

St Mary's Maths Curriculum

INTENT

At St Mary's we are committed to delivering a broad and balanced curriculum to enable our children to become competent, confident mathematicians.

Each lesson builds on previous knowledge, skills and understanding.

Lessons are taught in conceptual blocks, organised systematically enabling all children to acquire the appropriate level of skills and understanding. Lessons follow the White Rose scheme of teaching which moves learning towards maths mastery.

All children, including the most disadvantaged, more able and children with SEND receive challenge within the same broad and balanced curriculum.

IMPLEMENTATION

In each lesson all children are expected to focus on the same task: scaffolding for LA, challenge for GD. Children working significantly below age-related expectations have an IEP for maths and individually planned work.

Planning for all maths lessons is completed using White Rose resources, supported by other appropriate resources (selected using teacher's professional judgement).

Using White Rose scheme of work, year group teams create a termly plan and weekly for maths teaching

One lesson each week focusing on arithmetic.

Mental calculation strategies are taught.

Opportunities are frequently given to practise times tables in appropriate year groups.

Teachers model the correct use of mathematical processes and vocabulary.

Targets are highlighted to monitor understanding in the front of each child's maths book.

IMPACT

Children developed their mathematical understanding over 7 years of teaching.

Children develop a positive attitude towards maths – viewing maths lessons as engaging, enjoyable and challenging.

Children use mathematical language accurately and confidently.

Children learn effectively as a result of lessons that follow the White Rose teaching sequence and contribute towards a clear end goal.

Children of all abilities make good progress in lessons. The most disadvantaged children: with SEND are given the cultural capital needed to be successful. Children experience a rich, broad and balanced, engaging and challenging curriculum.

Draft Mathematics Policy

Purpose of Mathematical Study:

Mathematics is a fascinating, challenging, yet logical subject which permeates almost every discipline: *"I could never have gone far in any science because on the path of every science the lion Mathematics lies in wait for you."* – C. S. Lewis. Its value emerges in everyday life whenever a problem requires a solution. It has a critical role to play in enabling children to become financially literate adults, who are able to access higher education and enjoy real employment choices. Exciting, inspiring maths lessons, which develop curiosity, the ability to reason and appreciate the beauty of mathematical patterns are therefore critical keys to understanding the world.

Mathematics at St. Marys Academy

Maths teaching at St Marys aims to create positive, enthusiastic learners, who achieve real mathematical fluency, through the teaching for mastery approach. Following the Small Steps curriculum of White Rose Maths (version 3), Children will be offered varied and frequent opportunities to practice and develop factual recall and conceptual understanding. Maths lessons at St Marys will provide opportunities for the development of mathematical reasoning, awareness of conceptual relationships and patterns and opportunities to develop explanations using mathematical language. Children will be given opportunities to apply their understanding of mathematics to reason and solve increasingly sophisticated, multi-step problems.

The interconnected nature of maths necessitates the need for children to be able to confidently represent mathematical ideas flexibly. The programmes of study are taught in distinct topics, with opportunities to make connections across mathematical ideas, developing fluency, competence and mathematical reasoning for all children. Opportunities are provided to apply mathematical concepts across the curriculum: supported by both teachers and teaching assistants.

The expectation is that children in each year group will move through the mathematics program of study at broadly the same pace: progression dictated by the class teacher's assessment of secure understanding of each small step. Those children who demonstrate greater depth understanding of a small step are challenged through carefully planned questioning.

Children who demonstrate a lesser degree of fluency are supported through the use of scaffolding, use of manipulatives and adult support to move towards mathematical mastery. Children, who are attaining at a level significantly below their Key Stage age, will have a maths continuum completed by their teacher and an IEP to support their mathematical learning. They will be offered appropriately differentiated learning activities using White Rose Maths programs of study at an appropriate level.

Inclusion: WRM, teaching maths for mastery approach, offers all pupils access to the full maths curriculum. This inclusive approach, and its emphasis on promoting multiple methods of solving a problem, builds self-confidence and resilience in all children. Though the whole class goes through the same content at broadly the same pace, there is still plenty of opportunity for scaffolding (differentiation). Scaffolding occurs in the subtle teacher support and intervention provided to individual children during the lesson. Furthermore, scaffolding can take different forms: pre-tutoring before the lesson takes place, printed material stuck in maths books (to reduce cognitive load), sitting next to a more confident partner (peer support), using WRM work books, using manipulatives, pictorial representations, same day interventions to review learning and fix misconceptions quickly.

SEND Children: Children, who are working at a pre-key stage level, have a maths continuum completed for them and an IEP, which identifies their need in maths. These children may work in a WRM workbook at an appropriate level, joining in with whole class learning where appropriate. Most SEND children will work in mixed prior attainment groups; however, it is recognised that there may be circumstances where SEND children can be more effectively supported whilst working as a discrete group during maths lessons. The Power of One and Number Shark are maths intervention programs used to support SEND children, with specific needs.

