Maths Policy

St Patrick's Catholic Voluntary Academy

Approved by:	Headteacher	**Date:** January 2024
Last reviewed on:	September 2024	
Next review due by:	September 2025 (Annually)	

Contents

1. Rational and Objectives:

‘Mathematics is a creative and highly interconnected discipline that has been developed over centuries providing the solution to some of history’s most intriguing problems. It is essential to everyday life, critical to science, technology and engineering and necessary for financial literacy and most forms of employment. A high-quality mathematical education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the power and beauty of mathematics, and a sense of enjoyment and curiosity about the subject.’ (DfE 2013)

As can be seen from the above introduction, mathematics pervades all aspects of our lives and helps us to make sense of our world. With this in mind this policy promotes the basic and wider understanding of mathematics, and hopes to instill an enjoyment in the subject by supporting children to engage with it and build upon their own understanding and promote further learning. Learning skills are an important aspect of mathematics but such skills are only a means to an end, and should be taught and learned in a context that provides purpose and meaning.

This policy should be read in conjunction with the following school policies:
• Calculation Policy
• Assessment Policy
• Marking Policy
• SEND Policy
• Equality Policy

Copies are provided for staff and governors, as well as published on the School Website.

Paper copies of all documents are available upon request from the School Office or from the Curriculum Lead.

2. Aims:

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

The aims of teaching mathematics are:
· to promote enjoyment of learning through practical activity, exploration and discussion;
· to promote confidence and competence with numbers and the number system;
· to develop the ability to solve problems through decision-making and reasoning in a range of contexts;
· to develop a practical understanding of the ways in which information is gathered and presented;
· to explore features of shape and space, and develop measuring skills in a range of contexts;
· to understand the importance of mathematics in everyday life.

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 nonroutine 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 before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

3. Statutory requirements:

This policy reflects the requirements of the National Curriculum programmes of study, which all maintained schools in England must teach. It also reflects requirements for inclusion and equality as set out in the Special Educational Needs and Disability Code of Practice 2014 and Equality Act 2010, and refers to curriculum-related expectations of governing boards set out in the Department for Education's Governance Handbook. In addition, this policy acknowledges the requirements for promoting the learning and development of pupils set out in the Early Years Foundation Stage (EYFS) statutory framework.

4. Intent:

At St Patrick's Catholic Voluntary Academy, we believe mathematics is an essential skill which teaches us how to make sense of the world around us through developing the ability to calculate, to communicate, to reason and to solve problems. It enables children to understand and appreciate relationships and patterns in both number and space in their everyday lives, therefore it is an important part of our broad and balanced curriculum.

We intend to teach a curriculum that allows children to explore skills and knowledge in depth, to gain a secure understanding of subject matter, as well as regularly revisiting these to embed learning. Our concrete, pictorial, manipulatives, abstract approach provides children with a clear structure in which they can further develop and embed their knowledge and understanding of mathematical concepts. We therefore place great emphasis on the use of concrete resources and pictorial representations at all ages, to enable children to fully understand the concepts and principles when presented with abstract calculations and questions. Our aim is to develop a positive culture of deep understanding, confidence and competence in mathematics that produces strong secure learning. Our staff have high expectations and through mathematics encourage a 'can do' attitude to build resilience.

Early years (see also early year's policy)

Mathematics within the EYFS is developed through purposeful, play based experiences and will be represented throughout the indoor and outdoor provision. The learning will be based on the pupil's interests and current themes 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 pupils progress, they will be encouraged to record their mathematical thinking in a more formal way.

"Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes." Statutory framework for the early years foundation stage.

5. Expectations:

By the end of key stage 1 pupils are taught to:

The principal focus of mathematics teaching in Key Stage 1 – Year 1 and 2, is to ensure pupils develop confidence and mental fluency. The essential idea behind the mastery approach is that all children have a deep understanding so that future learning continues to build on solid foundations. If the subject is represented using concrete materials, pictorial representations and abstract symbols, it will allow children to visualise maths in varied ways, see connections and to independently explore and investigate a topic. Practical activities and resources offer the children a deeper mathematical understanding of more complex concepts. Providing children with visual representations also offers a scaffold when developing a more robust understanding of maths.

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, pupils begin to identify fractions using shapes, objects and quantities and make connections to equal sharing and grouping. Pupils are taught to count to ten in fractions, recognise equivalent fractions and develop their understanding of fractions on a number line.

