Farndon Fields Primary School

Nurture Talent,
Develop Learning, Inspire Success

Mathematics Subject Policy

Subject Leader: Imogen Haynes

Last Reviewed: March 2021

Rationale

This policy outlines the intent, implementation and intended impact for the teaching, leadership and assessment of mathematics at Farndon Fields Primary School. The school's policy for mathematics follows the 2014 National Curriculum Framework and the Early Years Foundation Stage Framework.

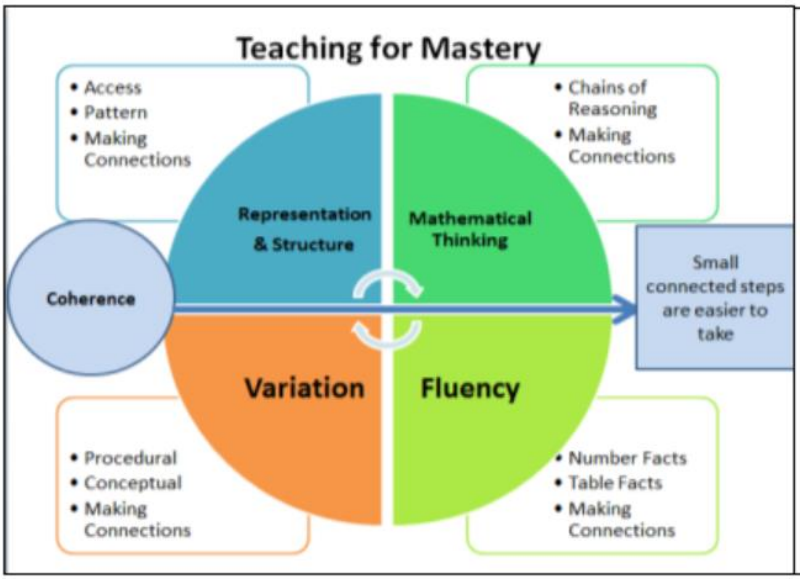
Our Mission

At Farndon Fields Primary School, we believe that every child in our school community should have *Limitless Learning* opportunities. We all have the ability to succeed and our school works hard to ensure that our pupils can *Nurture their Talent, Develop their Learning* and be *Inspired to Succeed.*

Our Values: Nurture, Inspire, Learn, Succeed

Intent

Farndon Fields Primary School began its transition towards Teaching for Mastery in 2016 and our maths teaching and learning journey continues to grow. Our teaching is based on the five key ideas of Teaching for Mastery: Coherence, Representation and Structure, Variation (procedural and conceptual), Fluency and Mathematical Thinking.



Our main goal is to instil a love of a mathematics in our children and staff. We want our children to be life-long mathematicians and to understand how mathematics is essential to everyday life. It is critical to science, technology, engineering and finance. Through developing children's curiosity and gaining an appreciation of the beauty and power of mathematics, we want all children to enjoy the subject and to experience success.

In our teaching and learning, we understand the importance of metacognition and developing self-regulation in children to become independent learners. Through our work on Growth Mindset, we have developed a culture where the children (and staff) understand that mistakes help us to learn and we should not be afraid of getting things wrong. To embed this further, we regularly give the children

the opportunity to self-mark and reflect; this allows the children to have a feeling of success as well as developing their resilience and perseverance.

We have embedded the three aims of the National Curriculum in our teaching: **fluency, reasoning** and **problem solving**. We believe that all three of these are equally important to develop well-rounded mathematicians.

The national curriculum for mathematics 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.

Implementation

How mathematics is planned and taught

Teachers mainly use the White Rose planning scheme to support their long-term planning.

