

Mawsley Community Primary School



MATHS POLICY

Policy Ownership	TLO
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Mawsley Community Primary School Mathematics Policy

At Mawsley Community Primary School we believe that ALL children CAN and WILL achieve in Mathematics.

1 Aims

1.1 Our view of Mathematics

Mathematics teaches children how to make sense of the world around them through developing their ability to calculate, reason and solve problems. It is a creative subject that enables children to understand relationships and patterns in both number and space in their everyday lives. Through their growing knowledge and understanding, children learn to appreciate the contribution made by many cultures to the development and application of mathematics. They appreciate and can understand the mathematical content in other subjects such as Art and Science and its application in all other curriculum areas. Mathematical understanding is an important requirement for many future careers and is highly valued by the world of industry and higher education.

1.2 The aims of teaching mathematics in Mawsley Primary School are:

- ❖ That children 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.
- ❖ That children can **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- ❖ That children 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.
- ❖ That all children are active participants in their learning and understand the high expectations we set for them.
- ❖ That children develop a **positive mathematical mindset**. They are encouraged to believe that:

- Everyone can learn maths to the highest level.
- Mistakes are valuable.
- Questions are really important.
- Mathematics is about communicating and connections.
- Mathematics is about learning not performing.
- Depth of understanding is more important than speed

2 Teaching and learning style

2.1 The 2014 curriculum

In 2014, the national curriculum for mathematics was designed to raise standards in mathematics, with the aim that the large majority of pupils will achieve mastery of the subject. Mathematics in Mawsley Primary School is taught following this 'Mastery' approach.

Teachers are clear that their role is to teach in a precise way which makes it possible for all pupils to engage successfully with tasks at the expected level of challenge. Pupils work on the same concept and engage in common discussions. Concepts are often explored together to make mathematical relationships explicit and strengthen pupils' understanding of mathematical connectivity. Precise questioning during lessons ensures that pupils develop fluent technical proficiency and think deeply about the underpinning mathematical concepts. There is no prioritization between technical proficiency and conceptual understanding; these two key aspects of mathematical learning are developed in parallel.

2.2 Key pedagogies

It is well documented that the most effective teachers are those who make connections. We believe that by looking at the bigger picture in mathematics- through the big ideas that span and connect the mathematics curriculum- teachers develop a deeper understanding of mathematics and are able to facilitate learning more effectively. The key pedagogies modelled, developed and applied are:

Prompting children's thinking through questions:

What do you notice?

What is the same and what is different?

Enabling learning through:

Drawing attention to...

Developing reasoning and making connections.

Providing opportunities for children to:

Manipulate, experience, see

Engage in talk

Developing children's thinking through:

Investigation

Scaffolding

During our daily lessons we encourage children to ask as well as answer mathematical questions. They have the opportunity to choose to use a wide range of resources, such as number lines, number squares, digit cards and small apparatus to support their work. Mathematical dictionaries are available in all classrooms and key vocabulary is displayed. ICT is used in mathematics lessons for modelling ideas and methods.

Fluency

Fluency comes from deep knowledge and practice. Pupils work hard and are productive. At early stages, explicit learning of multiplication tables is important in the journey towards fluency and contributes to quick and efficient mental calculation. Practice leads to other number facts becoming second nature. The ability to recall facts from long term memory and manipulate them to work out other facts is also important. All tasks are chosen and sequenced carefully, offering appropriate variation in order to reveal the underlying mathematical structure to pupils. Both class work and homework provide this 'intelligent practice', which helps to develop deep and sustainable knowledge.

2.3 Differentiation

In all classes children have a wide range of mathematical abilities. We recognise this fact and provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this through a range of strategies – in some lessons through differentiated group work and in other lessons by organising the children to work in pairs on rich tasks. Children are allowed the opportunity for intelligent practice by working independently in their practise books. We also believe that children learn best by teaching each other and provide opportunities for children to coach and mentor each other in the development of their mathematical skills.

In some year groups, children are placed in groups of similar abilities. Within these groups lessons are still differentiated and the children are moved between groups when appropriate. In upper key stage 2 differentiated activities are provided that the children move freely between without the limits of set groups being applied. Exceptionally gifted children are identified in all year groups and when appropriate accelerated learning is achieved by allowing the children to access the objectives of the year group above them.

