Maths Policy

Reviewed: September 2022
Next Review: September 2023

St George's Church of England Primary School

Bringing **faith** and **education** together

Policy reviewed by Mr J Shield,
Maths Lead

Maths Policy

Rationale

All school policies form a corporate, public and accountable statement of intent. As a Church of England primary school, it is very important to create an agreed whole school approach of which staff, children, parents, carers, governors and other agencies have a clear understanding. This policy is the formal statement of intent for mathematics. It reflects the essential part that Mathematics plays in the education of our pupils. It is important that a positive attitude towards Mathematics is encouraged amongst all our pupils in order to foster self-confidence and a sense of achievement. The policy also facilitates how we, as a school, meet the legal requirements of the current National Curriculum.

Vision

"A 'high-quality' mathematics education 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" (National Curriculum September 2013). At St George's CEP we wholeheartedly agree with this statement and strive to deliver teaching that creates opportunities for children to develop as true Mathematicians. We believe the importance of the new 'Mastery Curriculum' is key to children's progress in this.

To develop fluency in Mathematics, children need to secure a conceptual understanding and efficiency in procedural approaches. It is important to make connections between concrete materials, models and images, mathematical language, symbolic representations and prior learning. Furthermore, it is then essential that children have opportunities to practise the key skills whilst building the understanding and knowledge to apply these skills into more complex activities and problems. Problem solving should not be routine or closed-procedural. It should enable children to develop a range of skills including making generalisations, finding patterns, carrying out trial and improvement, making and testing hypotheses, making decisions, creating explanations and making connections.

Aims

At St George's Church of England Primary School, we believe that good teaching of Mathematics allows all pupils to foster an enjoyment and curiosity to reason and solve problems relating to numbers, thus helping them to better understand the world around them. Mathematics offers an insight into ever evolving patterns and sequences as well as dealing with abstract concepts such as number, quantity and space. In order to access, explore and master these concepts, children need to be afforded time to investigate using

practical equipment, be given opportunities by teachers to follow their own interests and develop a strong understanding of mathematical vocabulary. Our aim is for children to recognise how Maths helps them in their everyday life (as well as other curriculum subjects) and, through increasing resilience, enjoy the challenges that it brings.
At St George's Church of England Primary School, we believe these principles underpin good teaching and learning in the Maths curriculum:
Children should be able to:

- 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;
- **reason** mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language. Then explain such arguments and justifications with rich mathematical vocabulary;
- **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;
- develop an **enjoyment of learning** through **practical activity, investigation, exploration; mental exertion and discussion**;
- display **confidence and competence** with numbers and the number system;
- further the ability to **solve problems** through connecting ideas, decision-making and applying their knowledge to **real life contexts**;
- **develop mathematical skills** in a range of contexts, including other subjects such as Science and Geography;
- **explore features** of shape and space, and develop measuring skills in a range of contexts;
- **understand the importance of Mathematics** in everyday life, especially in relation to essential life skills such as telling the time and handling money;
- develop **positive attitudes** towards Mathematics by improving their **confidence, independence, resilience and co-operation** skills and understand **Growth Mindset** in a Mathematical context.

Staff should be able to:

- promote a confident, positive attitude towards the learning and use of Mathematics making it an **enjoyable experience**;
- promote confidence and competence with numbers and the number system;
- promote the ability to **solve problems** through connecting ideas, decision-making and applying their mathematical skills in a range of contexts, including other subjects such as Science;

- promote **mathematical reasoning** by following a line of enquiry, developing an argument and making justifications using mathematical language;
- promote the exploration of features of shape and space and develop measuring skills in a range of contexts;
- understand the **importance of Mathematics in everyday use**, especially in relation to essential life skills, such as telling the time and understanding money. Also, to use this when providing children with a context for reasoning and problem solving;
- foster **positive attitudes** towards mathematics by developing confidence, independence, resilience and cooperation skills in all pupils, and understand growth mindset in a mathematical context.
- **demonstrate how to use practical equipment** to nurture understanding of concepts.

Implementation of the Mathematics Policy Foundation Stage organisation:

• Our Foundation Stage teachers use the Early Years Foundation Stage Curriculum to support their teaching of Mathematics in the Foundation Stage.

