ST. MATTHEW'S C.E. PRIMARY ACADEMY

MATHEMATICS POLICY

Reviewed: February 2024
By: S Bryden and S Gretton
Date of next review: February 2027

Be blessed by God, be happy and aspire to be….

St Matthew's Church of England Primary Academy

Mathematics Policy

Mission Statement:

St. Matthew's C.E. Primary School and Nursery is dedicated to providing an education which enables every child to fulfil their best potential. It seeks to promote academic, emotional and spiritual growth in a Christian environment, welcoming children drawn from diverse cultures.

Vision Statement:

Inspired by Jesus' words (Matthew 5: 1-12), we strive to promote academic, emotional and spiritual growth in a Christian environment for all members of our school family.
We can all **'Be blessed by God, be happy and aspire to be…'**

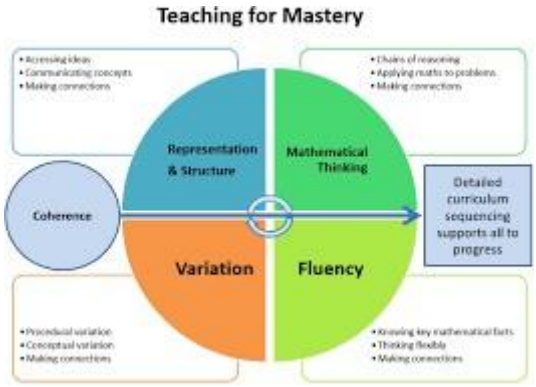
Introduction

This policy reflects the values and philosophy of St Matthew's in relation to the teaching and learning of Mathematics. It sets out a framework within which teaching and non-teaching staff can operate and gives guidance on planning, teaching and assessment. We aim to provide a consistent approach throughout school to mathematics. The policy has been drawn up as a result of staff discussion and has the full agreement of the Governing Body. The implementation of this policy is the responsibility of all the teaching staff.

Our Philosophy

Mathematics is a tool for everyday life. It is a whole network of concepts and relationships, which provide a way of viewing and making sense of the world. It is used to analyse and communicate information and ideas and to tackle a range of practical tasks and real-life problems. It also provides the materials and means for creating new imaginative worlds to explore

Aims of Mathematics at St Matthew's



Coherence	Representation and Structure	Mathematical Thinking	Fluency	Variation
Teaching is designed to enable a coherent learning progression through the curriculum. Lessons are broken down into small steps providing access for all pupils to develop a deep and connected understanding of mathematics. that they can apply in a range of contexts	Teachers carefully select representations of mathematics to expose mathematical structure supporting children to understand mathematical structures and make connections.	Children should engage in mathematical thinking in all lessons communicating ideas, discussing and reasoning with 'talk partners'.	Encouraging children's accurate recall of number facts and having flexibility to move between different contexts and representations, recognizing relationships and making connections.	We aim to represent the concept being taught in alternative ways. We encourage children to pay attention to what is kept the same and what changes.

Mathematics is a core subject within the National Curriculum. At St Matthew's we aim to develop numerate pupils who are confident enough to tackle mathematical problems without going immediately to teachers or friends for help. A 'mastery' approach is being adapted, developed and implemented at St Matthew's for the planning, delivery and engagement with mathematics.

Our pupils should:

- Have a sense of number and where it fits in the number system.
- Know by heart number facts such as number bonds, multiplication tables, doubles and halves.
- Use what they know by heart to help work out answers mentally.
- Calculate accurately and efficiently, both mentally and with pencil/paper, and recognise the operations needed to solve them.
- Explain their methods and reasoning using correct mathematical terms.
- Judge whether their answers are reasonable and have strategies for checking them, where necessary

- Suggest suitable units for measuring and make sensible estimates of measurements.
- Explain and make predictions from numbers in graphs, diagrams, charts and tables.