In the Early Years, mathematical understanding is developed through purposeful play-based experiences using both the indoor and outdoor learning environment. Learning is planned using the White Rose Early Years scheme of work (version 3), which considers the Early Learning Goals, building small key steps in learning throughout the year.

Mathematical understanding is developed through stories, songs, games, imaginative play, child-initiated learning, and structured teaching. *'Direct teaching may be necessary, but effective early mathematics teaching strategies*

are playful, not formal, so that all children become cheerful, not fearful mathematicians.' Gifford, S. (2018). Staff collect some photographic evidence, as a stimulus for retrieval, and use note-form evidence of observations of conceptual development. As children progress, they are encouraged to move towards recording their mathematical thinking in a more pictorial or written way.

Direct teaching of mathematics in Reception takes place each day. During the week, each child will do maths work with the teacher and the TA and will have the opportunity to work at maths activities independently. Independent learning maths activities are related to the concept in focus each week or are used as an opportunity to retrieve previous learning. Maths learning is evident in the Early Years learning environment.

Teaching in KS1 aims to ensure that children develop mathematical confidence and fluency with whole numbers, simple fractions, counting and place value. Lessons will involve working with numbers, words and the four operations - using manipulatives. When appropriate, children will begin to move between concrete and pictorial and abstract methodology. In KS1 children are taught to recognise, describe (using appropriate vocabulary) draw, compare and sort numbers and shapes. Maths lessons involve using a range of measures to describe and compare different quantities such as length, mass, capacity, volume, and money. **Time objectives** (outlined in WRM version 3) are taught as set of discreet ten-minute activities outside of maths lessons.

All classes in reception and KS1, follow the **Mastering Number Program**, which provides the planning for the daily sessions. All teachers follow their year group planning and all children in Reception and KS1 take part in the short number fluency activities every day - in addition to the daily maths lesson.

In lower KS2, teaching, using the mastery approach, ensures that children become increasingly fluent with whole numbers, simple fractions, simple decimal values and the four operations (including number facts and place value). This ensures that the children have sufficient mathematical fluency to apply strategies to calculate with increasingly large integers and negative values. Strategies from the KS1 Mastering Number Program have been introduced into Y3 in September 2023.

In years 3 and 4, children learn how to apply their mathematical understanding to investigate and solve problems involving simple fractions and decimals. Maths lessons enable children to draw shapes accurately and describe their properties

using appropriate mathematical language. In addition, children are taught to use measuring equipment correctly - beginning to make connections between measures and numbers. The Time objectives (from WRM V3) are taught throughout the year, outside daily maths lessons.

By the end of year 4, in readiness for Statutory Assessment, pupils should have memorised their multiplication tables up to and including the 12 times table facts; using this knowledge to show precision and fluency in their work.

In upper KS2, teaching reflects the Mastery Approach. Children reflect their understanding of the number system and place value by calculating with larger integers and negative values. Using fluidity between the concrete, pictorial and abstract approach, maths lessons enable children to make connections between the four rules of number and fractions, decimals, percentages and ratio. At this point in KS2, maths lessons enable children to solve increasing complex multi-step problems - demanding deeper conceptual understanding and the application of efficient pictorial, written and mental strategies in readiness for end of Key Stage Assessment.

A firm foundation in arithmetic enables the children to explore the principles of algebra. Knowledge developed in number is applied to concepts related to geometry and measures. Teaching ensures that children have the opportunity to classify shapes and describe properties using appropriate mathematical language.

Time objectives are taught in addition to the daily, maths lessons up to and including Y5 (there are no additional time objectives to be taught in Y6).

By the end of year 6, in readiness for Statutory Assessment, children should be fluent in the use of mental strategies and written methods for all 4 operations, including long multiplication and division, and in working with fractions, decimals, ratios and percentages.

Planning: Planning is undertaken at three levels-

- **Long Term Planning** indicates the concepts taught each term taken directly from the White Rose Maths schemes of work (updated version 3).
- **Medium Term Planning** is directly taken from WRM (updated version 3) at the start of each term. Additional resources may be included to scaffold and extend learning.

- **Short Term Planning** is available from WRM for each mathematical small step and is adapted by each year group team. This identifies the teaching and learning for each topic block. The short-term planning document or PowerPoint should include an opportunity for retrieval practise (using Flash Back Four from WRM or other similar resources selected by the teacher), teacher led introduction and modelling, opportunities for paired/group/practical/ independent work, key vocabulary and the use of stem sentences. Scaffolding and extension towards greater-depth learning activities are added by the teachers. Planning is annotated and amended. Questions from the WRM worksheets are carefully selected by the teacher. For example, the worksheets used from WRM in Y1 and Y2 are often very wordy - this is amended as appropriate by the teacher. All teachers and TAs are required to watch the WRM video before each maths lesson to ensure that appropriate manipulatives, representations and vocabulary are used within the lesson).