• The children have the opportunity to talk and communicate in a widening range of situations and to practise and extend their range of vocabulary and mathematical skills.

• The children explore, enjoy, learn about, and use Mathematics in a range of personalised situations.

• Mathematics is planned on a weekly basis and assessed using the criteria from the Early Learning Goals.

Parents and Carers:

• To be understanding and supportive of our aims in learning and teaching Mathematics.

• To attend and contribute to Parent Consultation Meetings.

• To attend PIE evenings that support their understanding of teaching methods, progression and strategies for learning.

• To support their children with Mathematics homework using Mathletics (please refer to Homework Policy) including the importance of learning their number bonds and times tables off by heart.

• To praise their children for the good things that they do in Mathematics.

• To communicate and work with School whenever further support is needed to develop their children's mathematical skills and understanding.

• To make mathematics part of children's everyday lives.

Governors:

• Meet with the Mathematics Subject Leader at least once a year to find out about the school's systems for planning work, supporting staff and monitoring progress, the allocation, use and adequacy of resources and how the standards of achievement are changing over time;
• Visit School and talk to pupils about their experiences of Mathematics;
• Promote and support the positive involvement of parents in Mathematics;
• Attend training and other events relating to the Mathematics curriculum;
• To be understanding and supportive of our aims in the learning and teaching of Mathematics and to review this policy annually.

Programmes of Study

At St George's we follow the White Rose Maths Scheme of Learning across all year groups. This programme of study is designed to cover all national curriculum strands ensuring that our children have the opportunity to meet age related expectations and surpass them where possible. Our programme is designed to balance fluency, reasoning and problem solving, ensuring that children have both the necessary number skills to complete calculations and the vocabulary and cognition required to solve increasingly sophisticated problems. This should produce knowledge that can also be transferred to other subject areas, such as science, Geography and computing.

Objectives

• To ensure that all pupils follow a broad and balanced mathematics programme based on the requirements of the National Curriculum;
• To ensure that all pupils are provided with interesting and challenging rich tasks that enable them to achieve standards commensurate with their abilities and potential;
• To ensure that pupils can work individually, collaboratively in groups and within the whole class;
• To allow pupils to develop as independent learners, able to make decisions about their own work.
• To allow every pupil to meet challenge and fulfil their potential.

Principles of Teaching and Learning

Mathematics means knowing about numbers and number operations. More than this, it requires an ability and inclination to solve numerical problems, including those involving money or measures. It also demands familiarity with the ways in which numerical information is gathered by counting and measuring, and is presented in graphs, charts and tables.

Numerate pupils should:
• have a sense of the size of a number
• know by heart tables, doubles and halves
• figure out answers mentally
• calculate mentally and with pencil and paper
• make sense of problems
• have strategies for checking
• explain methods and reasoning, using a rich mathematical vocabulary
• suggest suitable units for measuring
• make sensible estimates
• make predictions
• describe properties of shape, position and movement

Differentiation and Additional Education Needs
During lessons pupils may work in groups on tasks linked to the learning objectives of the lesson. Differentiation is used to cater for all abilities between the most and least capable in a class, however this can be flexible from lesson to lesson. Children are given many opportunities to choose their level of challenge based on their own level of understanding. Teaching is organised to enable pupils of all abilities access to the learning. Pupils with SEND may be supported within the class by Teaching Assistants and have additional interventions of support.
All pupils, including those with SEND, are set targets in mathematics that are regularly reviewed, monitored and reset. The most able mathematicians are provided with appropriate materials to ensure that they broaden, deepen and apply their knowledge, rather than moving onto the next year's objectives.

Breadth and Balance
The curriculum will include a full range of mathematical activities covering all aspects of the subject including number, measurement, geometry, statistics, ratio & proportion and algebra. Using and applying mathematics will be integrated throughout lessons including practical, investigational, problem-solving and oral activities. Every lesson will include elements of fluency and reasoning allowing children to practice skills and explain their understanding of them in a context.

Unit Structure
Each unit of work will follow the below pattern:
• Show What I Know (SWIK) lesson: children will have the chance to demonstrate what they already know or remember about a domain. This will be used by teachers to inform differentiation and planning as well as offer children a chance to self-assess their knowledge. It will be based on the age related expectations from the previous year group.

