

North Somercotes CE Primary School



Mathematics Policy

"Mathematics is the language with which God has written the universe."- Galileo

The word mathematics comes from the **Greek μάθημα** (máthēma), which, in the ancient Greek language, means "what one learns" and "what one gets to know."

What is Mathematics?

Our definition for KS2 – Mathematics is the study of number, geometry, measure, statistics, algebra, ratio and proportion.

Our definition for Foundation and KS1 – Mathematics is the study of number, measure and space in the world.

Mathematics is the study of numbers, shape, data, measurements and logical activities. Mathematics is a human activity, a social phenomenon, a set of methods used to help illuminate the world, and is part of our culture. We are surrounded by a mathematical world; therefore, the study of Mathematics is essential.

Context

Children at our school have limited experiences of other places, both in this country and in the wider world. This is partly due to the very low social mobility in North Somercotes. Many of our children do not understand the importance of mathematics or critical thinking. Most of the children in North Somercotes CE Primary School are White/British with 41% of them being pupil premium and 21% of the children being on the SEN register. Many of our children have limited mathematical language.

Intention:

"Mathematics is, in its own way, the poetry of logical ideas." – Albert Einstein

At North Somercotes CE Primary School, we believe that Mathematics provides a foundation for understanding the world around us. We follow the White Rose Maths framework for our structure. We intend for our children to:

- **Become fluent** in Mathematics so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately;
- **Reason mathematically** by following a line of enquiry and using mathematical language to justify, argue or prove a theory;
- **Solve problems** by applying their mathematics to a range of problems with increasing complexity;
- **Become efficient and fluent when using number** and number operations, which enables mental calculations and written procedures to be performed accurately.

Implementation:

How do we teach Mathematics?

At North Somercotes CE Primary School, we believe that Maths should be taught by ensuring a full coverage of the Mathematics curriculum. We do this by following White Rose Maths. This approach creates rigid continuity and progression in the teaching of this subject. Our Calculation Policies are broken down into skills to show a clear progression and expectation throughout our school. Using the White Rose Maths scheme means that our children can ask their own questions and form their own opinions (and be willing to change them). They will have the confidence to tackle problems which not only arise in mathematics but in other areas of the curriculum.

The intent of our mathematics curriculum is to maximise the development of every child's ability an academic achievement which is accessible to all as they progress through our school. In short, everyone can do maths: everyone can!

The updated White Rose Maths scheme used at North Somercotes CE Primary School follows the 'Ready to Progress' criteria produced by the DfE to ensure that gaps can be consolidated and closed. Mathematics is taught by following the White Rose scheme of learning and the small steps that each block contains. Each Yearly Overview breaks blocks of learning into the following units:

Number includes: counting, place value, calculations, fractions, percentage and decimals.

Geometry includes: properties of shape, position and direction

Measurements includes: in length, capacity and mass, time, temperature area, perimeter,

Statistics includes: reading and constructing tally charts, pictograms, bar charts, line graphs, pie charts, time tables

Ratio and proportion includes: relationship between two numbers, finding quantities of unknown amounts

Algebra includes: substituting letters for numbers, solving equations.

In order to achieve this, EYFS follow the White Rose Maths guidance that has been divided into 10 phases and provides a variety of opportunities to develop the understanding of number, shape, measure and spatial thinking. This element of learning allow children to explore numbers through oral, practical and play-activities using real life problems.

In Key Stage 1 and Key Stage 2*, our school is using the DfE approved White Rose Maths scheme to ensure consistency and progression. For each year groups, each of the major topic areas (Number, Measurement, Geometry and Statistics), the curriculum has been broken down into key areas by breaking down the National Curriculum objectives into 'small steps'. These small steps are our lessons. Step by step, strong foundations of cumulative knowledge and understanding are built where concepts are shown using concrete, pictorial and abstract and calculations expressed in different ways.

**Year 6 curriculum is adapted to meet the specific needs of the cohort. These are currently reviewed each year based on the impact of COVID-19 and missed learning opportunities in previous year groups. This curriculum ensure that the children in Year 6 are secondary ready and that all White Rose blocks are covered by the end of the academic year*

- Within all lessons **retrieval practice** is used to consolidate previous learning that has been taught to ensure that each child has a firm understanding. This may be within continuous provision or as a cold task. Cold tasks will be carried out daily in a Mini-Maths book and will give the children an opportunity to independently revisit prior learning to ensure that they “know and remember more”.
- At the beginning of each maths lesson, the class teacher will deliver an input to match the small steps that follow the national curriculum. This involves exposing the children to a range of fluency, which could be exploring new vocabulary, recapping previous learning or being introduced to a new concept. During the teacher input, the children often have the opportunity to develop their mathematical skills by using concrete apparatus to embed this understanding or to build on previous or new concepts.
- Following the teacher input, children have the opportunity to embed this learning and put in to practice new skills, by completing an activity either independently or in a small group supported by an adult. This activity could include a range of fluency which will build the foundation for mathematical reasoning and problem solving using real-life experiences.
- Every maths lesson allows for misconceptions to be addressed whether that be at the end of the lesson through a plenary or during the lesson through a mini-plenary.
- Each year group supplement their yearly overview by using a range of teaching resources [for example, Primary Stars, Classroom Secrets and Third Space] which provides further opportunities to develop mathematical reasoning and problem solving questions. This will broaden their learning outcomes by allowing the children to answer a range of questions that require using concrete apparatus, pictorial representation and abstract concepts.

