

SARISBURY CHURCH OF ENGLAND JUNIOR SCHOOL



MATHEMATICS POLICY *Autumn 2020*

Sarisbury Church of England Junior School

Mathematics Policy



Working and learning together for success

At Sarisbury Junior School, we believe in developing enthusiastic mathematicians, who can think critically and logically to make sense of the world around them. We aim to provide children with the mathematical skills that will enable them to confidently solve problems and apply their understanding of those skills in the real world with an engaging and purposeful curriculum. Through a mastery curriculum, we intend for all pupils to develop a deep understanding of the mathematical concepts they are learning. With the varied use of concrete apparatus, models and images, we enable children to develop their conceptual understanding of concepts; by being exposed to a range of representations, children are able to select suitable models when problem solving. Getting the right answer is not the fundamental purpose of mathematics – it is the journey to the answer that is key, therefore we encourage children to explain how they know their answer is correct with clear reasoning which is crucial to continue to deepen their understanding. In maths lessons, we provide children with high quality resources, such as the 'I See Maths' programme by Gareth Metcalf and White Rose Maths, that help children to experience the true richness of mathematics and encourage them to explore the key concepts and make crucial links between them.



Working and learning together for success

We believe that in order to gain and develop these skills in mathematics, children need to be given opportunities to learn through a variety of approaches, which challenge and stimulate. Children journey through concrete, pictorial and abstract representations of maths to secure understanding and enable them to reason and problem solve accurately. It is the understanding of the journey that enables them to develop into confident and secure mathematicians. Their mathematical experiences should allow them to succeed to boost their confidence and be sufficiently challenging to enable them to apply their knowledge and then learn new concepts.

Our maths curriculum has been organised into the different areas of maths:

Number – Number, Place Value

Number – Addition, Subtraction, Multiplication and Division

Number – Fractions, Decimals and Percentages

Ratio and Proportion

Measurements

Geometry – Properties of Shapes, Position and Direction

Statistics

Algebra

These areas of mathematics are taught repeatedly throughout each year – enabling children to develop and consolidate their learning with repeated practise and application to deeper problems. Not every year group will cover all these aspects of maths – due to their complexity. As pupils progress through the Key Stage, they take on greater demands within maths and are taught more complex aspects of mathematics with the expectation that the pupils understanding has developed sufficiently so that they can meet the demand of the challenging concepts. For example, Algebra and Ratio and Proportion are taught solely in Year 6. In some cases, there are strong cross curricular links where maths can be explored or reinforced in other subjects. A clear example of this is Statistics which are further developed in Science and Geography.

Some of these areas of mathematics easily overlap. The curriculum has been designed in this way to promote links between the different areas of mathematics and to promote the application of mathematics to real life contexts. This aids understanding and provides opportunities to deepen understanding.

Skills and Understanding

We believe that during the Key Stage, children should be taught to:

- *investigate and solve problems by breaking questions into manageable steps, identifying information needed, selecting and using appropriate methods and equipment (including ICT) and applying knowledge gained previously*
- *solve routine and non-routine problems by making connections between mathematical areas, noticing patterns, making estimates and checking results*
- *represent questions and problems in multiple ways*
- *communicate using notation, images, diagrams and symbols in order to present and interpret solutions in the correct context*
- *reason mathematically using precise language; explain their thinking and methods and suggest alternative ways of tackling problems*
- *understand and investigate general statements and search for patterns in their results*
- *use numbers and the number system to solve problems in a variety of mathematical contexts (e.g. fractions, decimals, percentages)*
- *use fluent and efficient mental and written strategies for a variety of numerical problems*
- *process, represent and interpret data in a variety of forms*

Our Aims:

Place Value

- *To develop an understanding that the value of a number depends on where it lies in relationships to other numbers*
- *To develop an understanding that values change when numbers are subjected to particular operations and how they change*

Number, including fractions and algebra

- *To develop pupils' understanding, use and estimation of numbers*
- *To develop pupils' ability to recognise and interpret symbolic and graphical representations*
- *To apply their knowledge and understanding to solve problems in a logical and ordered manner*
- *To use written and mental strategies in a fluent and efficient way to solve problems*
- *To develop a range of strategies and select appropriate methods so that pupils can work out patterns, operations and sequences of numbers mentally*
- *To develop rapid recall of number facts – such as number bonds, times table facts and division facts*

Shape, including location and movement

- *To develop pupils' understanding of the properties of shape*
- *To develop spatial awareness*

Measures

- *To be able to use a variety of common, everyday measures*
- *To know the relationship between common measures and be able to convert readily from one to another*

Data Handling

- *To be able to collect, process and interpret data*
- *To recognise that data can be represented in a variety of ways*
- *To develop an understanding of probability*

Problem Solving

Children will be given the opportunity to use and apply their knowledge and skills. Through the use of the 'I see maths' resources by Gareth Metcalfe children are provided with the opportunity to apply and deepen their understanding and see the richness of their mathematics. This will be in a variety of contexts in routine and non-routine problems with the opportunity to explain/reason how they are confident that their answer is accurate.

