



## Maths Policy

Our aim at St Luke's School is for all our children to approach mathematics with a positive, can-do attitude. Teachers have high expectations and promote the belief that 'We can all do maths!'. We aim to promote children's **curiosity** and enable them to safely take risks and learn from first-hand experience wherever necessary. We want children to be fluent with mathematical **understanding** from the most basic level so that they can build upon their own understanding. We aim to enable our children to develop conceptual understanding, **recall** of number facts and patterns and apply their knowledge rapidly and accurately. We aim to promote children's ability to **reason** through opportunities to discuss their thinking and understanding. This emphasis may result in less written work but much deeper understanding. We promote **problem solving** and solution finding. This is not only true in mathematical learning but in almost all aspects of school life. We aim to support children to make **progress at their own pace**. Often misconceptions cause greater difficulties at a later stage of learning. We will promote smaller group learning opportunities whenever possible and encourage children to revisit their thinking to ensure they feel secure in their understanding and able to move confidently on to next steps and challenges.

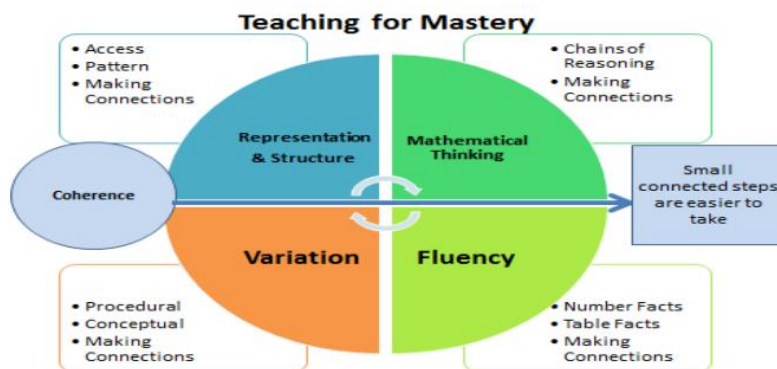
This policy is written with consideration to our school commitment to the rights of a child as outlined in the UN convention of rights for the child. Although direct reference to this is not continuously made, the policy has been written with full awareness of our responsibility as duty bearers and commitment to this purpose.

The National Curriculum provides a framework for mathematics, but the school is aware of the need for flexibility and creativity in teaching and learning styles in response to the needs of individual children.

### Implementation:

At St Luke's School, we have adopted a **teaching for mastery** approach that supports all children to deepen their understanding of maths and to improve progress for all. We use Abacus as a planning and teaching resource, which is supplemented and extended by White Rose Maths (WRM).

### What is teaching for mastery?



Our curriculum focuses on children developing skills of fluency in the fundamentals of mathematics, being able to reason and to solve problems.

**Fluency** 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 & 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 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 children.

### Mathematical Oracy

Our curriculum promotes mathematical talk. In lessons, there is a strong emphasis on using mathematical language and targeted and open-ended questioning to assess children's understanding and ensure that they are able to reason and explain their mathematical thinking. They are encouraged to share both mental and written strategies for working and to consider the efficiency of methods used.

### Additional resources

Alongside Abacus and White Rose Maths (which provide a variety of support materials), other resources are used regularly to supplement and enrich the maths curriculum offered. These resources include Timetable Rock Stars, Complete Maths Tutor, Nrich as well as resources & teaching guides from Third Space Maths.

Each classroom will be resourced with materials to support the delivery of maths; such items might include number lines, multiplication tables, 100 squares, 2D and 3D shapes, multilink cubes, dice, counters and other smaller items. Larger materials such as scales, fraction resources and measuring cylinders will be held centrally in the maths store cupboard in the school hall. Children should be encouraged to use a wide range of resources that are available to them in the classroom and which they feel would be beneficial to help them when completing maths work.

### EYFS (Nursery & Reception)

Mathematics within the EYFS is developed through a continuous provision approach. Purposeful, play based experiences are carefully planned to ensure a variety of mathematical activities linked to the pupil's current interests. These are represented throughout the indoor and outdoor provision and will focus on the expectations from Development Matters / Early Years Outcomes. Mathematical understanding can be developed through stories, songs, games, imaginative play, child initiated learning and structured teaching. As children progress, they will be encouraged to record their mathematical thinking in a more formal way. In Nursery, children have daily mathematical session building up to 15 minutes by the end of the year. In Reception, children are taught whole class for 20 minutes daily, with some small group work and 1:1 sessions taking place throughout the week. White Rose planning is used to support the Early Learning Goals, to ensure that children are given the opportunity to master the fundamental mathematical skills.