Maths Lessons: Children work in mixed prior attainment groups in all classes. Maths is taught each day. Teachers employ a range of teaching and learning strategies to support children moving towards mathematics mastery using White Rose Teaching for Mastery Resources version 3 (supplemented as appropriate). Learning Intentions are not shared at the beginning of each lesson; however, each lesson does have a focus for whole class work. Maths lessons begin with retrieval practise using WRM Flash Back Four or similar material selected/prepared by the teacher. Next, the whole class work together to explore a concept: the teacher modelling mathematical processes and reasoning, taking care to model correct use of mathematical vocabulary. Children then have the opportunity to explore the concept collaboratively. Children are also given opportunities to work in small groups or pairs and independently because the children are expected to complete assessment tests independently. During the lesson, the teacher will draw out the mathematical learning covered, address misconceptions and model effective reasoning. In maths lessons, every child will have the opportunity to explore fluency, problem solving and reasoning, whilst working in mixed prior attainment groups. Manipulatives are available for every child to use to represent mathematics.

Arithmetic and Mental Strategies: Arithmetic has an important role to play in the development of mathematical conceptual fluency. Confident arithmetic enables the child to focus on developing effective problem solving and reasoning strategies. Every day, as part of or in addition to maths lessons, each class

engages with White Rose Maths Flash Back Four (or similar resource selected by the teacher). In addition, once each week, (**Friday Fluency**) the children have the opportunity to focus solely on arithmetic processes using arithmetic games, mental calculation tests, times tables rehearsals and Rising Stars Arithmetic papers (supported by other resources as appropriate). Children are encouraged to work within a time limit as they move through KS2, in preparation for the end of KS2 Statutory Assessment.

Timestables: In preparation for the end of Y4 Times Tables Statutory Assessment, children in Y4 have at least two laptops permanently available in their classroom to allow for on-line test practice, access to which is monitored and recorded via a simple tick-list. In addition, children in Y4 play times table recall games.

As part of the preparation for Statutory Assessment at the end of Y4, children in Y3 will also have access to at least two laptops permanently available for online times table practise. Children in Y3 are expected to have fluent recall of the 2,3,4,5,6, 10,11 times table by the end of Y3. In preparation for Y4 statutory Assessment, at the end of Y3 the children will be given a test in the style of the Statutory Assessment (only testing 2,3,4,5,6,10,11 times tables).

Those children in Y5 who do not pass the times tables assessment at the end of Y4, will continue to have the same opportunities to practise times tables during Y5. This should be daily access to TTRS to practise quick recall of times tables facts. All other children are also expected to have weekly access to TTRS to practise retrieval. This should be evidenced by a simple tick list. At the start of Y6, times tables knowledge is assessed and those children who still do not have sufficiently competent recall will continue to have daily access to TTRS during Y6. All other children will have weekly access to practise retrieval.

Intervention: The development of times table recall in Y4 is monitored by the class teachers and the maths lead. In the Summer Term, after SATs, Children in need of additional support to learn to recall times table facts rapidly will have a Y6 Personal Tutor to support them, who they meet with during lunchtime.

Rock Stars: To support the development of effective times table recall, St Marys has purchased membership to Timetables Rock Stars for each child in KS1 and KS2. Children have the opportunity to play in school time and are encouraged to play the games at home. Each year group has a Rock Stars display to encourage the children to engage with the program. In addition, each week

on-line Rock Stars Tournaments are held - the team with the most participants and highest score is awarded the Rock Star Trophy.

Scaffolding (Differentiation): The Mastery approach requires the same concept to be focused on by the whole class whilst working in mixed prior attainment groups. Teachers link concrete, pictorial and abstract approaches in all lessons. **Struggling learners** are provided with additional scaffolding and learning support. These children receive pre-tutoring with a teacher/TA. In these sessions, the children watch the WRM video for the lesson with the teacher/TA, work on white boards, practise the use of representations and rehearse the use of appropriate vocabulary. **Greater Depth** learners are challenged through the presentation of problems of increasing complexity, in unfamiliar contexts and in-depth questioning and reasoning challenges. **SEND** children, who are working below key stage objectives, have a maths IEP and are presented with appropriate individualised work.

Manipulatives: At St Marys teachers recognise that in depth mathematical understanding is achieved through Teaching for Mastery: a concrete - pictorial - abstract approach. It is understood that practical work, using manipulatives, can be recorded pictorially, though teacher made notes, photographically or via video recording.