2.4 Problem solving and reasoning

Problem solving and reasoning are essential skills in order for high quality mathematical learning to occur. Opportunities for reasoning and problem solving are highlighted on weekly plans. Sentence stems and key vocabulary are displayed in all classrooms in order to extend and model children's explanations of their mathematical reasoning.

2.5 Lesson structure.

On occasion a problem can be presented to the children with little input the

outcomes of which, will direct the content of the next lesson. (See appendix 1 for Mastery maths @ Mawsley)

1. Power up- fluency or reasoning exercise.
2. Introduce new objective and success criteria. It is important that children know not just what they are learning but why it is important and how it links with previous learning. They also need to be introduced to any new vocabulary.
3. Discover- problem involving pair work.
4. Share- teacher led solving of problem in discover (explore different methods)
5. Think together- teacher lead. I do, we do, you do. Children given strengthening and deepening activities.
6. Practice- independent thinking. Children given strengthening and deepening activities with an extra challenge level available.
7. Reflect and assess- independent thinking and pair work. Children reflect on whether they have met the learning objective.

3 Mathematics curriculum planning

- 3.1** Mawsley Primary School uses the 'Power Maths' scheme, which is fully in line with the 2014 National Mathematics curriculum, as the basis for all teaching and learning in mathematics. However, it is clearly understood that all lessons must be tailored to meet the needs of the children and as such teachers will often adapt the programme to meet these needs.
- 3.2** We follow Power Maths long term plans but at a pace that allows maximum learning to take place. Weekly plans are produced which identify children who may be falling behind their targets, includes questions to extend thinking and highlights reasoning opportunities for all abilities. (See appendix 2)

4 The Foundation Stage

- 4.1** We teach mathematics in our reception class and relate the mathematical aspects of the children's work to the objectives set out in the Early Learning Goals. This underpins the curriculum planning for children from birth to five. We give all the children ample opportunity to develop their understanding of number, measurement, pattern, shape and space, through varied activities that allow them to enjoy, explore, practise and talk confidently about mathematics. We employ Numicon as a concrete resource that allows the children to explore and understand the properties of number. There is a strong focus on children applying the skills they have learned in practical and real-life contexts.

5 Contribution of mathematics to teaching in other curriculum areas

5.1 English

The teaching of Mathematics contributes significantly to children's

understanding of English in our school by actively promoting the skills of reading, writing, speaking and listening. For example, in mathematics lessons we expect children to read and interpret problems, in order to identify the mathematics involved. They are also improving their command of English when they explain and present their work to others during plenary sessions. In English lessons, too, maths can contribute: younger children enjoy stories and rhyme that rely on counting and sequencing, while older children encounter mathematical vocabulary, graphs and charts when reading non-fiction texts.

5.2 Personal, social and health education (PSHE) and citizenship

Mathematics contributes to the teaching of PSHE and citizenship. The work that children do outside their normal lessons encourages independent study and helps them to become increasingly responsible for their own learning. The planned activities that children do within the classroom encourage them to work together and respect each other's views. We present older children with real-life situations in their mathematics work on the spending of money and in the discover part of lessons.

5.3 Spiritual, moral, social and cultural development

The teaching of mathematics supports the social development of our children through the way we expect them to work with each other in lessons. We group children so that they work together, and we give them the chance to discuss their ideas and results. The study of famous mathematicians around the world contributes to the cultural development of our children.

6 Mathematics Science and ICT

6.1 Information and communication technology enhances the teaching of mathematics significantly, because ICT is particularly useful for mathematical tasks. It also offers ways of impacting on learning which are not possible with conventional methods. Teachers can use software to present information visually, dynamically and interactively, so that children understand concepts more quickly. Younger children use ICT to communicate results with appropriate mathematical symbols. Science allows many data handling techniques to have a real purpose. Children produce graphs and tables when explaining their results, or when identifying repeating patterns. The cross over between mathematics, science and ICT is significant. When working on control, children can use both standard and non-standard measures for distance and angle and use ICT sensors to measure temperature and sound levels. They can also use simulations to identify patterns and relationships.

