



# St. Mary and St. Giles Church of England School



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# Mathematics Policy

## **Our vision for Maths at SMSG**

At St Mary and St Giles we believe that Mathematics is a vital part of the curriculum which provides our children with powerful ways to describe, analyse and even change the world. Children can experience a sense of awe and wonder as they solve a problem for the first time, discover a more elegant solution and make links between different areas of mathematics.

It teaches them how to make sense of the world around them through developing their ability to calculate, to reason and to solve problems. It enables our children to understand relationships and pattern in both number and space in their everyday lives. Through their growing knowledge and understanding, our children will learn to appreciate the contribution made by many cultures to the development and application of mathematics.

### **At SMSG we aim to:**

- Promote enjoyment and enthusiasm for learning through practical activity, exploration and discussion.
- Foster positive attitudes, fascination and excitement of discovery through the teaching and learning of mathematical concepts.
- Promote confidence and competence with numbers and the number system.
- Instil in our children a 'can do' attitude and perceive themselves as mathematicians.
- Broaden children's knowledge and understanding of how mathematics is used in the wider world.
- Develop our children's use and understanding of mathematical language and recognise its importance as a language for communication and thinking.
- Develop the ability to solve problems through decision-making and reasoning in a range of contexts.
- Explore features of shape and space, and develop measuring skills in a range of contexts.
- Understand the importance of mathematics in everyday life.

In line with guidance in the EYFS Framework and the National Curriculum 2014, children at St Mary and St Giles C of E School will be given opportunities to study mathematics as part of a broad and balanced curriculum.

SMSG is currently in a process of transition to a new maths mastery curriculum based upon the Singapore approach to teaching mathematics. During this transitional phrase (up to the end of the 2019- 2020 academic year) the children in Year 6 will continue to be taught mathematics based on planning from the IFTL Trust. All other year groups will be taught using the Singapore approach to teaching mathematics.

### **Our curriculum**

The content and principles underpinning the 2014 mathematics curriculum and the maths curriculum at SMSG reflect those found in high-performing education systems internationally, particularly those of east and south-east Asian countries such as Singapore, Japan, South Korea and China. These principles and features characterise our approach:

- Teachers reinforce an expectation that all pupils are capable of achieving high standards in mathematics;
- The large majority of pupils progress through the curriculum content at the same pace.
- Differentiation is achieved by emphasising deep knowledge and through individual support and rapid intervention.
- Teaching is underpinned by methodical curriculum design and supported by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge;
- Practice and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts;
- Teachers use precise questioning in class to test conceptual and procedural knowledge, and assess pupils regularly to identify those requiring intervention so that all pupils keep up.

The intention of these approaches is to provide all children with full access to the curriculum, enabling them to achieve confidence and competence – ‘mastery’ – in mathematics.

### **Early Years**

Children in Nursery and Reception will be taught maths through delivery of the mathematics area of learning in the Early Years Foundation Stage framework. The teaching of maths in the EYFS involves providing children with opportunities to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe shapes, spaces, and measures. Children will develop their understanding through planned, purposeful play and through a mix of adult-led and child-initiated activity. There are opportunities to undertake maths activities within continuous provision/outdoor play and enhancements linked to the current learning. It is expected that the vast majority of children in Nursery and Reception will be taught maths in mixed ability groups, with the whole cohort working towards the early learning goals at broadly the same pace. Pupils who grasp concepts rapidly will be challenged through having access to a wider variety of problems, whilst those children who are not sufficiently fluent in their understanding will be given opportunities to further develop their understanding before moving on.

- There are opportunities for children to “bump” into Maths throughout the EYFS (both inside and outside) – through both planned activities and the self-selection of easily accessible quality maths resources
- Children are just as likely to access the Mathematics curriculum through cooking activities in the kitchen, building activities in the construction area or in the outdoor area
- Children’s interests are used as a vehicle for delivering the curriculum. For instance, an interest in dinosaurs may give rise to sorting, counting and recording the number of dinosaurs in small world play
- Staff support children’s learning through planned activities but also value and support self-initiated mathematical learning.
- Towards the end of Reception teachers aim to draw the elements of a daily mathematics lesson together so that by the time children move into Year 1 they are familiar with a structured lesson / activity.

