

Subject Rationale - Mathematics

Purpose of study

Mathematics is a creative and highly inter-connected 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 nonroutine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

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 before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

Intent

We strive to ensure that all children can achieve and have success within the three key aims from the 2014 National curriculum for mathematics. At Landscape, these skills are embedded within maths lessons and developed consistently over time. We want all children to enjoy mathematics and to experience success in the subject, both independently and as part of a collaborative team. Using the mastery approach, we believe that all children are capable of achieving highly in mathematics. The five big ideas of coherence, representation and structure, mathematical thinking, fluency and variation underpin our maths curriculum and help children explore and demonstrate mathematical ideas, enrich their learning experience and deepen understanding.

A high-quality mathematics education at Landscape, therefore provides the children with 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.

Implementation

- At Landscore, maths is taught on a daily basis following the national curriculum. We use White Rose Schemes of Work flexibly to support teachers with their planning and assessment.
- Alongside daily maths sessions, an additional 15 minutes three times a week is spent focusing on No Nonsense Number Facts to build fluency and precision of the four operations and to think about numbers in a different way.
- The calculation policy is used within school to ensure a consistent approach to teaching the four operations over time.
- At the start of each new topic, key vocabulary is introduced and revisited regularly to develop language acquisition, embedding as the topic progresses.
- All lessons begin with a short review to help develop long-term memory.
- Children are taught through clear modelling and have the opportunity to develop their knowledge and understanding of mathematical concepts. The mastery approach incorporates using objects, pictures, words and numbers to help children explore and demonstrate mathematical ideas, enrich their learning experience and deepen understanding at all levels.
- Reasoning and problem solving are integral to the activities children are given to develop their mathematical thinking.
- Resources are readily available to assist demonstration of securing a conceptual understanding of the different skills appropriate for each year group. We ensure all children use concrete manipulatives regularly to allow for exploration and to develop a deep understanding.
- Children are encouraged to explore, apply and evaluate their mathematical approach during investigations to develop a deeper understanding when solving different problems / puzzles.
- A love of maths is encouraged throughout school via links with others subjects, applying an ever growing range of skills with growing independence.
- Children with additional needs are included in whole class lessons and teachers provide scaffolding and relevant support as necessary through interventions. For those children who are working outside of the year group curriculum, individual learning activities are provided to ensure their progress.

Impact

Landscore has a supportive ethos and our teaching and assessment approaches support the children in developing their collaborative and independent skills as well as strategies to move forward in their learning. Throughout each lesson, formative assessment takes place and we try to ensure feedback is given to the children to ensure they are meeting the specific learning objective.

- Children demonstrate a quick recall of facts and procedures.
- Children show confidence in believing that they will achieve.
- Each child achieves objectives (expected standard) for their year group.
- Children develop the flexibility and fluidity to move between different contexts and representations of maths.
- Children are able to recognise relationships and make connections in maths.
- Mathematical concepts or skills are mastered when a child can show it in multiple ways, using the mathematical language to explain their ideas, and can independently apply the concept to new problems in unfamiliar situations.
- Children show a high level of pride in the presentation and understanding of the work.