St Thomas of Canterbury RC Primary School

Mathematics Policy

Updated September 2023

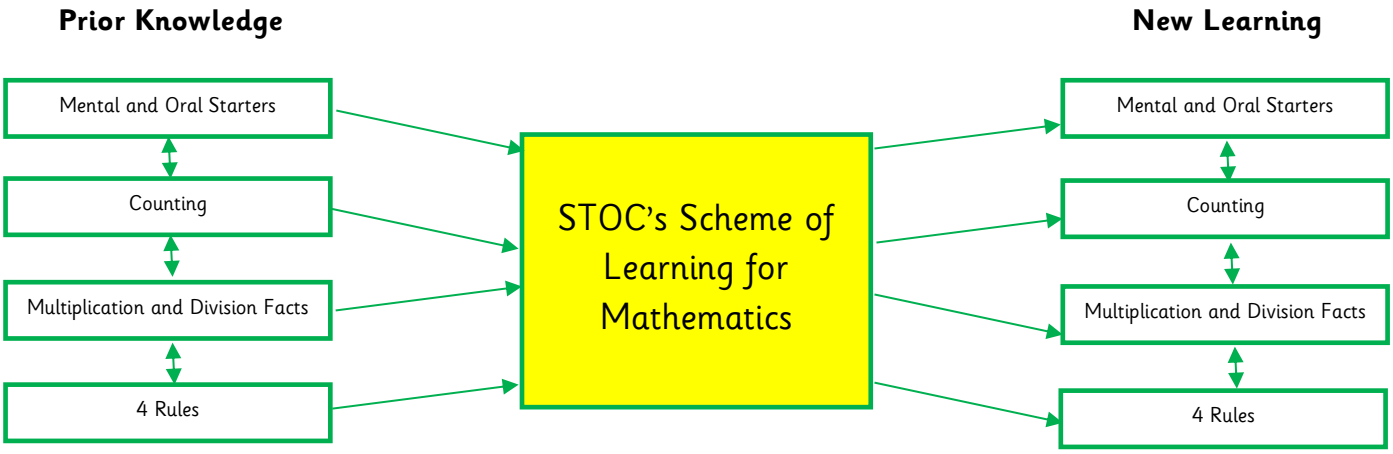
Intent

The scheme fully incorporates the 2014 National Curriculum – Programmes of Study for Mathematics. It meets the 3 aims of fluency, reasoning and problem solving, and also research into how children learn best and best learn mathematics.

It provides opportunities for children to draw upon what is already known, expose connections and make realisations. It is an interconnected curriculum, which continually builds upon a solid foundation. The content excites children and enables them to build an appreciation of the beauty and wonder of mathematics, and equips them for today and long into the future.

It also drives towards our whole school intentions of: Reading, inclusion and Attitudes. Comprehension and inference is developed to support the exploration and exposure of connections, reasoning and problem solving. This is largely through, 'I know that…', 'I know when…', 'I know how…' and 'I know why…'. The development of language to support understanding, make connections and effectively reason is central to the scheme. The language already known and that, which is new learning is explicitly outlined through the learning journey. All children are able to access the scheme of learning. Children move through at largely the same pace, working on the same objective. Rapid graspers are challenged further to broaden and deepen their understanding and those that need more time are supported effectively to master the objective. Children with SEND are assisted in making appropriate steps of progress to master objectives and close the gaps between them and their peers.