• Small Steps: children taught a range of 'small steps' lessons, covering the national curriculum strands for that unit. These will be drawn from the White Rose planning. Each lesson will involve a combination of fluency, reasoning and problem solving. This will be evidenced in their books daily
• SWIK lesson: children will have the chance to independently demonstrate what they have learned across the unit. This will offer an opportunity to guide self-review and will be the main guidance in termly moderations.

Lesson Structure
At St George's we ensure that our lessons follow the 'Rosenshine Principles'. In Maths specifically, the following principles should also be borne in mind:
• The phases within lessons should introduce, develop and review the learning focus while maintaining a sharp beginning, coherence across the session and a clear conclusion.
• Children should know what they are learning and why, along with the extent of the progress they are making.
• Children should have the opportunity to enquire, question and explore to build knowledge and understanding.
• Planning needs to be adapted to meet the needs of children's learning in response to assessment and on-going review.

Lessons will have clear learning objectives that are communicated to the children.
They will involve different elements:
• Demonstration – showing how to
• Explanation – giving examples
• Questioning –challenging understanding
• Discussion & evaluation – thinking about methods and errors
• Direction – taking care, setting out neatly
• Evaluation – why did I do well/not understand

The aim is to secure good progress within a class as a whole. Within the Foundation Stage mathematical development is through teacher directed and child-initiated tasks.

Attainment targets
By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Key Stage 1
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. This should

involve working with numerals, words and the four operations, including with practical resources (e.g. concrete objects and measuring tools).
At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.
By the end of Year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency. Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

Lower Key Stage 2 – Years 3-4
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.
At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils 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, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.
Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

Upper Key Stage 2 – Years 5-6
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.
At this stage, pupils 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, pupils 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 pupils 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.

Cross Curricular Skills and Links
The programmes of study are organised in a distinct sequence and structured into separate domains. Pupils should make connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to Science and other subjects where appropriate.

Calculators
Calculators should not be used as a substitute for good written and mental arithmetic. They should therefore only be introduced near the end of Key Stage 2 to support pupils' conceptual understanding and exploration of more complex number problems, if written and mental arithmetic are secure.

Spoken Language
The National Curriculum for mathematics reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. They must be assisted in making their thinking clear to themselves as well as others and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions. This should be supported with appropriate sentence stems and vocabulary on working walls and worksheets. Children will self-assess weekly, based on vocabulary from their current unit of work.

Assessment, Recording and Reporting
Teachers are expected to make regular assessments of pupils' progress and record them systematically. The record will indicate the progress made by the whole class against the end of year group expectations. This will be reported to Subject Leaders and Parents.

This will involve:
• Informal testing of mental recall and mental calculation, given orally.
• Evaluation of group progress against termly plans.
• 3 internal moderations in Autumn, Spring and Summer terms against the end of year group expectations, data reported to Maths SL and Assessment co-ordinator.

• Children's progress against the end of year expectations will be reported to parents 3 times per year.

Equal Opportunities

Teaching materials are chosen to reflect the cultural and ethnic diversity of our society. We try to avoid stereotyping through gender or race. Pupils' performance is monitored to ensure that no group of pupils is disadvantaged. In lessons the full participation of both girls and boys is encouraged and care is taken to ensure that the emphasis on whole class teaching does not disadvantage any gender group.

Health and Safety

In line with the school's Health and Safety Policy, pupils are instructed in the safe use of all equipment. In particular, extra care should be taken when using heavy weights with balances on the floor. Care needs to be taken when younger children are using small apparatus such as counting objects. Pupils working outside the classroom will work in pairs or groups or with an adult.

The Role of the Subject Leader

The Subject Leader will:

• Take the lead in policy development and oversee the production of schemes or work designed to ensure progression and continuity in Mathematics throughout the school.
• Support colleagues in their development of detailed short-term plans and the implementation of the scheme of work and in assessment and record-keeping.
• Monitor the delivery of the Mathematics Curriculum including termly moderations and advise the Headteacher and staff on action needed.
• Take responsibility for the purchase and organisation of central resources for Mathematics.
• Keep up to date with developments in Mathematics and disseminate information to colleagues as appropriate.

Resourcing

An annual review of resources is overseen by the Subject Leader for Mathematics.