FCVS

Mathematics Policy

May 2021

Introduction

Mathematics is a core subject in the National Curriculum and we use the objectives as the basis for implementing the statutory requirements of the programme of study for mathematics. We firmly believe that all children, given the encouragement, guidance and self-belief can be mathematicians. To that end we follow the principles of teaching for mastery which embeds the core skills in mathematics, alongside providing the practical activities and visual models, which enable pupils to apply their skills and provides the firm foundations for developing mathematical understanding and confidence in the subject.

Principles

The teaching of mathematics is given a high priority as it teaches pupils to make sense of the world through developing their ability to see patterns, to calculate, reason and tackle mathematical challenges. It enables pupils to understand and appreciate relationships and pattern in number in their everyday lives through growing knowledge and understanding. We follow the principles of the five big ideas of teaching for mastery:

Coherence

- Making connections between new concepts and those that have already been understood and ensuring that all steps in learning are small steps that enable children to build their confidence and understanding.

Representation and Structure

- Visual representations and practical resources are used in lessons to make the structure of the mathematical concepts understandable and explainable by the children. The aim being that children will develop a deeper understanding of what is actually happening rather than just learning a process.

Mathematical Thinking

- Mathematical discussions are a key part of developing confidence in mathematics so talking and explaining is expected in all lessons. If taught ideas are to be understood deeply, they must be thought about, reasoned with and discussed with others.

Fluency

- Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics is vital.

Variation

- Varying the way a concept is initially presented to children, by giving examples that display a concept as well as those that don't display it. Also, carefully varying practise questions so that mechanical repetition is avoided and thinking is encouraged.

Teaching and Learning

The Essence of mathematics Teaching for Mastery

• Mathematics teaching for mastery rejects the idea that a large proportion of people 'just can't do maths'.
• All pupils are encouraged by the belief that by working hard at mathematics they can succeed.
• Pupils are taught through whole-class interactive teaching, where the focus is on all pupils working together on the same lesson content at the same time.
• If a pupil fails to grasp a concept or procedure, this is identified quickly and early interventions are put in place to enable pupils to move on.
• Lesson design identifies the new mathematics that is to be taught, the key points, the difficult points and a carefully sequenced journey through the learning. In a typical lesson the teacher leads back and forth interaction, including questioning, short tasks, explanation, demonstration and discussion.
• Procedural fluency and conceptual understanding are developed in tandem because each supports the development of the other.
• It is recognised that practise is a vital part of learning, but the practise used is intelligent practise that both reinforces pupils' procedural fluency and develops their conceptual understanding.
• Significant time is spent developing deep knowledge of the key ideas that are needed to underpin future learning. The structure and connections within the mathematics are emphasised, so that pupils develop deep understanding that can be sustained.
• Key facts such as multiplication tables and addition facts within 10 are learnt to automaticity to avoid cognitive overload in the working memory and enable pupils to focus on new concepts.

White Rose medium term plans are used to ensure progression and the ability to consolidate key concepts to build mastery. Teachers use the learning objectives from the National Curriculum and the progression within the calculation policy to inform their planning of basic arithmetic skills. Teachers plan lessons to enable pupils to use and apply their basic calculation skills across the broad spectrum of mathematical contexts. Throughout the year mathematics is taught through problem solving so that pupils are constantly engaged in using their skills to solve problems and therefore they develop a deeper understanding of how to apply their skills.

As the year progresses pupils develop their skills, understanding and confidence in order to tackle a wider variety of mathematical challenges. Teachers make it explicit to pupils when they are utilising their existing skills and thus help pupils to make the links across the different areas of mathematics. A variety of teaching and learning styles are used in mathematics lessons to develop pupils' knowledge, skills and understanding. We do this through daily lessons that build on existing skills and provide stimulating opportunities for pupils to develop their own mathematical understanding and confidence. Visual models and manipulatives are used to help pupils move from the concrete, through the iconic and to the symbolic representations used in mathematics.

During lessons children are encouraged to ask as well as answer mathematical questions and to discuss and explain their reasoning using mathematical language. Learning walls and resource tables are used to support pupils in their learning and to encourage the pupils' active engagement in their own learning. Children use ICT in mathematics where it will enhance their learning. Wherever possible, we encourage children to use and apply their learning in everyday situations.

Assessment is ongoing, within a series of lessons, through questioning, observations and marking. Teachers are responsive to the progress that pupils make and are able to move them on in their learning at the correct point to facilitate maximum progress. Class teachers plan for the first two days of the week in advance and then plan on a daily basis according to the progress of their pupils.
We provide suitable learning opportunities for all pupils by matching the challenge of the task to the ability of the pupil, through a range of strategies, which include mastery tasks, additional support in interventions or by organising children to work in pairs on open-ended problems or games.

In Nursery and Reception, work relates to the objectives set out in the EYFSC. All pupils have ample opportunity through play, focus groups and whole class activities to develop understanding of number, measurement, pattern, shape and space and allow them to enjoy, explore, practise and talk confidently about mathematics.

Inclusion and equal opportunities

Mathematics forms part of our policy to provide a broad and balanced education to all pupils. We plan lessons to provide learning opportunities that enable all pupils to make progress by setting suitable learning challenges and responding to each child's different needs. Assessment against the NC allows us to consider each pupil's attainment and progress against expected objectives.

When progress falls significantly outside the expected range, pupils are targeted and given specific support through interventions such as Numbers Count, 1stclass@number1, 1stclass@number2 and Number Sense. Our assessment process looks at factors such as classroom organisation, materials, teaching styles and differentiation, in order to take additional or different action to enable children to learn more effectively. This ensures that teaching is matched to the needs of all pupils.

Children new to English can, with support, often attain very well in mathematics. Explicit teaching of mathematical vocabulary is vital to support the development of first and second language learners alike, teachers need to pre-teach mathematical vocabulary. EAL children need to receive extra support in understanding the vocabulary surrounding mathematical word challenges.

Assessment and Record Keeping

Ongoing formative assessment enables teachers to adjust daily plans and match teaching objectives and success criteria to needs. Assessment includes verbal feedback to guide progress, recorded responses through marking, observations and encouragement of pupils to make judgements about how they can improve their strategies. End-of-year assessments are used to inform planning and interventions and information is passed onto future teachers at the end of the year to ensure a smooth transition which enables teachers to maximise progress. In Years 2 and 6 there are statutory national tests and in Years 3, 4 and 5 summative assessments are used to gauge progress and attainment. Results are analysed to identify weaknesses to be addressed in future teaching.

Health and safety

It is the responsibility of all staff to monitor safety and report any issues to the Headteacher and site manager immediately. Risk assessments are carried out prior to any activity which presents unfamiliar challenge and for visits off-site in order to ensure safety of all pupils and staff.

Resources

The teaching of mathematics across the school is well resourced. All classrooms have number lines, appropriate small apparatus including; numicon, dienes, place value counters and cuisenaire. The library contains books to support children's individual research and includes mathematical stories. A range of mathematics software is available. MyMaths is available to all pupils from Year 1 to Year 6, which they can access at home to complete homework. Time Tables Rockstars is used from Year 3 to Year 6 to help pupils develop their times tables knowledge and fluency.

Guidelines - See separate policies for 'Calculations', 'Presentation' and 'Feedback and marking.'

Written - Signed and dated

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Ratified - Signed and dated