6.2 Mathematics and other subjects

Mathematical problem solving and links to other subjects such as Art are promoted through mathematically themed sessions which occur during 'wow weeks'. Such days have historically included the study of the work of Jackson Pollack and the mathematics contained within and the mathematics of other cultures which was explored through the context of a crystal maze. Sessions are often linked to the teaching of humanities such as exploring Mayan

mathematics, comparing specifications of World War II planes and comparing the costs of toys.

7 Mathematics and inclusion

7.1 At our school we teach mathematics to all children, whatever their ability and individual needs. Mathematics forms part of the school curriculum policy to provide a broad and balanced education to all children. Differentiation occurs in the support and intervention provided to different pupils, not in the topics taught, particularly at earlier stages. There is no differentiation in content taught, but the questioning and scaffolding individual pupils 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. Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with rapid intervention – commonly through individual or small group support. 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. For further details see the SEND inclusion policy.

7.2 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, and differentiation – so that we can take some additional or different action to enable the child to learn more effectively. For some children, a numeracy intervention called 'Catch Up Numeracy' is then employed. Assessment against the National Curriculum allows us to consider each child's attainment and progress against expected levels. This ensures that our teaching is matched to the child's needs.

7.3 Intervention for some children with additional needs will lead to the creation of an Individual Education Plan (IEP). This may include, as appropriate, specific targets relating to mathematics. Class Action Plans (CAPs) identify special groups such as pupil premium children and set short term targets in order that these children make accelerated progress.

7.4 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.

8 Assessment for learning

8.1 Teachers will assess children's work in mathematics from three aspects (long-term, medium-term and short-term). We use short-term assessments to help us adjust our daily plans. These short-term assessments consist of questioning and observation in the lesson and a reflect activity at the end of the lesson (usually).

We make medium-term assessments to measure progress against the key objectives, and to help us plan the next unit of work. The children complete termly assessments (Rising Stars tests) which produce a judgement as to whether they are meeting age related expectation, which allows us to ensure the children are making appropriate progress. The results from these tests are analysed and any children who may be falling behind their expected progress are identified. Gaps in understanding are also identified which help to inform future planning.

We make long-term assessments towards the end of the school year, and we use these to assess progress against school and national targets. We can then set targets for the next school year and make a summary of each child's progress before discussing it with parents. We pass this information on to the next teacher at the end of the year, so that s/he can plan for the new school year. We make the long-term assessments with the help of end-of-year tests and teacher assessments. We use the national tests for children in Year 2 and Year 6..We also make annual assessments of children's progress measured against the level descriptions of the National Curriculum.

- 8.2** Detailed records consisting of all the above assessments are kept by the class teacher and are monitored by the mathematics lead, phase leaders and SLT.

9 Resources

- 9.1** A coherent programme of high quality curriculum materials is used to support classroom teaching. Concrete and pictorial representations of mathematics are chosen carefully to help build procedural and conceptual knowledge together. Exercises are structured with great care to build deep conceptual knowledge alongside developing procedural fluency. The focus is on the development of deep structural knowledge and the ability to make connections. Making connections in mathematics deepens knowledge of concepts and procedures, ensures what is learnt is sustained over time, and cuts down the time required to assimilate and master later concepts and techniques

10 Monitoring and review

- 10.1** Monitoring of the standards of children's work and of the quality of teaching in mathematics is the responsibility of the subject leader. The work of the subject leader also involves supporting colleagues in their teaching, being informed about current developments in the subject, and providing a strategic lead and direction for mathematics in the school. The subject leader gives the headteacher and governors an annual summary in which strengths and weaknesses in the subject are evaluated, and areas for further improvement are identified. Evaluations are made each term of the progress of special groups and the progress of each year group and identifies children not making expected progress. The headteacher allocates regular management time to the

subject leaders so that they can review samples of children's work and undertake lesson observations of mathematics teaching across the school..

- 10.2** This policy will be reviewed at least every two years. This policy was reviewed and agreed by the Curriculum Committee on .