In EYFS, children will:

- develop their skills, knowledge and understanding of mathematics through oral, practical and play activities.
- use and applying mathematics in practical tasks, in real-life problems, and within mathematics itself.
- develop their use and understanding of mathematical language in context, through communicating/talking about their work and the methods used to develop their reasoning.
- use more formal methods of working and recording when they are developmentally ready.
- explore, estimate and solve real life problems in both the indoor and outdoor environment.
- develop their understanding of measures, investigate the properties of shape and develop early ideas of position and movement through practical experiences.
- sort, match, sequence compare objects and events, explore and create simple patterns and relationships, and present their work in a variety of ways.

KS1 and KS2 expectations taken from the National Curriculum

In Key Stage 1 mathematics continues to build on the knowledge skills and understanding begun in EYFS. Children will:

- develop confidence and mental fluency with whole numbers, counting and place value, involving working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools].
- develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary.
- using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.
- develop their use and understanding of mathematical language in context, through communicating/talking about their work and the methods used to develop their reasoning.
- read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.
- by the end of year 2, pupils will know the number bonds to 20 and be precise in using and understanding place value.

In Lower Key Stage 2, mathematics continues to build on the knowledge skills and understanding begun in previous phases. Children will:

- be increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value.
- develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers.
- develop their ability to solve a range of problems, including with simple fractions and decimal place value.
- become increasingly accurate and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them.
- use measuring instruments with accuracy and make connections between measure and number.
- develop their use and understanding of mathematical language in context, through communicating/talking about their work and the methods used to develop their reasoning.
- read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.
- 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.

In Upper Key Stage 2, mathematics continues to build on the knowledge skills and understanding begun in previous phases. Children will:

- extend their understanding of the number system and place value to include larger integers.
- develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio.

- 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.
- classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.
- extend knowledge developed in measure and link to number
- develop their use and understanding of mathematical language in context, through communicating/talking about their work and the methods used to develop their reasoning.
- read, spell and pronounce mathematical vocabulary correctly
- introduced to the language of algebra as a means for solving a variety of problems.
- by the end of year 6, pupils will be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.

Display and Environment

Where appropriate, children will be exposed to a variety of resources, such as ten frames, Numicon, bar models, place value counters and shapes either in concrete, abstract or in pictorial form. There should be purposeful displays showing strategies to provide evidence to why they have an answer. Vocabulary related to the strand and pertinent to their age range should be on display and referred to consistently.

Roles and Responsibilities

Subject Leaders

The Mathematics subject leaders monitor the way their subject is being taught throughout the school by:

- Work scrutiny
- Learning walks
- Pupil voice
- Lesson observations
- Monitoring of learning environment
- Teacher interviews
- Ensuring that all key documentation, such as assessment, is up to date.

The Mathematics subject leaders have the responsibility for monitoring the way in which resources are stored and managed. North Somercotes CE Primary School works closely with LEAD Teaching School Lincolnshire and the East Midlands Maths Hub in ensuring high quality, up to date relevant CPD and partnership work.

Teaching Staff

All teaching and non-teaching staff will ensure that the school curriculum is implemented in the accordance with this policy.

Staff will ensure there are using the correct mathematical vocabulary for their year group in line with our maths scheme: White Rose. They will be confident with their subject

knowledge and are aware of the expectations of key end points for previous and next year groups and end of key stage requirements as per the White Rose scheme of learning document and yearly overview.

Inclusion:

Further information can be found in our Equality Information and Objectives Statement, and in our SEN policy and information report.

- The school's mathematics curriculum, lessons and materials will support equality of opportunity and an inclusive attitude to all learners. We will ensure that children are provided with a broad and balanced curriculum.
- All pupils will have equal opportunity to reach their full potential across the mathematics curriculum regardless of their race, gender, cultural background or ability. Class teachers will be responsible for planning activities that are differentiated and suitably challenging to meet the needs of all children, enabling access to the study of mathematics.
- We will ensure our Bottom 20% readers are able to fully access all aspects of the Maths curriculum through adapting of resources, additional adult support and other means of quality first teaching support.

Impact:

Mathematics is a subject that we are proud of and its impact can stretch wider when its value is recognised. Our children will leave North Somercotes CE Primary School having a depth of knowledge across all the strands of number, measure, geometry, statistics, algebra and ratio and proportion. They will have learnt knowledge and skills, through high-quality teaching, which can support them through later life. Our children will also be critical thinkers and have the confidence to challenge an idea using arguments of their own using the correct terminology and evidence (concrete, pictorial or abstract) to support their thinking.

We allow the children to let their light shine by showing them real life situations and problems as we know social mobility is low in North Somercotes, so children have the experience of the wider world. We make sure they have opportunities to use their learning experiences and to understand mathematics is not just about knowing times tables, giving our children a 'can do' approach. We encourage resilience when using our mastery approach and let children come to their own conclusions, teaching them that is fine to make a mistake or change their mind now that they have learnt new skills and knowledge.

The children at North Somercotes CE Primary School will have regular opportunities to shine their light through our mastery approach in mathematics, where children are able to use their gained knowledge to make their own informed decisions. From the teaching of mathematics, our children will be able to articulate their findings with precise mathematical vocabulary that they can clearly apply to other areas of life.

Policy Agreed: Summer '23
Policy Review: Summer '26