



Springdale Primary School

Mathematics Policy

Subject leader and Curriculum Co-ordinator:

Mrs Sally Grayson

Headteacher : Mrs Janice Hopkins



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As we are continually striving to improve the teaching and learning of Maths, this policy will be reviewed Spring Term 2023

Our Learning Ethos

The National Curriculum 2014 states that:

“Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history’s most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. A high-quality mathematics education therefore 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.”

At Springdale we see Maths as a multi-discipline, cross curricular subject which develops vital, logical reasoning strategies. Mathematics pervades all aspects of our lives and helps us to make sense of our world. With this in mind this policy promotes the secure knowledge of skills to develop an understanding of mathematics in a context which provides purpose and meaning. As much revolves around the discussion about maths between talk partners, identifying learning errors and explanations of mathematical thinking, as it does the completion of calculations. The process by which they achieved their answer, rather than the answer itself. We want the children to see Mathematics as being relevant to their world and applicable to everyday life, as well as being something that they will need as they move on through their school life and ultimately to the world of employment. To that end we are developing a Maths curriculum that promotes the children’s ability to think mathematically, one which allows them to understand their learning by breaking it down into a series of manageable steps and embeds their skills by application.

This policy should be read in conjunction with the following school policies:

- Counting Policy (appendix 1)
- Visual Calculation Policy (appendix 2))
- Assessment Policy
- Marking Policy
- SEND Policy
- Equality Policy
- Inclusion Policy
- Health and Safety Policy

Our Aims

To ensure the National curriculum guidelines for teaching Maths are met by :

- Developing secure understanding using concrete resources/ real life experiences.
- Reinforcing fluency by revisiting
- Supporting the children to become fluent mathematical thinkers by ensuring that learning starts from a foundation of secure understanding and progresses in small steps.
- Naturally developing cross curricular learning links
- Creating a lively, exciting and stimulating environment. **Inspiring children to learn through enthusiasm..**
- Insisting upon partner talk and teamwork as an integral part of learning to develop deeper thinking skills and reasoning strategies.
- Challenging children to stretch themselves beyond their comfort zones: to take risks safely
- Modelling precise and accurate mathematical vocabulary and encouraging children to use this vocabulary with confidence to reason and explain
- Developing the confidence and ability to explain not only what IS but also what is NOT
e.g. 'It is a square because it has 4 equal straight sides joined at right-angles'
AND ' It is not a square because although it has 4 straight sides and 4 right-angles, only the opposite sides are equal'.
- Promoting the question '**Why?**' when developing problem solving and solution finding strategies. Facilitating curiosity.
- Reinforcing and securing their understanding of number, number pattern and number relationships
- Ensuring the majority of children know all their times tables and can recall them at rapidly (6 seconds) by the end of year 4.
- Supporting children to if learning is unstable by making time for children to revisit their learning to ensure they feel secure in their understanding and able to move confidently on to next steps and challenges.
- Providing opportunities for accelerated progress and greater depth attainment through deeper understanding.

Our Planning Structure

The foundation of our learning at Springdale is are is The National Curriculum

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should be based on the security of the pupils' understanding. The National Curriculum provides a framework for the teaching mathematics however at Springdale we have children with a wide variety of needs and starting points, so the school is aware of the need for flexibility and creativity in teaching and learning styles to ensure the individual learning needs are met. Our planning is guided by the National Curriculum requirements that all children should:

- ❖ Become **FLUENT**
- ❖ **REASON** and **EXPLAIN** mathematically
- ❖ Can **SOLVE PROBLEMS**

Long Term Plans or Yearly Overview (appendix 3) ensure consistency, balance and progression in teaching focusses across school.

Medium Term Plans. (appendix 4) detail the learning focusses for each unit of work for that year group but also for the year group above and below so that staff are able to provide extra support or challenge as necessary.

Short Term Planning

Teachers across year group to plan and deliver lessons that suit the particular learning styles of the children within the year group. They will use their own judgement and formative assessment to ensure a flexible approach is adopted which recognises the pace of learning within the classroom. All formal planning is uploaded into the whole school shared planning folder. These are monitored and reviewed termly by Maths Leads and SMT. Teachers also keep a copy of their plans in their own planning folder. For weekly planning teachers use Teaching for Master Powerpoints, Power Maths, White Rose, Enrich, Collins and Target Your Maths and other resources to design daily lessons incorporate the above elements.

