Mathematics Policy 2024

Reviewed by Megan Martin July 2024

Springwell Park Primary School

Mathematics 2024

Introduction

A 'high-quality' mathematics education provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject (National Curriculum July 2014).

Aims

We aim to develop lively, enquiring minds and encourage pupils to become self- motivated, confident and capable in order to solve problems that will become an integral part of their future.
The national curriculum for mathematics aims to ensure that all pupils:

- Become **fluent** in the fundamentals of mathematics, through varied and frequent practice with increasingly complex problems over time, so that pupils have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems.

- **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.

Mastering maths means acquiring a deep, long-term, secure and adaptable understanding of the subject. At any one point in a pupil's journey through school, achieving mastery is taken to mean acquiring a solid enough understanding of the maths that's been taught to enable him/her move on to more advanced material.' NCETM 2016

Our aim in Maths is for the children to acquire knowledge and skills and to become confident and effective in using mathematical language and numbers. We aim for all the children to develop an interest, enjoyment and confidence in Mathematics as a practical tool for use throughout adult life.

Since September 2014, all of our staff have attended training in teaching mathematics using a mastery approach. We now use this approach in our mathematics teaching.

Throughout the curriculum great emphasis is placed upon basic skills, the 4 operations, problem solving, practical activities and mental and oral work. We aim to integrate fluency, reasoning and problem solving throughout every lesson, using a range of activities to challenge children at every level. Concrete resources are used from EYFS to year 6 to help develop an understanding, which are used alongside pictorial representations to help the children make connections with their mathematical learning.

Alongside our daily maths lessons, children are involved in targeted maths sessions that are tailored to their specific needs or gaps in their understanding.

Maths Lessons at Springwell

Main Maths Lessons

All pupils have a daily maths lesson. The school follows the White Rose Maths scheme, enhanced with Nrich and NCETM resources. This scheme of learning is designed to support a mastery approach to teaching and learning, as well as to support the aims and objectives of the National Curriculum.

At Springwell Park we use the following key features in each lesson:

1. **Fluency** – This allows children to use hands on approaches such as using number beads, multilink or counters to physically show a concept.

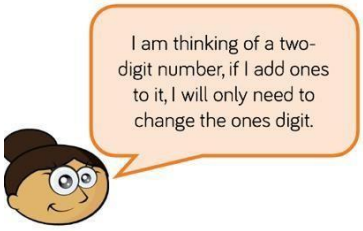
2. **Reasoning** – This allows children to start explaining their understanding of a mathematical concept. By ensuring all children can verbalise their understanding, it helps them to build a secure understanding.

3. **Problem Solving –** Is placing mathematical concepts in different contexts allowing children to apply their knowledge and understanding, showing a greater depth of learning. We explore five types of problem solving in different strands of mathematics:

    - Two and three step word problems including bar model
    - Finding all possibilities
    - Finding rules and describing patterns
    - Diagram problems and visual patterns
    - Logic problems

Work in children's maths books will be labelled yellow for fluency, green for reasoning and blue for problem solving.

For example:

Fluency	Reasoning	Problem Solving
17 + 5 = ____	 Explain your answer.	Here are three digit cards. 6 7 8 Place the digit cards in the number sentence. How many different totals can you find? □□ + □ = What is the smallest total? What is the largest total?

At Springwell Park we support our pupils by introducing concepts using the following approach:

Concrete – children have the opportunity to use physical objects to help them understand what they are doing.

Pictorial – children use pictorial representations. These representations can then be used to help reason and solve problems.

Abstract – both concrete and pictorial representations should support understanding of abstract methods.