Implementation

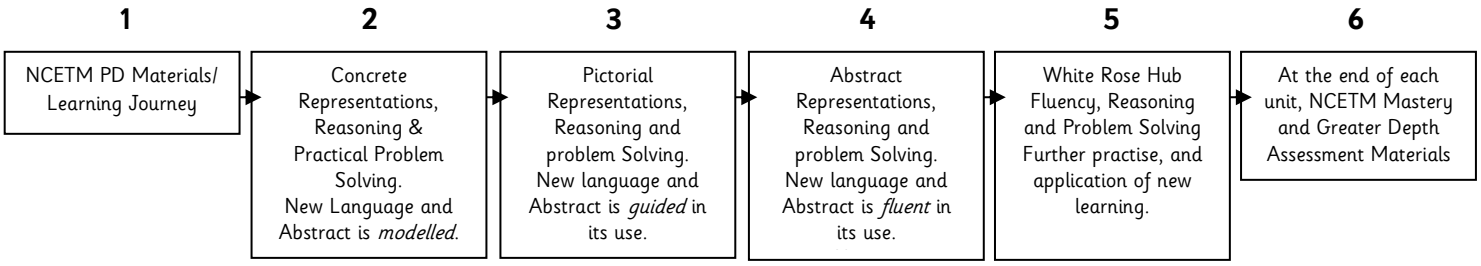


STOC's Scheme of Learning for Mathematics

Each year group has an overview page, which outlines what is taught and when. Each unit has been planned in an order that builds on prior knowledge and supports the learning to come.

For each new objective, the previous year's objective is outlined so what the children already know and can do is clear. This creates the starting point for building upon prior knowledge. The objectives have been broken down into small, progressive steps in learning, which correlate with a teaching and learning outline. This ensures a solid foundation in which to build upon, where children actively draw upon what is already known and expose connections to support with new learning.

The journey for each small step in learning



1. The NCETM PD Materials feature in the journey as a teacher subject knowledge enhancement and/or an introduction to a new concept.
2. Small steps in learning begin with concrete representations, reasoning and practical problem solving. This supports children in developing a conceptual understanding, realising connections and an introduction to new and modelled mathematical language and the abstract representation.
3. It develops towards the use of pictorial representations, reasoning and practical problem solving. This supports children in deepening their conceptual understanding and building the links between the concrete and the abstract. At this stage, the children will be guided in the use of new language and the abstract representations.
4. This is then followed by the use of abstract representations, reasoning and practical problem solving. This supports children in their fluency and in particularly, their efficiency. A deep conceptual understanding has been developed and the children are fluent in the use of the mathematical language.
5. Further opportunities to practise and apply new learning through the White Rose hub 'Fluency, Reasoning and Problem Solving' activities are provided. This supports children to develop a deeper and broader understanding and continues to develop their fluency and in particularly, their flexibility.
6. At the end of each unit, children are assessed through problem solving, using the NCETM Mastery and Mastery with Greater Depth materials. Teachers address any misconceptions that arise before moving onto a new unit.

Language
Mathematical language is accumulative and is organised alongside the objectives. Already known language, that is being revisited, is in black type and new language, that is to be learnt, is in red. Alongside the language are good examples of key questions to ask the children and also encourage the children to be asking. The NCETM PD Materials/Learning Journeys also set out key stem sentences that are to be used. There is space here to develop this further with the children.

Assessment
The learning journey incorporates the STOC's Assessment documents, the Sheffield STAT. The indicators are highlighted in pink and the Key Performance Indicators are highlighted in pink with the abbreviation KPI written next to it. This supports teachers with assessing each child in relation to the year group's content.

Although each session is set out, a teacher's effective use of formative assessment is invaluable. If a child is not secure, an intervention needs to take place, later in the day, to ensure they can then move on to the next step in learning, with the whole class the following day. Each step of the learning journey needs to be secure to ensure gaps in learning are not masked until a later date.

It is expected that all children, except those with specific SEND, will have completed the learning journey by the end of the school year. This will mean that almost all children will achieve at least the Expected Standard/Secure/Age Related Expectations. These children will complete all of the mastery assessments before moving onto new learning however they may need some guidance and support to complete those that are mastery, with greater depth.

Rapid graspers need to be challenged further to broaden and deepen their understanding through wider application and practise. They could delve deeper into the concept through problem solving using: Nrich, Pixl's answer-free zones, Pixl's explain how you know, WRH problems of the day, WRH investigations, Mathematical Challenges, Pixl's reasoning problems and they may also become a class expert to explain and model their understanding for other children within the class – this could be with individuals, a group or a recorded video for others to use at a later date. The Rapid graspers will be able to complete the mastery and the mastery with greater depth assessments before moving onto new learning.

