St Mary's Catholic Primary School

Maths Policy

Date	Review Date	Responsible Person

Contents

1. Curriculum Statement
2. Teaching and Learning
3. Assessment:
   - 3.1 Assessment for Learning (AfL)
   - 3.2 Formative Assessment
   - 3.3 Summative Assessment
4. Planning and Resources
5. Organisation
6. EYFS
7. KS1 and KS2
8. Equal Opportunities

9. Inclusion

10. Role of the Subject Leader

11. Parents

1. Curriculum Statement

Intent

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

- Become fluent in the fundamentals of Mathematics
- Are able to reason mathematically
- Can solve problems by applying their Mathematics

Our curriculum, which is carefully sequenced, ensures that all children can achieve and experience success in Mathematics. It is progressively demanding and aims to broaden and deepen children's mathematical knowledge. Our curriculum is designed to ensure that new concepts are easily assimilated and build on children's prior knowledge. These skills are embedded within Maths lessons and developed consistently over time, through the application of declarative, procedural and conditional knowledge.

We want all children to enjoy Mathematics through a growing self confidence in their ability and provide opportunities for children to retrieve, recall, over learn key facts and reason mathematically ensuring automaticity is achieved. We are committed to developing children's curiosity about the subject, as well as an appreciation of the beauty and power of Mathematics. Maths is a universal language - we aim to help children understand the purpose and the importance of mathematics in the wider world and encourage them to work in a logical way to ensure they are able to use their mathematical skills and knowledge confidently in their lives in a range of different contexts.

Beginning in EYFS, we ensure a firm foundation in number sense, which develops across the school to ensure by the end of Key Stage Two children are confident and proficient in all areas of the maths curriculum.

Implementation

The content and principles underpinning the 2014 Mathematics curriculum and the Maths curriculum at St. Mary's reflect those found in high-performing education systems internationally, particularly those of east and south-east Asian countries such as Singapore, Japan, South Korea and China. These principles and features characterise this approach and convey how our curriculum is implemented:

- Teachers reinforce an expectation that all children are capable of achieving high standards in Mathematics.
- The large majority of children progress through the curriculum content at the same pace; Significant time is spent developing deep knowledge of the key ideas that are needed to underpin future learning. This ensures that all can master concepts before moving to the next part of the curriculum sequence, allowing no pupil to be left behind.

- If a pupil fails to grasp a concept or procedure, this is identified quickly and early intervention ensures the pupil is ready to move forward with the whole class in the next lesson.
- The structure and connections within the mathematics are emphasised, so that pupils develop deep learning that can be sustained.
- Lesson pedagogy identifies the new mathematics that is to be taught, the key points, the difficult points and a carefully sequenced journey through the learning. In a typical lesson pupils sit facing the teacher and the teacher leads back and forth interaction, including questioning, short tasks, explanation, demonstration, and discussion.
- Practice and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts.
- Teachers use precise questioning in class to test conceptual and procedural knowledge and assess children regularly to identify those requiring intervention, so that all children keep up.
- We avoid cognitive overload in the working memory and enable pupils to focus on new concepts.

To ensure whole consistency and progression, the school uses the nationally recognised Power Maths and White Rose schemes. The White Rose curriculum is a cumulative curriculum, so that once a topic is covered, it is met many times again in other contexts. For example, place value is revisited in addition and subtraction and multiplication and division. The curriculum recognises the importance of children's conceptual understanding of number. It is therefore designed to ensure that time is invested in reinforcing this to build competency.

Lessons are planned to provide plenty of opportunities to build reasoning and problem solving elements into the curriculum. When introduced to a new concept, children have the opportunity to use concrete objects and manipulatives to help them understand what they are doing. Alongside this, children are encouraged to use pictorial representations. These representations can then be used to help reason and solve problems. Both concrete and pictorial representations support children's understanding of abstract methods.

Mathematical topics are taught in blocks, to enable the achievement of 'mastery' over time.