At this stage, pupils will also develop their ability to recognise, describe, draw, compare and sort different shapes. Pupils 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 pupils across an entire curriculum.

By the end of key stage 2 pupils are taught to:

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 tables and show precision and fluency in their work.

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 ratios. 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.

6. Progression

In the Early Years, pupils experience mathematics through Understanding the World, through activities that allow them to think creatively and critically. Staff encourage pupil's curiosity by being play partners, asking 'wondering' questions about what they are doing and what would happen if they were to do something another way.

Learning from the Early Years is built upon in Key Stage One and in Key Stage Two. Previous learning is revisited before new learning occurs, to ensure misconceptions are addressed and that pupils are gaining a deeper understanding as they build upon their current knowledge with new knowledge. Learning is broken down into small steps to support this and reduce cognitive overload.

7. Implementation:

At St Patrick's Catholic Voluntary Academy, we teach Mathematics using the White Rose Mastery scheme from Foundation Stage 2 to Year 6. Maths lessons are taught daily, set by the whole school non-negotiable timetable, monitored by the Subject Lead and Senior leadership team.

A typical maths lesson includes a clear, concise learning objective. It will include focused mental work and the Mastery principles: The 5 Big Ideas (Representation and structure, Mathematical thinking, Variation, Fluency, Coherence using small steps) with clearly identified learning outcomes and sufficient challenge for all children. Manipulatives are readily available during maths sessions for children to choose or be directed towards to further their understanding of concepts. In addition to this all children will complete morning maths work which

will plug identified gaps and develop the skills covered to ensure a secure understanding of manipulating number and fact fluency.

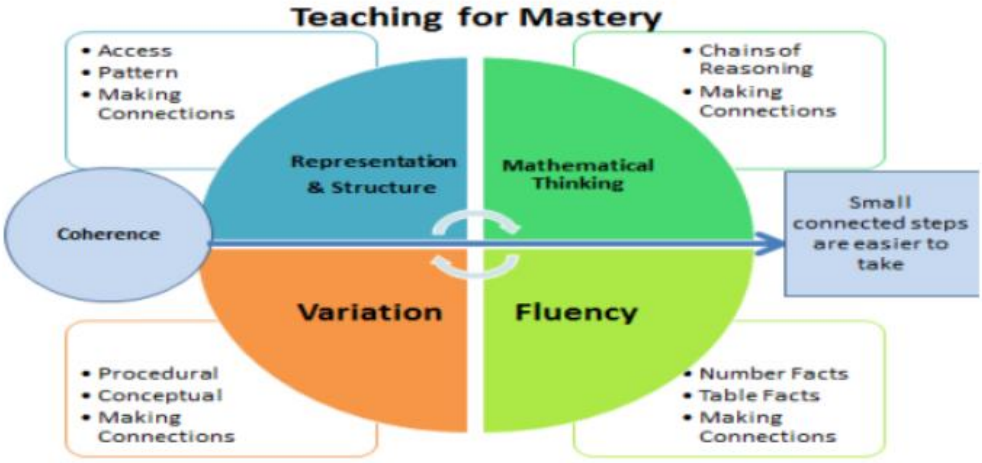
Children record their work in the agreed age appropriate manner. Foundation Stage record their working in Maths books, in Key Stage 1 (Years 1 and 2) as well as Year 3, children record their work in White Rose Maths booklets and from Year 4 upwards, children record their work in Maths books. It is also important to record aspects of mathematical investigations and to ensure that children are taught and display knowledge of a variety of methods for recording their work. Children will be supported to use the most appropriate and convenient method of recording.

Assessment is an integral part of learning and teachers participate in live marking within lessons, verbal feedback regularly to individual learners and addressing misconceptions as they arise.

Teachers use short-term assessments as an informal part of every lesson and are closely matched to the teaching objectives. Medium term assessments are carried out every half- term in order to review and record the progress the pupils have made in relation to the Point in Time Assessment Statements (PITA). As well as long term assessments e.g. The optional end of Key Stage 1, Year 2 assessment which take place in June, and the end of Key Stage 2, Year 6 assessments which take place in May (SATs). Children are assessed using end of block assessments from White Rose Maths at the end of every topic covered.

8. Content and delivery

What is teaching for mastery?



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 and 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 pupils.

As a result of teaching and learning in mathematics, our aim is that pupils will be able to meet the key aims of the National Curriculum for maths.

