MATHEMATICS GUIDELINES (CURRICULUM)

Reviewer: Lisa Todd

Updated: October 2022

Review: Autumn 2024

Introduction

These guidelines outline the purpose, nature and management of the teaching and learning of mathematics. The implementation of these guidelines is the responsibility of all the teaching staff and will be monitored by the Headteacher.

Intent

Mathematics is about expressing relationships and ideas in numerical, graphical, symbolic, verbal and pictorial forms. The context for mathematics lessons is practical and linked with real life to allow the children to make rich connections.

Children are taught to become fluent in the fundamentals – the rapid mental recall of number patterns and relationships drawing on knowledge of place value, number bonds and times tables.

Children, as mathematicians, are taught to use the language of mathematics to reason – to make conjectures and generalisations, to develop arguments and to persevere in seeking solutions to prove their ideas.

They are also taught to solve increasingly sophisticated problems and puzzles as they grow older using logic and algebra to express many possibilities.

Aims

Our chief aims in teaching mathematics are that all children will:

- build upon positive attitudes towards mathematics and see mathematics as a language used to express sets of connected ideas;
- develop conceptual and procedural fluency through varied, frequent practice, using manipulatives where they support the learning;
- grow as mathematical thinkers, including reasoning, justifying and proving their ideas; and
- persevere in seeking solutions for routine and non-routine problems.

Our overriding aim is that Whitegrove children are inspired, curious mathematicians, who use a collaborative approach to investigate and endeavour to resolve unforeseen, real life challenges.

National Curriculum

At Key Stages 1 and 2, schemes of work are planned in accordance with the requirements stated in the National Curriculum document. Cross-curricular links are explored where appropriate, including the use of ICT to access, organise and present information.

Planning and Teaching methods

Medium term planning is set out within Active Learn Abacus; these plans are modified by staff, if necessary, to meet the particular needs of their teaching group. The core material details the focus of each lesson, main teaching and learning activities and assessable outcomes. They also detail opportunities for deepening each child's learning within teaching units and scaffolding learning for children who require more security.

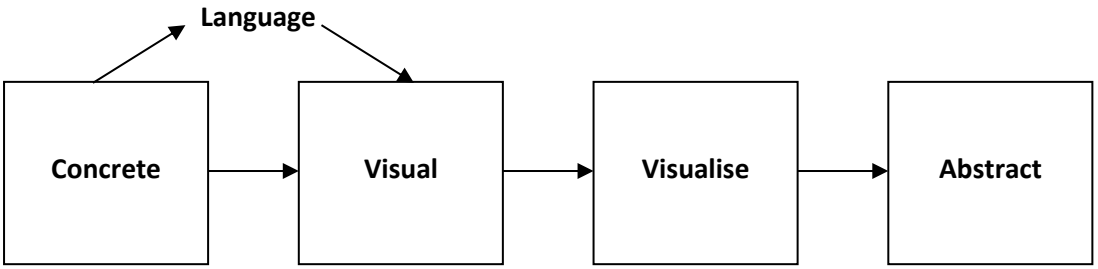
Within the main activity, teachers use many strategies such as demonstration, explanation and direct instruction. Whenever possible, the whole group is kept working at the same pace, usually interactively, and scaffolding and challenge are provided through carefully planned teacher questioning.

The types of mathematical experiences offered to the children enable every child to reach their full potential through experiencing enriching, open-ended learning. Children have opportunities to engage in investigations, practical tasks, games and computer programs.

They are also encouraged to select and use a variety of mathematical equipment (e.g. Numicon, dienes, place value counters, number lines) and, when appropriate, use our school environment and the surrounding area as a mathematical resource.

Quality models and images are used to support children's concept development from concrete through to the abstract. In approaching new learning, children initially use resources to model number relationships like Numicon, dienes and place value counters. This progresses to the children visualising models and images which also support their reasoning and problems solving.

Concrete apparatus continues to be used to ensure secure understanding and support children in learning new methods throughout the school. Some of these are exemplified within the Calculation Guidelines.



The organisation within the classroom enables children to:

- work independently to develop their own strategies;
- work in small groups to share experiences and value the ideas of others;
- take part in whole class discussion and activities;
- have free access to resources at all times; and
- develop autonomy by enabling them to develop individual problem-solving strategies.

Children are given opportunities to:

- discuss their mathematical thinking with others using appropriate mathematical language;
- gain a sense of the size of a number and where this fits into the number system;
- learn important number facts by heart, such as number bonds and multiplication tables;
- apply known facts to calculate answers mentally;
- calculate accurately and efficiently, using both mental and written methods;
- make sense of number problems, recognising the operation(s) needed to solve them;
- explain their thoughts using the correct mathematical terms;
- check the reasonableness of their answers;
- suggest suitable units and equipment for estimating and measuring quantities;
- explain and make predictions from numbers in graphs, charts, tables and diagrams.

Children are taught to record their work in a well-organised and increasingly systematic form. They are encouraged to develop their own methods of recording the results of problems, puzzles and investigations, to show their individual thought processes. Similarly, they are encouraged to adopt methods of recording, which are appropriate to the activities being undertaken.

Work is recorded in books of plain or squared paper, according to the age, ability of the child and the appropriate recording method for the task or investigation.

Mathematical discussion forms an integral part of lessons as it gives children the chance to express their thinking in their own words. This is facilitated through enriching class and individual discussions.

Implementation

Progression for all pupils

At Whitegrove, we provide a broad and balanced curriculum for all our pupils. We recognise the fact that there are children of widely different abilities and varying needs in all classes, and we provide suitable learning opportunities for all children by differentiating activities within Mathematics to ensure that the specific needs of individual children are best met. Children are encouraged and supported to develop their skills in this subject.

We achieve this by:

- responding to pupils' diverse learning needs;
- setting tasks which are open-ended and can have a variety of responses;
- setting tasks of increasing difficulty;
- providing resources of different complexity, according to the ability of the child;
- using classroom assistants to support the work of individual children or groups of children.
- increasing both the degree of skill (e.g. handling documentary evidence) and knowledge and understanding.

- This means asking and answering increasingly challenging questions and presenting arguments of growing maturity and complexity based on more advanced collection and interpretation of evidence.

Mathematics is taught in ability sets from Year 3 onwards. This allows for scaffolding to support those children establishing understanding of a new concept and challenge for those children who are ready to deepen their understanding.

All children will be taught the curriculum for their year group. The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace.

Impact

Assessment

Children's progress in Mathematics is assessed against the Age Related Expectations. These describe the types and range of performance that the majority of pupils should characteristically demonstrate, having been taught the relevant programmes of study.

The role of the Mathematics Lead(ers)

The Mathematics Lead(ers) is / (are) responsible for:

- Supporting and working with colleagues and keeping them informed of changes and developments within their subject.
- Monitoring the relevance, continuity and progression of the mathematics curriculum throughout the school and recommending any action needed.
- Providing advice about the mathematics and calculation policies and schemes of work.
- Keeping, updating and extending resources, ensuring staff are aware of their availability and identifying future needs.
- Keeping own skills and knowledge up to date through reading and attending relevant courses and by developing links with sources of expertise and information beyond the school.