St James' Lanehead Church of England Primary School

Mathematics Policy

Date of Policy:	October 2024
Person Responsible:	Mrs L O'Brien
Review Date:	October 2025

Our Mission

Our church school seeks to inspire each individual to flourish, grow and learn with Jesus at the heart of all we do.

Mathematics Curriculum

Intent

The 2014 National Curriculum for Maths aims to ensure that all children:

1. 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

2. Be able to **reason** mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

3. Be able to **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.

FLUENCY – REASONING – PROBLEM SOLVING

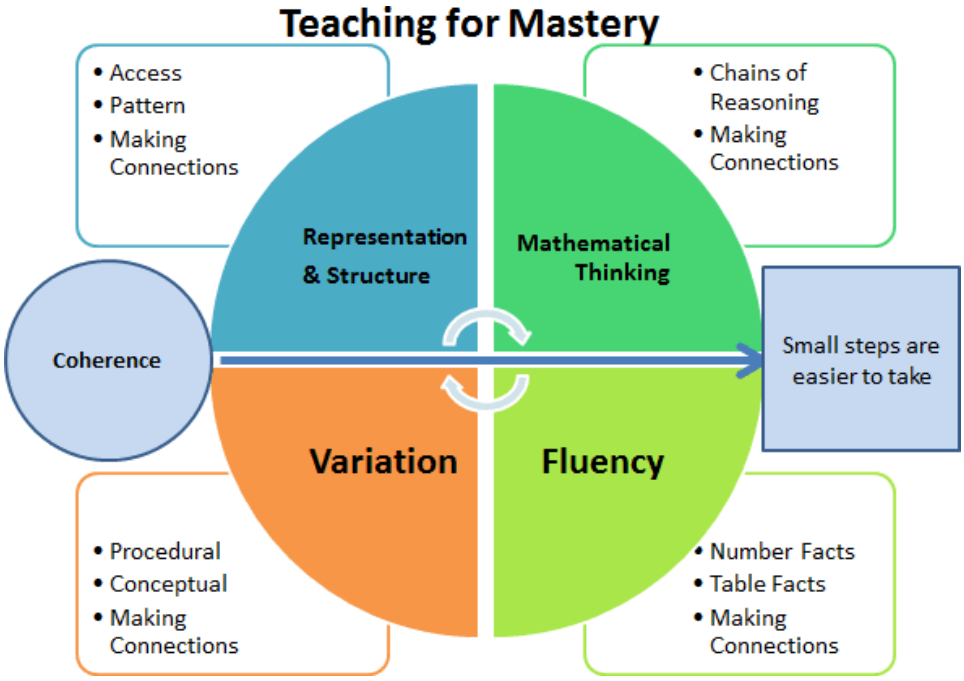
These three key aims of the National Curriculum should be addressed in each sequence of learning.

At St James' Lanehead CE Primary School:

We aim to provide all children with a broad and balanced curriculum where they will flourish. Pupils are taught in line with national requirements, and the teachers endeavour to enrich the
children's learning with purposeful and creative learning experiences so that all pupils are fully equipped to be active and positive local, British and Global citizens, as well as prepared for the next phase of their lives.

In Mathematics, we want all children to leave school at age related expectations. We value a maths curriculum that is creative and engaging and allows children to be independent thinkers who relish a challenge and are willing to take risks. We want all children to enjoy Mathematics and to experience success in the subject, with the ability to reason mathematically. We want children to develop the necessary skills to be deep thinkers. We want our children to acquire the maths skills that can be recalled quickly and transferred to new learning and in different contexts. Maths is the foundation for understanding the world and we want our children to be ready for life outside school and be able to apply their knowledge in their everyday lives. We know that children start our school lower than the national average.

At St James' Lanehead we are part of the Abacus North West Maths Hub and we use a Mastery approach for teaching.



Implementation

At St James' Lanehead:

The Maths subject leader works with other teachers at our school as part of the Abacus North West Maths Hub.

As a school we use a mastery approach and teachers use White Rose Maths planning resources in order to ensure that our children have full coverage of the Maths National Curriculum.

Teachers use the White Rose Hub planning scheme which supports the mastery in maths approach to maths.

This is also a very useful resource to support our families in relation to the National lockdowns. All children are planned for within the maths lessons ensuring that the teacher offers the necessary support and challenge for each individual to make progress. We ensure that maths is taught in creative and engaging lessons using a wide array of maths manipulatives to aid and support our children in their learning. Maths is widely promoted across the school and our classrooms have working walls that the children can utilise to support their learning and provide extra challenge.

Maths is taught in year groups with some mixed year groups on a daily basis.