• In our school we aim to promote children's **curiosity** and enable them to safely take risks and learn from first-hand experience wherever necessary
• Our primary focus is to support the children to become fluent in 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.

9. Impact:

Our approach to the teaching of Mathematics at Saint Patrick's Catholic Voluntary Academy will result in engaging, high quality maths education which provides pupils with an understanding of the ever-changing world around them. Pupils will see themselves as mathematicians, no matter what age they are, with an awareness of possible future roles and careers in the mathematical world. Pupils will be able to question ideas and reflect on knowledge. Our pupils will work practically and collaboratively, they will be able to articulate their understanding of mathematical concepts and be able to express and reason using specific mathematical language. High quality programs and resources are used to enable a rich curriculum delivery.

The impact of learning will be assessed by the subject lead with the curriculum leader through a triangulation of activities, which include: lesson observations, planning scrutinies, book looks, pupil voice, staff voice and expected subject content and progression.

10. Classroom Organization and Teaching Style:

• All children receive a daily maths lesson.
• Each lesson focuses on one clear learning objective which all children are expected to master; reasoning and problem-solving activities enable those children who grasp the objective rapidly to extend their learning by exploring it at greater depth.
• Each lesson should include elements of: fluency, to practise skills; reasoning, to deepen understanding; and problem solving, to apply skills depending on the objective being taught and the understanding of the children.
• Teachers use the White Rose Mastery planning and resources to aid Maths teaching within school. This is supported by the use of Nrich, NCETM, TTrockstars and Mathletics to provide full and varied coverage of skills and reasoning techniques.
• Whole class teaching is adopted and children work in mixed ability groups. We believe that all children should have the same standard of teaching and to ensure this we aim not to group children based on their ability but also accept that at times this may be necessary. We therefore aim to differentiate by outcome and scaffolding provided rather than work set.

11. Resources:

Resources for the delivery of the maths curriculum are stored both centrally and in classrooms. Everyday basic equipment is kept in classrooms. Additional equipment and topic specific items are stored centrally. There are central stores in the corridor areas and the designated Maths Room. New learning resources are invested when staff have received training and or carried out research and believe they will be of benefit to the children's learning, knowledge and understanding.

12. Inclusion:

We are a fully inclusive school and activities are carefully planned and adapted according to the needs of our pupils. Teachers set high expectations for all pupils and every effort must be made by teachers to ensure that pupils with SEN or disability are enabled to participate as fully and as effectively as possible in all mathematical activities.

We use appropriate assessment to set ambitious targets and plan challenging work for all groups, including

- More able pupils
- Pupils with low prior attainment
- Pupils from disadvantaged backgrounds
- Pupils with SEN
- Pupils with English as an additional language (EAL).

Teachers will use adaptive teaching activities and ideas which are suggested within the medium-term plans for each lesson, as well as their own adaptive teaching techniques, so that all pupils can access appropriate Maths lessons, regardless of their academic ability or Special Educational Need.

We aim for all pupils, regardless of their race, gender or ability to develop their knowledge and achieve skills and understanding of Mathematics to enable them to make informed choices, dealing appropriately with different situations and making positive contributions to society. We consider prior learning, knowledge and skills already gained.

Pupils with English as an additional language are supported in a variety of ways, including but not limited to; reading of questions, repeating of instructions, translated instructions and practical demonstration of skills.

Gifted and Talented:

For gifted and talented pupils, teachers provide additional opportunities to take responsibility, develop leadership skills, think creatively and use their talents for the good of the class or the wider community. In order to stretch and challenge pupils should generally be catered within the class by use of a variety of extension activities, by greater depth in questioning and understanding and by an emphasis on work involving higher order thinking skills. Furthermore, these pupils should be given opportunities to explain their knowledge, thinking and learning using high-level technical vocabulary with precision. Suggested activities for stretch and challenge are present on all medium-term lesson plans for each session.

The words “gifted” and “talented” can be used in many different ways. The Department for Education and Skills uses the following definitions:

Gifted: the top 5%-10% of pupils per school measured by actual or potential achievement in English, Maths, Science, History, Geography, Modern Foreign Languages, RE, ICT or Design and Technology.

Talented: the top 5%-10% of pupils per school measured by actual or potential achievement in the subjects of Art, Music, PE or the Performing Arts. However, one element of this description should be emphasized: it is the top 5%-10% of pupils, *per school, regardless of the overall ability profile of the pupils.*

How to identify the More Able in Mathematics:

Parent and Pupil Feedback: a student might have interests outside of school that teachers are unaware of. Parents should be invited to communicate this information to teachers. Equally pupils should be encouraged to identify their own individual strengths and weaknesses.