These teaching blocks are broken down into smaller steps, to help children understand concepts better. This approach means that children do not cover too many concepts at once which can lead to cognitive overload. Each lesson phase provides the means for children to achieve greater depth, with children who are quick to grasp new content, being offered rich and sophisticated problems, within the lesson as appropriate.

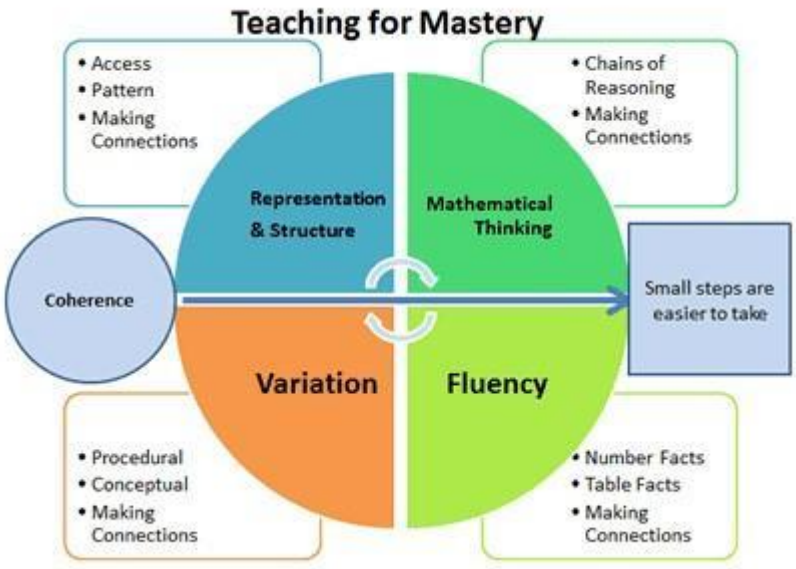
Impact

The school has a supportive ethos and our approaches support the children in developing their collaborative and independent skills, as well as empathy and the need to recognise the achievement of others. Students can underperform in Mathematics because they think they cannot do it or are not naturally good at it. The school's use of White Rose Maths addresses these preconceptions by ensuring that all children experience challenge and success in Mathematics by developing a growth mindset.

Regular and ongoing assessment informs teaching, as well as intervention, to support and enable the success of each child. These factors ensure that we are able to maintain high standards, with achievement at the end of KS2 well above the national average, as well an increasingly high proportion of children demonstrating greater depth, at the end of each phase.

2. **Teaching and Learning**

Effective teaching for mastery is underpinned by five big ideas, first published by the National Centre for Excellence (NCETM) in mathematics in 2017 -



Coherence

Lessons are broken down into small connected steps that gradually unfold the concept, providing access for all children and leading to a generalisation of the concept and the ability to apply the concept to a range of contexts.

Representation and Structure

Representations used in lessons expose the mathematical structure being taught, the aim being that students can do the maths without recourse to the representation

Mathematical Thinking

If taught ideas are to be understood deeply, they must not merely be passively received but must be worked on by the student: thought about, reasoned with and discussed with others

Fluency

Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics

Variation

Variation is twofold. It is firstly about how the teacher represents the concept being taught, often in more than one way, to draw attention to critical aspects, and to develop deep and holistic understanding. It is also about the sequencing of the episodes, activities and exercises used within a lesson and follow up practice, paying attention to what is kept the same and what changes, to connect the mathematics and draw attention to mathematical relationships and structure.

Source: https://www.ncetm.org.uk/teaching-for-mastery/mastery-explained/five-big-ideas-inteaching-for-mastery/