Year Group Targets

Targets at the back of children's books break down the National Curriculum requirements into small steps and are used to locate evidence of targets achieved, assess learning and track progress. (see below)

Assessment and Marking

Teachers use formative assessment throughout their teaching to plan and to assess children's progress. This will be ongoing and informed by annotated plans and work in children's books. Summative assessment is used to support teacher assessments to identify next steps informing planning and interventions. Teachers provide these assessments three a year, this data is monitored by SMT. In year 2 and 6 formative assessments once a term and are more regular and this data is used to target support, track progress and make predictions. A consistent approach is being developed across school to establish termly assessments to track progress.

Children are encouraged to self-assess their understanding using a 3 dot system- with 3 dots being fully understood and identify their leaning needs through our self-assessment Elephant Questions which are evident in all classrooms. Children/Teachers identify 'Learning Behaviours' which are also evident in all classrooms to support their learning. Children will be provided with learning feedback either verbally or through class or individual marking. Children have year group targets at the back of their maths books which are used to identify when a learning target has been met. A date is recorded on the target which links to the evidence in the book. Targets need to be met three times at least before they are highlighted. Highlighted targets show secure understanding. Often, in order to clarify understanding of a concept, children will be set reinforcement/challenge tasks, but not for every lesson; these should be completed by the children at the start of the next lesson. When marking work teachers will check the task set and should adhere to the school's Marking Policy.

Homework

Maths homework is set as a weekly number of on TT Rockstars on specified times tables. They may also send home extra practise on areas of weakness as the need arises, especially in year 5 and 6 as they prepare for end of KS Tests and transition to KS3.

Timetabling

EYFS to have 5 lessons per week linked to the EYFS 2018 framework and intervention timetabled as required.

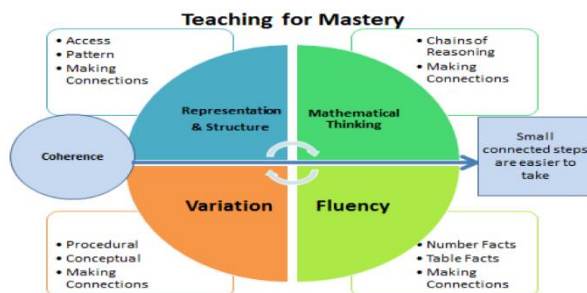
KS1 are timetabled to have five hours per week are dedicated to the discrete teaching of maths with 1 hour of these lessons being dedicated to arithmetic in year 2.

KS2 have five and a half hours per week dedicated to the discrete teaching of maths, with a weekly arithmetic lesson. The extra half an hour can be used for interventions, time tables practise or developing reasoning skill.

Our Learning Environment

Springdale is currently involved in a Teaching For Mastery Project supported SHaWmaths Hub. Lead Teachers are promoting and developing this teaching and learning approach across school. Though only in the early stages, it is felt to be having a positive impact in promoting our mathematic aims

What is teaching for mastery?



FLUENCY INVOLVES:

- Quick recall of facts and procedures
- The flexibility and fluidity to move between different contexts and representations of mathematics.
- The ability to recognise relationships and make connections in mathematics

REPRESENTATION & STRUCTURE

- Mathematical structures are the key patterns and generalisations that underpin sets of numbers – they are the laws and relationships that we want children to spot. Using different representations can help children to ‘see’ these laws and relationships.

VARIATION

- **Procedural variation** – This is a deliberate change in the type of examples used and questions set, to draw attention to certain features.

Across all phases we use Concrete, Pictorial, Abstract (CPA) Development of understanding and Numicon is used across school to support and reinforce learning.



EYFS

Mathematics within the EYFS is developed through purposeful, play based experiences and that are represented throughout the indoor and outdoor provision. The learning is based on pupil's interests and current themes and will focus on the expectations from Development Matters / Early Years Outcomes. Mathematical understanding will be developed through stories, songs, games, imaginative play, child initiated learning and structured teaching. The main focus will be a deep and secure understanding of numbers to 10, within 10 and the relationship between them using counting and patterns. Children are taught to count to 20 and develop the language of 1 more and 1 less. They will know how to add single digit numbers and solve doubling, halving and sharing problems using concrete resources. Children will be taught to use everyday language alongside mathematical language to describe and compare size, weight, capacity position, distance, time and money. As children progress, they will be encouraged to record their mathematical thinking in a more formal way. Group discussions and explanations will be an integral part of the learning process.

Key Stage 1 Maths.

