South Hykeham Community Primary School Maths Curriculum

Expectations

Level Expected at the End of EYFS

In our Foundation Stage, this involves following the 'Statutory framework for the Early Years Foundation Stage', and the following are expected:

- 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.
- Children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built.
- Children develop their spatial reasoning skills across all areas of mathematics including shape, space and measures.
- 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 are not afraid to make mistakes.

More specifically, the Early Learning Goals set out the expectations for the end of EYFS, which are outlined as follows:

ELG: Number

Children at the expected level of development will:

- Have a deep understanding of number to 10, including the composition of each number;
- Subitise (recognise quantities without counting) up to 5;
- Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (including subtraction facts) and some number bonds to 10, including double facts.

ELG: Numerical Patterns

Children at the expected level of development will:

- Verbally count beyond 20, recognising the pattern of the counting system;
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity;
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

Key Stage 1 National Curriculum Expectations

In Key Stage 1, the main focus for the teaching of mathematics 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.

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

By the end of this Key Stage, the children should know their number bonds to 20 and be precise in using and understanding place value. An emphasis on practice to aid fluency is expected at this stage. In addition, the children should read and spell mathematical vocabulary at a level consistent with their word reading and spelling knowledge at Key Stage 1.

The Year 1 and Year 2 specific expectations are outlined in the statutory requirements in the Year group programmes of study in the National Curriculum for England.

Lower Key Stage 2 National Curriculum Expectations

In Years 3 & 4, the main focus for the teaching of mathematics is to ensure that children become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. They should develop efficient written and mental methods and perform calculations accurately, with increasingly large whole numbers.

At this stage, children should develop their ability to solve a range of problems, including with simple fractions and decimal place value. They should be taught to draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. They should also be able to use measuring instruments with accuracy and make connections between measure and number. Furthermore, they should 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, children should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.

The Year 3 and Year 4 specific expectations are outlined in the statutory requirements in the Year group programmes of study in the National Curriculum for England.

Upper Key Stage 2 National Curriculum Expectations

In Years 5 & 6, the main focus of the teaching of mathematics is to ensure that children extend their understanding of the number system and place value to include larger integers. This should develop the connections that they make between multiplication and division with fractions, decimals, percentages and ratio.

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

By the end of year 6, the children should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages. They should read, spell and pronounce mathematical vocabulary correctly.

The Year 5 and Year 6 specific expectations are outlined in the statutory requirements in the Year group programmes of study in the National Curriculum for England.

Intent

Mathematics is essential to everyday life and is critical to most industries and forms of employment. Therefore, at South Hykeham Community Primary School, our curriculum aims to enable children to see the purpose behind their mathematics learning, by embedding their learning in real-life examples and practical activities and using their mathematical skills in a range of subjects. Through this, we aim to ensure that children are able to understand the highly interconnected nature of mathematics and use and apply their mathematical knowledge and understanding across a range of contexts.

Our expectation is that the majority of pupils will be taught the content from their year group with those who are not sufficiently fluent with earlier content, being given opportunities to consolidate their understanding before moving on and those who require greater challenge, being provided with rich and sophisticated problems. Our aim is to ensure that the children spend time becoming masters of the curriculum content, developing a deep and secure understanding and being able to apply and be creative with their knowledge in multiple ways.

We foster positive 'can-do' attitudes towards mathematics and believe that all children can achieve in maths. Our curriculum is broken down into manageable steps in order to help all children experience success in mathematics. We aim to develop a sense of enjoyment and curiosity in mathematics by encouraging children to investigate and make links between concepts and teaching the children that mistakes and misconceptions are opportunities to develop a deeper understanding of mathematical concepts.

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 develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- 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.

Implementation

At South Hykeham Community Primary School, our mathematics curriculum is designed to enable children to build on prior learning and develop mastery of concepts by adopting a spiral approach to teaching the requirements of the National Curriculum Programmes of Study. This spiral approach is laid out in the Year group medium term maps, which set out the Year group statutory requirements into terms so that all of the strands of mathematics - number (including place value, addition & subtraction, multiplication & division, fractions (and decimals and percentages where relevant)), measurement, geometry and statistics – are taught in each term. This allows for strands and concepts to be revisited throughout the year to ensure that children can recap previously learned knowledge, concepts and procedures over time, ensuring that mathematical knowledge becomes deeply embedded in pupils' memories. The progression of objectives across the year, within each strand, has been carefully mapped out so that the knowledge, concepts and procedures are sequenced to enable the children to systematically build on their mathematical knowledge and skills throughout the year. It is also sequenced to enable connections to be made between different mathematical ideas, enabling the children to develop mastery of the subject. Teachers use the school progression maps to enable them to ensure that children have mastery of the previous years' content before moving on to their year group content.