Maths is taught daily during the morning. A typical maths lesson lasts approximately 1 hour, is designed using our signature lesson pedagogy and follows the 'I Do, We Do, You Do, Do Again' structure. It begins with a short task to retrieve prior knowledge ('Do again'). This is usually in the format of a question recalling learning from last lesson, last week, last unit and last term/year. This provides regular recall practice to build fluency.
The small step for the lesson is then shared with the children and they revisit key concepts from previous learning that support the key learning of the lesson. Teachers will model learning (I Do), children will then solve contextual problems as a class, with the teacher that exposes the structure of the mathematical concept ('You Do'). In this part of the lesson, teachers use careful questions to draw out children's discussions and their reasoning and the children learn from misconceptions through whole class reasoning. To support this, the teacher will often use a stem sentence to scaffold children's articulation of mathematical ideas and reasoning, and/or a generalisation that supports application of the concept. The variation in this part of the lesson enables a deeper understanding of the concept and may include the use of related concrete resources, as well as representations of the problem to provide a secure base of understanding. It involves teacher modelling, with pupils encouraged to work collaboratively to support learning. The teacher will review responses and then share answers and strategies, addressing any misconceptions. This practice uses conceptual and procedural variation to build fluency and develop greater understanding of underlying mathematical concepts. This 'intelligent practice' supports mathematical thinking and enables children to:

'Recognise and use connections among mathematical ideas; understand how mathematical ideas interconnect and build on one another to produce a coherent whole; recognise and apply mathematics in contexts outside of mathematics'.

(Annenberg Foundation, 2017)

Where appropriate and depending on the topic, children will continue to have access to concrete resources which they can use to complete the practice task. Some children might be supported through additional scaffolding provided by the teacher. This may include provided models of the calculation method that the children will need to use, or copies of the worded question, with key aspects and vocabulary highlighted.

Children then move on to independent application of fluency style questions ('You Do'). Children who complete these are provided with further 'rich and sophisticated' reasoning and problem solving from the White Rose Maths scheme of learning. This is explicit in children's books with a red border for fluency and a blue border for reasoning and problem solving style questions.

3. **Assessment**

3.1 Assessment for Learning:

Children receive effective feedback through teacher assessment, both orally and through written feedback, 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. A daily fluency activity supports children's recall of key number facts, which frees working memory. Teachers will make informed choices as to

when they should progress to new content according to the degree of fluency that children are able to demonstrate.

- The 'Do Again' task provides the means for the teacher to assess, review and revisit previous related content, so that all children are well prepared for new content.
- The 'I Do/ We Do' part of the lesson is when a new mathematical concept is introduced and the guided practice aspect of this part of the lessons means that children are well prepared to be able to apply the skills, knowledge and strategies taught they have learnt for the 'You Do' task.
- Common misconceptions are identified and 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 self and peer assessment are used consistently as outlined by the school's 'Presentation, Marking and Feedback Policy'.
- 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 approach in the subject.

3.2 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.

At the end of each blocked unit of work, the children also complete the carefully aligned White Rose Maths 'End of Unit Assessment'. The outcome of this is used by the teacher to ensure that any identified gaps in understanding can be addressed before the next unit is taught. Each child's results are also input on a class spreadsheet, which provides an overview of achievement in each specific area within the programme of study. This also informs dialogue with parents and carers during open evenings, as well as the judgements made at the end of the term as to the extent that each child has achieved the expectation for their year group.

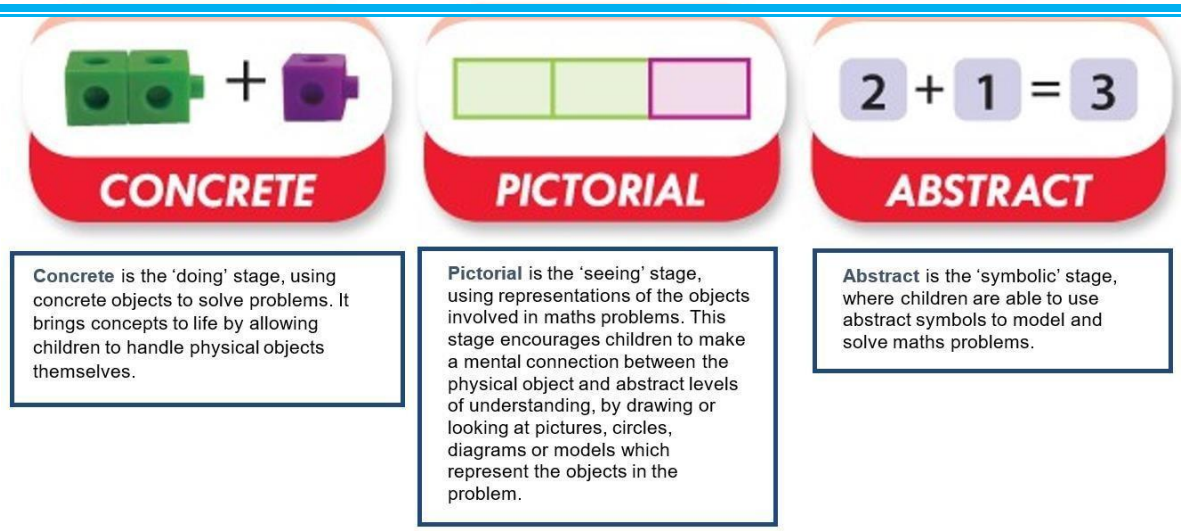
3.3 Summative Assessment:

Teachers administer a termly arithmetic paper and a reasoning and problem-solving paper which specifically links to the coverage for that term. The results of these papers are used to identify children's ongoing target areas, which are communicated to the children, as well as to parents and carers at Parents Evening. They are also used alongside the end of unit assessments and outcomes of work, to inform the whole school tracking of attainment and progress of each child.

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.

4. **Planning and Resources**

The use of manipulatives objects is an integral part of the White Rose Maths scheme which incorporates the concrete – pictorial – abstract pedagogy:



Each classroom has its own supply of mathematical equipment, in line with the White Rose Maths calculation policies, which the school has adopted (this is also available on the school's website).

Teachers also have access to the White Rose Maths and Power Maths Interactive Teaching Resources for the purpose of modelling strategies and demonstrating the use of concrete resources.

The school subscribes to the White Rose Maths Premium Resource Centre. This provides access to visual resources (including lesson slides that teachers can adapt), as well as small steps planning guidance and reasoning and problem solving questions that accompany each small step, to inform and use in lessons.

The subject leader attends regular training through the Local Leaders of Maths Education (LLME) network and also with the NCETM. This informs the school's use of nationally available resources, including the NCETM's ready to progress exemplification materials:

https://www.ncetm.org.uk/classroom-resources/exemplification-of-ready-to-progress-criteria/

Teachers are encouraged to use the school playgrounds as an outdoor classroom when possible, for example, when teaching length, area or perimeter.

5. **Organisation**

The school has implemented a blocked curriculum approach to the teaching of Mathematics. This ensures that children are able to focus for longer on each specific area of Maths and develop a more secure understanding over time. This approach is also designed to enable children to progress to a greater depth of understanding.

Subsequent blocks continue to consolidate previous learning so that the children continually practise key skills and are able to recognise how different aspects of Maths are linked. For example, when children have completed a block which has enabled them to master the multiplication of two-digit numbers, a subsequent block on area and shape might provide opportunities to use this understanding when calculating the area of shapes with 2-digit length and width dimensions.

6. **EYFS**

There are six key areas of early mathematics learning, which collectively provide a platform for everything children will encounter as they progress through their maths learning at primary school, and beyond:

- Cardinality and Counting
- Comparison
- Composition
- Pattern
- Shape and Space
- Measure

Children in Nursery have a short daily Maths teaching session, during which time they begin to develop their understanding of simple mathematical concepts. These are informed by the Development Matters Framework as well as the six key areas of early mathematical learning.

Teaching and learning might include:

- Identifying different amounts of up to three objects so that children are able to recognise amounts without counting them (subitising).
- Activities which expose the composition and cardinality of numbers to five.
- Manipulating shapes and talking about 2D and 3D shapes, using mathematical and informal language.
- Investigating, describing and creating sequences and repeating patterns with different colours and objects.
- Make comparisons between objects relating to size, weight, measure and length.

Children are taught these concepts using physical resources, pictorial resources, songs, games and role-play. There is no focus activity linked to these sessions.

In Reception, children have a 15 minute teaching session, which is informed by the White Rose Maths Scheme for Reception. This consists of an input from the class teacher and then linked activities in the areas of continuous provision where children can apply their learning. Throughout the week a child will then work with an adult - either a teacher or a supporting adult - on a differentiated task.

