HIGHLANDS PRIMARY SCHOOL

Mathematics Policy

Introduction

This policy outlines the aims, organisation and management for the teaching and learning of mathematics at Highlands Primary School. Mathematics is a life skill. It is an essential element of communication, widely used in society, both in everyday situations and in the world of work. "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" (National Curriculum 2014).

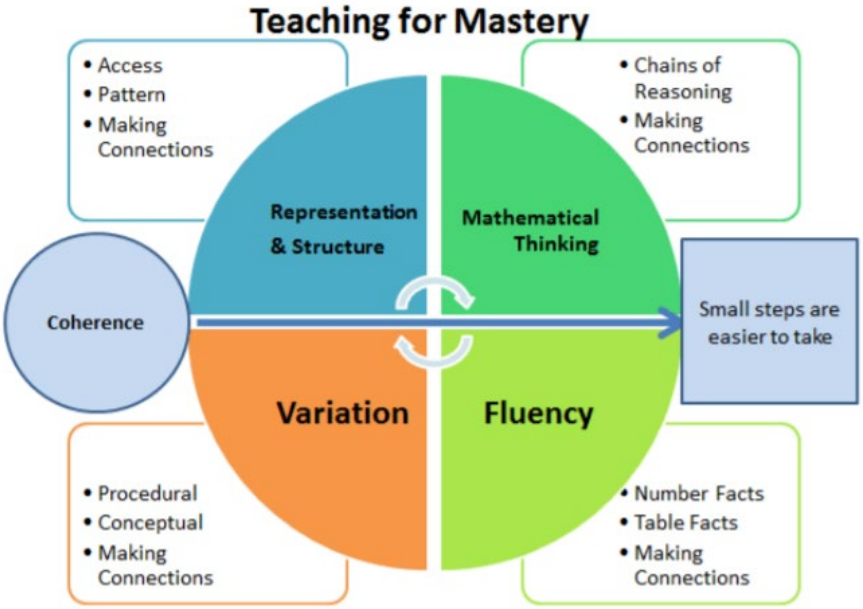
Intent

The National Curriculum (2014) 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 have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems
- 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 Maths Curriculum at Highlands follows a Teaching for Mastery Approach. At the centre of our maths vision is the belief that all children have the potential to succeed. We believe that all children, where possible, should have access to the same curriculum content and should deepen their conceptual understanding by tackling challenging and varied problems.

The principles of a Teaching for Mastery Approach are:



Coherence	Representation and Structure	Mathematical Thinking	Fluency
Lessons are broken down into small, connected steps that gradually unfold the concept, providing access for all children and leading to a generalisation of the concept and the ability to apply the concept to a range of contexts.	Representations used in lessons expose the mathematical structure being taught, the aim being that students can do the maths without recourse to the representation.	If taught ideas are to be understood deeply, they must not merely be passively received but must be worked on by the student: thought about, reasoned and discussed with others.	Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics.

Variation
Variation is twofold. It is firstly about how the teacher represents the concept being taught, often in more than one way, to draw attention to critical aspects, and to develop deep and holistic understanding. It is also about the sequencing of the episodes, activities and exercises used within a lesson and follow up practice, paying attention to what is kept the same and what changes, to connect the mathematics and draw attention to mathematical relationships and structure.

Our intent focuses on equipping all pupils with the mathematics they need to master the curriculum for each year group, which requires that all pupils:

- recall key number facts with speed and accuracy and use them to calculate and work out unknown facts;
- develop their ability to apply mathematical skills with confidence and understanding when solving problems.
- apply 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
- express themselves and their ideas using the language of mathematics with assurance.
- have sufficient depth of knowledge and understanding to reason and explain mathematical concepts and procedures and use them to solve a variety of problems.
- develop positive attitudes to mathematics, recognising that mathematics can be both useful and enjoyable.
- nurture a fascination and excitement of mathematics
- are able to use and apply the skills in other curricular areas.

Our expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of the pupil's understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content. Those children who are not sufficiently fluent with earlier materials should consolidate their understanding, including through additional practice, before moving on.

Implementation

Organisation

- A daily mathematics lesson of 45-60 minutes is taught from Year 1-6.
- Retrieval practice is provided at the beginning of daily lessons allowing children the opportunity to rehearse previous skills.
- To secure fluency facts, mastery number is taught daily, four times a weeks in years 1, 2, 4 and 5.
- In EYFS, pupils experience mathematics on a daily basis through mastery numbers, directed tasks and child initiated play. Opportunities for mathematics should be developed through daily routines and all areas of learning.