### **Key Stage 1 (Year 1 & Year 2)**

Throughout Key Stage 1, it is important that children gain a secure knowledge of number and place value and become confident when using the four operations in both formal methods as well as problem solving where often the approach is not immediately evident. Alongside number work, children begin to identify fractions using shapes, objects and quantities and make connections to equal sharing and grouping. Children are taught to count to ten in fractions, recognise equivalent fractions and develop their understanding of fractions on a number line. At this stage, children will also develop their ability to recognise, describe, draw, compare and sort different shapes. Children have the opportunity to use a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money and are expected to use related vocabulary for all topics. Other subjects may have strong links to some maths topics allowing cross-curricular teaching. For example, shape through art or computing, measures through science or coordinates in geography. This is to ensure we continually maximise learning opportunities for all children across an entire curriculum.

### **Lower Key Stage 2 (Year 3 & Year 4)**

The principal focus of mathematics teaching in lower Key Stage 2 is to ensure that children become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that children develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, children should develop their ability to solve a

range of problems, including with simple fractions and decimal place value. Teaching should also ensure that children draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number. By the end of Year 4, children should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.

### **Upper Key Stage 2 (Year 5 & Year 6)**

The principal focus of mathematics teaching in upper Key Stage 2 is to ensure that children extend their understanding of the number system and place value to include larger integers. This should develop the connections that children make between multiplication and division with fractions, decimals, percentages and ratio. At this stage, children should 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. With this foundation in arithmetic, children are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that children classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them. By the end of Year 6, children should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.

Alongside the above objectives runs a desire to implement key reasoning and problem solving skills within lessons and also throughout the wider life of school. We aim to develop children's resilience, focus and problem skills by providing them with relevant challenge via various mathematical representations including open ended problems and real word application.

### **Maths Journaling**

Maths journals are an exercise book used by children to record their methods, explanations and ideas for solving maths problems and learning of mathematical concepts. They give children the opportunity to reflect on their learning and consolidate their understanding. Maths journals provide teachers with



insight into a learner's thinking and understanding of mathematical ideas, allowing them to assess and address misconceptions as they surface.

Every journal entry needs to begin with the date and a title - the writing of the title is modelled to the children demonstrating the adult's expectation. A good journal title should reflect the mathematical idea the lesson has focused on.

Learners are typically given one problem or mathematical idea to journal about. The focus of journaling is not to simply solve the problem. Instead, journals show how the children express their mathematical thinking. Children are encouraged to use multiple ways to show their understanding of mathematical ideas. Children may journal a number of times throughout a unit of work. These journals may reflect different methods, representations or discoveries they have made to explain their understanding of concepts. The more children journal, the more they develop their metacognition skills. It encourages them to reflect on the mathematical concepts being learned and how to best articulate their thinking.

Journaling can be used at the end of a topic as an assessment tool – recording what the children have learned. It can often be interesting for children and teachers to compare journals at the beginning of the unit with journals at the end of the unit.

### **Inclusion**

All children are provided access to the full maths curriculum. This inclusive approach, and its emphasis on promoting multiple methods of solving a problem, builds self-confidence and resilience in children. Though the whole class goes through the same content at the same pace, there is still plenty of opportunity for differentiation. Differentiation occurs in the support and intervention provided to different children, not in the topics taught, particularly at earlier stages.

There is no differentiation in content taught, but the questioning and scaffolding individual children receive in class as they work through problems will differ, with higher attaining children, or those who grasp concepts quickly, challenged through more demanding problems which deepen their knowledge of the same content. Those children who are not sufficiently fluent are provided additional support to consolidate their understanding before moving on. Children's difficulties and misconceptions are identified through immediate formative assessment and addressed with intervention - commonly through individual or small group support.

Where children make less than expected progress efforts are made to ensure relevant support is put in place to help support the child. No child will be denied a full curriculum however and concepts will be revisited throughout the year to help with long term understanding.

Members of the SEND support team are timetabled to support learning for either targeted interventions, pre-teach new concepts or to monitor groups whilst the class teacher supports SEND children.

### **Assessments:**

Regular and ongoing assessment in all year groups informs teaching, as well as interventions, to support and enable the success of every child. Assessment for learning is integral to the daily teaching of mathematics where teachers assess learning in lessons through careful observation, listening to the children, engaging them in discussions about work, asking open-ended questions and checking for understanding. This will then link to whole class feedback which will begin 3 maths lessons a week. Whole Class Feedback will identify and discuss misconceptions and move learning forward.



Children compete termly PUMA (Progress in Understanding Mathematics Assessments), with the data being analysed to identify next steps and informing future planning for the class and for whole school. Summative pupil attainment is recorded on the class Excel "Data Sheet" and at the completion of each term on SIMS.