The principal focus of mathematics teaching in key stage 1 is to ensure pupils develop confidence and mental fluency of numbers beyond 20, including relationships, patterns and Place Value. The essential idea behind the mastery approach is that all children have a deep understanding so that future learning continues to build on solid foundations. If the learning is represented using concrete materials, pictorial representations and abstract symbols, it will allow children to visualise maths in varied ways, see connections and to independently explore and investigate. Practical activities and resources offer the children a deeper mathematical understanding of more complex concepts. Providing children with visual representations also offers a scaffold when developing a more robust understanding of maths. Throughout Key Stage 1 children will gain a secure knowledge of number and place value and become confident when using the four operations in both formal methods as well as problem solving strategies supported by representations. Alongside number work children at Springdale begin to identify fractions using shapes, objects and quantities and make connections to equal sharing and grouping. At this stage, children will also develop their ability to identify, describe, draw, compare and sort different shapes. Children will have the opportunity to use a range of measures to describe and compare different quantities such as length, mass, capacity/volume time and money and are expected to use related vocabulary for all topics. Children will be encouraged to use estimation as a first accuracy check. Cross-curricular links will be identified wherever they enhance and reinforce learning for example, shape through art or computing, measures and graphs/chart through science or co-ordinates in geography. This is to ensure we continually maximise learning opportunities for all pupils across an entire curriculum. Daily practise of counting and times tables using concrete materials, movement and songs will develop fluency. Group discussions, partner talk and annotations will be an integral part of the learning process. By the end of Year 2 the children should know number bonds to 20 and be precise in using and understanding place value and be able to read and spell mathematical vocabulary at level consistent with Key Stage 1.

Key Stage 2 maths Lower Key Stage 2 – Years 3-4.

Our principal focus of mathematics teaching in lower Key Stage 2 is to ensure that children become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value needs to be embedded so that this skill can be transferred to larger numbers. This should ensure that children develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, children will develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching will ensure that children draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them using accurate vocabulary. Children will learn how to use measuring instruments with accuracy and make connections between measure and number. Children will be encouraged to use estimation, inverse checks and partner checks as a method of identifying errors and developing accuracy. Cross-curricular links will be identified wherever they enhance and reinforce learning to ensure we continually maximise learning opportunities for all pupils across an entire curriculum. Our children will be taught to read and spell mathematical vocabulary correctly and confidently in line with key stage expectations. By the end of Year 4, children should be able to recall multiplication tables up to and including the 12 multiplication table, including related division facts with precision and speed. Daily practise of times tables using concrete materials, movement and songs will develop this fluency. Group discussions, partner talk, 'why' explanations and annotations will be an integral part of the learning process.

Upper Key Stage 2 – Years 5-6

The principal focus of mathematics teaching in upper Key Stage 2 is to ensure that pupils extend their understanding of the number system and place value to include numbers larger integers (up to 1,000,000) and decimals. This will develop the connections that children make between multiplication and division with fractions, decimals, percentages and ratio. At this stage, children will develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, children are introduced to the language of algebra as a means for solving a variety of missing number problems in to lay foundations for KS 3. Teaching in geometry and measures will consolidate and extend knowledge

developed in number. Pupils will be able classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them. Children will be taught how to use estimation, inverse checks and partner checks as a method of identifying errors and developing accuracy. Cross-curricular links will be identified wherever they enhance and reinforce learning to ensure we continually maximise learning opportunities for all pupils across an entire curriculum. Our children will be taught to read, spell and pronounce mathematical vocabulary correctly. By the end of Year 6, pupils should be fluent in written methods for all four operations, including long multiplication and formal division, and in working with fractions, decimals and percentages. Daily practise of times tables using concrete materials, movement and songs will develop this fluency. Group discussions, partner talk, 'why'/'prove it'/ comparison explanations and annotations will be an integral part of the learning process.

Inclusion

In line with the School's Inclusion Policy each child will have an equal entitlement to all aspects of the Maths curriculum and to experience the full range of Maths activities. Therefore, in delivering Maths, care will be taken to ensure that a variety of learning styles are accessed and teaching methods adopted. As Springdale has a Language Resource Base many of our children have a wide variety of individual learning needs therefore teaching resources, support and organisation needs to be flexible to ensure the needs of all children are met. We are currently developing a Teaching for Mastery approach and moving towards a whole class approach where appropriate.