Maths Books:

- Year group maths targets are stuck in the front of each child's maths assessment book, which are highlighted appropriately to reflect to each child's mathematical understanding as is demonstrated in their White Rose End of Topic Tests. Children working below key stage expectations have a personalised set of maths targets, which they are assessed against.
- Children are encouraged to present their maths work in a neat and organised manner, including a margin and date. Children are encouraged to use a ruler to draw straight lines in their maths work. Where necessary, children are given opportunities to practise using a ruler to draw straight lines. Children are expected to write one digit in each square in their maths book.

Equipment: Frequently used maths equipment is kept readily accessible in each classroom. Other resources are stored in the Maths Cupboard on the first floor. The maths lead monitors the requirement of additional maths resources.

Marking: Marking of maths work is summative, supportive and diagnostic. It is most effectively done as soon after the lesson as possible: misconceptions are

then quickly addressed, opportunities to move thinking towards greater depth are seized. Marking takes the form of positive written comments in individual maths books, which reflect the learning taking part in the lesson, highlighting achievements, modelling correct procedures, correct vocabulary, the use of stem sentences and challenge misconceptions. Gap tasks are used, where appropriate, to clarify mathematical understanding and practise specific procedures. Feedback also includes verbal conversations between child and teacher.

Peer and self-marking using green pen is actively encouraged; ensuring that children quickly know that they are using an appropriate strategy to calculate - allowing interventions to be effectively deployed.

Assessment:

- Informal assessment is ongoing during each maths lesson, informing interventions - which take place as soon after the lesson as is practical.
- Times tables are practised daily where appropriate. A simple tick list to record access is maintained in all KS2 classes.
- A formal assessment test takes place at the end of each term using the NFER test material (Y1 Spring and Summer term only, Y3, Y4, Y5). Results are collated, shared with the maths lead and used to inform interventions. In Y2 and Y6 SATs material is used instead of NFER tests. There is no NFER test for Y1 Autumn Term: teacher assessment is collated.
- White Rose end of block tests are used at the end of each topic and kept in each child's Maths Assessment book. Results of these are used to inform targets highlighted. In Y6, Topic appropriate SATs questions are used.
- Class teachers indicate progress on Insight three times each year.

Monitoring: Teachers are responsible for ensuring that the curriculum outlined on the White Rose scheme of learning (Version 3) is taught each term. This is monitored by the maths lead through book scrutiny, pupil voice and learning walks. End of term assessment data is shared with the maths lead, who together with the class teacher, identifies and plans appropriate targeted interventions.

CPD: White Rose online CPD resources have been made available to all teachers. Places on CPD maths courses have been made available for both teachers and TAs as appropriate. Staff meeting time has had a maths focus. The maths lead

has modelled maths teaching, conducted learning walks and supported staff by team teaching.

All teachers in EYFS and KS1 have been accessing the Mastering Number training courses via zoom. All staff are taking part in Teaching for Mastery Program.

Displays:

- Each class has a Rock Stars display
- Maths resources are clearly displayed in each classroom and are easily accessible to children.
- Maths working walls are used in each classroom.
- Age-appropriate maths concepts are displayed in each Key Stage area of the school.
- TTRS results are displayed each week just outside the hall.

Website:

Class pages contain:

- Yearly targets
- Maths curriculum taught each term
- Homework
- Links to WRM parents pages
- Links to TTRS
- Useful links

Parents:

At St Marys parents are actively encouraged to be involved in their children's maths learning.

- Parent have the opportunity to look at their children's maths work at termly parents' evenings.
- Yearly targets are provided in written format and are available on the website.
- A yearly written progress report is provided for all parents.
- Homework activities, which include maths, are provided on a half termly basis (weekly basis in Y6). Children in KS2 are encouraged to learn

specific times tables facts each week in preparation for a weekly test. Results are recorded on Insight. Y6 are provided with homework tasks using Maths Shed.

- Maths focus days are held: Rock Stars Day, International Day of Mathematics are celebrated.
- Mathematician of the Week certificates are given out by the maths lead on a weekly basis. These children are named in the weekly newsletter.
- Y2 and Y6 SAT meeting are held annually.
- Times Table Rock Star achievement certificates are given out. Rock Stars online Tournaments are held every week.
- Parents are invited to attend maths information events - for example Mastering number workshop.

Review:

The monitoring of maths teaching and pupil progress is the shared responsibility of teachers, maths lead and the senior leadership team. The work of the maths lead includes supporting colleagues in the teaching of maths, keeping up to date with current developments, as well as providing a strategic lead and direction for the subject.

Donna Winters (maths lead)

Updated September 2023