

Mathematics Policy

Intent

At Litherland Moss Primary School we have a passion for high standards in mathematics and believe that all pupils can become excellent mathematicians. We believe that mathematics helps to develop logical and critical thinking and offers children a powerful way to communicate. We believe that every child can master an understanding and love of maths with teaching and support. At our school we use the 'Maths No Problem' scheme which encourages pupils to master mathematical concepts in greater detail using a three-step learning process: concrete, pictorial and abstract. The approach develops a deep and sustainable understanding of maths in our pupils and allows them to develop their existing knowledge by exploring and solving mathematical problems in a tangible way. We encourage our pupils to explain their methods, talk to each other about how they have solved a problem and find relationships and patterns in their processes and solutions. We believe that this is an inclusive approach to teaching and learning in mathematics and the emphasis on promoting multiple methods of solving a problem, builds resilience and self confidence in our pupils. Mathematical vocabulary is at the heart of each of our lessons; ensuring pupils understand and use the correct terminology to communicate confidently about the maths they are working on and concisely explain their thinking and working in maths. We highly value mathematical talk and see it as a unique way of communicating. At Litherland Moss we believe in deepening thinking within the area of study, rather than accelerating onto the next topic. Students are given time to think deeply about the maths and really understand concepts at a relational level rather than simply rote learn a set of rules or procedures. This equips them with the skills and confidence they need to progress in maths.

Implementation

Maths is taught daily at Litherland Moss in KS1 and KS2. We believe that it is important to prioritise basic skills and arithmetic alongside problem solving and reasoning and we therefore dedicate one maths lesson a week to the teaching of basic skills. The remaining four days are taught using the Maths No Problem Primary Series.

- **Lesson structure:**

- 1) **In Focus Task** – Each lesson begins with a problem. The pupils discuss the problem with their partner and their teacher, and they consider what they can see in the picture and which methods may be needed to solve the problem. The children are given time to explore the problem using concrete resources and are encouraged to describe their methods and explain their reasoning using mathematical vocabulary. The children then write down their ideas in their maths journal. The journal task showcases the children's understanding of mathematical concepts and encourages them to use a range of methods to solve the same problem.

- **Guided Practice** – This is a set of questions to consolidate learning and allow pupils to apply their knowledge. It gives examples of the types of questions that the pupils may be asked in their workbook, giving them the confidence to put their newfound knowledge into practice independently, in groups or collectively as a class. Discussion and modelling during the guided practice encourages mathematical fluency and further development of reasoning skills.
- **Independent practice** – This takes place in the pupil’s workbooks. Pupils are given time to independently answer a range of questions directly linked to the National Curriculum objective. Initially, the workbook questions are often scaffolded and as the pupils work through them, the scaffolding is reduced and the questions become more challenging. The workbook tasks allow children to evidence their mastery of the mathematical concept being taught.
- **Responsive Intervention**
Having seen how the children have worked and interacted during the In Focus task and the Guided Practice, it allows teachers to identify which children didn’t have a firm understanding of the problem and they can then be supported with adult help and/or the use of concrete materials during the Independent Practice. Pupils may then require an intervention in the afternoon to consolidate learning further and reinforce methods and mathematical concepts with an additional problem or set of questions. Responsive intervention is available daily to address misconceptions and respond to any gaps in the children’s knowledge or conceptual understanding. Responsive Intervention is provided in the afternoon by a teaching assistant for any child identified as needing further support.
- **Assessment**
Assessment of maths is continuous and ongoing. Teacher assessment in maths happens daily in the form of differentiated questioning and rapid marking and feedback. This is used to inform teaching and quickly identify any pupils who may need further support or require responsive intervention. We also conduct formative assessments in maths using the Maths No Problem end of book tests, end of chapter reviews and revision activities.
- **Maths working walls**
We have a maths working wall in each classroom to display the current maths focus alongside key vocabulary that can be used to aid learning. Children are encouraged to use the working wall when explaining their reasoning both verbally and during their journal task. Working walls are kept up to date and should be referred to in lessons to encourage children to use them.

Impact

The children at Litherland Moss are enthusiastic about maths and can reason mathematically. Pupils enjoy sharing their methodologies, thoughts and ideas with others and they are confident in solving problems. Our pupils are resilient learners who make rich connections across mathematical ideas to develop their fluency.

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the Mathematics Programmes of study of the National Curriculum.

The principal focus of mathematics teaching in Key Stage 1 is to ensure that pupils develop:

- Confidence and mental fluency with whole numbers, counting and place value.
- The ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary.
- Knowledge of number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.
- The ability to read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.

The principal focus of mathematics teaching in lower Key Stage 2 is to ensure that pupils:

- Become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.
- Develop their ability to solve a range of problems, including with simple fractions and decimal place value.
- Draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them.
- Use measuring instruments with accuracy and make connections between measure and number.
- By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.
- Read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

The principal focus of mathematics teaching in upper Key Stage 2 is to ensure that pupils:

- Extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

- Develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation.
- Are introduced to the language of algebra as a means for solving a variety of problems.
- Classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.
- By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.
- Pupils should read, spell and pronounce mathematical vocabulary correctly.