Barnfields Primary School: Mathematics Subject Rationale

Mathematics Subject Quest at Barnfields:

Discover the properties of different relationships and to explain universal truths from a very basic set of commonly accepted belief system of numbers and symbols.

Knowledge Types in Mathematics

Declarative	Procedural	Conditional
		

Mathematics Intention

At Barnfields Primary School, we believe that children deserve an ambitious mathematics curriculum that prepares them for everyday life and future employment. Our mathematics curriculum adopts the mastery approach, enabling the children to acquire a deep, long term, secure and adaptable understanding of the subject. The curriculum focuses on the fundamentals of number, geometry, measurement and statistics.

Our mathematics curriculum will give children the opportunity to become fluent in the fundamentals of mathematics. They are taught to reason mathematically by following a line of enquiry, finding connections and establishing relationships whilst using mathematical language. Children are taught to 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.

Provision, Planning and Delivery

Provision

We bring our vision for Mathematics to life by:

- Ensuring all teaching and learning is underpinned by the belief that all children are capable of being successful Mathematicians and this is not something that is pre-determined.
- Following the National Curriculum for Maths from Reception- Year 6. We supplement this by using White Rose to provide the structure and coverage in each year group allowing time to revisit concepts when required.
- Prioritising the teaching of fluency, reasoning and problem solving in our daily Mathematics lessons.
- Providing a wide range of manipulatives in all classes to ensure children have fully understood a concept at the concrete stage before introducing the pictorial and abstract representation.
- Carefully exploring misconceptions allowing children to recognise that making mistakes is a powerful way to learn in Mathematics and not something to be afraid of.

- Encouraging our children to be clear communicators in Mathematics by building in regular opportunities for children to discuss, explore and reason about a concept.
- Reinforcing fluency in number through the use of the Mastering Number programme in EYFS and KS1; prioritising this further in KS2 through the allocation of dedicated sessions to practice and embed times tables.
- Promoting the use of mathematical vocabulary when exploring the various components of Mathematics
- Adapting teaching and learning opportunities to ensure all children move along their mastery journey with an appropriate level of support and challenge

Planning

At Barnfields Primary School, we follow the National Curriculum for Mathematics to ensure all children have access to appropriate age-related knowledge and skills. We are then further assisted by the White Rose Scheme of Learning to future guide and support teaching practice and pedagogy from Reception to Year 6.

The long-term plan consists of unit blocks where children explore and deepen their understanding around one unit. Depending on the unit, these blocks can range from one week to five weeks. This ensures children build on their foundational understanding of *Number and Place Value, Addition and Subtraction, Multiplication and Division, Fractions, Measurement, Geometry and Statistics*.

White Rose is based on the mastery approach which is used successfully in many countries (such as Singapore) and carefully sequences concepts and procedures into small steps to build mathematical knowledge and skills systematically over time. There is a distinct focus on number work. Children who have an excellent grasp of number make better mathematicians. Spending longer on mastering key topics will build a child's confidence and help secure understanding. We also carefully build in regular opportunities for retrieval to ensure content is frequently revisited enabling it to become securely embedded to build on in future learning. In addition to the daily Maths lesson, learners complete daily 'Flashback4' questions to ensure robust knowledge through spaced practice to ensure fluency of calculation skills at an age appropriate level.

Our Mathematics curriculum is broken down into small, manageable steps that all children work on in class together. Those that need any extra support are provided with extra scaffolding through the use of modelling, resources and adult support. For those that require more challenge, we provide rich tasks and deeper problems to build a more profound understanding throughout the lesson. The scheme interleaves prior content with new concepts. This helps children make links between topics, understand them more deeply and secures knowledge ready to build on future learning.

Delivery

The children have a daily Mathematics lesson, and in addition, extra time is dedicated to enhancing number fluency through the Mastering Number program in EYFS and KS1, as well as improving Times Tables fluency for students in Years 3 to 6. Where required, we also deliver a range of other interventions to ensure our learners are fully secure in their acquisition of number these include: The Power of 2 and 3, securing number bonds and times tables as applicable.

