The Magdalen Church of England / Methodist Primary School

Policy document for the teaching of Mathematics

2022 - 2023

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Maths Curriculum Policy

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Introduction

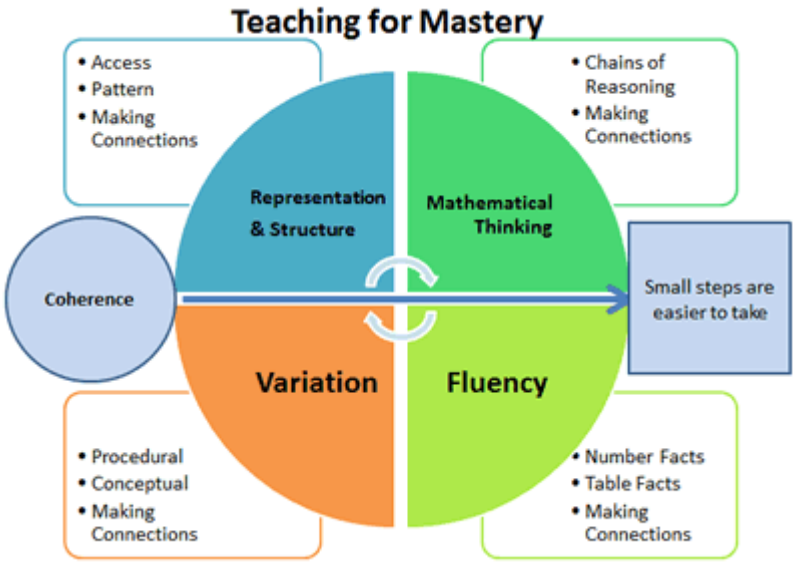
"Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most 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." (DfE, 2013)

It is our belief that all pupils should be encouraged and helped to realise their full potential in Maths. We want the children to see Mathematics as being relevant to their world and applicable to everyday life as well as being something that they will need as they move on through their school life and ultimately to the world of employment.

To that end, a high-quality, inter-related and creative Maths experience should be one that develops the children's ability to think mathematically and one which allows them to apply the tools to which they have been exposed in a variety of ways.

We place a strong emphasis on teaching Mathematical skills and concepts in concrete and practical contexts. Teachers should use concrete and pictorial activities which enable the children to use and apply skills, knowledge and understanding.

Aims/Objectives



Strategies

At the Magdalen Church of England / Methodist Primary School, we teach Mathematics in a Teaching for Mastery approach, supported by Maths No Problem to delivery high-quality maths education.

Developing Fluency

Fluency is developed during maths lesson and a short fluency session, independent of the maths lesson. It encompasses the systematic teaching of number facts, the flexibility and fluidity to move between different contexts and representations of mathematics, and 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 – When a concept is presented in different ways, to show what a concept is, in all of its different forms.

Mathematical Thinking

- Looking for patterns and relationships
- Logical reasoning
- Making connections

Coherence

Teachers will plan effective lessons that are broken down in small steps to develop mastery and address all aspects in a logical progression. This will support deep and sustainable learning for all.

As a result of teaching and learning in mathematics, our aim is that pupils will meet the key aims of the National curriculum in Mathematics.

Using the Programmes of Study from the National Curriculum the aims of mathematics are:

- To promote enjoyment and enthusiasm for learning through practical activity, exploration and discussion, inspiring confidence in maths
- To create a lively, exciting and stimulating environment in which all children can learn Maths
- Ensure the delivery of Maths is filled with cross curricular opportunities
- To promote confidence and competence with numbers and the number system and to use mathematical vocabulary to reason and explain
- To develop the ability to solve problems through decision making and reasoning in a range of contexts
- To develop a practical understanding of the ways in which information is gathered and presented.
- To explore features of shape and space and develop measuring skills in a range of contexts
- For children to challenge and stretch themselves and take risks in their learning
- To promote the concept that acquiring mathematical knowledge and skills provides the foundation for understanding Maths in everyday life.

Reception:

Maths is taught as a whole class daily lesson and guided maths sessions take place each day. Continuous provision allows children to explore the mathematical opportunities within their environment, through play, independently and in small groups, both inside and outdoors.

Number, Shape, Space and Measure, Pattern and Problem Solving is taught through daily teaching and exploration in continuous provision, with support from Maths No Problem – Foundations. During units with a focus on Shape, Space and Measure or Pattern, children's number acquisition is supported through NCETM's Mastering Number programme.

Year 1:

Children are taught discrete maths lessons, this begins as groups at the start of the year, and build up to a whole class by the end of Year One. Each session begins with daily number sense that teaches the systematic acquisition of number facts, developing fluency and mental strategies. This is followed by new teaching and guided activities based around this. In addition, continuous provision is developed to allow children to explore mathematical opportunities independently throughout every morning and afternoon. This blended approach to learning prepares children for their future education.

Year 2-6:

Fluency sessions

Every morning children complete a retrieval task as part of their 'morning maths'. Following this, all children in Years 2-6 complete a short session to develop their fluency of number facts and mental strategies. In Years 2 and 3, this is to develop quick recall and fluency of addition and subtraction facts within 20 and to gain fluency in times table facts. Year 4 focuses on efficient strategies of calculation, and the learning of times tables. In Year 5 and 6 fluency sessions, move on to explore efficient strategies of calculation, understanding of fractions and application of calculation to problem solving and reasoning.