To enable children to develop their problem solving skills, there should be regular planned time for children to apply the following:

- Estimating
- Rounding and approximating
- Checking the reasonableness of an answer
- Using a variety of ways to record methods
- Using mental strategies
- Selecting appropriate methods and equipment
- Investigating approaches
- Awareness of pattern
- Problems with increasing complexity, involving more than one operation

Our Strategies:

The new National Curriculum for Mathematics is used to devise our maths curriculum. When possible, themes are used to encourage children to have a purpose for doing their Maths work.

Each of the areas will be covered each year as indicated by our maths curriculum. Year groups will allocate the suggested hours as appropriate to allow them to deliver the best possible mathematics curriculum; making links with other subjects where appropriate e.g. linking data handling to geography, science and ICT.

Children will work in class groups, with all the class focusing on the same objective but may work to different depths. Tasks will focus on fluency of calculations, reasoning of their mathematical journey to an answer and solving problems. Work will be recorded in a range of ways; including formal written methods, informal jottings, photographs of concrete resources used and images drawn to support calculations. Children will correct any mistakes in their books and this will be marked by the teacher.

Teachers will produce S plans that will detail learning outcomes, objective to be met and promote cross domain links in all areas of mathematics. Squared maths books will be used to encourage clear, logical and efficient recording of work.

All pupils will receive a daily maths lesson, lasting for approximately 50 – 60 minutes. Lessons will include elements of mathematical fluency practise, reasoning of answers and solving of problems. Plenaries will be used throughout lessons to assess pupil's understanding and confidences and introduce next steps.

There will be opportunities for children to work individually, in small groups and as part of a whole class. Children will be encouraged to work collaboratively and cooperatively.

Maths resources will be accessible within each classroom in order to enable all children to choose equipment which will help them to learn. This equipment will be used regularly to expose the maths in a problem and to demonstrate and explain new mathematical concepts.

Progression and continuity will be fostered by collaborative planning and monitoring of children's work.

Assessment and record keeping will be carried out regularly by class teachers. Teachers will regularly assess and reflect on children's growing understanding and confidence in order to provide the right support and challenge for the following session. Teachers will track pupil progress in line with the Hampshire Assessment Model and each phase's key objectives to assess whether children are on track to meet Age Related Expectations by the end of the year. This will be completed at the end of each phase and the data given to the Headteacher to form part of the pupil progress reviews. Evidence will be collected by the Maths Manager periodically to monitor progress across the school.

More confident children will be stretched within the classroom with activities designed to deepen, extend and enrich their understanding with more opportunities to reason and solve non-routine problems making broader links with other aspects of maths.

Planning, Assessment and Reporting

To support the planning of maths in our school, the following documents are available:

- New National Curriculum supporting materials, guidance and resources
- Long Term Plan – Yearly Overview
- Medium Term / S plans
- NCTEM Mastery Documents and CPD documents
- 'I see Maths'
- White Rose Maths Hub schemes of work
- Maths No Problem textbooks and workbooks
- A range of problem solving resources including Dip and Pick Packs; Can you convince me cards; Graded Problem cards; Rising Stars Problem Solving and Reasoning books
- Online resources include Interactive Resources and Mathletics
- Times Table Rockstars

Teachers will record as and when significant progress is made and will identify areas where expected progress is not being made. Teachers will track progress against key objectives identified in the Hampshire Assessment Model for each phase leading towards meeting Age Related Expectations by the end of the year.

The annual report for parents detailing the children's progress in maths will be issued in July. In addition, a written summary of progress towards targets will inform the parents' evening discussions in November and March. A copy of this summary will be issued to parents.

Our Resources:

Key maths resources that support daily learning are located in each classroom in toolboxes. These include ways of representing numbers in different ways, place value cards and equipment useful for calculating. Specific maths resources that are usefully for particular areas of maths are stored in the central resources area.

Ipads are available in for each year group to support teaching and learning. Interactive Whiteboards are used in each session to model and explore mathematical concepts.

Mathletics is a fantastic online resource that is bought into by the school. It allows children to individually access and practise all areas of maths relevant to their stage of learning. It is mainly accessed at home whether directed through home learning or independently for children to practise and reinforce their learning.

Responsibilities:

It is the responsibility of the maths leader to:

- *Keep up to date with developments and initiatives in maths and provide guidance and professional development opportunities for staff as appropriate*
- *Lead assessment in maths through the moderation of pupils' work, pupil interviews and the analysis of teacher assessment / test data*
- *Ensure the action plan is current and regularly reviewed*
- *Manage the resources to support teaching and learning in mathematics*
- *Liaise with colleagues at Key Stage 1 and Key Stage 3 to support effective transition*
- *Support colleagues in their S planning*

It is the responsibility of teachers to:

- *Deliver the curriculum outlined in the scheme of work and produce appropriate Plans and resource*
- *Use resources responsibly and encourage pupils to do otherwise*
- *Mark children's work and provide feedback according to the school's marking policy*
- *Identify individual and group targets, review work with pupils encouraging children to self-assess*
- *Assess pupil progress regularly and use this to inform planning, and to ensure appropriate challenge is given to deepen children's learning as well as appropriate scaffold put in place for those needing additional support*

It is the responsibility of the children to:

- *Use maths resources appropriately and in a thoughtful way*
- *Present their work neatly and clearly*
- *Persevere with problem solving*
- *Ensure that all work is being produced to the best of their ability*