Maths Policy

Implementation date: September 2023

Review Date: September 2024

Curriculum Rationale

We have the following goals in all curriculum areas:

Success – We celebrate individuality, and the success that each child has, and we recognise that this will take a variety of forms.

Motivation – We aim for all of our children to be motivated young people who have a desire to do their best and try their hardest.

Confidence – We provide a nurturing environment where all our pupils develop confidence in themselves to be successful members of their community.

Aspiration - We are aspirational for our children, providing a curriculum that ensures each learner has the opportunity to reach their true potential.

These aims are achieved by adhering to the following learning motto:

IGNITE – EXCITE – ENGAGE

We aim to:

Ignite a passion for learning and the curiosity to explore the world.

Excite pupils with a curriculum that is fun, and which contains a wealth of rich experiences

Engage all learners and members of the community.

1.) INTRODUCTION

The National Curriculum describes mathematics as follows:

*"**Mathematics** is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject."*
Mathematics equips pupils with the uniquely powerful set of tools to understand and change the world. These tools include logical reasoning, problem solving skills and the ability to think in abstract ways."

Mathematics is important and integral to all aspects of everyday life, and with this in mind we endeavour to ensure that children develop a healthy and enthusiastic attitude towards mathematics that will remain with them.

The following policy reflects our values and philosophy in relation to the provision and teaching of Mathematics at St Michael's Community Academy.

1.) AIMS

We have the following aims for all of our pupils, taken from the National Curriculum:

- To become **fluent** in the fundamentals of mathematics through frequent practice with increasingly complex problems over time, so that children have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately

- To **reason mathematically** by following a line of enquiry, exploring relationships and generalisations, and presenting explanations using mathematical language

- To develop the ability to **solve problems** by applying 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.

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.
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.

We endeavour to teach Maths in a way that:

- delivers Maths in line with National Curriculum guidelines
- ensures the delivery of Maths is filled with **cross curricular opportunities**
- creates a **lively, exciting and stimulating environment** in which the children can learn Maths
- allows time for partner talk in order to **stimulate and develop a curiosity** for Maths
- **challenges children** to stretch themselves and take risks in their learning
- creates a sense of **awe and wonder** surrounding Maths
- ensures children in Key Stage 1 are secure in their understanding of number and number relationships
- provides children with the opportunity for a range of **challenges for all abilities**

2.) APPROACH/IMPLEMENTATION:

At St. Michael's Community Academy, we adopt a mastery approach to the teaching and learning of Mathematics using the Power Maths approach from Year One-Year Six.
In Reception, the Mastering Number approach is used to teach Maths.
Essentially, our ethos is that all children can be successful in the study of mathematics. We do not accept that 'some children cannot do maths' or that children should be limited by prior attainment. Maths is for everyone! We teach the skills to ensure our children are resilient learners who become life-long Mathematicians. We aim to deliver an inspiring and engaging Mathematics curriculum through high quality teaching.
The Power Maths approach enables children to be numerate, creative, independent, inquisitive, enquiring and confident. Children should not be afraid to make mistakes and should fully embrace the fact that mistakes are part of learning! A mastery curriculum promotes a deep, long-term, secure and adaptable understanding of the subject, so that children become fluent in calculations; possess a growing confidence to reason mathematically and hone their problem-solving skills.

Organisation and Curriculum Coverage

At St. Michael's Community Academy, we recognise that children need to be confident and fluent across each yearly objective. To ensure consistent coverage, teachers follow the Power Maths scheme of learning to support their planning. Teachers are also developing their understanding of mastery whilst working with the Maths Hub.
Power Maths is an exciting and inspiring class mastery approach, which has been recommended by the Department for Education.
Every year group (Years 1-6) has a 15 minute fluency starter within a daily maths lesson followed by a 45 minute Power Maths lesson.
The fluency part of the lesson focuses on consolidating gaps and accelerating progress which can then be applied in different contexts.
Following this, each Power Maths lesson is divided into sections that involve plenty of discovery, sharing, thinking together, practice and reflection.
The main lesson begins with a 'Discover' and 'Share' task in which a contextual problem is shared for the children to discuss in partners. This helps promote discussion and ensures that mathematical ideas are introduced in a logical way to support conceptual understanding. In KS1, these problems are almost always presented with objects (concrete manipulatives) for children to use. Children may also use manipulatives in KS2 and this is encouraged. Teachers use careful questions to draw out children's discussions and their reasoning and the children learn from misconceptions through whole class reasoning. Following this, the children are presented with varied similar problems which they might discuss with a partner or within a small group. At this point, scaffolding is carefully reduced to prepare children for independent practice. This is the 'Think together' part of the lesson and the

