a pupil has worked out the answer using an abstract method, they could be asked to use concrete manipulatives to convince others that they are correct.

The school uses this concrete - pictorial - abstract approach to promote and develop children's fluency, reasoning and problem solving and to help all children deepen their understanding of concepts.

Fluency

Pupils need to be able to recall and apply mathematical knowledge both rapidly and accurately. As well as fluency of facts, they need to be able to move

confidently between contexts and representations, recognise relationships and make connections in mathematics.

Children are expected to become fluent in concepts at their year group/stage in maths, apply these concepts across the curriculum and use them for reasoning and solving problems. When they are able to do this, it is then that they are considered by the teacher to be fully secure in their knowledge and understanding at that stage.

Problem Solving

Pupils are encouraged to identify, understand and apply relevant mathematical principles and make connections between different ideas. Concepts will be explored in a variety of representations and problem-solving contexts to give pupils a richer and deeper learning experience. Pupils will combine different concepts to solve complex problems and apply knowledge to real-life situations.

Reasoning

The way pupils speak and write about mathematics is vital to their learning. Pupils will be encouraged to explain the mathematics in full sentences, as well as explaining how they know an answer is correct or wrong.

Greater Depth

All teachers will focus on depth: deepening understanding before accelerating content coverage. Pupils will be given time to fully understand, explore and apply ideas. This enables pupils to truly grasp concepts. The expectation is that the majority of children will move through the curriculum at broadly the same pace. However, decisions about when to progress should always be at the discretion of the teacher. Pupils who grasp concepts quickly should not be accelerated onto the next stage but instead be challenged through rich and sophisticated problems in different contexts.

Our Mathematics Planning:

- long term and medium term plans are supported by Power Maths and White Rose Schemes of Learning and the NCETM Teaching For Mastery spines;

- individual lessons begin with retrieval practice, followed by exploration of key vocabulary, introduction of new learning, varied fluency opportunities and reason and problem solving;
- all year groups from Reception – Y6 access a daily arithmetic session (Mastering Number session R –Y2) to develop mental fluency;
- Y3 – Y4 have a weekly times table lesson and times tables are taught at the start of all maths lessons from Y3 to Y6, and Y2 in the spring and summer term;
- the prior learning in retrieval practice will come from yesterday, last week, last term, last year and in preparation for mathematics in another area of the curriculum;
- mathematics will be used and applied within other areas of the curriculum.

Assessment for Learning:

- teachers and teaching assistants continuously assess pupils' work, understanding and progress in mathematics' lessons. They then use this knowledge to adapt their practice accordingly;
- advice on how to improve and the next steps to take are verbally given to pupils during the lesson and they then act upon them (see school marking policy);
- daily post teach sessions are delivered by teachers from Y1 to Y6 to address any concerns from that day's lesson.
- end of block, half termly arithmetic assessments and end of year summative assessments are also used;
- Y3 and Y4 use TTRS Soundcheck weekly;
- assessments during lessons, as well as termly assessment tests are used to update individual pupil assessment sheets. These are then used by teachers to inform future planning and to ensure that pupils are being adequately challenged as well as addressing any gaps or areas in which they are not completely secure yet;
- the Headteacher, Senior Leadership Team and subject lead also use them to track the progress of classes from term to term;
- children undertake the national SATs tests at the end of Y6.

Mathematics and Inclusion

At Marton Manor Primary, we teach mathematics to all children, whatever their ability, ethnicity, religion, gender, sexual orientation, disability, age, social circumstances or individual needs. Mathematics forms part of the school curriculum policy to provide a broad and balanced education to all children. Through our mathematics teaching, we provide learning opportunities that enable all pupils to make good progress. We strive hard to meet the needs of those pupils with special educational needs, those with disabilities, those with special gifts and talents and those learning English as an additional language, and we take all reasonable steps to achieve this. Teachers will identify specific needs and steps necessary to allow children to access the curriculum at an appropriate level.

When progress falls significantly outside the expected range, the child may have special educational needs. Our assessment process looks at a range of factors – classroom organisation, teaching materials, teaching style, appropriate scaffolding and adaptations – so that we can take some additional or different action to enable the child to learn more effectively. Where necessary, children presenting with possible signs of dyscalculia are assessed by the Language and Learning Maths specialist and/or Educational Psychologist and any recommendations provided are followed up in class.

Children who are having difficulty with a certain aspect of Maths or have missed lessons through illness are targeted through interventions (including pre and post-teach). The impact of these interventions and the progress made by pupils are continuously assessed.

We enable all pupils to have access to the full range of activities involved in learning mathematics. Where children are to participate in activities outside the classroom (a 'maths trail', for example), we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils.

Opportunities for Cross Curricular Links

As well as through discrete mathematics lessons, it is important that children are able to recognise when the application of mathematical skills and concepts is appropriate in other subjects across the curriculum. This will help children to see mathematics as a broad and varied subject, and to apply it in a range of contexts.

When planning for other subjects, teachers should identify opportunities for developing mathematical skills and learning. The table below contains some ideas for applying mathematics within a range of curriculum subjects, but it is up to individual teachers to decide when, and in which units of work / topics, mathematics can be used to enhance and deepen learning.

Science	Data handling, such as tables, bar charts and line graphs; measuring and comparing, e.g. temperature, time, volume; converting units and using simple equations; angles, e.g. refraction
ICT / Computing	Position and direction, e.g. Roamer/Beebot/Logo; sensing equipment and spreadsheets / databases for the handling of statistics; geometry using graphics or coding programmes
History	Calculation of dates and timelines; alternative number systems e.g. Roman numerals;
Geography	Calculation of time difference; co-ordinates; statistics, e.g. bar charts, line graphs and pie charts
Music	Number pattern and timing (counting beats)
D&T	Measuring e.g. lengths, times, volumes; fractions, ratio and proportion, e.g. within food technology
P.E.	Statistics, such as mean; measuring, e.g. distances and times; position and direction; point scoring
Art	Geometry, e.g. symmetry, properties of shape, angles, reflection, translation and rotation

Opportunities for the daily revisiting of key skills should also be built into classroom routines.

Developing, Monitoring and Evaluating Mathematics

Mathematics is a core subject and therefore must have a rigorous monitoring system in place. This monitoring is to ensure that children receive the challenging, broad and balanced curriculum which they are entitled to. Regular monitoring

allows the Mathematics Lead and Senior Leadership Team to identify strengths, training needs and changes required to meet the needs of the children.

Evaluation of the teaching and learning of mathematics will be derived from regular:

- lesson observations or learning walks;
- analysis of the impact of teachers' planning on pupil outcomes;
- scrutiny of children's work;
- discussions with pupils about their learning;
- analysis of teacher assessment and relevant data.

Findings from the monitoring process will be fed back to members of staff, as appropriate, in order to drive further development in teaching and learning across the school. Colleagues will be supported where necessary in their teaching and will be kept informed about current developments in mathematics. The Governing Body will also be provided with reports on progress in Mathematics as part of pupil data monitoring including progress of vulnerable groups and those pupils working at greater depth and as part of the wider School Improvement Plan.