- A pre-assessment (either White Rose or Century.AI) for the new unit is carried out with the class.
- Data is analysed and used to inform planning of the unit:
  - What areas are a particular strength or need developing. This will inform the level of scaffolding needed, any pre-requisite knowledge that will need to be re-visited and how long to factor in for concepts.
  - Children who are already secure with concepts who will need deeper thinking opportunities.
  - Children who may need additional support and scaffolding within the unit.
- The unit is taught using the White Rose planning scheme, alongside the DfE Mathematics Guidance: Key Stages 1 and 2 document.
- A post-assessment for the unit is carried out with the class. Data is analysed and used to monitor progress, whilst highlighting any strengths or gaps.
- A 1-2 day enrichment period before starting the new topic, where learning which is not secure is re-visited with children, and children who have mastered the learning have further opportunities to investigate Greater Depth tasks.

To support our planning we use various high quality resources:

- White Rose Schemes of learning https://whiterosemaths.com/resources/primary-resources/
- DfE Mathematics Guidance: Key Stages 1 and 2 https://assets.publishing.service.gov.uk/government/uploads/system/uploads/attachment_data/file/897806/Maths_guidance_KS_1_and_2.pdf
- NCETM Mastery Assessment documents https://www.ncetm.org.uk/classroom-resources/assessment-materials-primary/
- NRich resources https://nrich.maths.org/
- Interactive representations from mathsbot - https://mathsbot.com/
- I See Problem Solving / I See Reasoning documents – Gareth Metcalfe

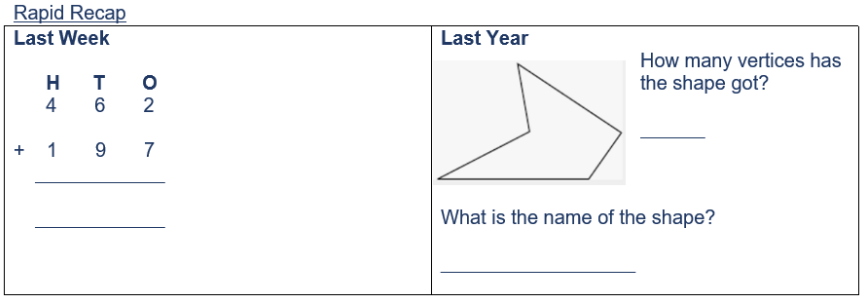
Teachers plan with a blended learning approach. This is where technology is used, alongside non-technological teaching approaches, to best support children's learning and development. Children have access to a range of online platforms for in class learning, assessment and homework:

- Century AI https://www.century.tech/
- Times Tables Rockstars https://ttrockstars.com/
- Numbots https://numbots.com/
- Microsoft TEAMs https://www.microsoft.com/en-gb/microsoft-365/microsoft-teams/group-chat-software

Retrieval Practice

Retrieval practice is a fundamental part of our mathematics curriculum as it is proven to strengthen memory and make it easier to retrieve the information later. Opportunities for retrieval practice occur in many places in the mathematics curriculum:

- **Rapid Recap** – We begin each lesson in KS1 and KS2 with two retrieval questions. These questions may be from 'Last Lesson', 'Last Week', 'Last Topic' or 'Last Year'. These are oral in Year 1 and recorded in books in Years 2-6.



- **Times Table Practice / Times Table Rockstars** – Children in Years 3-6 (with Year 2 joining in Autumn 2) practise their times tables 2-3 times a week as start / end of the day tasks. This may be through a paper version, or on the ipads on Times Table Rockstars.
- **Flashback Four** – Children may be set White Rose's Flashback Four during start / end of the day tasks to aid them in retrieving knowledge.

Planning and Teaching in EYFS

Maths is taught as part of the Area of Learning designated as 'Mathematics' in the EYFS Curriculum. The EYFS Curriculum is made up of two strands: 'Number' and 'Numerical Patterns'. It is essential that all children develop a strong foundation in number so that they develop the building blocks needed to become successful mathematicians. Children should be able to count with confidence and develop a deep understanding of numbers to 10, including the links and patterns between these numbers. Children are provided with frequent and varied opportunities to build and apply this understanding. This includes using manipulatives, such as counters and tens frames, for supporting with counting. It is also important that children develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. The EYFS curriculum is planned to include rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. They will a develop positive attitude and interest in mathematics, look for patterns and links, talk to others about what they notice, 'give it a go' and not be afraid to make mistakes. The ultimate aim of maths teaching in EYFS is to be Year 1 ready.