The national curriculum for mathematics aims to ensure that all pupils:

- Become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- Reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- 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.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich 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.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

Teaching and learning

Organisation and Curriculum Coverage

At St Matthew's, we recognise that children need to be confident and fluent across each yearly objective. To ensure consistent coverage, teachers follow the White Rose Maths scheme of learning to support their planning. Teachers are also developing their understanding of mastery whilst working within the Maths Hub and regular in-house CPD. White Rose is an exciting and inspiring class mastery approach, which has been recommended by the Department for Education.

Our maths lessons involve fluency and problem solving/reasoning for the majority of the time.
Each lesson begins with a short fluency session, often recapping previous learning.
We follow a mastery approach with whole class interactive teaching where pupils work on questions individually/pairs. The lesson moves onto pupils carrying out independent tasks, whilst staff further support pupils who have not yet grasped the concept.
We encourage active learning so our maths lessons will have a lot of purposeful talk around the task – they will rarely be silent.
To develop our pupils' vocabulary, we encourage the use of stem sentences where appropriate during the lesson. A stem sentence describes the representation and helps the students move to working in the abstract e.g. "ten tenths is equivalent to one whole".
We follow the CPA approach in maths across school that uses physical and visual aids to build a child's understanding of abstract topics. Pupils are introduced to a new mathematical concept through the use of concrete resources (e.g. fruit, Dienes blocks etc). When they are comfortable solving problems with physical aids, they are given problems with pictures – usually pictorial representations of the concrete objects they were using. Then they are asked to solve problems where they only have the abstract i.e. numbers or other symbols. Building these steps across a lesson can help pupils better understand the relationship between numbers and the real world, and therefore helps secure their understanding of the mathematical concept they are learning.
Twice weekly, in the starter session, pupils will focus upon their class maths targets based on the Key Instant recall of basic facts e.g. number bonds, doubles and halves, etc. The pupils are tested at the beginning and at the end of each half term to measure progress.

High quality resources are used in conjunction with White Rose Maths, such as NRICH and NCETM to support, stretch and challenge all children within the classroom. In addition, the school's calculation policy is used to ensure a coherent approach to teaching the operations across our school.

Our curriculum builds on the concrete, pictorial, abstract approach. By using all three, the children can explore and demonstrate their mathematical learning. Together, these elements help to cement knowledge so children truly understand what they have learnt. All children have access to a wide range of concrete Mathematical resources to help them build on their concrete understanding of Mathematical concepts.

All children when introduced to a new concept for the first time are encouraged to physically represent mathematical concepts. Objects and pictures are used to demonstrate and visualise abstract ideas, alongside numbers and symbols. Throughout St Matthew's, you will see these three methods being used:

Concrete – children have the opportunity to use concrete objects and manipulatives to help them understand and explain what they are doing.

Pictorial – children then build on this concrete approach by using these pictorial representations, which can then be used to reason and solve problems.

Abstract – with the foundations firmly laid by using the concrete and pictorial methods the children can move onto an abstract approach using numbers and key concepts with confidence.

Teachers teach Maths using the online interactive tool, enabling them to model pictorial and abstract concepts which children can replicate and apply to their own learning.

Children practice their times tables frequently and children from Y4 onwards are expected to chant up to, and including, their 12 times tables. All children (from Y1-Y6) have access to Times Table Rock Star. In Year 4, children practice their times tables (and the inverse) under timed conditions, similar to those they will be tested in under in the national Year 4 Multiplication Tables Check from Spring 2022. In the Early Years and in KS1, all children have access to Numbots which allows them to practice counting, number bonds, halves and doubles and simple number patterns.

Resources

The use of Mathematics resources is integral to the concrete – pictorial – abstract approach and thus planned into teaching and learning. The school has a wide variety of good quality equipment and resources, both tangible and ICT based, to support our learning and teaching.

These resources are used by our teachers and children in a number of ways including:

- Demonstrating or modelling an idea, an operation or method of calculation.

