Mathematics

Intent

At Holland Moor we want our children to become data analysts, chartered accountants, astronomers, engineers and bankers. At Holland Moor we understand maths is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. We want our children to be excited about using maths to solve intriguing problems. We aim to provide a high-quality mathematics curriculum that will provide 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. We aim to give our pupils opportunities to 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. We want every child at Holland Moor to be experts at reasoning mathematically with accurate use of mathematical language to provide justification or proof. Our curriculum allows pupils to solve problems by applying their mathematics to a variety of routine and nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions. We aim to encourage resilience, adaptability, and acceptance that struggle is often a necessary step in learning by providing appropriate challenge.

Implementation

Mathematics at Holland Moor is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas.

- The units of study are, by necessity, organised into apparently distinct domains, but pupils are given many opportunities to make rich connections across mathematical ideas to develop fluency, mathematical reasoning, and competence in solving increasingly sophisticated problems.

- There are chances to apply mathematical knowledge in other subjects including Science, Geography, History, Design Technology and Computing.

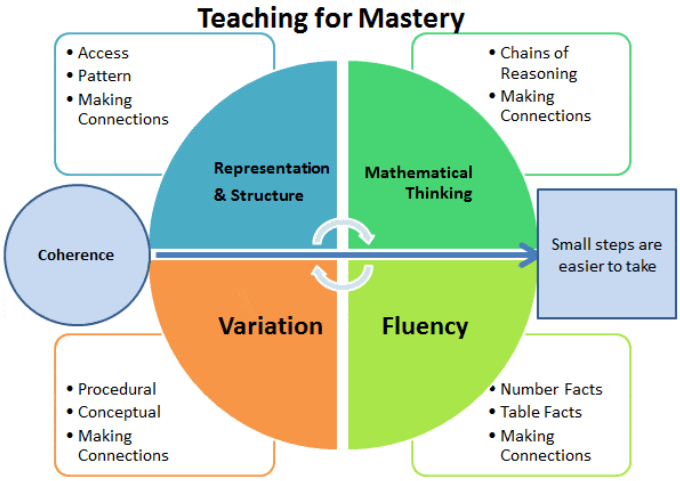
- At each Key Stage, the expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems to deeper understanding, not be accelerated through new content. Those who are not

sufficiently fluent with earlier material should consolidate their understanding, with additional practice, before moving on.

- At Key Stage1 and Key Stage 2a we follow a mastery approach to teaching maths by delivering the Red Rose Lancashire Maths Scheme.

- The scheme focuses on the 5 big ideas in teaching for mastery:

  - Coherence
  - Representation and Structure
  - Mathematical Thinking
  - Fluency
  - Variation



- When teaching for mastery we ensure six core elements are included in each unit of work:

  1. Diagnostic pre-assessment with pre-teaching
  2. High-quality, group-based initial instruction
  3. Progress monitoring through regular formative assessment
  4. High-quality corrective instruction
  5. Second, parallel formative assessment
  6. Enrichment or extension activities (deeper learning)

Mathematics

In KS2B, in order to ensure consistency across phases we use Lancashire maths planning. An abstract approach is used which builds on skills and learning from previous years.

- Pre-teaching new key vocabulary takes place prior to our Maths lessons. This technique facilitates the understanding of new words by giving our pupils their meanings before they encounter them. This practice reduces cognitive load and facilitates learning.

- Teachers use highly effective techniques to check for understanding, including signal it, choose it and summarize it in each lesson to ensure misconceptions are highlighted and addressed with immediate intervention.

- Teachers use precise questioning in class to test conceptual and procedural knowledge and assess children regularly to identify those requiring intervention, so that all children keep up. Children's explanations and their proficiency in articulating mathematical reasoning, with the precise use of mathematical vocabulary, are supported with teachers placing a strong emphasis on the correct use of mathematical language.

- Our teachers use many effective modelling techniques such as my turn, our turn, your turn, live modelling and direct instruction to ensure their children have an enhanced learning process. During these instructional strategies our teachers simultaneously describe what they're doing and why they're doing it. They are interactive processes that, through structured guided practice, makes concepts more accessible and foster positive pupil outcomes.

- Teachers use a concrete, pictorial, abstract (CPA) approach to teaching which is highly effective in developing a deep and sustainable understanding of maths in pupils. The CPA approach builds on children's existing knowledge by introducing abstract concepts in a concrete and tangible way. It involves moving from concrete materials to pictorial representations, to abstract symbols and problems.

- All children have access to a kit box filled with a variety of concrete resources to aid understanding. Kits vary depending on year group.

- Our children are provided with various types of scaffolding depending on task and need. Scaffolding helps them to systematically build their knowledge base and supports their learning, allowing them to gain confidence when performing tasks independently. Scaffolding might include a set success-criteria or breaking learning down into manageable chunks.

- To support children in their ability to know more and remember more, we provide regular opportunities to review prior learning from previous lessons and even previous units of work through a variety of retrieval activities.

Mathematics

- *In order to advance individual children's mathematics skills in school and at home, we utilise both Number Bots and Times Tables Rock Stars (TTRS) for multiplication practice, application and consolidation.*

- *We continuously strive to better ourselves and frequently share ideas and things that have been particularly effective. Continuous professional development (CPD) is provided in the form of staff meetings, team teaching, reflective discussions with colleagues, and observing good practice.*

Impact

At Holland Moor, children talk enthusiastically about their mathematics lessons and speak about how they love learning about mathematics. They can articulate the context in which mathematics is being taught and relate this to real-life purposes. Children show confidence and believe they can learn about a new mathematics area and apply the knowledge and skills they already have.

Pupils know how and why mathematics is used in the outside world and in the workplace. They know about different ways that mathematics can be used to support their future potential. Mathematical concepts or skills are mastered when a child can show them in multiple ways, using the mathematical language to explain their ideas, and can independently apply the concept to new problems in unfamiliar situations. Children demonstrate a quick recall of facts and procedures including the recollection of the times tables.

Mathematics

Pupils use acquired vocabulary fluently in mathematics lessons. They have the skills to use methods independently and show resilience when tackling problems. The flexibility and fluidity to move between different contexts and representations of mathematics. Children show a high level of pride in the presentation and understanding of the work. The chance to develop the ability to recognise relationships and make connections in mathematics lessons. Teachers plan a range of opportunities to use mathematics inside and outside school. Links are also made with high schools in order to prepare the children for the next stage of their education.

All children secure a long-term, deep and adaptable understanding of mathematics which they can apply in different contexts.

Holland Moor's Maths journey has a positive impact on our children leading to outstanding progress over time across key stages, relative to a child's individual starting point. Children are confident and competent mathematicians who can proficiently articulate reasoning for their solutions. They are excited about developing a foundation for understanding the world and show an appreciation of the beauty and power of mathematics, with a sense of enjoyment and curiosity about the subject. Children will therefore be expected to leave Holland Moor reaching at least age-related expectations for Maths.