For example:

What a typical Springwell maths lesson looks like:

Children will be working on age related objectives

- Review of previous lessons/feedback
- Consolidation of basic skills/previous learning
- Sharing the learning objective
- Teacher modelling and demonstrating – following a 'concrete, pictorial, abstract' approach (stages may be presented alongside eachother to help the children make connections in their learning)
- Children choosing to use core representations if needed
- Precise questioning to encourage reasoning – open-ended/probing
- Mathematical Vocabulary modelled and encouraged to be used throughout
- Group work/ paired work/ independent work
- Culture where children learn from their mistakes and fix them
- Practice and consolidation or enquiry/problem solving tasks, dependent on stage in teaching sequence
- Application of skills in a variety of contexts to deepen understanding
- Teaching assistant working with targeted children/group
- Self-assessment of learning

Maths Planning at Springwell

Our long-term plans are designed to allow our pupils to develop their understanding, look for patterns and make connections in maths. Our teaching is based on the National Curriculum for Mathematics 2014 and Statutory framework for the Early Years Foundation Stage 2021.

We then use White Rose Maths schemes to support the long-term planning for mathematics taught in the school. Alongside this, we refer to the NCETM, Nrich, Testbase and Classroom Secrets to ensure the children have a broad and balanced curriculum, that offers challenge.

Daily Arithmetic session: Y3 and Y6

Our daily arithmetic sessions are an opportunity to engage in spaced out retrieval practice in short bursts to help with remembering and higher long-term retention. Arithmetic sessions will take place outside of the Maths lesson. This is a time to practice arithmetic skills through '6 and a twist' and 'counting stick' sessions.

2 x Counting Stick Sessions - Based on the current times tables the class are learning

3 x '6 and a twist' sessions - Class teachers design specific questions tailored to their pupils' needs – keeping key facts 'bubbling' throughout the year

- *'6' - arithmetic style questions*

- *'twist' - For example: a reasoning question/list all possibilities/ find the odd one out/convince me*

We encourage the children to think if they can 'calculate mentally', 'use jottings' or 'use formal written method'. They choose the most efficient method for them. We believe it is with this regular practice that young learners will become fluent and confident mathematicians.

Note:

Years 4 and 5 focus on 'Mastering Number' for 2 sessions per week and then '6 and a Twist' for 3 sessions per week

Year 6 focus on '6 and a twist' sessions for the whole week

Mastering Number Programme (Reception, Year 1 and Year 2)

For the third year, we are taking part in the 'Mastering Number Programme' at EYFS/KS1. This project aims to secure firm foundations in the development of good number sense for all children from Reception through to Year 1 and Year 2. The aim over time is that children will leave KS1 with fluency in calculation and with confidence and flexibility with number. Attention will be given to key knowledge and understanding needed in Reception classes, and progression through KS1 to support success in the future. All pupils will have access to a Rekenrek to use during this daily session.

Reception - 15 minutes daily

Y1 - whole class, 15 minutes daily, timetabled for straight after lunch. (therefore, an hour and 15 minutes of maths, including the untouched morning hour).

Y2 - Everybody doing Rekenek daily for 15 minutes (in addition to an hour of maths) until Easter test week. Once the data has been inputted, the children with strong number move away from Rekenek and do arithmetic in place of Rekenek to help with their transition to Year 3.

Mastering Number Programme at KS2 (Year 4 and 5)

For the second year, our school is going to be taking part in the NCETM 'Mastering Number at KS2' programme for our Year 4 and 5 children. Teachers will be working with their whole class two days per week using the Mastering Number Programme, to develop children's deep understanding and confidence of multiplicative relationships and automaticity of facts.
The staff training for this commenced in October 2023 and the resources will be shared with new staffing changes for the academic year 2024-2025.

Calculation Policy at Springwell

The calculation policy is to support the teaching and planning of mathematics. This policy sets out the progression of strategies and written methods children will be taught to develop their understanding of the four operations. Strategies set out in a Concrete, Pictorial and Abstract (CPA) approach to develop children's deep understanding and mastery of mathematical concepts. These are called core representations. Children can use concrete objects to help them make sense of the concept or problem; this could be anything from real or plastic fruit, to straws, counters or cubes. This is then developed through the use of images, models and children's own pictorial representations before moving on to the abstract mathematics. It is also worth noting that if a child has moved on from concrete to pictorial, it does not mean that the concrete cannot be used alongside the pictorial. Or if a child is working in the abstract, 'proving' something or 'working out' could involve use of the concrete or pictorial therefore building on prior learning. Then as children become more independent, they will be able to and encouraged to select strategies which are most efficient for the activity.