Maths lessons

Maths lessons in Years 1-6 are taught between four and five times per week and exceed a total of five hours. Maths No Problem supports the delivery of our Mathematics curriculum.

These lessons begin with 'In Focus' problem solving, where children work collaboratively to find different methods to solve the given problem. After a whole-class, rich discussion of problem solving strategies with the teacher, children then use the strategies they have just been taught to solve the same (or a similar) question with their maths partner.

Following this, children complete guided practice. This is taught in a ping-pong style to ensure quick pace. Children then move onto independent practice.

The lesson ends with a short learning review, summarising the lesson's learning. This lesson sequence ensures that each lesson has aspects of fluency, problem solving and reasoning practice.

Display and Resources:

In the classrooms there should be, either on display or easily accessible to children, appropriate resources, particularly concrete and pictorial apparatus to support children to grasp concepts.

- Mathematical vocabulary should be displayed so that children use this in the communication of their understanding.
- Working walls should add to learning, providing scaffolds for children.
- Mathematical materials, equipment and resources are available for children to use.

The mathematics leader should be informed when equipment needs replacing or supplementing. The children are shown how to take care of equipment and resources and progressively encouraged to select materials suitable for the task in which they are engaged.

Links to other curriculum areas

English: Logical sequencing of events, chronology, positional language, syllables and lines in poems, making predictions, comparisons using Venn diagrams or tables

Science: Statistics for recording data (tally charts), presenting data, bar charts, pie charts, pictograms, line graphs, line of best fit for predicting trends, angles of reflection and refraction, speed of light and sound, recording measurements of height, length, temperature or time, weight, mass, size and distance of planets, calculating averages

History: Chronology, timelines, army sizes in battles, ratio and proportion, Roman numerals, journey distances and times, area and perimeter of historical housing

Geography: Gathering data, recording data, analysing data (i.e. traffic, trees, weather), measures - rainfall mm, temperature, distances of rivers, population sizes, co-ordinates, map reading, angles, turns, directions

Art & DT: measuring, creating scale models, shape and 3D nets sequencing

ICT: Programming, logical sequencing, 3D mapping, turns, angles

PE: Measuring distances, personal best times, angles when hitting, batting or kicking balls, height, lengths, weight, estimation

RE: Chronology, logical reasoning

PSHE: Venn diagrams, money, budgeting, careers

Music: Time signatures, composition in time, tempo, sequences or structure of music, repeating patterns, note lengths

Roles:

The role of the subject leader:

The role of the subject leader is to:

- to provide a strategic lead and direction for the subject
- to support and offer advice to colleagues on issues related to the subject;
- to monitor pupil progress in that subject area;
- to provide efficient resource management for the subject.

It is the role of the Maths subject leader to keep up to date with developments in Maths, at both national and local level. They review the way the subject is taught in the school and plan for improvement. This development planning links to whole-school objectives. Each subject leader reviews the curriculum plans for their subject, ensures that there is full coverage of the National Curriculum and that progression is planned.

They must then monitor and review this on a regular basis, by conducting book scrutiny, learning walks, data analysis and through discussion with both pupils and staff. This will then inform future plans and development of the subject.

Parental Support and Homework

We recognise that parents make a significant difference to the pupils' progress in maths and encourage this essential partnership. Homework follows the school's Homework Policy and is used for the following purposes:

- To practice a skill
- To learn something by rote such as times tables and formulae
- To revise for an assessment
- To explore a mathematical problem or question
- To research a topic

Outcomes

Intended Outcomes

Our pupils will learn to:

- Develop the appropriate mathematical language associated with number, shape and position;
- Use and apply mathematics in practical tasks, in real life problems and in acquiring further knowledge, skills and understanding in the subject itself;
- Understand and use the four operations of number in relevant contexts;
- Understand relationships between numbers, learn basic number facts and develop a range of computational methods;
- Understand place value in our counting system and understand how it can be extended into numbers below zero.
- Use their mathematical skills in simple problem solving;
- Collect, interpret and represent data in tabular, graphical and diagrammatic form;
- Develop mental methods of calculation;
- Recognise, describe and represent shapes and patterns in terms of their properties, location and movement;
- Measure quantities including length, area, volume/capacity, angle, temperature, time and mass;
- By the time children reach Year 6 they will be introduced to ratio/ proportion and language of algebra as a means for solving a variety of problems.
- Pupils to be at the Age Related Expectations (ARE) at the end of their appropriate school year.

Monitoring and Assessment

- Teachers continuously assess the children informally (formative assessment) through their marking and interactions with the pupils during lessons.
- Across a range of lessons children should be allowed to engage in mathematical discussion (talk partner or group work), investigations, problem solving, practical experiences and written methods, as well as allowing for time to demonstrate their understanding through gap tasks.
- Children will be formally assessed three times per year. These summative assessments will inform the planning and teaching cycle.
- In EYFS children are benchmarked when they enter the school, following this, children's attainment and progress is tracked on a daily and weekly basis.