This structure 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 assessment on a daily basis, 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 addition, then activities on the Maths 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.

7. **KS1 and KS2**

Through Years 1 to 6 we use a coherent programme of high-quality materials and exercises, which are structured with great care to build deep conceptual knowledge, alongside developing procedural fluency.

Our KS1 and KS2 teachers use White Rose Maths Premium lesson slides, which they adapt accordingly. Children record their work, including problem solving and reasoning questions, in their maths book. They might also use their maths book to record key number facts and make representations of mathematical concepts.

Teachers plan, modify and source activities and additional tasks which offer support and scaffolding where appropriate, and provide further challenge for children who are able to progress further in their learning.

The White Rose Maths progression document, available on the school website, provides an overview of how the scheme covers the statutory requirements of the 2014 National Curriculum (p3-25). It also shows how concepts build over time and how the teaching blocks are sequenced in each year group.
https://assets.whiterosemaths.com/fixed/wrm/2019/11/National-Curriculum-Progression-Primary.pdf

8. **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.

9. **Inclusion**

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

'Children 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.'

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 or within the lesson.

A range of inclusion strategies, disseminated by the SENDCO, 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 overseen by the SENDCO, in collaboration with the class teacher and with the knowledge of SMT. Specific arrangements for the provision of children with SEND will be communicated to parents and carers during SEND reviews.

10. **Role of the Subject Leader**

The subject leader will raise the profile of Maths at St. Mary's Primary School through best practice. They will model lessons, as appropriate to new staff, ECTs and peers to support continued professional development. They will ensure the high quality of Maths displays around the school, present certificates of achievement during end of term assemblies and involve the school in 'celebrations' of Maths, including participation in events such as 'World Maths Day'. The subject leader will support staff in providing

- opportunities for learning outside the classroom in Maths and will identify and organise opportunities which enable this, as appropriate.
- The subject leader will monitor progression and continuity of Maths throughout the school through lesson observations and regular monitoring of outcomes of work in Maths exercise books.
- The subject leader will ensure that all staff have access to year group plans and the relevant resources which accompany them.
- The subject leader will monitor children's progress through the analysis of whole school data. They will use this data to inform the subject development plan which will detail how standards in the subject are to be maintained and developed further.
- The subject leader will, on a regular basis, organise, audit and purchase central and class-based Maths resources.
- Through ongoing involvement in the DfE funded Maths Hubs programme, the subject leader will keep up to date on current developments in Maths education and disseminate information to colleagues. They will also contribute directly to the Maths Hubs programme, as a mastery specialist and support staff in demonstrating best practice to visitors from other schools.
- The subject leader will extend relationships and make contacts beyond the school.
- The subject leader will develop opportunities for parents/carers to become more involved in Maths education.
- The subject leader will ensure that all staff have access to professional development including observations of outstanding practice in the subject.
- The Maths Subject Leader will disseminate the school's practice to other schools within a local network.

11. **Parents**

- The school recognises that parents and carers have a valuable role to play in supporting their child's mathematical learning. An overview of the Maths curriculum is available on the school's website, as well as guidance in the progression in calculation methods used by the school. Paper copies of these documents are also available on request and the

curriculum letter, published by each year group, also outlines the Maths topics to be covered.

- Activities which link to each Maths topic are suggested for parents and carers to try at home with their child in each Reception newsletter.
- Children are given regular Maths homework from Reception to Year 6, which include tasks that will focus on developing number fluency.
- White Rose Maths Home Learning Links which support the key content from each year group are available on the school's website.
- Parents are informed of their child's progress at Parents Evenings and this is also communicated in written school reports.
- Parents and carers are encouraged to speak to their child's Maths teacher at any point during the year, either informally or by making a specific appointment. Information about their child's standards, achievements and future targets in Maths is shared during
- parent/carer meetings, as well as ways that parents/carers may be able to assist with their child's learning.
- The school also provides a number of opportunities for parents/carers to learn about what their child is learning and the way their child is being taught through parent workshops.

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