Teaching methods include discussions between teacher and pupil, discussions between pupils, practical work, group activities, individual work, practice of basic skills and routines and investigative work. Each lesson begins with a recap of previous learning; this is followed by the main teaching input and pupil activities. The main teaching points are consolidated in a plenary session in which pupils are given time to review, reflect, discuss and evaluate their work and learning. To help build fluency, ten minutes mental maths takes place daily in each year group.

In order to support pupils who are not 'keeping up', dynamic interventions take place.

Our teaching for mastery is underpinned by the NCETM's Big Ideas.

- Opportunities for ***Mathematical Thinking*** allow children to make chains of reasoning connected with the otherareas of their mathematics.
- A focus on ***Representation and Structure*** ensures concepts are explored using concrete, pictorial and abstractrepresentations, the children actively look for patterns and generalise whilst problem solving.
- ***Coherence*** is achieved through the planning of small, connected steps to link every question and lesson within atopic.
- Teachers use both procedural and conceptual ***Variation*** within their lessons and there remains an emphasis on

We also have a specialist mathematics teacher assistant who is deployed to deliver mathematics interventions every afternoon. She has been trained to deliver 1st Class @ Number interventions to small groups of children across Years 2 to 5. In addition, Y6 are supported by a teacher in order to 'close gaps' and prepare pupils for the end of KS2 SATs.

This document has been created using content provided by the NCETM/Maths Hub Mastery Specialist Programme.

Teaching for Mastery Principles

- **It is achievable for all** – we have high expectations and encourage a positive 'can do' mindset towards mathematics in ***all*** pupils, creating learning experiences which develop children's resilience in the face of a challenge and carefully scaffolding learning so everyone can make progress.

- **Deep and sustainable learning** – lessons are designed with careful small steps, questions and tasks in place to ensure the learning is not superficial.

- **The ability to build on something that has already been sufficiently mastered** – pupils' learning of concepts is seen a continuum across the school.

- **The ability to reason about a concept and make connections –** pupils are encouraged to make connections and spot patterns between different concepts (E.g. the link between ratio, division and fractions) and use precise mathematical language, which frees up working memory and deepens conceptual understanding.

- **Conceptual and procedural fluency** – teachers move mathematics from one context to another (using objects, pictorial representations, equations and word problems). There are high expectations for pupils to learn times tables, key number facts (so they are automatic) and have a true sense of number. Pupils are also encouraged to think whether their method for tackling a given calculation or problem is Appropriate, Reliable and Efficient (A.R.E).

- **Problem solving is central** – this develops pupils' understanding of why something works so that they truly have an appreciation of what they are doing rather than just learning to repeat routines without grasping what is happening.

- **Challenge through greater depth** - rather than accelerated content, (moving onto next year's concepts) teachersset tasks to deepen knowledge and improve reasoning skills within the objectives of their year group.

Curriculum design and planning

- Teachers plan the sequences of learning using the national curriculum statutory guidance. Staff plan for 'small steps' and building on prior knowledge (as recommended by The Maths Hub) and spend time to think about the learning. The materials from the new White Rose Maths Schemes of Learning are used as a starting point in order to develop a coherent and comprehensive conceptual pathway through the mathematics. Teachers use the White Rose Maths materials to sequence their learning in small steps. The focus is on the **whole class progressing together**. Collaborative planning with year group colleagues and the Maths leader alongside specialists in school is encouraged to ensure consistency. Support assistants are utilised to enable pupils to achieve and not to create dependency on the adult.

- Learning is broken down into small, connected steps, building from what pupils already know.

The lesson journey should be detailed and evident on powerpoints as there is no requirementfor teachers to produce detailed paper plans. Teachers are expected to include opportunities to address any misconceptions that may occur and provide time to discuss any errors that could be made. Regular discussions with the Maths lead about "what are the children learning, now and why" are held in order to track progression and to address any professional development needs with staff.

- The use of TEAMS and pre-recorded learning is also used to support children and their families in terms of bubble closures. Parents are guided towards the White Rose Maths lesson videos in order to support their children's learning.

- Difficult points and potential misconceptions are identified in advance and strategies to address them are planned into lessons.

- Key questions are planned, to challenge thinking and develop learning for all pupils.

- Contexts and representations are carefully chosen to develop reasoning skills and to help pupils link concrete ideas to abstract mathematical concepts.

- The use of high quality materials and tasks to support learning and provide access to the mathematics, is integrated into lessons. These may include White Rose Maths Schemes of Learning and Assessment Materials, Power Maths, NCETM Mastery materials and NRICH, in addition to visual images and concrete resources.