Effective pedagogy in EYFS is made up of a mix of different approaches. Children learn through play, adult modelling, observing each other and through guided learning and direct teaching. With this in mind, the children receive four whole class, teacher-led maths teaching sessions per week. They have access to independent child-initiated maths activities daily. Staff also provide opportunities for the children to work as guided groups weekly to apply the whole class learning. Children are given opportunities to work on maths activities both indoors and outdoors. These activities are based on the main areas as outlined in the EYFS curriculum.

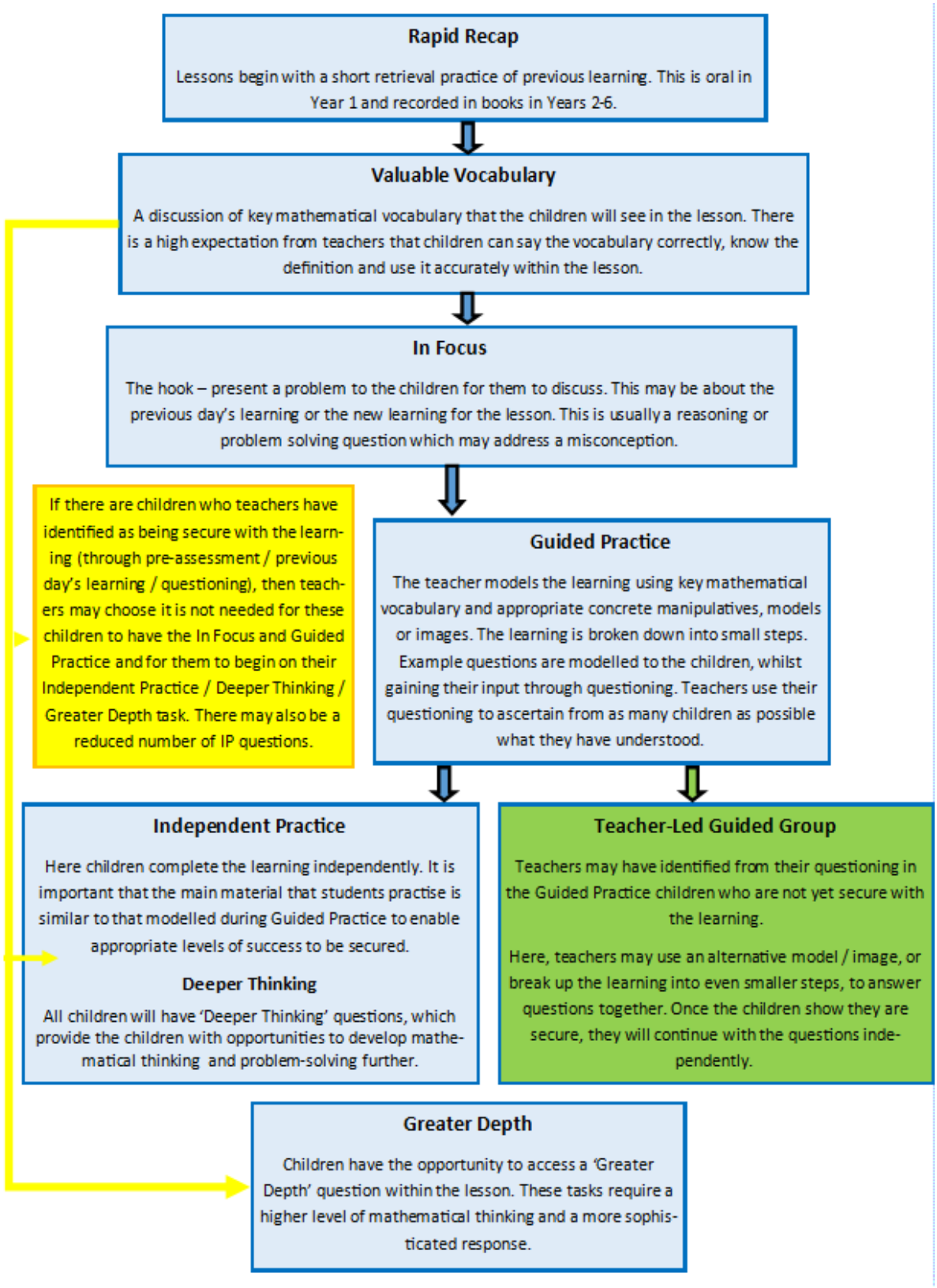
Throughout the year in EYFS, each week the learning is focussed on one number alongside skills such as addition and subtraction. As with the rest of the school, the maths planning builds on previous learning and allows time for children to develop 'mastery' in the key areas of mathematics without moving onto a new concept too quickly. Daily Review and retrieval are also key to the EYFS teaching and learning, where the daily review links back to prior learning. Planning is updated daily taking into account previous learning. This ensures the maths activities are appropriate and relevant to the children's learning needs and their interests. Maths activities in continuous provision are planned based on both the children's interests and curriculum coverage.