Teacher identification: teachers are often best placed to identify which students are gifted or talented. They may also be aware of when students with gifted and talented potential are underachieving.

What support should More Able pupils be given?

Once the More Able pupils have been identified, our school will begin a coherent and consistent provision strategy. This will usually involve a combination of the following methods of support.

Enrichment: when pupils are encouraged to go beyond the usual limits of a subject or topic. Enrichment activities might involve extra classroom exercises or more open-ended project work.

Extension: when pupils are given activities that develop higher order thinking skills and work practices. Extension activities help pupils to work with greater autonomy and self-discipline.

13. Assessment

• Assessment for Learning is used in every mathematics lesson across the school to assess whether pupils have understood a concept or if misconceptions have occurred. This allows for misconceptions and gaps to be addressed, ensuring we are building on secure mathematical understanding. A specific mastery approach is followed during lessons and tasks are used throughout the lesson sequence to assess the progress of pupils and their understanding as well as a range of abstract and concrete activities. End of topic White Rose assessment are also used to assess progress. Parents and Carers are informed of their child's progress and achievements in their end of year report and during parent's meetings.

• Medium term assessments are carried out every term (December, March and June). The results of these will inform the completion of highlighting the assessment statements within the class purple assessment file.

• Y2 (optional) and Y6 long term assessment will take place in May 2024 (S.A.T.S)

14. Parental Involvement:

At St. Patrick's Catholic Voluntary Academy, we encourage parents to be involved by encouraging use of IT and maths skills at home for home-learning tasks and use of the school website. The school offers access to TTRockstars and Mathletics programmes online to facilitate home learning using technology. Mathematics homework is set weekly and parents are expected to monitor and encourage the completion of this.

15. Roles and responsibilities

15.1 The governing board

The governing board will hold the headteacher to account for the implementation of this policy.

The governing board has delegated the approval of this policy to the headteacher.

15.2 The headteacher

The headteacher is responsible for ensuring that Mathematics is taught consistently across the school.

15.3 Staff

Staff are responsible for:

- Delivering Mathematics in a consistent way
- Modelling positive attitudes to Mathematics
- Monitoring progress
- Responding to the needs of individual pupils

The Role of the Mathematics Subject Leader

- Supports colleagues in their teaching by keeping them informed about current developments in the subject.
- Provide a summary of the pupil's work and observe Mathematics lessons across the school.
- Plan CPD for staff.
- Monitor provision of the curriculum and resources across the whole school.
- Monitor the progress pupils have made pre and post teaching through assessment activities, not just assessing against the intended end points.
- Provide adequate resources for all classes which are catalogued, stored and replenished as required.
- Attend yearly meetings with The South Yorkshire Maths Hub to ensure our curriculum is up to date and meeting the needs of our pupils.
- Attend yearly meetings associated with the local authority to gain knowledge of updates to national procedures and keep abreast of national assessment criteria.

16. Monitoring arrangements

The monitoring of the teaching of Mathematics and pupil progress is the shared responsibility of teachers, Subject Leader, and the Senior Leadership Team. The work of the Subject Leader includes supporting colleagues in the teaching of Mathematics, keeping up to date with current developments as well as providing a strategic lead and direction for the subject. The school's governing body receive regular updates to inform them of the vision for continually driving forward the curriculum based on a selection of the following each term:

- Learning Walks
- Book looks
- Planning Scrutinies
- Lesson Observations
- Pupil Voice
- Staff Voice.

17. Policy Monitoring and Review:

This policy is monitored by the Mathematics Subject Leader. It is evaluated and reviewed by the whole staff and Governors annually or sooner to ensure that it continues to meet the needs of the pupils, staff and parents, and that it is in line with current DfE advice and guidance.

18. Links with other policies

This policy links particularly to the following policies and procedures:

- Child Protection Policy.
- Behaviour Policy.
- Anti-bullying Policy.
- Online Safety Policy
- SEND Policy.
- Early Years Foundation Stage Policy (EYFS Policy)
- Relationships and Health Education Policy. (RHE Policy)
- Personal, Social, Health, Economic Education Policy. (PSHE Policy)
- Marking and Feedback Policy.

September 2024.