Progression

At Barnfields, we ensure progression in Mathematics education by having designed a curriculum that builds children's knowledge systematically over time. We understand that progression means children 'knowing more, remembering more', and being able to apply this knowledge both successfully and independently. To achieve this, we carefully sequence learning so that children develop **declarative, procedural and conditional knowledge** in a structured way.

Our goal is to ensure that over time all children have developed the knowledge and skills to be accomplished mathematicians.

To support this, we plan our curriculum so that each new concept builds on prior learning. We make sure children have strong foundations by teaching essential knowledge in a clear and coherent way. Our whole-school Barnfields Calculation Policy works in tandem with the White Rose Scheme of learning which heavily advocates the use of the Concrete, Pictorial and Abstract (CPD) method to support and enhance the mathematical opportunities we provide at Barnfields. This ensures learners are initially introduced to a concept through the use of concrete resources e.g. place value counters, they then begin to represent these pictorially themselves and finally once the concept is understood use the abstract (e.g. numerals) to effectively communicate the Maths involved. Staff are aware this is not a linear approach and move between the three stages as required. This ensures a real depth of understanding for all learners.

Practice is a key part of our approach. We build in regular opportunities for children to revisit and refine skills, ensuring they have time to master techniques before applying them in new and more complex contexts.

Assessment, Recording and Reporting

Assessment

Children are assessed both formatively and summatively throughout the academic year. Much of this assessment takes place in class through the use of oral questioning, written examples and activities carefully designed for our pupils. This allows our teachers to make informed judgements about each child's attainment and progress within Mathematics and inform their future teaching accordingly.

In addition to this, the children also complete government standardised assessments in the Summer Term of Year 2, Year 4 and Year 6. In Year 2, the children sit one Arithmetic and one Reasoning paper and these test the content of the Mathematics curriculum covered throughout KS1. In Year 6, the children sit a total of three papers, Paper 1 being arithmetic based and Papers 2 and 3 having a Reasoning focus. Similarly, the papers are designed to test the content of the whole KS2 Mathematics curriculum. In both year groups the children are then assessed as either working towards the expected standard, working at the expected standard or working above the expected standard. In Year 4, the children completed the Multiplication Tables check. This is an online assessment where children are required to recall their times tables at speed (they have 6 seconds to answer each question) up to 12 x 12. There is no pass mark for this assessment.

We also use standardised testing throughout the school. From Years 1-5 we have implemented the use of NTS Mathematics assessments. These are completed termly by the children and are split into three papers: Paper 1 being arithmetic-based and the Papers 2 and 3 having a reasoning focus. The data of each child is then entered into an analysis programme called Boost Insights which allows teachers to analyse the performance of each child as well as their class. They then use this information to support both individual and class progress and attainment.

Recording

Maths learning is documented in children's personal maths books, which are marked after each lesson by the child's class teacher. This allows the teacher to plan in individual and collective next steps in learning and to adapt their learning journey as required. To further support this, we also use White Rose unit tests as both pre-assessment markers to ensure our coverage of the unit is cohort-specific and end of unit to allow gap analysis to take place and

ensure opportunities to close these are built into future teaching and learning. Learning is recorded in pencil using squared paper to promote good mathematical organisation.

Reporting

Teachers upload pupil attainment data onto Sonar at the end of each half term, determining if a child is either working towards age-related expectation, at age-related expectation or exceeding age-related expectation. The aim of this assessment is to provide an evaluation of how much knowledge pupils have learned and remembered and how proficient they are as mathematicians. Teachers also assess each child against a series of National Curriculum objectives allowing them to identify gaps in learning and act to close these. They enable leaders to monitor the attainment and progress in Maths for learners across the school and to act accordingly on any issues highlighted as a result of this.

Children's progress in Maths is formally communicated to parents termly through Parent Data sheets and end of year reports. Additionally, updates are discussed at Parents Evening twice a year.

Supporting Research:

Ofsted (2023) Co-ordinating Mathematical Success: The Mathematics Subject Report
Ofsted (2021) Research Review Series: Mathematics