SARISBURY CHURCH OF ENGLAND JUNIOR SCHOOL

MATHEMATICS POLICY

Autumn 2017

Sarisbury Church of England Junior School

Mathematics Policy

Working and learning together for success

At Sarisbury, we believe in developing maths for life, teaching children to become mathematicians and not just becoming good at maths. We encourage children to develop mathematical skills that enable them to explore and solve problems encountered in the 'outside world'. Our maths curriculum teaches and develops a logical approach to solving problems through fluency in calculations, including written and mental strategies that are valuable in everyday life. We believe that every child has a right to these skills and through a range of activities; we aim to provide them with a 'tool box' that they can apply when solving problems in 'real life'. Children are encouraged to select the strategy or 'tool' that will help them to tackle the problem in the most efficient and accurate way. 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 their journey to how they know their answer is correct with clear reasoning.

The majority of maths taught at Sarisbury is done through a daily maths lesson, linked to the new National Curriculum. Children explore the key concepts of place value, number, geometry, measures and data handling. By making links between these areas and encouraging children to apply their maths skills to real life contexts, we aim to ensure that they are confident and enthusiastic in their approach to maths.

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 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 'toolkit' 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 and understanding of probability*

Problem Solving
Children will be given the opportunity to use and apply their knowledge and skills. 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. Where possible, themes are used to encourage children to have a purpose for doing their Maths work and an end product where their skills have been used.

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.

Weekly maths plans will be produced in each year group which detail objectives, learning outcomes, assessment opportunities, a range of tasks and resources to be used to support and challenge each pupil in the class.

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.

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 done 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 able 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.

Weekly, short term planning for maths will be the responsibility of the year group and will be based on regular and on-going assessment and dialogue.

Regular workshops for parents are available to share the strategies and support used in class to support the learning of maths at home.

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 / Weekly Planning
- NCTEM Mastery Documents
- 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

Year teams complete a weekly / daily maths plan using the Scheme of Work / new National Curriculum.

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 June/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.

Lap tops and learn-pads 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 medium / short term planning*

It is the responsibility of teachers to:

- *Deliver the curriculum outlined in the scheme of work and produce appropriate weekly / daily plans*
- *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 weekly planning, recognising gifted and talented pupils, as well as 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*
- *Be aware of their learning journey and work towards achieving it*
- *Ensure that all work is being produced to the best of their ability*