To further support the development of mastery, opportunities for applying mathematical knowledge and understanding are planned into other curriculum subjects, e.g. measuring in D.T., bar charts and tables in Science, ensuring the children are able to use and apply what they know in a broad range of contexts. Opportunities relating to real-life, such as baking, constructing, money etc. are also planned in to encourage our children to see the purpose of mathematics.

At South Hykeham Community Primary School, our medium term maps are used alongside a range of high quality resources such as those created by the NCETM, White Rose and NRich, to plan daily mathematics lessons, which create opportunities to develop fluency, reasoning and problem solving within each session. Each of these sessions is broken down into small steps to support children in developing a deep and secure understanding of concepts. They are given opportunities to embed their learning through independent and collaborative activities and where misconceptions are identified, these are readdressed by supported practice, in order to ensure all children achieve. In order to ensure that all children achieve their mathematical potential, a range of strategies such as: use of scaffolding, additional resources and equipment, adult support, intervention sessions are used to support those children who have SEND and those who are having difficulty securing mastery of a concept. Where children demonstrate mastery of concepts more quickly than others, they are challenged with rich and sophisticated problems, as well as exploratory, investigative tasks, based on their year group objectives.

An emphasis is placed on the use of concrete equipment throughout the year groups, in order to help children develop a secure understanding of concepts and teaching follows Bruner's approach of moving from the concrete to the pictorial, to the symbolic/abstract.

When teaching objectives related to the four number operations (addition, subtraction, multiplication and division), teachers follow the school's calculation policy, in order to ensure that there is a consistent approach across the school and children are able to build on their prior knowledge and understanding. This policy also sets out the key mathematical vocabulary to be used across the four operations, ensuring there is consistency across the school. The use of accurate mathematical language is reinforced throughout the daily maths sessions, with children being given frequent opportunities to use the mathematical vocabulary they have been taught, particularly through reasoning and problem solving tasks. We use the phrase 'SLAM' within our lessons to encourage the children to 'Speak Like A Mathematician'.

In order to increase the opportunities for reasoning and problem solving, our children have a specific problem solving and reasoning session once a week, which may be related to their current learning or provide an opportunity to revisit prior learning. In Key Stage 1, this session is done as a group, where ideas and solutions are mostly presented orally and in Key Stage 2 this is done independently or in small groups and recorded in reasoning books.

As well as a daily mathematics lesson, the children from Years 1 to 6 have a daily 'Fluent in Five' session, which enables them to develop fluency in the use of all four number operations, as well as calculations related to fractions. Through these sessions, children work independently on calculating the answers to the questions and then an emphasis is placed on discussing the range of methods used and evaluating the efficiency of each. These sessions provide valuable opportunities to practise and consolidate calculation methods, improving the children's ability to remember them. Furthermore, to support our children in developing fluency in their times tables, from Year 2 onwards, we use 'Times Tables Rockstars' as an online tool to help children practise their knowledge of these and children take part in national competitions on this platform to encourage and motivate them to improve their fluency.

Teachers use formative assessment on a daily basis to enable them to adjust their teaching and planning accordingly, to ensure that children are able to meet year group expectations. Feedback is given to children to ensure they know the next steps to help them progress and interventions are put in place for those who require it.
'Maths Blasts' are used at the start of topics to ascertain the children's current level of understanding of the previous year's related objectives (as laid out in the progression documents) in order to enable teachers to tailor learning to the children's starting points. 'Maths Blasts' that assess the objectives taught through the topic are then used at the end of the topic to ascertain next steps when the topic is returned to in the spiral curriculum. Summative assessments, in the form of NfER tests, are used termly to monitor children's progress in mathematics and the results of these are analysed by teachers, the subject leader and the Senior Management Team, in order to help track children's progress and determine next steps in learning. Both formative and summative assessments are used to help teachers complete the online assessment tool 'Classroom Monitor', to assess whether children have met year group expectations.

Impact

The children at South Hykeham Community Primary School will be confident mathematicians who have developed a sense of enjoyment and curiosity about the subject. They will understand what a secure understanding of maths can enable them to achieve in their lives and they will be able to apply their knowledge and understanding in a range of contexts. In addition, they will achieve their full potential, having at least met age related expectations by the end of their year group. At the end of KS2, children will be prepared for the next stage of their mathematical learning, moving into KS3. This means that they will be fluent in the fundamentals of mathematics with a conceptual understanding and the ability to recall and apply knowledge rapidly and accurately. They will have the skills to solve problems by applying their mathematics to a variety of situations with increasing sophistication, including in unfamiliar contexts and to model real-life scenarios. Children will be able to reason mathematically by following a line of enquiry and develop and present a justification, argument or proof using mathematical language.

The impact is measured via a range of means including: book scrutinies, lesson observations, learning walks and drop-ins, pupil interviews, discussions with staff, pupil progress meetings and data analysis, which are carried out by the subject leader and/or the S.M.T.