



St Mary's Catholic Primary School

MATHS AT ST MARY'S

RATIONALE

At St Mary's, we believe that Mathematics is an essential tool for daily life; therefore, we are determined that every pupil will demonstrate the mathematical knowledge, concepts and procedures appropriate for their age and demonstrate good progress from their individual starting points. The essential idea behind Maths at St Mary's is that all children need a deep understanding of the mathematics they are learning so that they can be successful within the world in which they live. We believe that all pupils are capable of understanding and making sense of these mathematical concepts and ideas.

OUR AIMS

The National Curriculum (2014) 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.

We also aim for, through a carefully designed, sequences and ambitious curriculum, for all pupils to:

- be fluent in the recall of key recall facts.
- apply mathematical knowledge and skills appropriately, flexibly and creatively.
- see themselves as mathematicians.
- grow into motivated, self-assured and independent mathematicians.
- develop a passion and enthusiasm for mathematics.



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CURRICULUM

Mathematics is taught daily throughout the school at St Mary's. Our Curriculum is structured using WhiteRose Maths as our spine. This means that we teach Mathematics in blocks, which have been sequenced in a coherent and logical manner, using 'small steps' to break down each topic into the key elements that allow for deep learning and mastery of the mathematical content. These blocks are interleaved, which means that key ideas, concepts and knowledge are revisited within and across years (for example, multiplication and division skills are revisited when studying fractions or area). WhiteRose Maths, used alongside the NCETM (The National Centre for Excellence in the Teaching of Mathematics) mastery professional development resources, the DfE non-statutory curriculum guidance, and the Gateshead Assessment Profile (GAP) provides teachers with a clear sequence in which to consolidate and build on prior learning. The length of time which teachers spend on individual objectives is informed by and dependent on the individual starting points and needs of the children in their class as well as ongoing formative assessment. The use of WhiteRose Maths as our curriculum spine in terms of sequencing allows teachers to easily build on prior learning and ensures that our curriculum is progressive and provides challenge for those who grasp concepts quickly.

Our Mathematics curriculum also follows the St Mary's calculation policy, which outlines the procedural knowledge progression in calculation throughout the school. The calculation policy provides a clear sequence of what, when and how the teaching of calculation, including multiplication and division facts, is introduced and developed throughout the school.

Alongside this, we have also developed 'Key Recall Facts' for each year group (based on the National Curriculum expectations for that year group) which outline the essential declarative (and appropriate procedural) knowledge we expect the children to know by the end of that year. The areas are Number, Addition and Subtraction Facts, Multiplication Tables Facts, Measurement, Geometry and Statistics which are outlined in our Key Recall Facts progression document. These facts are essential to allow children to direct their working memory and attention to solving mathematical problems.

As Mathematics is an interconnected and interdisciplinary subject, we also look for opportunities to make links between areas of Mathematics and the wider curriculum through the idea of 'Maths Outside of the Maths Lesson'. Teachers are encouraged to look for opportunities to consolidate this learning from Mathematics lessons in other curriculum subjects (for example, statistics in Science).



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EARLY YEARS FOUNDATION STAGE (EYFS)

At St Mary's, Maths in EYFS is guided by the Early Learning Goals outlined within the Statutory framework for the early years foundation stage. Maths is taught both within the continuous provision and as a discrete subject, thus providing frequent and varied opportunities to apply this understanding to make sense of the world around them. Within the EYFS, children develop a strong grounding in early number, which we see as the foundations for future mathematical learning: the principles of counting, understanding relationships of numbers within 10, developing shared mathematical vocabulary and exploring spatial reasoning in all areas of Maths. At St Mary's, our EYFS Maths Curriculum is underpinned by WhiteRose Maths, which we use as our curriculum spine to sequence Maths teaching in the Early Years.

WHAT DOES MATHS TEACHING LOOK LIKE AT ST MARY'S?

At St Mary's, we follow these principles to enable our children to that every pupil will demonstrate the mathematical knowledge, concepts and procedures appropriate for their age and demonstrate good progress from their individual starting points.

1. Mastery approach

At St Mary's we follow a mastery approach to Mathematics. Mastery in our school means that learning is fluent, deep and embedded so that it can be built upon and connected to. It also means that we believe all pupils can succeed in Mathematics. In lessons, this will be apparent through whole-class teaching in which all pupils work together on the same objectives/ concepts at the same time (with varying degrees of support, scaffolding and challenges) to allow all pupils to achieve. Our teaching is both proactive and reactive: we plan for the mastery of each small step but also 'act on what we see' to ensure the appropriate support is in place for all children.