The strategies are separated into the 4 operations for easy reference. Children should be moved through the strategies at a pace appropriate to their age-related expectations as defined in the EYFS and National Curriculum. Teaching of the strategies rely on good levels of number sense, fluency and ability to reason mathematically. Children need to be supported to gain depth of understanding within the strategy through the CPA approach.

Marking and Feedback at Springwell

Consistently high-quality marking and constructive feedback from teachers ensures pupils make progress in their learning.

Marking is in line with our school Marking and Feedback Policy. Pupil response and reflection time is in line with the school Marking and Feedback Policy, and where afternoon intervention has taken place, it is noted by the class teacher, as 'Mop Up'.

Maths Books at Springwell

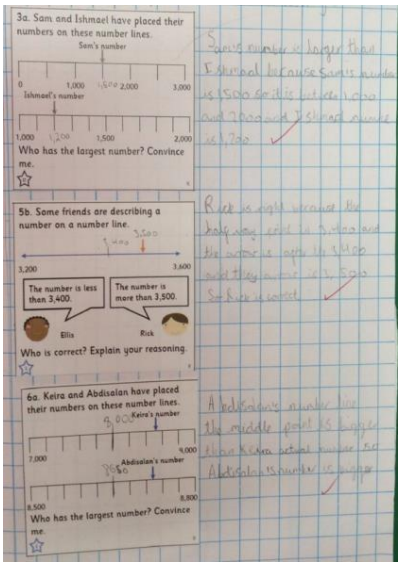
Pupils should be reminded to always take pride in their work.

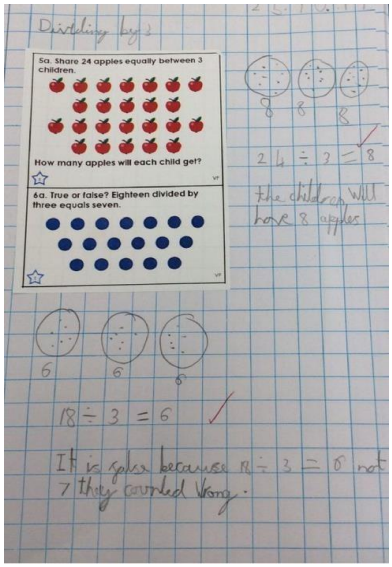
Presentation

- Date and learning objectives are clearly presented at the start of each lesson
- All maths work is to be done using a sharp pencil
- Pupils will use a ruler when appropriate
- 1 square, 1 digit is used throughout the school

Number Layout of work – use DUMTUM

(Draw margins 2 squares wide on left and middle of page)
Date at the top right-hand page
Underline
Miss a line
Title of Fluency (highlighted yellow) or Reasoning (highlighted green) or Problem-Solving (highlighted blue) and learning objective to the left-hand side of page
Underline
Miss a line
Begin work
Work across the page
Rule off
Start new work underneath
1 digit per square





Working Walls at Springwell

The learning environment is key to supporting pupils' learning and a maths working wall is a key part of this.

Our maths working walls in our classroom are a display of the current learning process. They may include objectives, success criteria/steps to success, models and images, challenges, vocabulary or examples of good work.

Maths Homework at Springwell

Opportunities for pupils to practise and consolidate their skills and knowledge are extended through the regular setting of homework. Teachers set homework that matches a pupil's needs accurately:

- Weekly maths facts test (dependent on year group, it could be number bonds/times tables/equivalent fractions).
- Key Instant Recall Facts half termly. These are some maths facts that children just need to know, i.e., the times tables. It is a government requirement that children learn these facts by heart and can instantly recall them. Mastering them will also really help with their work in school.
- Regular number bonds practice on Numbots and times table practice on TT Rockstars
- As part of 'catch-up' teachers may send home work to consolidate class lessons.
- Pupils from Years 1 – 6 have logins for maths.co.uk (from Spring Term 2 2024) that the teacher can set specific work on.

