

Contents

1.1 Our Curriculum

2.1 Mathematics Intent

2.2 Fluency

2.3 Reasoning

2.4 Problem Solving

3.1 Mathematics Implementation

3.2 Types of Problem Solving

3.3 Mathematics in the Wider Curriculum

3.4 Multiplication Tables

3.5 Mathematical Vocabulary

4.1 Mathematics Impact

5.1 Continuing Professional Development

1.1 Curriculum

At St Catharine's, we believe that every child has the potential to succeed in mathematics and our curriculum design is intended to foster enjoyment of maths and develop successful learning by developing the necessary skills to become confident, fluent, reasoning and problem-solving mathematicians. We believe that a high-quality maths curriculum develops confident and resilient children, who can apply taught content and skills to every day contexts and life experiences. A high-quality mathematics education therefore 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.

Our mathematics curriculum is based on the expectations and aims of the 2014 National Curriculum for mathematics and the 2021 statutory framework for the Early Years Foundation Stage. We have high expectations within our curriculum, focusing on the mastery approach to teaching mathematics. Within a teaching sequence, children will be challenged in all three core aims of the maths curriculum: fluency, reasoning and problem-solving. All staff have high expectations of pupils in lessons and expect them to demonstrate their understanding in a variety of ways using a concrete, pictorial, abstract approach. Children develop fluency through spaced retrieval practice and learning a new concept and apply this knowledge to reasoning and problem-solving tasks.

2.1 Mathematics Intent

Here, at St Catharine's, we understand the importance of Mathematics providing a foundation for understanding the world. We recognise the importance of children being able to reason mathematically, develop an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject. We carefully aim to ensure that children gain a deep, conceptual understanding of a range of mathematical ideas, to ensure that our children can recognise relationships between current and prior learning.

The intent of our Maths Curriculum is to support the National Curriculum in its 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.
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2.2 Mathematical Fluency

Our Intended Curriculum to Develop St Catharine's Fluent Mathematicians

Fluency means becoming 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.

In our school we ensure that children become confident in the two types of fluency:

- Conceptual fluency (e.g. exploring five strands of place value, what an equivalent fraction is and identifying features of different representations of data)
 - Procedural fluency (e.g. $+$, $-$, \times , \div calculation methods linked to whole numbers, fractions and decimals and exploring step by step methods)
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2.3 Mathematical Reasoning

Our Intended Curriculum to develop St Catharine's Reasoning Mathematicians

Reasoning mathematically means following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical

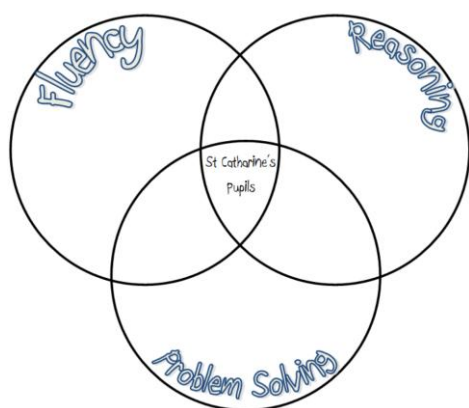
language. In our school, we ensure that children become confident in mathematical reasoning through providing opportunities for them to:

- Conjecture relationships and generalisations e.g. if I add an odd and an odd number it will always result in an even number or all quadrilaterals have 4 right angles – true or false?
 - Developing an argument, justification or proof using mathematical language e.g. prove it, justify, convince me, how can you work it and how did you work it out?
 - Reasoning twists – this is explored through challenges such as: alike and different, odd one out, true or false, spot the mistake and sometimes, always or never true. These reasoning challenges can be adopted or adapted for any strand of mathematics: number, measurement and geometry. See appendix 1.
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2.4 Mathematical Problem Solving

Our Intended Curriculum to develop St Catharine's Problem-Solving Mathematicians

Problem-solving means 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. **Problem solving** requires the children to be secure in and build upon conceptual understanding (**fluency**) and mathematical thinking and language (**reasoning**) to help solve sophisticated problems in unfamiliar contexts. The White Rose Maths Hub materials form the basis of the teaching sequences from EYFS to Year 6 at St Catharine's. This underpins our maths philosophy and ensures that fluency, reasoning and problem solving are taught through a concrete, pictorial and symbolic methodology.