Key Stages 1 and 2

In Key Stage 1 and 2 children have a daily mathematics session of 60 minutes. Teachers also plan and provide opportunities for children to use and apply maths knowledge and skills in other areas of the curriculum.

Effective teaching of Mathematics:

At Farndon Fields Primary School, there are distinct parts to our maths lessons. However, this does not mean that every lesson needs to follow the exact structure or sequence and it is not intended to be used as a checklist for each lesson.



Questioning and Reasoning Strategies used at Farndon Fields Primary School:

- How do you know? Convince me.
- What's the same? What's different?
- Explain how you got your answer. What did you do?
- What do you notice?
- Explain your reasoning.
- How many different ways can you show me?
- Give me an example. Give me a non-example.
- Always, sometimes, never?
- Which is the odd one out? Why?
- Work systematically to show… How do you know that you have all of the solutions?
- Probing questions (staying with a child to probe deeper to check understanding)
- Say it again better (ask children to rephrase answers a second time to build a deeper, higher quality answer)
- Whole class response: choral, whiteboard, ABCD, thumbs up + down for true or false

Classroom environment

Every classroom has a maths working wall where key concepts, representations, models, vocabulary and methods are developed with the children and displayed to develop the overall learning journey. This allows the whole class to have ownership of their learning and they are able to refer to key concepts through the topic.

Children also have access to manipulatives to support them in their learning: number lines, place value charts, multiplication grids, Numicon, dienes, cubes, bead strings and other key resources.

Marking

Children self-mark their answers: yellow for correct and blue for incorrect (from Year 2 onwards). This enables the teacher to assess which children need support/challenge and allows the children to self-correct in purple pen. Teachers mark green for correct and pink for incorrect / develop further. Deeper Thinking and Greater Depth tasks may also be self-marked, but these will require more careful marking and assessing by the teacher.

Deeper Thinking and Greater Depth

All children are challenged and encouraged to deepen their thinking in every maths lesson. Through various points in the lesson, children are able to access 'Deeper Thinking' questions. This may be an oral question; as part of the teacher input on the lesson slides or a question in their books. Examples of Deeper Thinking tasks, depending on the age of the child, could include asking children to justify their thinking; having an unclear starting point or to work systematically. Deeper Thinking tasks are for children to demonstrate they have mastered the concept.