Teaching maths for mastery is different because it 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 pupils. Though the whole class goes through the same content at the same pace, there is still plenty of opportunity for differentiation. Taking a mastery approach, differentiation occurs in the support and intervention provided to different pupils, not in the topics taught, particularly at earlier stages. There is no differentiation in content taught, but the questioning and scaffolding individual pupils receive in class as they work through problems will differ, with higher attaining children, or those pupils who grasp concepts quickly, challenged through more demanding problems which deepen their knowledge of the same content. Those children who are not sufficiently fluent are provided additional support to consolidate their understanding before moving on. Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with intervention –through individual or small group support. The idea is that there will be very few 'closing the gap' strategies, because there are very few gaps to close. Key Stage 1 will be trialling this approach from September 2020 using Power Maths and supporting Powerpoints from the SHAW maths hub. Key Stage 2- particularly Year 3 and 4 will be trialling parts of this approach within their classrooms to assess the effectiveness on progress and attainment following Staff training provided by Maths lead and collaborative work during 2019/2020 CPD.

Lesson Organisation in KS1 and KS2

- ❖ All children receive a daily maths lesson, although mathematical skills run through many other areas of the curriculum.
- ❖ Each lesson starts with 5 mins. of counting or times tables fluency.
- ❖ Following this there is a 5 mins. fluency activity where children work with a partner to revisit a skill already taught to ensure security understanding over time. This will be slightly extended at least once a week as children will be given 4 questions, each using a different operation at a level that has been previously taught and children will mark and identifying learning errors- using peer and teacher modelling. This assesses security of learning and enable children to identify learning error.
- ❖ Each lesson focusses on one clear learning objective which all children are expected to master using a small step approach; reasoning activities enable those children who grasp the objective rapidly to extend their learning by exploring it at greater depth.
- ❖ Each lesson includes elements of: **fluency**, to practise skills; **reasoning**, to deepen understanding; and **problem solving**, to apply skills
- ❖ During each lesson there will be a reasoning challenge linked to their learning and often a challenge question set in teacher marking to assess the security of learning.

- ❖ Teachers use Year Group Overviews/ Medium Term plans and Year Group learning targets to set **their teaching focus and objectives. (appendices 3 and 4.)**
- ❖ **Whole class teaching is adopted and children work in mixed ability groups OR children are placed into ability sets within their year groups. All classrooms have maths displays with key vocabulary clearly displayed.**
- ❖ Every classroom has a range of practical apparatus to support children's learning, with additional resources stored centrally in the Maths Resources Room.

Resources and Displays

Alongside Numicon each classroom will be resourced with materials to support children's learning such as; number lines, multiplication tables, 100 squares, 2D and 3D shapes, multilink cubes, dice, mirrors and other smaller items. Classroom equipment is updated regularly as the needs arises. Equipment that is more specific is stored centrally in Maths and Science Resource Room Children will be directed and encouraged to use practical resources to support their learning. Each classroom should have a Working Wall dedicated to Maths to support and embed learning. Classrooms/Corridors may also have an interactive or progress area such as a TT Rockstars Board or a Number/Focus of the week board alongside subject specific supports.

Teaching Times Tables

'It is not enough to expect children to learn their times tables, we have to teach them' Teachers Research Group Camden 2016

At Springdale, within our teaching we develop the children's understanding of multiplication and it's relationship to division, but if number facts are to be learnt they need to be practise. Many of our children lack the resilience, drive and home support to do this. Research show that a whole school approach with the expectation that key facts need to be learnt is an effective way of achieving mastery.. We want our children to be able to recall number facts accurately and rapidly as this has a positive impact on their mental speed and mathematical fluency. Therefore we provide routines and strategies that enable them to remember key facts.

- At the start of every children recall number/ times tables facts at speed. This may take the form of chanting, singing, dancing or playing games to reinforce them.
- Homework is set on Times Tables Rockstars where teacher can set specific times tables and track progress
- Numbergym is used within school to support the recall of number and times tables facts at speed. Children have a record card which tracks their progress and rewards for speed and accuracy are given in our Merit Assembly
- A weekly written tests that links to the times table focus for the week informs teachers of learning needs and next steps.

Arithmetic Lessons

Our summative data at Springdale shows that an individual timed test requires a range of skills both, emotional and practical, that are not always met in our daily lesson format. To address this and improve our performances in a test by practising test skills we regular arithmetic lessons which is weekly in Year 2 and Year 6. During these lessons the teacher will model a skill or an area of difficulty using annotation, the children will practise with the teacher and then have a set of questions to work through independently, individually and silently. Scaffolding resources are provided if necessary. Children mark their own work using green editing pens and identify errors. If anyone gets a question wrong and can't identify their error teacher/child models so child/children are able to identify their mistake. Children write a TOP TIP for themselves next time they are completing arithmetic questions e.g 'Don't forget to add the carrying figure.