## **Years 1 – 6**

Teachers in years 1 - 6 are supported in their teaching of mathematics a scheme published by 'White Rose' With a focus on teaching maths for mastery, the series is designed to improve the maths confidence of both teachers and learners.

The Singapore approach to mathematics teaches pupils to understand maths in stages, beginning with concrete(using counters, Base 10, number disks and so on), then moving to pictorial(solving problems where pictures are involved), and finally working in the abstract(where numbers represent symbolic values). Through this process, children learn numerous strategies to work with numbers and build understanding.

The whole class works through the programme of study at the same pace with ample time and practice in each topic before moving on. The concept of teaching to mastery is to ensure that topics are well developed. An idea is well formed then reinforced by practice. New knowledge is then used in subsequent lessons so that all ideas build on top of each other and pupils have plenty of opportunities to develop relationships between topics. Ideas are revisited in a spiral as pupils progress through the years, each time at a higher level.

### Lesson structure

Each lesson is divided into distinct parts: an 'In Focus' task, Let's Learn, Guided Practice and independent practice. Throughout the lesson the children have access to the resources that they need.

During the In Focus task, children work with their learning partner on a single problem from the textbook or on the screen allowing the teacher to assess what they currently know and extend their understanding.

In the Let's Learn part of the lesson the teacher goes through with the children how to solve the problem in the In Focus. During this part of the lesson the children work with their learning partner. This part of the lesson introduces new concepts through the Concrete-Pictorial-Abstract (C-P-A) approach with the use of engaging pictures and manipulatives. Guided examples are provided for reinforcement.

In the guided practice section, children work through further questions with their learning partner but under the guidance of the teacher, to practise an idea that has been developed in the let's learn task.

The final section of the lesson is independent practice where the children work in their Maths journals to apply the ideas and taught that lesson.

### Differentiation and support

In a mastery approach, differentiation occurs in the support and intervention provided to different pupils, not in the topics taught. 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 rapid graspers 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 – ideally through individual or small group support later the same day.

**These guidelines demonstrate what we expect from our teachers and pupils in mathematics**

Key Aspects	Teacher	Pupils
High expectations of engagement and attainment for every child	Conveys the message that progress is made through engagement and effort. Expects every pupils to succeed. Is enthusiastic about the learning expected. Gives every pupil the opportunity to experience or master key ideas.	Have high aspirations, believe they can achieve and work hard in order to do so. Want to learn and enjoy learning.
	Follows a mastery curriculum. Differentiates through scaffolding, questioning and use of concrete and pictorial representations – instead of offering pupils different tasks. Uses speaking and listening activities, engaging resources and novel 'ways in' to a concept. Extends through further developing depth of language, conceptual understanding or mathematical thinking. Immediately acts on assessment from questioning and observation	Explore mathematics and ask questions to deepen their appreciation of the subject. Are challenging by solving less routine problems, demonstrating using concrete manipulatives / drawing diagrams, explaining in full sentences or asking their own questions.
Fewer topics, greater depth  Depth of mastery for all	Develops conceptual understanding through multiple representations and connections. Has a full understanding where and why this lesson falls in the sequence and in the longer term development of pupils' mathematical understanding. Anticipates and incorporates misconceptions and inaccuracies.	Have access to concrete manipulatives. Manipulate objects or use pictorial representations to deepen their understanding. Make links between concrete, pictorial and abstract representations Link new learning to previous learning in mathematics, other subjects and beyond school. Demonstrate conceptual understanding through tackling new problems.
	Develops communication of mathematical ideas, justifications and proofs	Participate in pair/group discussion tasks. Are ready to answer in class questioning/discussion. Speak in full sentences.