Resources for this purpose may include: a number line; place value cards; dienes; tens frame; place value counters and grids; money or coins; measuring equipment for capacity, mass and length; bead strings; the interactive whiteboards and related software; 3D shapes and/or nets; Numicon; multilink cubes; clocks; protractors; calculators; dice; individual whiteboards and pens; and 2D shapes and

pattern blocks, amongst other things.

- Enabling children to use a calculation strategy or method that they couldn't do without help, by using any of the above or other resources as required.

Standard resources, such as number lines, multi-link cubes, dienes, number squares and counters are located within individual classrooms. Resources within individual classes are accessible to all children who should be encouraged to be responsible for their use.

An interactive teaching tool for the purpose of modelling strategies is available to all teachers as part of the White Rose Maths scheme.

EYFS

In Nursery and Reception, we follow the EYFS framework. Children in Nursery have a short Maths teaching session, during which time they begin to develop their understanding of simple mathematical concepts such as counting, maintaining 1 to 1 correspondence, simple pattern making, to recognise and describe simple 2d and 3d shapes. Children are taught these concepts using physical resources, pictorial resources, songs, games and role-play.

In Reception, children have a two-part lesson from Autumn 1. This consists of:

1. Whole class oral and mental starter - 5 minutes
2. Whole class main teaching - 10 minutes (class may be divided into 2 smaller groups)
3. Focus activity - grouped according to current attainment and taught by a supporting adult/teacher 10-15 min.
4. Four 10/15-minute Mastery Maths sessions weekly.

Throughout the week independent activities are put into provision to allow children to apply their mathematical skills and knowledge. These include both a written and a practical activity.

This structure to the lesson enables teachers to secure a good balance between whole class work, group teaching and individual practice. It also enables teachers to establish regular routines thereby maximising teaching time. It supports daily assessment, as well as individual feedback to children, ensuring that children receive immediate intervention as required during the supported focus activity.

In both Nursery and Reception, the independent activities at the Maths table link to the focus for the week. For example, if the focus for the week is 2d shapes, then activities in the Maths area will often link to this. In addition to these planned independent activities, children also have the opportunity to self-select Maths resources to consolidate their learning during child-initiated activities. We recognise the importance of play-based learning and therefore encourage children to develop their understanding during their play. Such opportunities are provided in both the inside and outside environment.

Regular observations and assessments help to ensure that children that need additional intervention to consolidate their mathematical understanding are identified and supported by appropriate interventions.

Calculation policies

The calculation policies can be found on the school website; these are split into Reception, KS1, LKS2 and UKS2 and show the White Rose Maths progression in calculation (addition, subtraction, multiplication and division) and how this works in line with the National Curriculum. The consistent use of the CPA (concrete, pictorial, abstract) approach across White Rose Maths helps children develop mastery across all the operations in an efficient and reliable way. These policies show how these methods develop children's confidence in their understanding of both written and mental methods.

Key facts recall - 'Learning by Heart' programme

Developing children's knowledge of mathematical facts so that they know them 'by heart' is a valuable tool to support calculation strategies, and also helps to build confidence. Regular practice is needed to secure knowledge and help children instantly recall facts.

At St Matthew's, we encourage children to think 'Can I do this in my head?' Having a range of number facts at their fingertips really empowers the children and enables them to approach tasks with confidence.

Each year group has half termly targets set that aims to improve the children's rapid recall of key facts: number bonds, times table and division facts, halves and doubles, counting on and back in different steps.

These are shared with all staff, children and parents with ideas, vocabulary and websites designed to support the children in the rapid recall of these important facts. They are shared on Class Dojo and are available on the school website. Paper copies are sent out each term.

Displays

Each class is expected to have an up-to-date Maths working wall, which changes with each maths unit, modelling the Mathematical concepts. Unit vocabulary should also be up on displays and changed when a new unit starts.

Planning

All planning should be readily available in year planning folders. Plans should be available from the beginning of the week, should anyone need to take your class.

White Rose Maths and/or NCETM interactive tools and resources should be used throughout all lessons to ensure high quality delivery.