Our aim throughout these lessons is that children

- Work individually- promoting responsibility for learning
- Developing accuracy at speed
- Are regularly exposure to working under pressure with time constraints- a life skill many adults struggle with
- Use unfamiliar formats to embedding knowledge

- Annotate their work to support understanding and accuracy
- Ensuring that we provide the best chance to achieve success

Parental Involvement

AT SCHOOL, we encourage parents to be involved by:

- ❖ Inviting them into school twice/three times yearly to discuss the progress of their child.
- ❖ Providing parents with a booklet with yearly targets and a yearly report outlining their child's achievements.
- ❖ Holding information meetings/ workshops for parents e.g. Times Table Rockstars, Calculations Policy, Year 4 Times
- ❖ Setting homework activities weekly Times Table homework on Purple Mash/TT Rockstars to be completed by or with their child.
- ❖ Regular updates on Blogs and Latest news on the School Website
- ❖ Encouraging parents to communicate through our School Homework Diary so any concerns can be dealt with immediately.

Monitoring and Review.

The monitoring of maths teaching and pupil progress is the shared responsibility of teachers, subject leader and the senior leadership team.

Monitoring of Teaching and Learning in Maths consists of:

- Planning Reviews
- Learning environment reviews (displays, working walls, learning prompts, resources)
- Sampling of books- book trawls
- Ongoing professional dialogue
- Lesson Observations by SMT
- Talking to pupils- interviews and questionnaires.

The school's governing body are involved in learning environment reviews and receive regular updates to inform them of the vision for continually improving progress and attainment.

CPD and Staff Involvement

To ensure progress and consistency all initiatives in Maths are informed by the ideas and opinions of all staff. A Counting and Numerical Calculation Policy (appendices 1 and 2) was developed in 2018 to ensure that Springdale has a consistent approach to the strategies taught and the next steps in learning. Year Group Coverage Overviews were designed to ensure consistency and balance in Teaching and Learning. (appendix 3.) The programmes of study set out within each domain in the National Curriculum are detailed in Year Group Medium Term Plans which used to ensure children get the learning experience that is required. (appendix 4)

All teaching staff at Springdale attend staff meetings that regularly have a Maths focus, which provide information on current thinking and introduces them to new teaching methodologies and ideas. The school has been involved with SHaW Maths Hub Teaching for Mastery Project. We have provided training for teachers and teaching assistants on Teaching for Mastery and Teachers have collaboratively planned and delivered a week using this approach. Following this we evidenced the learning, evaluated our strategies and devised a workable school approach

We participate in National Number Days, this year had a Times Tables theme and the whole school dressed as Rockstars to promote the use of this resource across school.

The SHaW hub has provided support on specific areas of Teaching for Mastery and we have been trialling Active Maths resources which link maths skills to fitness with great success. In addition, staff who are teaching at the end of each key stage have received CPD addressing the requirements of the curriculum particularly in relation to assessment and moderation.

The role of the maths lead

Primary Purpose:

To be a Curriculum Leader; fulfil a curriculum and teaching role in accordance with the directions given by the Head teacher and Governing Body.

Directly Responsible to:

The Head teacher

Principle responsibilities:

To carry out the duties of a Subject Leader as outlined within this job description and with regard to Teacher's Pay and Conditions Document.

Curriculum and Whole School Responsibilities

- ❖ Act as leader for maths leading and co-ordinating the learning and teaching within the subject
 - ❖ Contribute to the school's programme of monitoring and self-evaluation to ensure high standards attained by pupils
 - ❖ Support colleagues as part of self-review process encouraging the evaluation and sharing of good practice, report outcomes of monitoring activity to Curriculum Leader and Leadership Team.
 - ❖ From evidence of monitoring and self-review activities contribute objectives to the School Improvement Plan
 - ❖ Establish resource priorities and monitor the effectiveness of resource usage and spending
 - ❖ Help in creating reports and action plans for a range of audiences; Governors etc...
 - ❖ Maintain a sound knowledge of statutory curriculum requirements
 - ❖ Ensure staff have access to information and guidance relating to maths and liaise with professional development coordinator to ensure staff and school offer subject coverage and balance.
 - ❖ Have total support of the school aims and ethos and the leadership drive to ensure them.
 - ❖ Undertake any other duties or responsibilities which may be reasonably regarded as within the nature of the post or determined by the Headteacher
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- ❖ Act as a role model for others through the setting of high personal standards of classroom practice. These to include the development of an effective learning environment that fosters high standards of achievement and behaviour.

