
Mathematics Policy

Spring 2017

Summary

This policy outlines the mathematics procedures for Fieldhead Carr Primary School for classes from FS to Year 6.

Recommendation

Governors are requested to read this policy, consider its content and approve its adoption. This policy should be reviewed as any changes are made.

Author's Role	Assistant Headteacher (Maths)
Date	Spring 2017
Internal Review Date	Spring 2018
Review date	As changes

Purpose of Mathematics

Mathematics is a creative and highly interconnected 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 for financial literacy and most forms of employment. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

Aims

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
- The content and principles underpinning the mathematics curriculum reflect those found in high performing education systems internationally, particularly those of east and south-east Asian countries such as Singapore, Japan, South Korea and China.

The principles and features that characterise this 'mastery' approach are:

Teachers reinforce an expectation that all pupils are capable of achieving high standards in mathematics.

- The large majority of pupils progress through the curriculum content at the same pace. Differentiation is achieved by emphasising deep knowledge and through individual support and intervention.
- Teaching is underpinned by methodical curriculum design and supported by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge.
- Practice and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts in tandem.
- Teachers use precise questioning in class to test conceptual and procedural knowledge, and assess pupils regularly to identify those requiring intervention so that all pupils keep up.

Curriculum design

A detailed, structured curriculum is mapped out across all year groups, ensuring continuity and supporting transition. Effective mastery curricula in mathematics are designed in relatively small carefully sequenced steps, which must each be mastered before pupils move to the next stage.

Fundamental skills and knowledge are secured first. This often entails focusing on curriculum content in considerable depth at early stages.

A coherent programme of high quality curriculum materials is used to support classroom teaching. Concrete and pictorial representations of mathematics are chosen carefully to help build procedural and conceptual knowledge together. Exercises are structured with great care to build deep conceptual knowledge alongside developing procedural fluency. The focus is on the development of deep structural knowledge and the ability to make connections. Making connections in mathematics deepens knowledge of concepts and procedures, ensures what is learnt is sustained over time, and cuts down the time required to assimilate and master later concepts and techniques. Fieldhead Carr Primary also uses 'Maths No Problem' text books which provide a highly scaffolded learning framework with problem solving at its core. The programme encourages extensive practice to develop fluency and mastery, so that every child – across all abilities – can succeed in mathematics

Lesson design

Lessons are crafted with similar care and are often perfected over time with input from other teachers, drawing on evidence from observations of pupils in class. Lesson designs set out in detail well-tested methods to teach a given mathematical topic. They include a variety of representations needed to introduce and explore a concept effectively and also set out related teacher explanations and questions to pupils. Developing number fluency through regular counting is a key component of maths lessons at Fieldhead Carr Primary School, as we appreciate the importance of children having secure number knowledge which includes multiplication facts. Therefore each lesson is structured around a timetable warm up each day, followed by a mental maths input, usually linking to the four operations but can also link to other areas within the mathematics curriculum.

We feel that well-structured reasoning activities, in addition to challenging mathematical problems, will help deepen children's understanding. The first part of the main lesson is always a 'hook; activity, which is an open ended, explorative problem to engage the children's thinking ready for the rest of the lesson. Children are provided with a 'maths jotter book' as well as their traditional maths book. This enables pupils to record freely, pursue lines of enquiry and capture their mathematical thinking.

The EYFS provide a wide range of areas of provision, each promoting learning opportunities across some or all of the areas of experience. Children develop mathematical understanding through spontaneous, adult led and structured activities. In Foundation Stage 2 children are brought together to discuss ideas about numeracy, reasoning and problem solving, and challenges are then put forward for them to pursue in the areas of provision.

Teaching methods

Pupils work on the same tasks and engage in common discussions. Concepts are often explored together to make mathematical relationships explicit and strengthen pupils' understanding of mathematical connectivity.

Precise questioning during lessons ensures that pupils develop fluent technical proficiency and think deeply about the underpinning mathematical concepts. There is no prioritisation between technical proficiency and conceptual understanding; in successful classrooms these two key aspects of mathematical learning are developed in parallel.

Pupil support and differentiation

Taking a mastery approach, differentiation occurs in the support and intervention provided to different pupils, not in the topics taught, particularly at earlier stages. There is no differentiation in content taught as such, but the questioning and scaffolding individual pupils receive in class as they work through problems will differ, with higher

attainers challenged through more demanding problems which deepen their knowledge of the same content. Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with intervention – commonly through the school's 'Same Day Intervention' (SDI). This may take place alongside the teacher within the classroom or through targeted sessions in a smaller group setting often in the afternoon following the morning's maths lesson.

Assessment and Reporting

Assessment is something that continually happens within the classroom, with day to day observations and discussions with pupils often outlining the next steps in learning. Children in years 1, 2, 3, 4, 5 and 6 will sit standardised maths tests in December, March and July. This enables teachers to see how children perform under these types of conditions and also support us in our teacher assessment at that point. Children in years 2 and 6 will complete SAT's tests in May of each year.

Parents will be given a formal report in the summer term on progress so far and will also be informed of the next steps in their child's learning. There are also 2 formal parents' evenings

over the course of the academic year where progress and attainment can be discussed. In addition to this, there is an open morning at the end of each half term 'Fieldhead showcase' where parents can come into school and view their child's work.

Calculation support

Our formal calculation policy links to the concrete, pictorial and abstract method of teaching and ensures continuity in supporting children through their calculations. These documents are used by teaching staff throughout the school and offer guidance for the calculation strategies that are being taught within each year group. As a school we believe that all students, when introduced to a key new concept, should have the opportunity to build competency in this topic by using the CPA approach (Concrete, Pictorial, Abstract).

Concrete – students should have the opportunity to use concrete objects and manipulatives to help them understand what they are doing.

Pictorial – students should then build on this concrete approach by using pictorial representations. These representations can then be used to reason and solve problems.

Abstract – with the foundations firmly laid, students should be able to move to an abstract approach using numbers and key concepts with confidence.