Children also have the opportunity to access a 'Greater Depth' question within the lesson. These tasks require a higher level of mathematical thinking and a more sophisticated response. Teachers use the

NCETM Primary Assessment Materials 'Teaching for Mastery' to support with ensuring that the Greater Depth questions they provide are appropriately pitched for their year group (https://www.ncetm.org.uk/classroom-resources/assessment-materials-primary/).

Teachers regularly begin their maths lessons with discussing and modelling the Greater Depth task from the previous lesson with the whole class. This allows for all children to regularly access Greater Depth tasks and are exposed to the mathematical thought behind approaching these questions.

Further opportunities for Greater Depth tasks are provided in a 1-2 day enrichment time between topics. After the children's post-assessment, children are assessed as either requiring consolidation, where areas they have not yet mastered are addressed with them, or as having mastered the topic. These children will then have further lesson time where they will discuss Greater Depth tasks with peers and their class teacher. This is also an opportunity to model the thought processes behind Greater Depth questions.

Multiplication Tables

Throughout the year groups in Farndon Fields Primary School, children are developing and consolidating their multiplication knowledge in line with the age-related National Curriculum expectations. This includes a variety of tasks:

- Times Tables Rock Stars online
- MTC simulation practice (Soundcheck on TTRS)
- Times Table Sheet Timed Practice
- Pattern investigation
- Counting stick
- Multiplication games

Inclusion and Equal Opportunities (challenge for all):

We believe that every child should have equal opportunities to achieve their full potential and access an ambitious and coherent curriculum that leads to deep learning and understanding, regardless of race, gender, cultural background, ability or a special educational need or disability.

If a child has a special educational need or disability, we will do our very best to ensure we meet that child's individual needs when accessing the mathematics curriculum. We comply with the requirements set out in the SEND Code of Practice. If a teacher has concerns about the progress of a child, then they will liaise with the in school SENDCO to arrange appropriate assessment of need and set up personal provision or differentiation within the classroom environment to meet the needs of that child.

Impact

Assessing Progress

Formative Assessment:

Pupils' progress will be assessed using regular formative assessment in lessons through strategies such as questioning, regular retrieval practice, quizzing, independent learning tasks, pre and post assessments and the assessment of work in books.

At the start of each topic, the children will complete a pre assessment to assess prior learning and a post assessment at the end. Teachers will use both these assessments formatively to provide further feedback or re-visit concepts where necessary to close gaps and ensure pupils have mastered the curriculum content at that point.

Assessing long-term learning:

Summative Assessment:

Summative assessment in mathematics takes place at the end of every term in line with the School and Trust Assessment Schedule. In Years 1, 3, 4 and 5 this take the form of Rising Stars Assessment and in Years 2 and 6 it is previous SATs papers. Years 2 and 6 take part in the Statutory Assessment Tests (SATs) that take place in May.

In Year 4, the children complete the Multiplication Tables Check (MTC) in June each year. 'Soundcheck' MTC simulation assessments take place regularly as part of normal classroom practice, and a more formal 'Soundcheck' assessment is carried out and reported at the end of each half term.

Tracking Pupil Progress:

In mathematics children are tracked in multiple ways:

- Online Tracker where children have an **overall judgement**: pre-year group, working towards the expected standard, working at the expected standard or working at greater depth within the expected standard. This is assessed each half term.
- Tracker against the DfE Ready to Progress statements completed after each topic, where appropriate.
- MTC simulation through 'Soundcheck' in Year 4 each half term.
- Tracking of EYFS to end of KS1 statutory assessment data and end of KS1 statutory assessment data to end of KS2 statutory assessment data.
- Baseline assessment in EYFS and tracking against Early Learning Goals.

A provision map is used for each class, which is updated half-termly by the class teacher, to ensure appropriate provision for the changing, varying needs of children. This could include in class, QFT provision, or out of class interventions. Pupil progress meetings with the class teachers, Maths subject lead and SLT take place half-termly to track children's progress.

Individual progress is reported to parents through two termly Parents' Evenings and an end of year report.