St Matthew's Church of England Primary Academy and Nursery – Mathematics

Teachers plan strategically to take advantage of opportunities to make cross-curricular links. They will plan for pupils to practise and apply the skills, knowledge and understanding acquired through Maths lessons to other areas of the curriculum.

Examples of cross curricular learning could include:

Department	Mathematical content
Art	Symmetry; other transformations; paint mixtures as a ratio
Geography	Representing data; finding averages; use of spreadsheets
History	Timelines; sequencing events
Digital Literacy	Collecting and representing data
MFL	Dates; counting in other languages
PE	Collecting real data; timing; measuring
Science	Formulae; calculating means and percentages; calculating with positive, negative and decimals; substitution; rearranging formulae; collecting and representing data.
DT	Measurement; properties of shape; scaling and ratio.
English	Identifying important information in a text will help them to better understand problem solving questions.
Music	Sequencing

Taking a mastery approach, differentiation occurs in the support and intervention provided to different children, not in the topics taught, particularly at earlier stages.

There is little differentiation in the content taught but the questioning and scaffolding individual children 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 before acceleration onto new content. Children's difficulties and misconceptions are identified through immediate formative assessment and addressed with rapid intervention – commonly through individual or small group support later the same day.

A range of inclusion strategies, as listed on the school's inclusion planning key, are embedded in practice and teachers are aware of the special educational needs of the children in their Maths class, as well as those who have English as an additional language.

Although the expectation is that the majority of children will move through the programmes of study at broadly the same pace, the 2014 National Curriculum states: Decisions about when to progress should always be based on the security of children's understanding and their readiness to progress to the next stage.'

If a child's needs are best met by following an alternative plan, including coverage of the content from a previous year, this will be directed by the SENDCo, in collaboration with the class teacher and with the knowledge of SLT. Specific arrangements for the provision of children with SEND will be communicated to parents and carers during parents' consultation meetings/SEND reviews.

Equal Opportunities

The school is committed to ensuring the active participation and progress of all children in their learning.

All children will be given equal opportunities to achieve their best possible standard, whatever their current attainment and irrespective of gender, ethnic, social or cultural background, home language or any other aspect that could affect their participation or the progress of which they are capable.

British Values (SMSC) SMSC

Children will have opportunities to:

Spiritual Education

- Use imagination and creativity to explore ideas while learning mathematics by: identifying and applying patterns and rules to everyday problem-solving; writing own problems and challenges that use those patterns or rules.

Moral Education

- Understanding the consequences of actions: E.g. If you perform a particular action to one number, will the same outcome apply to other numbers? Is it always the case? 'Sometimes, always, never' statements.

Social Education

- Developing personal qualities and using social skills: Working in pairs or groups to solve problems.

- Perseverance when struggling to answer questions; not being afraid to try – it's ok to be wrong, it's not ok not to try; taking turns when playing maths games.

- Participating, co-operating and resolving conflicts: as above, but also 'X thinks____, Y thinks ___, who is right?' type questions.

Cultural Education

- Understanding and appreciating personal influences: taking into account other people's views and understanding how to express own views. E.g. How to explain to someone where they may

have gone wrong in a question.

BRITISH VALUES

Democracy

- Take into account the views of others in shared activities. Voting when collecting data.

The Rule of Law

- Undertake safe practices, following class rules during tasks and activities for the benefit of all.
- Understand the consequences if rules are not followed.

Individual Liberty

- Work within boundaries to make safe choices during practical activities. Make own choices within data handling activities.

Tolerance of those with different faiths and beliefs

- Use maths to learn about different faiths and cultures around the world. E.g. looking atpatterns/shapes within Islam / Hindu religions.