Interventions and use of Additional Adults

Interventions are used to support pupils who have been identified through teacher assessment as having gaps in mathematical understanding:

- 1:1 or small group intervention following the lesson on the same day (or day after dependent on teacher release time) for children who have not grasped concepts (Class teachers in Springwell are released three afternoons a week for half hour sessions to support pupils – this is marked in the pupil's books as '**Mop Up'**). This time can also be used for 'pre-teaching'.
- Pupils with gaps in mathematical fluency are to have timetabled sessions on TT Rockstars or Numbots.

Interventions are reviewed regularly to assess impact.

Mathematical provision for SEND children

At Springwell Park we are passionate about inclusive education for all and we are driven by the desire to ensure that all of the children at Springwell Park have the best chance to succeed in life. We believe that pupils with Special Educational Needs and Disability (SEND) have the greatest need for excellent teaching and are entitled to provision that supports achievement at, and enjoyment of, school. We follow a comprehensive and structured approach to assessing, identifying and responding to individual needs throughout the school year to ensure pupils identified with SEND can reach their full potential.

How are rapid graspers stretched?

- Enquiry tasks: List all possibilities, True/False questions, 'Is it true that...' questions
- Broader enrichment tasks in a range of contexts
- Opportunities to reason/write explanations
- Opportunities to explain to others
- Opportunities to generate their own questions and problems – innovate
- Opportunities to problem solve

Assessment and Moderation

Assessment is an integral part of teaching and learning and is a continuous process. It is the responsibility of the class teacher to assess all pupils in their class.

Assessment information can be gathered in various ways including by: pupil teacher discussions, observations, through marking, questioning etc. Following a block of work, teachers carry end of unit assessment to gather data and inform future planning. Using these alongside test results from White Rose arithmetic and reasoning papers, teachers input data into INSIGHT and use their data to help inform planning and identify gaps, which can then be addressed.

Numbots (Reception, Year 1 and Year 2) is an online resource which helps younger children with their number bonds.

Times Table Rockstars is an online resource which helps children with their instant recall and speed of their times tables. These are both monitored termly.

From Spring Term 2 2024, class teachers from Year 1 – 6 will have access to maths.co.uk where they can set online assessments for their pupils. Teachers can use these to help with planning and help identify individual targets for their children.

In the summer term, Class teachers use the *2020 DfE guidance ready-to-progress criteria and identify aspects that have: been taught in school to children by the class teacher or have been taught but further consolidation This reflects on how effectively pupils have learnt, remembered and are able to apply what has been taught. This evaluation is used as a useful transition document for the next class teacher.

Monitoring and Evaluation

Monitoring is important as it allows leaders to have an accurate understanding of pupils' performance.

Monitoring exercises are undertaken across the year and include: book scrutiny, observations, learning walks, pupil interviews, maths surgeries, moderation meetings, staff discussion, and audit of resources.

Cross Curricular

Throughout the whole curriculum, opportunities to extend and promote Mathematics should be sought. For example, in Science topics, children will also develop their mathematical skills. This will help children appreciate how to *Work Scientifically* but also practice discrete mathematical skills.

Role of the Subject Leader - *The subject leader is responsible for leading mathematics throughout the school.*

This will include:

- Monitoring and evaluation
- Leading CPD
- Write an action plan
- Interventions
- Resources audit
- Overview of data

Parents

Parents have an important role and influence on a pupil's attitude and attainment in maths.
We actively encourage and involve them in school life by:

- Sharing curriculum content
- Providing homework
- Parents' evenings
- Newsletters
- Stay and Play sessions EYFS
- Maths workshops

Reporting to Parents

Reporting to parents is undertaken on a termly basis through parents' evenings and annually through a written report.

Inclusion and Equal Opportunities

All pupils have equal access to the curriculum regardless of their race, sex, religious belief or ability. This is monitored by analyzing pupil performance throughout the school to ensure that there is no disparity between groups.