2. Procedural and conceptual fluency

Mastery at St Mary's involves developing procedural and conceptual fluency alongside one another and securing the rapid recall Key Recall Facts and knowledge (such multiplication and division facts or number bonds) and procedures (such as written methods for the four operations or how to find fractions of amounts) to enable pupils to focus their attention on new concepts by avoiding cognitive overload. Procedural and conceptual fluency are very much interlinked and not mutually exclusive. In order to develop fluency in both areas, teachers will, in almost all Maths lessons, start the lesson with retrieval practice in order to review and recall previously learned content, key facts and key knowledge. This, coupled with other opportunities for 'Maths Outside of the Maths Lesson' will allow children to recall this key knowledge regularly so that working memory is freed to



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concentrate on more complex understanding and identifying and making connections between different areas of mathematics. Variation of task design is also crucial to developing both procedural and conceptual fluency. Teachers select and design tasks which are conceptually similar but in which emphasis is also placed on the differences between problems. Varying the way problems are presented, the procedures used to solve the problem and the application of the procedures or concepts to a given problem are all key strategies which we use at St Mary's and we follow a 'variation not variety' mantra with regard to task design.

To support children in overlearning and practising number bonds, mental addition and subtraction and multiplication and division facts, we use (both in class and for homework) Times Table Rockstars, Numbots and IXL Maths, which are fun and engaging ways for pupils to build their speed and accuracy in these areas. The programs also allow teachers to monitor and assess each individual child's progress and plan to support children to fluently recall this knowledge.

3. Reasoning and Problem Solving throughout

At St Mary's we believe that reasoning and problem solving are vital for all children and should be embedded both within Maths lessons and across a unit of work. Reasoning and problem solving allow students recognise the underlying structure of different problem types and apply their knowledge and understanding to a range or mathematical, real-world, routine and non-routine problems, where logical thinking so that children can develop strategies for solving similar problems with related structures. Although some lessons will be focused purely on procedural calculations and most involving varied fluency, there will also be regular opportunities for reasoning and problem solving. Some lessons will also be focused on teaching through reasoning and teaching through problem solving and a greater focus may be applied to skills such as working systematically or proving/disproving a statement.

4. Modelling

We use the concrete-pictorial-abstract approach to representing the underlying concepts of number. This approach is not limited to early Mathematics but can be seen at varying stages throughout the school (for example, the use of Numicon to teach short division in KS2 or the use of algebra tiles in Year 6). These different representations (and consequently physical manipulatives) are used in worked examples and guided practice to provide strong models, appropriate repetition and also rich discussion of examples and non-examples using accurate mathematical vocabulary. It is also common to see the use of mini-whiteboards to give children the opportunity to practice and the teacher the opportunity to intervene when needed.



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5. Support for All

Another strength of WhiteRose Maths being the spine of the St Mary's Mathematics curriculum is the ease in which learning can be sequenced back to previous year groups (when appropriate) in order to support learning. Most support and challenge will be provided through 'quality-first teaching' through using strategies such as questioning. Teachers will be able to scaffold and adjust tasks to meet the needs of all learners, whether that be through scaffolded tasks to help children to access learning or through designing tasks with a 'high ceiling' for those who grasp concepts quickly. Ways in which teachers may scaffold tasks are through adjusting the complexity of the numbers involved in a task, using task boards or video examples to further model learning, adding a 'low floor' to tasks by building in smaller steps as an 'in' to the task. Adding a 'high ceiling' to tasks may be achieved through encouraging children to refine their mathematical reasoning using more specific language, finding more/ all possible solutions to a given problem or designing their own problems with similar underlying structures.

Teachers and Teaching Assistants will support children within a focus group or as individuals to enable all children to access tasks based on the teacher's knowledge of the children and will be fluid depending on ongoing assessment.

WHAT DO CHILDREN'S BOOKS LOOK LIKE?

In all National Curriculum year groups, Children's books will largely include copies of the task they are working on stuck into their books but sometimes purely procedural calculations. These tasks will be colour-coded in three ways to indicate the type of task it is: fluency (green), reasoning (purple) and problem solving (blue). This enables children to recognise the underlying structures of a given problem and begin to make links and connections with the skills required in each one (e.g. a purple reasoning task with #EXPLAINIT indicates that a written sentence using mathematical vocabulary is needed).

Effective feedback, both oral and written, is how children learn to be better mathematicians. Marking and feedback takes place in line with the school policy and can be:

- Formative – focused on improving children's work, giving children clear advice on how to improve.
- Written feedback focused on the learning objective for the piece and be clear and actionable.
- Whole-class – focusing on a specific problem or area of development.