children might record some of their working out in their Maths journals, a mini whiteboard or on their iPad. The teacher uses this part of the lesson to address any initial errors and confirm the different methods and strategies that can be used. The children are then shown a 'challenge' which promotes a greater depth of thinking. The class then progress to the 'Practice' part of the lesson, which is designed to be completed independently. This practice uses conceptual and procedural variation to build fluency and develop greater understanding of underlying mathematical concepts. A challenge question and links to other areas of Maths encourages children to take their understanding to a greater level of depth. The final part of the sequence is a 'reflect' task. This is an opportunity for children to review, reason and reflect on learning and enables the teacher to gauge their depth of understanding. Children are encouraged to solve problems each day through the use of concrete resources, pictorial representations and abstract thinking. Each child has their own Practice Book in which they answer questions and discuss their thinking with their teacher. At the heart of this programme is the idea that all children can be successful mathematicians with the right mind-set.

Early Years Foundation Stage:

The Early Years Foundation Stage (EYFS) states that:

"Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. 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. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes."

(The Statutory Framework for Early Years Foundation Stage 2023)

The level of development children should be expected to have attained in Mathematics by the end of the EYFS is defined by the early learning goals as set out below:

ELG: Number

Children at the expected level of development will:

- Have a deep understanding of number to 10, including the composition of each number;
- Subitise (recognise quantities without counting) up to 5; -
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

ELG: Numerical

Patterns Children at the expected level of development will:

- Verbally count beyond 20, recognising the pattern of the counting system;
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity;
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally

In addition to the above, the EYFS curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures.

The successful teaching of mathematics lies within the context of high-quality interactions and classroom provision. Across EYFS, our mathematically rich environment provides a range of contexts for our children to explore concepts using different representations. All children develop using a hands-on practical approach and we focus on deepening understanding through practical adult-led activities, songs and rhymes and co-play experiences using a range of high-quality resources (e.g. concrete/ pictorial/ abstract). We are language rich and have a strong focus on using sentence stems to develop reasoning during teaching sessions, play based learning opportunities and within our daily routines.

In Snuggly Bugs Preschool and Nursery, mathematics is heavily taught through play-based experiences both indoors and outdoors. Reception children take part in the NCETM Mastering Number Programme which is supported by CBBC Numberblocks. The programme is explicitly delivered in 10 minute daily sessions and aims to secure firm foundations in the development of good number sense. All Reception children follow and participate in the 31- week Mastering Number project. There is a fundamental focus on subitising (recognising an amount without counting) and developing a deep understanding of numbers to 10 using a variety of representations, including Numberblocks, tens frames and rekenreks.

Mastering Number (Key Stage One):

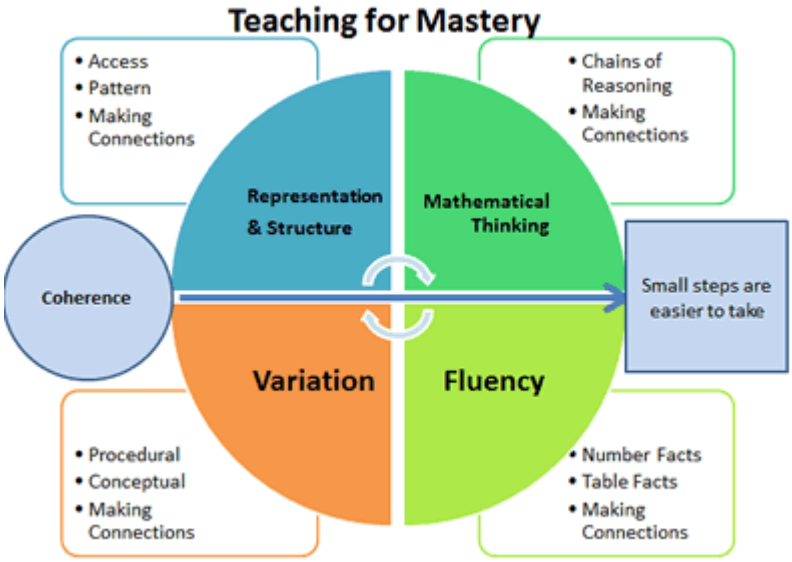
Key Stage One children also follow the NCETM Mastering Number programme, in addition to daily Power Maths lessons.
Mastering Number is taught as daily, ten-minute sessions focusing on two key strands: automaticity of number facts and the development of number sense.
This programme adopts the mindset that all children **can** think mathematically and this is developed with explicit teaching.

Additional Fluency Sessions in Key Stage Two:

In order to further develop pupils' fluency, all children in Key Stage Two receive two additional 15 minute fluency sessions each week. This is an opportunity to practise fundamental skills necessary to be a successful mathematician.