3.1 Implementation

At St Catharine's, our approach to the curriculum is designed to develop children's knowledge and understanding of mathematical concepts from the Early Years through to the end of Year 6. In school, to guide and support teachers with planning and assessment, we follow the national curriculum and access and adapt, where appropriate, the White Rose Schemes of Work. Within a teaching sequence, there is a clear and structured approach to

lessons in EYFS, KS1 and KS2 to ensure all children have access to a well-planned and meaningful maths curriculum which is taught daily. Each Maths lesson will follow broadly the same structure (please see lesson structure - appendix 2); however, depending upon the concept, teachers may employ a range of lesson styles in order to maximise the learning opportunities of the class and where appropriate, lessons are modified to meet the needs of individual learners. These lessons include, but are not limited to:

- Challenge lessons– a progression of difficulty is set out by the teacher. These often, but not always begin with fluency and progress to reasoning and problem solving. The children work though this continuum in order to consolidate and stretch their learning at the own pace. Children who are identified as having a good understanding of the area may start at a more challenging question.
- Conceptual lessons– give the children the opportunity to explore Maths. They are particularly important when children are being introduced to a new concept. For example, by building shapes with a specified volume using cubes. These may not be evident in books but will be evident virtually to show the learning objective has been delivered.
- Reactive lessons- when teaching a lesson, the teacher may uncover a misconception held with the majority of class. Although not strictly part of the objective, the teacher may plan and deliver a lesson in order to address the misconception. These lessons are not expected to occur often.
- Differentiated lessons- a more traditional style of lesson where work is differentiated for groups of learners.
- Arithmetic fluency lessons– a chance for children to focus heavily on one particular fluency skill in order to become confident and apply the skill to future lessons. In this lesson, children are encouraged to use efficient methods, with a focus on speed and accuracy.

Our Calculation Policy is used within school to ensure a consistent approach to teaching the four operations over time. This includes mathematical language and vocabulary, core representations and calculation methods.

We carefully follow the concrete, pictorial and abstract (CPA) approach, selecting the most appropriate core representations to develop confident, fluent, reasoning and problem-solving mathematicians.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, pupils who grasp concepts rapidly are challenged through being offered rich and sophisticated problems before any acceleration through new content.

3.2 Types of Problem Solving

Problem solving means 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.

Problem solving requires the children to be secure in and build upon conceptual understanding (fluency) and mathematical thinking and language (reasoning) to help solve sophisticated problems in unfamiliar contexts.

We explore the five types of problem solving in different strands of mathematics –

- Two and three step word problems including bar model
- Finding all possibilities
- Finding rules and describing patterns
- Diagram problems and visual puzzles
- Logic problems

Please see our Reasoning and Problem Solving Document which demonstrates activities you may see in the children's books in Appendix 4.

3.3 Mathematics in the Wider Curriculum

Mathematics plays a vital role across the wider curriculum in both Key Stage 1 and Key Stage 2, helping children to develop problem-solving, reasoning and analytical skills that support learning in many subjects. In science, pupils use maths to measure, record and compare data, while in geography they interpret charts, maps and coordinates. History lessons often involve understanding timelines and sequencing events, and in design and technology children apply mathematical concepts such as shape, measurement and scale when creating models and structures. Maths also supports computing through patterns, logic and algorithms, and in physical education pupils use counting, timing and scoring. By making clear links between mathematics and other curriculum areas, children are able to see the relevance of maths in everyday life, build confidence in applying their skills in different contexts, and develop a deeper and more meaningful understanding of learning overall.

Please see appendix ___ for our Mathematical Wider Curriculum Links

3.4 Multiplication Tables

Learning multiplication tables is an essential part of mathematical development throughout Key Stage 1 and Key Stage 2 because it helps children build fluency, confidence and accuracy in calculation. A secure knowledge of multiplication facts allows pupils to solve problems more efficiently and supports learning in other areas of maths such as division, fractions, measurement and problem-solving.

The Year 4 Multiplication Tables Check encourages children to recall times tables quickly and accurately, preparing them for more advanced mathematical concepts in Key Stage 2 and beyond. Developing rapid recall also reduces cognitive load, enabling pupils to focus on reasoning and applying their understanding rather than working out basic facts. Strong multiplication knowledge supports everyday life skills and creates a solid foundation for future success in mathematics.