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- Small-group or individual conferencing - oral feedback through simple prompts, suggestions and advice, or through questions to make a child think about his or her work.
- Sometimes, marking will focus on a single problem and be more in depth or take a more general approach.

Children have the opportunity to act on and use feedback to improve their work.

ASSESSMENT

Assessment forms a key role in our curriculum. Pupil attainment is assessed using our assessment cycle. As well as the ongoing, daily formative assessment that takes place as part of quality-first teaching, pupils will complete a number of different summative assessments throughout the year, which are used to inform future planning. Pupils in all curriculum year groups complete the WhiteRose Maths end-of-unit quizzes. Pupils also complete the termly WhiteRose Maths formal, written assessments which consist of an arithmetic test and a problem solving and reasoning test, which indicate progress against key curriculum statements and objectives. Pupils in Year 2 and Year 6 complete the end-of-Key Stage statutory assessments and pupils in Year 4 complete the Multiplication Tables Check. These assessments are used to inform teacher assessment against the Gateshead Assessment Profile for Mathematics.

Pupils who are not making as much progress as their peers are identified early through the assessment cycle. They are discussed at half-termly pupil progress meetings with the SLT and appropriate interventions are discussed and implemented by the class teacher, with the support of the SENCo.

Assessment is also ongoing through formative assessment within each Maths lesson, which teachers use to inform continuing support and planning.

Where possible, Key Recall Facts are tracked and assessed regularly using Numbots and Times Table Rockstars.

SPECIAL EDUCATIONAL NEEDS AND DISABILITY (SEND)

Our curriculum at St Mary's is inclusive: children with SEND can access the curriculum. Teachers will adapt teaching to meet the individual needs of children with SEND as outlined in their IEP or EHCP, in which learning needs and individualized targets are set in conjunction with the SENDCo and parents. Adaptations may



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include modified tasks, the effective use of resources or appropriate deployment of support staff/ teacher time. Where necessary and appropriate, teachers may refer to the small steps from previous year groups to meet individual learner's needs.

REPORTING

Parents are informed of their child's progress in Mathematics on a termly basis: through parent consultations in the Autumn and Spring Terms and through an end-of-year report in the Summer Term. At each stage, parents are informed of their child's attainment against the Gateshead Assessment Profile and they are provided with short term targets to help their child make progress. This allows for opportunities for discussion around how parents can best support their child in Maths.

MONITORING

We monitor the impact of the St Mary's Mathematics curriculum through our ongoing monitoring cycle, which involves:

- The relevant statutory assessments for Mathematics in EYFS, end of Key Stage 1, Year 4 and end of Key Stage 2.
- Termly tracking and assessment data being shared with the SLT and subject leads, which inform termly pupil progress meetings.
- Learning walks and formal observations.
- Regular engagement with Local Authority moderation sessions (mid-year checks)
- In-house moderation



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CURRICULUM OVERVIEW

	Autumn 1		Autumn 2		Spring 1		Spring 2		Summer 1			Summer 2		
Year 1	Place Value (within 10)	Addition and Subtraction (within 10)	Geometry: Shape	Place Value (within 20)	Addition and Subtraction (within 20)	Place Value (within 50)	Length and Height	Weight and Volume	Multiplication and Division	Fractions	Geometry: Position and Direction	Place Value (within 100)	Money	Time
Year 2	Place Value		Number: Addition and Subtraction	Money	Number: Multiplication and Division	Number: Multiplication and Division	Statistics	Geometry: Properties of Shape	Fractions	Length and Height	Geometry: Position and Direction	Problem Solving and efficient methods	Time	Mass, Capacity and Temperature
Year 3	Place Value		Number: Addition and Subtraction	Number: Multiplication and Division	Number: Multiplication and Division	Money	Statistics	Length and Perimeter	Fractions	Fractions	Time	Geometry: Properties of Shape	Mass and Capacity	
Year 4	Place Value	Number: Addition and Subtraction	Measurement: Length and Perimeter	Number: Multiplication and Division	Number: Multiplication and Division	Measurement : Area	Fractions	Decimals	Money	Time	Statistics	Geometry: Properties of Shape	Geometry: Position and Direction	
Year 5	Place Value	Number: Addition and Subtraction	Statistics	Number: Multiplication and Division	Measurement: Perimeter and Area	Number: Multiplication and Division	Fractions	Decimals and Percentages	Decimals	Geometry : Properties of Shape	Geometry: Position and Direction	Measurement: Converting Units Volume		
Year 6	Place Value	Decimals	Four Operations		Fractions	Percentages	Converting Measures	Algebra	Ratio	Measurement: Perimeter, Area and Volume	Geometry: Properties of Shape	Geometry: Position and Direction	Statistics	Secondary School Transition