(See Appendix 1: Fluency Trackers)

Taken from the NCETM for Mastery guidance:



3.) RESOURCES

High quality resources are used in conjunction with Power Maths, such as NRich and NCETM to support, stretch and challenge all children within the classroom. In addition, the school's calculation policy (divided into phases within the school: Key Stage One, Lower Key Stage Two and Upper Key Stage Two. These reflect our use of *Power Maths)* is used to ensure a coherent approach to teaching the operations across our school. Our curriculum builds on the concrete, pictorial, abstract approach. By using all three, the children can explore and demonstrate their mathematical learning. Together, these elements help to cement knowledge so children truly understand what they have learnt. All children have access to a wide range of concrete Mathematical resources to help them build on their concrete understanding of Mathematical concepts. All children when introduced to a new concept for the first time are encouraged to physically represent mathematical concepts. Objects and pictures are used to demonstrate and visualise abstract ideas, alongside numbers and symbols. Throughout St. Michael's Community Academy, you will see these three methods being used:

Concrete – children have the opportunity to use concrete objects and manipulatives to help them understand and explain what they are doing.

Pictorial – children then build on this concrete approach by using these pictorial representations, which can then be used to reason and solve problems.

Abstract – with the foundations firmly laid by using the concrete and pictorial methods the children can move onto an abstract approach using numbers and key concepts with confidence.

4.) INCLUSION

Adopting a mastery approach, differentiation occurs in the support and intervention provided to different children, not in the topics taught, particularly at earlier stages.

There is little differentiation in the content taught but the questioning and scaffolding individual children receive in class as they work through problems will differ, with higher attainers challenged through more demanding problems, which deepen their knowledge of the same content before

acceleration onto new content. Children's difficulties and misconceptions are identified through immediate formative assessment, often achieved through instant feedback, and addressed with rapid intervention – commonly through individual or small group support.
Although the expectation is that the majority of children will move through the programmes of study at broadly the same pace, the 2014 National Curriculum states: 'Decisions about when to progress should always be based on the security of children's understanding and their readiness to progress to the next stage.'
If a child's needs are best met by following an alternative plan (PIVATS), including coverage of the content
from a previous year, this will be directed by the SENDCo, in collaboration with the class teacher and with the knowledge of SLT.

5.) STANDARDS

As a school, we have consistent high expectations regarding both presentation and methodology.

Pupils are taught how to use formal and informal methods to record their calculations, investigations and other mathematical work, children are encouraged to select independently, from the methods taught, suitable ways of recording their results.

Children's recordings are encouraged to be neat and of a high standard; presented in a clear and organised way and in a variety of forms **e.g.** diagrammatically, graphically, pictorially, as a model or in written form. Children will use either Showbie on their iPads to record practical work, Power Maths Practice Books or Maths journals (used for consolidation).

Teachers respond to pupil work and guide them accordingly following the school feedback policy.

The scrutiny of standards in pupils' Maths work forms a part of each term's monitoring and evaluation cycle.

6.) ASSESSMENT

Assessment is regarded as an integral and purposeful part of teaching and learning and is a continuous process. It is the responsibility of the class teacher to assess all pupils in
their class, ensure that teaching is matched to the child's current level of attainment, and record their progress.

Formative assessment is carried out on an ongoing basis during lessons and as part of daily/weekly evaluations of how well pupils are doing. Feedback to pupils may be verbal or it may be in written form, and in all cases will be in accordance with the school's feedback policy.

End of Unit checks are used within the Power Maths scheme and NTS assessments from Hodder Education are completed on a termly basis (December, April and July) to generate standardised scores. These outcomes are used to inform data uploads on the school tracking tool (Arbor). This information is used to identify any issues regarding the progress of ability groups, gender, EAL, Pupil Premium and those with Special Educational Needs and will be discussed at termly progress meetings with SLT.

7.) DISPLAYS

We recognise the importance of a stimulating learning environment. Each classroom is required to have a mathematical working wall with displays which include: **mathematical vocabulary**, **sentence stems**, **models and images**, **children's work** and **interactive activities**.

The working wall is expected to be updated regularly and reflect the current/most recent learning of pupils, as well as references to basic skills and knowledge that pupils will need to practise regularly in order to gain fluency.

Maths books and a range of mathematical equipment are available in classrooms. Children are encouraged to work independently where appropriate within the classroom, selecting the equipment they need.

8.) EQUAL OPPORTUNITIES

All children have equal access to the curriculum regardless of their gender, ethnicity, age or ability. This is monitored by analysing pupil performance throughout the school to ensure that there is no disparity between groups.

9.) PARENTAL ENGAGEMENT

At St Michael's Community Academy we encourage parents to be involved by:

- Inviting them into school twice yearly to discuss the progress of their child, along with a formal written report at the end of each academic year
- Holding family learning workshops for parents focusing on areas of mathematics
- Engage in mathematical challenges at home
- Inviting parents of Year 6 pupils to a meeting on supporting their children with SATs