	Uses modelling to support pupils in developing independence in their mathematical recording. Considers own language and models expected language use clearly and accurately.	Use correct mathematical words and symbols. Use the key words.
	Develops mathematical thinking and ability to generalise Ensures every pupil participates in active thinking through a variety of questioning techniques. Encourages use of independent learning strategies, such as journaling. Involves pupils in generalising by comparing and classifying mathematical objects or talking about what might be sometimes, always or never true.	Do as much of the cognitive work – the writing, thinking, analysing and talking – as possible. Seek general patterns and create examples.
Every opportunity is used to develop mathematical problem solving	Ensures that lesson time is used purposefully. Makes clear what pupils should be doing at every point in the lesson, so no time is wasted. Minimises teacher talk.	Participate fully – everyone is engaged in the task. Collaborate, discussing their thinking. Work independently for some of the lesson. Demonstrate mastery and the ability to 'go it alone'

### Fluency

At SMSG every maths lesson will start with some fluency and this will happen before the In Focus task from 'White Rose' Staff will use the Flashback 4's from White Rose.

### TT Rockstars and NumberBots

As a school we have access to TT Rockstars and NumberBots.

NumberBots is mainly aimed at KS1. To start with teacher will display it on their board and the children will call out the answer. In Year 2 as the children begin to develop their keyboard skills and the quickness to match they will start to use it independently.

The children in Years 2-6 will have access to TT Rockstars. All children in Years 3-6 will complete a Soundcheck every half term and using the Baseline check sheets, the children will complete a paper based test every half term.

### Cross curricular

Opportunities are used to draw mathematical experiences out of a range of activities in other subjects, such as in PE, Science and Design and Technology, to enable children to apply and use Mathematics in both real life and academic contexts.

### **Inclusion (please refer also to the School's Inclusion Policy)**

Inclusion is about every child having educational needs that are special and the School meeting these diverse needs in order to ensure the active participation and progress of all children in their learning.

Inclusive practice in Mathematics should enable all children to achieve their best possible standard; whatever their ability, and irrespective of gender, ethnic, social or cultural background, home language or any other aspect that could affect their participation in, or progress in their learning.

### **Parents/Carers**

The School aims to involve parents/carers in their children's learning as much as possible and to inform them regularly of their child's progress in Mathematics.

Parents/carers have the opportunity to meet with child's class teacher at least twice a year at Parents' Evening Meetings and receive written reports during the year.

School also provides a number of opportunities for parents/carers to learn about what their child is learning and the way their child is being taught through parent workshops and online videos especially designed for parents.

### **Subject Leader**

The role of the Subject Leader is to provide professional leadership and management in Mathematics in order to secure high quality teaching, effective use of resources and high standards of learning and achievement for all pupils.

They will achieve this by affecting the following key areas: strategic direction and development; learning and teaching (including planning and marking and presentation); leading and managing staff; and efficient and effective deployment of staff and resources.

The Subject Leader has regular discussions with the Head and other senior leaders about learning and teaching in Mathematics.

### **Assessment**

Assessment will be based on observation, discussion and product, where appropriate, and will be a continuous process throughout school. Formative assessments will inform teachers' planning. At the end of every block the children will complete an end of block assessment to help inform teachers of what they have learnt. During the year children will also complete summative assessment from Cornerstones. SATs will also form part of the assessment process at the end of Key Stage 1 and Key Stage 2. In the Foundation Stage, children are assessed using the Baseline at the start of Nursery and Reception to inform their next steps of learning. Children's progress against the Early Learning Goals associated with the mathematics area of learning are assessed on an ongoing basis. These judgments inform the Early Years Foundation Stage Profile at the end of Reception. For further details, see the school's Assessment Policy.

### **Reporting to Parents**

Mathematics is part of the written report given to parents at the end of the school year. Verbal reports are also made at the Parents' Evenings in the Autumn term. Parents may ask for further details and clarification throughout the year.

### **Staff Development**

Identified training needs of individuals or whole staff will be supported by the provision of in-service courses either within school, within the Trust or by other providers.

### **Monitoring**

The subject leader/SLT will monitor the implementation of this subject, through pupil interviews, learning walks, observations in classroom, scrutiny of work and monitoring of planning files. Class teachers and the Assessment Lead meet on a termly basis for a pupil progress meeting to analyse the cohort data for each year group and identify children that need further help to meet age-related expectations. The governing body are kept updated through reports from the Head teacher and subject leader.