Key principles of a lesson

- At the beginning of each lesson, children should have the opportunity for retrieval practice, making connections and/or rehearsal of number and times table facts.
- At the beginning of each lesson, a review may take place to address any whole class misconceptions from the previous lesson or revisit prior learning.
- New concepts are introduced using a CPA approach. Guided examples are provided for reinforcement.
- Representations used in lessons expose the mathematical structure being taught.
- Stem sentences are used to allow learners to verbalise their mathematical thinking, using the correct mathematical vocabulary.
- Misconceptions are planned for and addressed within the main teaching.
- Pupils work through well-structured tasks, which consolidate the concepts, problem solving and reasoning which has taken place in the lesson. Questions include mathematical variation- they are designed to extend pupil's thinking rather than just being lots of examples presented in the same kind of way.
- Although children are expected to use formal written methods, the teaching should allow children to select the most efficient method.
- The level of challenge should not move children onto the next year group's curriculum in their learning; it should widen the breadth and depth of the knowledge to ensure mastery across different contexts in real life.

Teaching strategies

In order to provide the children with active and stimulating learning experiences, a variety of teaching and learning opportunities are adopted:-

- Children may work individually on a task, in pairs or in a small group, depending on the nature of the activity.
- Wherever possible, practical 'real' activities are used to introduce concepts and reinforce learning objectives.
- Opportunities to transfer skills learnt, to real situations, are used whenever possible.
- Activities are planned to encourage the full and active participation of all pupils.
- Teachers use carefully planned questions throughout the lesson in order to meet the needs of all children.
- A CPA approach is utilised in all year groups, all classes have access to a range of mathematical manipulatives to support learning and understanding.

- Teachers place a strong emphasis on correct use of mathematical language; this is supported by key vocabulary being displayed. Stem sentences are used and modelled during whole class input.
- Teachers value pupils' oral contributions and create an ethos in which all children feel they can contribute.
- Reasoning and problem solving skills are taught explicitly by teachers as part of maths lessons in order to model the use of correct mathematical vocabulary.
- Children in EYFS use numberblocks to support their knowledge of number through the mastery number problem.

Curriculum Planning

Long term planning

Long term planning is based on the White Rose Maths resources. All mathematical topics will be taught in blocks so that children can master each mathematical concept and apply it across a range of contexts.

Medium term planning

Teachers will use the White Rose small steps which use the National Curriculum to teach sequences that build learning over time. The emphasis is to develop a sequence of teaching and learning that encompasses the cycle of assess, plan, teach, practise, apply, and review through every unit. A strong emphasis on using and applying including reasoning in mathematics is embedded within the curriculum.

EYFS

The mathematical work undertaken within the Foundation Stage is guided by the requirements set out in the Early Years curriculum and the revised framework document. All children are given opportunities to develop their understanding of mathematics through varied activities that allow children to use, enjoy, explore, practise and talk about mathematics. Pupils explore the 'story' of numbers to ten and the development of models and images for numbers as a solid foundation for further progress. Mastery number is used in EYFS to support planning.

Impact

Assessment

Day-to-day assessments

As part of the ongoing teaching and learning process, teachers will assess children's understanding, achievement and progress in mathematics during the lesson and when their work is marked. Teachers will make use of questioning at different stages of pupil's learning, including prior to a unit beginning to identify misconceptions, during a unit of work to check these have been addressed and also at the end. Any children who have not met the learning objective, will be identified and adaptation to planning will be made for the following day addressed these gaps and consolidate learning.

Learners will also be taught to assess and evaluate their own achievements by recognising successes, learning from their own mistakes and identifying areas for improvement. In KS2, children will self-mark and self-edit their work to unpick misconceptions.

Summative assessments

Summative assessments are carried out termly in years 1 to 6. This enables attainment to be tracked and will inform provision maps and planning. Gap analysis will be carried out and used to inform planning. White Rose end of units assessments will also be used for those children who are ready in order to assess and review pupils' progress and attainment at the end of each unit.

Teachers are involved in moderation of mathematics in the following ways:

- With colleagues in school during year group meetings
- With colleagues in school during professional development meetings.

Environment

It is important that both the whole school and classroom environment supports both the learning and teaching of mathematics. The school aims to provide a mathematically stimulating environment:

- through the use of working walls to support learning and teaching in a lesson or series of lessons.
- through interactive displays that promote mathematical thinking and discussion
- through displays of pupils' work that celebrate achievement, including WAGOLLs ('What a good one looks like')
- by providing a good range of resources and manipulatives for teacher and pupil use. In every classroom, resources such as number lines, hundred squares, place value counters, double-sided counters, place value charts and multiplication squares are displayed as appropriate and used for whole class or individual work. Children are encouraged to access these independently.

See appendix A for a list of the year group specific expectations.

Homework

We recognise the importance of making links between home and school and encourage parental involvement with the learning of mathematics. Homework provides opportunities for children:

- to practise and consolidate their skills and knowledge of mental arithmetic methods;
- to share their mathematical work with their family;
- to prepare for their future learning.