St John's C of E Primary School

Maths Policy

Introduction

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 in most forms of employment. A high-quality mathematics education, therefore, provides a foundation for understanding the world, the ability to reason mathematically and a sense of enjoyment and curiosity about the subject.

Mathematics is a proficiency which involves confidence and competence with numbers and measures. It requires an understanding of the number system, a repertoire of computational skills and an ability to solve number problems in a variety of ways. Mathematics gives children a way of coming to terms with their environment. Practical tasks and real-life problems can be approached from a mathematical point of view. Mathematics provides children with imaginative areas of exploration and study and gives them the materials upon which to exercise their mathematical skills. These skills are a necessary tool of everyday life. Mathematics should help children to develop an appreciation of, and enjoyment in, the subject itself; as well as a realisation of its role in other curriculum areas.

Our mission statement (intent):

We want to inspire and engage our children through a meaningful, practical approach to maths which encourages them to make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competency in solving increasingly sophisticated problems.

We aim to give children an appreciation for the beauty and power of mathematics and its place in understanding the world around them. Engage them in purposeful mathematical conversations through rich problem-solving tasks. Challenge them to develop elegant solutions to problems by manipulating concrete resources, developing precise visual representations alongside fluent mental and written strategies.

National Curriculum Guidance

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 have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems

• Can 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.

Teaching for Mastery

The teaching of mathematics at St John's follows a mastery approach where children learn in small steps to ensure the mastery of new skills before moving on. This is achieved through learning journeys that are built around rich problem-solving tasks and using the Concrete, Pictorial and Abstract approach where children learn to represent problems in a variety of ways.

The key principles of this mastery approach are the following:

- Fluency- the quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics;
- Representation and structure- representations used in lessons expose the mathematical structure being taught, the aim being that students can do the maths without recourse to the representation;
- Mathematical thinking- if taught ideas are to be understood deeply, they must not merely be passively received but must be worked on by the student: thought about, reasoned with and discussed with others;
- Variation- this is firstly about how the teacher represents the concept being taught, often in more than one way, to draw attention to critical aspects, and to develop deep and holistic understanding. It is also about the sequencing of the episodes, activities and exercises used within a lesson and follow up practice, paying attention to what is kept the same and what changes, to connect the mathematics and draw attention to mathematical relationships and structure.
- Coherence- lessons are broken down into small connected steps that gradually unfold the concept, providing access for all children and leading to a generalisation of the concept and the ability to apply the concept to a range of contexts.

Our School Curriculum

Early Years Foundation Stage

The programme of study in Early Years is set out by the EYFS Framework which was introduced in 2014 and has recently been updated in September 2021. This document states that Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically.

Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. By providing frequent and varied opportunities to build and apply this understanding - such as using manipulatives, including small pebbles and tens frames for organising counting - children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures. It is important that children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

As part of our EYFS curriculum, children are given the opportunity to develop fluency through the NCETM mastering number programme. It is aimed at strengthening the understanding of number, and fluency with number facts, among children in the first three years of school. Daily work using a rekenrek (abacus-like practical resource) as part of a 'number sense' session, enables children to

build a strong foundation in their understanding of number and prepare them for the future challenges of the curriculum.

Key Stage 1

The programme of study in Key Stage 1 is set out by the National Curriculum, first published in 2014. As a school we follow the Hampshire Assessment model which breaks each Year into 3 phases. Initially, children recap and consolidate learning from the previous year alongside the learning of some new objectives in phase one. Phase 2 and 3 then build upon this to cover the remaining objectives set out in the national curriculum. Children continue to develop fluency through the NCETM mastering number programme.

The principal focus of mathematics teaching in Key Stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources (e.g. concrete objects and measuring tools).

At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of Year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.

Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

Key Stage 2

Lower Key Stage 2

The principal focus of mathematics teaching in lower key stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value.

Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number.

By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work. Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

Upper Key Stage 2

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 larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

At this stage, pupils should 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, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

By the end of year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.

Pupils should read, spell and pronounce mathematical vocabulary correctly.

Teaching and Learning

The approach to teaching and learning of Mathematics at St John's is built around a timetable which includes:-

- 4-5 maths lessons each week
- Daily arithmetic work each morning in KS2
- Daily number fluency work in KS1

The curriculum is delivered in class by teachers although some small group work may be led by learning support assistants. The mastery approach to mathematics is designed to allow all children to keep up with the learning so maths is taught in mixed ability classes. However, for some pupils with SEND, a more individualised approach may be required to meet the needs of particular pupils.

Planning follows the Hampshire phased approach to the National curriculum. Long term plans are developed from this and inform teachers' medium and short term planning. Class teachers are responsible for the relevant provision of their own classes and individually develop weekly plans which give details of learning objectives and appropriate differentiated activities. Although planned in advance, they are adjusted on a daily basis to better suit the arising needs of a class and individual pupils. Plans are centred around key problem-solving tasks which shape a unit of work. These tasks are revisited following a sequence of lessons to allow children to apply the new skills they have learned, and teachers to see progress from starting points. Teachers use concrete apparatus, pictorial representations and abstract written methods throughout units of work to develop children's conceptual understanding. Children are encouraged to reason mathematically using stem sentences, to enable them to gain a deeper understanding of newly taught concepts.