- Opportunities for extra fluency practice (*instant recall of key facts, such as number bonds, times tables, division facts, addition and subtraction facts*) should be provided outside mathematics. School has purchased online resources to encourage fluency. All children have access to Times Table Rockstars and / or Numbots. Teams of children take part in the Multiplication Bee competition against other schools.

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<u>Learning and Teaching will be based on the Concrete-Pictorial- Abstract model</u>

- **Concrete is the "doing" stage.** During this stage, students use concrete objects to model problems. Unlike traditional maths teaching methods where teachers demonstrate how to solve a problem, the CPA approach brings concepts to life by allowing children to experience and handle physical (concrete) objects. With the CPA framework, every abstract concept is first introduced using physical, interactive concrete materials.
- **Pictorial is the "seeing" stage.** Here, visual representations of concrete objects are used to model problems. This stage encourages children to make a mental connection between the physical object they just handled and the abstract pictures, diagrams or models that represent the objects from the problem.
- **Abstract is the "symbolic" stage**, where children use abstract symbols to model problems. Students will not progress to this stage until they have demonstrated that they have a solid understanding of the concrete and pictorial stages of the problem. The abstract stage involves the teacher introducing abstract concepts (for example, mathematical symbols). Children are introduced to the concept at a symbolic level, using only numbers, notation, and mathematical symbols (for example, +, –, x, ÷) to indicate addition, multiplication or division.

In each class, maths boxes are available to support children's learning. These contain concrete and pictorial resources that are appropriate to the stage where the children are in their mathematical learning. As children progress through school, they will take more control over which resources to select.

What we would see in a typical lesson

- Lessons are sharply focused; digression is generally avoided.
- Key new learning points are identified explicitly.
- There is regular interchange between concrete/contextual ideas, pictorial representations and their abstract/symbolic representation.
- Mathematical generalisations are emphasised as they emerge from underlying mathematics, which is thoroughly explored within contexts that make sense to pupils.
- Making comparisons is an important feature of developing deep knowledge. The questions "What's the same, what's different?" are often used to draw attention to essential features of concepts.
- Repetition of key ideas (for example, in the form of whole class recitation, repeating to talk partners etc) is used frequently. This helps to verbalise and embed mathematical ideas and provides pupils with a shared language to think about and communicate mathematics. Stem sentences are used and displayed on working walls for the children to refer to.
- Teacher-led discussion is interspersed with short tasks involving pupil to pupil discussion and completion of shortactivities.
- Formative assessment is carried out throughout the lesson; the teacher regularly checks pupils' knowledge and understanding and adjusts the lesson accordingly.
- Gaps in pupils' knowledge and understanding are identified early by in-class questioning. They are addressed rapidly through individual or small group intervention, either on the same day or the next day, which may be separate from the main mathematics lesson, to ensure all pupils are ready for the next lesson.
- Teachers discuss their mathematics teaching regularly with colleagues, sharing teaching ideas and classroom experiences in detail and working together to improve their practice.
- Cognitive science research will be used in order for pupils to develop their long term memory so that they are able to know more and remember more!
- Support assistants allowing pupils to grapple with concepts and not over assisting.
- Assessment – please refer to the assessment policy on the school website.

Support with home learning:

As a school we use TEAMS as online platform. TEAMS allows us to record learning and give feedback to pupils. We also have a suite of parental videos for the families to use so that they are also confident to support their children in their learning.

We use resources advised from the Education Endowment Foundation such as Learning By Questions within Key Stage 2. This allows pupils to gain immediate feedback and also assists the teachers with their assessments.

We have made the decision to use the White Rose Maths resources as we feel that these resources are a valuable tool. These resources support our families, teachers and pupils.

There are lots of great maths sites which can help children practise their maths; some are listed below:

When it comes to times tables, speed AND accuracy are important – the more facts your child remembers, the easier it is for them to do harder calculations. Times Table Rock Stars is a fun and challenging programme designed to help pupils master the times tables. To be a Times Table Rock Star you need to answer any multiplication fact up to 12×12 in less than 3 seconds!

https://ttrockstars.com/

- **A Maths Dictionary for Kids** – very good for looking up maths words etc
- **mathsisfun** – fun games and explanations of mathematical concepts
- **Mr Nussbaum** – good games and fun maths
- **NRich Maths** – a great resource for mathematical activities, particularly problem solving and reasoning
- **URBrainy** – a good resource to practise multiplication tables and to prepare for the Year 4 Multiplication Tables Check
- **Funbrain** – fun maths games

- **Murderous Maths** – a really jolly maths website, great ideas.
- **myminimaths** - useful for KS2
- **primarygames** - a range of fun games
- **Mathsframe** – a wide range of games and activities