Mutual Respect

- To behave appropriately, allowing all participants the opportunity to work effectively.
- Take turns and share equipment.
- Review each other's work respectfully.
- Work collaboratively on projects/problems, help and advise others

Assessment

Children receive effective feedback through teacher assessment and AfL is integral to the design of each lesson;

- The structure of the teaching sequence ensures that children know how to be successful in their independent work. Common misconceptions are addressed within the teaching sequence and key understanding within each 'small step' is reviewed and checked by the teacher and the children before progression to further depth.
- At the end of the lesson, the children review their work and often self and peer assessment are used.
- The children's self-assessment is reviewed by the teacher during review of the children's work to inform where consolidation might be required. Opportunities for additional practice and correction

are provided by the teacher, as appropriate, during marking, with a focus on promoting and achieving a growth mindset within the subject.

Class teachers continually assess the children's understanding as they move around the groups, questioning the children's understanding, observing them at work and through the marking of work. This information is recorded on a regular basis. Children may be working below (B), just at (JA), securely at (At) or above (A) against the end of year expectations. Children on IEPs may be working on and assessed against a lower year group's curriculum but are exposed to their own year group curriculum too.

Formative assessment

Short term assessment is a feature of each lesson. Observations and careful questioning enable teachers to adjust lessons and brief other adults in the class if necessary.

Summative assessment

At the end of each blocked unit of work, the children also complete the End of Unit Assessment. The outcome of this is used by the teacher to ensure that any identified gaps in understanding can be planned into starters in the following half term. This informs the judgements made at the end of the term as to the extent that each child has demonstrated mastery of each 'fundamental' objective.

Assessment data in maths is reviewed throughout the year to inform interventions and to also ensure that provision remains well-informed to enable optimum progress and achievement. End of year data is used to measure the extent to which attainment gaps for individuals and identified groups of learners are being closed. This data is used to inform whole school and subject development priorities for the next school year.

Termly assessments will be updated on the school assessment tracker for Maths. Teachers will record children's performance against the age-related objectives for the curriculum and decide whether children are working below, just at, securely at or above age-related expectations. Assessments are used to inform planning and close gaps, in order to accelerate progress. Subject leaders will analyse termly data and address areas for curriculum development.

Children's attainment, progress and barriers to learning will be discussed in half termly Pupil Progress Meetings with senior leaders and clear actions to work on will be planned together, to support pupils and staff in closing gaps.

Exercise Books for Recording

It is school policy that the following pattern is used:

Year 2 1cm squares

Year 3 1cm squares

Year 4 1cm squares

Year 5 7mm squares

Year 6 7mm squares

When using squares, one square should be used for each digit.

In FS, the majority of work is practically based, and any recorded work is collated in a floor book. Evidence of mathematical work is recorded in individual folders. Photographs of maths work are shared with parents through class dojo on a weekly basis.

Monitoring and review

The Role of the Mathematics Subject Leaders

Subject leads play an active role in the school self-evaluation cycle and throughout the year they will:

- Ensure there is clear progression throughout the school.
- Report to SLT & Governors
- Listen to 'Pupil voice'
- Carry out book looks and learning walks.
- Update staff on new developments, ideas and resources.
- Identify any training needs and offer extra support and guidance to staff when it is appropriate.
- Take the lead in policy development designed to ensure progression and continuity throughout the school.
- Assist the head teacher in carrying out the audit, reviewing and amending of the action plan.
- To provide an example to the school by taking a lead in teaching mathematics and classroom organisation
- Promote websites (Times Table Rock Stas and Numbots) and set challenges.
- Share Rapid Recall key skill targets for each year group with parents, staff and children with ideas, vocabulary and websites to support the children's learning.
- Monitor and evaluate progress and standards within the subject.
- Review planning and assessment.
- Specify, order and maintain resources throughout the curriculum and make recommendations for future funding of mathematics.
- Keep up to date with developments in mathematics through reading and training and share relevant information with colleagues.
- Liaise with staff to inform future professional development requirements and to plan staff meetings and/or INSET where necessary.
- Produce an annual subject development plan for the school improvement plan.
- Participate in research projects/researched based projects that promotes understanding of and confidence in Maths.