If a child has a specific SEND need, which has meant that they are struggling to keep up, it may be that you choose to remove the greater depth assessments from their learning journey. However they must continue to complete the mastery/secure assessments before moving on to new learning. This will highlight any misconceptions to be addressed before moving forward, to ensure they are continuing to build upon a solid foundation.

All learning is revisited regularly during the mental and oral starters to continue to develop fluency (flexibility, accuracy and efficiency) and embed in the long-term memory. Therefore, the mental and oral starter objectives follow the learning that takes place in the scheme of learning.

To ensure children can learn the whole of the mathematics' curriculum, on the odd occasion where a lesson is missed, e.g. cultural day or a class trip, mathematics' lessons will need to be blocked in order to catch up.

Any new children to the school need to be assessed and started on the learning journey at the point which is building on what they currently know.

Counting

The counting objectives precede the learning that takes place in the mathematics' lesson, as children are able to apply their counting skills and knowledge of counting patterns to support them in learning a new concept. The following sequence for counting is to be used to develop deep, conceptual understanding. This sequence is also used in the journey for learning the multiplication and division facts.

1. **Direct Modelling**
- Begin to develop conceptual understanding using representations and models, e.g. numicon

2. **Concrete Counting**
- Counting unitary (one-by-one) e.g. 1, 2, 3, 4, 5, 6, 7 = 1 group 1, 2, 3, 4, 5, 6, 7 = 2 groups
- Begin to group
- Counting on e.g. 1, 2, 3, 4, 5, 6, 7 = 1 group 8, 9, 10, 11, 12, 13, 14 = 2 groups
- Then, 7 = 1 group, 8, 9, 10, 11, 12, 13, 14

3. Counting Rhythmically
- Concrete/ pictorial approach.
- Opportunities to count rhythmically- begin using a hundred square, where the numbers being counted are highlighted.
- Use hundred square without highlighted numbers.
- Take hundred square away- starting at zero
- Count back to zero
- Count on from different starting points within sequence.
- Count backwards from different starting points within the sequence.

4. Explore Patterns (Concrete- pictorial- abstract approach)
- Patterns within hundred square (e.g. 9's diagonal/ +ten – one)
- Build on understanding of number bonds (addition and subtraction facts)
- Crossing the next 10.
- Doubling halving (2, 4, 8 x tables 3, 6, 12 etc)
- Recognise patterns of ones and where the tens change e.g. 0, 2, 4, 6, 8, 10, 12, 14, 16, 18, 20
- Identify missing numbers within a sequence

Our children are provided with a wide variety of opportunities to apply their learning, deepen their understanding and also appreciate the purpose of what they have been learning. Examples of this includes: using reasoning skills to decipher what a number of Neolithic artefacts are and their purpose, in history; understanding and using measures in geography; making estimates of time/distance/weight in design and technology; geometric understanding in art; algebraic understanding in music; and collecting, presenting and analysing data in science. Through the maths curriculum, that we provide, our children are building a solid foundation for understanding the world, appreciating the beauty and wonder of mathematics and becoming equipped for life today and long into the future.

Impact

	Expected Standard	High Maths
School % 2023	**97%**	**55%**
National % 2023*	73%	NA
Difference	+24%	NA
Average scaled score (school) 2023	**110**	
National scale score 2023	104	
Difference	+6	

*GD national has not yet been released.

IDSR: November 2022 (2021-22 data)

- KS2 **progress** in mathematics (4.2) was **significantly above** national and in the **highest 20%** of all schools in 2022 as well as in 2019, 2018 and 2017.
- KS2 attainment of the EXS (100+) in mathematics (94%) and the high standard (110+) in mathematics (46%) was **significantly above** national and in the **highest 20%** of all schools in 2022, as well as in 2019, 2018 and 2017. Of the 65 pupils, 4 did not meet the expected standard, with an average scaled score of 92.
- The KS2 four-year average mathematics attainment score (109.0) was in the **highest 20%** of all schools in 2022.
- There is nothing significant to highlight in KS1 or EYFS attainment.