Daily recall of times tables in Key Stage 1 and Key Stage 2 is important for developing fluency and confidence in mathematics. Regular practice helps children to quickly remember key multiplication and division facts, allowing them to solve calculations more efficiently and accurately. In Key Stage 1, pupils begin to build early understanding through counting patterns and simple multiplication facts of the 2, 5, 10 and 3 times tables, while in Key Stage 2 they strengthen rapid recall of all times tables to support more complex mathematical learning. Consistent daily rehearsal also improves problem-solving skills and helps children apply their knowledge across different areas of the curriculum and in everyday situations.

3.5 Mathematical Vocabulary

At St Catharine's, the teaching of vocabulary within mathematics lessons is a fundamental part of pupils' learning and plays a key role in developing comprehension, communication and critical thinking. We believe that children who can confidently use mathematical language are better able to explain their reasoning, justify their methods and develop a deeper understanding of mathematical concepts. Drawing on the work of Mary Myatt, we recognise that a rich vocabulary enables children to communicate ideas clearly, make meaningful connections in their learning and engage more effectively across the curriculum. Our approach is also informed by the guidance within the National Centre for Excellence in the Teaching of Mathematics (NCETM) vocabulary guidance, which highlights the importance of explicitly teaching mathematical language to support fluency, reasoning and problem-solving. Mathematical vocabulary is embedded throughout all lessons and interactions, ensuring pupils regularly hear, practise and apply precise mathematical terminology.

We use a range of practical strategies to support vocabulary development in mathematics. Working walls display key mathematical vocabulary that is regularly updated and accessible to all pupils, helping to create a language-rich classroom environment. Topic-specific vocabulary is introduced at the beginning of units, while teachers provide direct instruction on unfamiliar words through discussing definitions, synonyms and mathematical meanings. Sentence stems and sentence frames are sometimes used to scaffold children's spoken and written explanations, enabling pupils to communicate their thinking with increasing accuracy and confidence. Children are encouraged to apply new vocabulary within full sentences during discussions and written work, and ambitious mathematical language is celebrated through verbal praise and written feedback. Through this consistent approach, pupils develop a secure understanding of mathematical concepts and become increasingly confident in articulating their ideas, reasoning and outcomes effectively.

4.1 Mathematical Impact

At St Catharine's, our mathematics curriculum is carefully designed to ensure that every child has the opportunity to succeed and develop confidence as a mathematician. We recognise the importance of mathematical vocabulary in supporting pupils' understanding, communication and reasoning.

Assessment is an integral part of mathematics teaching and learning at St Catharine's and may be both formative and summative. Teachers assess pupils continuously through

observations, questioning, discussions and targeted interventions with individuals and groups. This ongoing assessment informs planning and ensures that children access the correct lesson type, including pre-teaching or post-teaching sessions where appropriate, to address misconceptions, reinforce understanding or provide additional challenge. Lessons are carefully adapted to meet the needs of all learners and ensure an appropriate level of support and challenge. Pupils are also given regular opportunities to reflect on their learning through self-assessment and peer assessment, enabling them to identify next steps and improve their work independently.

Termly NFER assessments are completed and analysed, with outcomes recorded on Arbor to identify trends, monitor progress and support the identification of focus groups requiring further intervention or support. End of Key Stage assessments are administered in line with current statutory guidance and requirements.

The impact of mathematics teaching at St Catharine's is monitored regularly as part of our whole-school monitoring cycle. We are committed to continually raising standards, maintaining high expectations and promoting effective teaching and learning across the school. Monitoring activities, including learning walks, book scrutinies, pupil voice, staff feedback and mathematics-focused CPD, enable leaders to evaluate the effectiveness of the curriculum and identify areas for development. This process also supports the sharing of strong practice across the school and informs tailored professional development to further enhance teaching and learning in mathematics.

5.1 Continued Professional Development

In order to maintain the highest quality of teaching and learning in mathematics, St Catharine's is fully committed to the continuous professional development of both teachers and teaching assistants. The Maths Subject Leader plays a key role in identifying priorities for development and is responsible for coordinating, delivering and sourcing relevant training opportunities for staff. Staff are encouraged to attend training linked to current educational initiatives and developments in mathematics teaching to ensure practice remains up to date and informed by the latest guidance and research. Information, strategies and resources gained through professional development are then disseminated across the staff team, ensuring that effective practice is shared consistently and embedded throughout the school.