



# HAYFIELD LANE PRIMARY SCHOOL

## MATHEMATICS POLICY

HAYFIELD LANE... BUILDING CRITICAL THINKERS OF THE FUTURE, WITH A ZEST FOR LIFE-LONG LEARNING, WHO SHARE COLLECTIVE RESPONSIBILITY AS ACTIVE AND EQUITABLE CITIZENS

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## Rationale

At Hayfield Lane Primary School we are committed to ensuring that children have a positive and meaningful experience of mathematics throughout the school. We offer a curriculum that secures essential knowledge and skills whilst giving the children many opportunities to use and apply their mathematical skills across the curriculum, through real life problem solving and mathematical investigations.

Maths in Key Stages 1 and 2 is a subject which involves confidence and competence in the areas of number, measurement, geometry and statistics and this is built on from secure foundations that are made in EYFS. This Mathematics Policy values underpinning mathematical learning by providing a balance between conceptual understanding and procedural fluency in order to develop arithmetic proficiency. It supports the ability to solve problems in a variety of mathematical contexts.

We recognise that these are fundamental necessities for children to be able to fulfil their potential in their early academic lives and in society as a whole, allowing them to meet challenges equipped as numerate individuals. In early years and primary education, we supply the foundations for everything that will follow.

## 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 non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

### ***Engage. Explore. Succeed***

*At Hayfield Lane Primary we believe that maths is an adventure for children (and adults) to engage with, explore and succeed in mathematics.*

We use a whole-class mastery programme designed to spark curiosity and excitement and help children nurture confidence in maths. At the heart of our Maths curriculum is the belief that all children can achieve. It's built around a child-centred lesson design that models and embeds a growth mindset approach to maths.

We strongly value offering the children opportunities to use models and images to support their thinking, with teaching and learning following the Concrete Pictorial Abstract (CPA) approach. This philosophy permeates everything about our teaching and how the children encounter mathematics in school.

Children (and adults!) can find maths challenging because it is abstract. The CPA approach builds on children's existing knowledge by introducing abstract concepts in a concrete and tangible way. It involves moving between concrete materials, to pictorial representations, to abstract symbols and problems. CPA develops a deep and sustainable understanding of maths in children.

**Concrete** is the 'doing' stage. Concepts are brought to life by children using concrete objects to model and solve problems by handling physical objects.

**Pictorial** is the 'seeing' stage. Visual representations of concrete objects are used to model problems. This stage encourages children to make a mental connection between the physical object they just handled and the abstract pictures, diagrams or models that represent the objects from the problem. Building or drawing a model makes it easier for children to grasp difficult abstract concepts.

**Abstract** is the 'symbolic' stage. Children use abstract symbols to model problems. Children will not progress to this stage until they have demonstrated that they have a solid understanding of the concrete and pictorial stages of the problem. The abstract stage involves teachers introducing abstract concepts (for example, mathematical symbols). Children are introduced to mathematical symbols (for example, +, -, x) to indicate addition, multiplication or division.

Each child should be able to think and solve problems mathematically by using appropriate skills, concrete apparatus, concepts and knowledge. Children should be provided with rich and enjoyable experiences related to both individual needs and the wider requirements of society.

We aim for the children to:

- ✓ Have a positive attitude to mathematics.
- ✓ Have self confidence in their approach to maths.
- ✓ Be able to work systematically, cooperatively and with perseverance.
- ✓ Be able to think logically and independently.
- ✓ Experience a sense of achievement regardless of age or ability.
- ✓ Understand the appropriate underlying skills, concepts and knowledge of number, measurement, geometry and statistics.
- ✓ Effectively use concrete, pictorial and abstract representations to support thinking, learning and understanding.
- ✓ Be able to apply previously acquired concepts, skills and knowledge and understanding to new situations both in and out of school.
- ✓ Understand and appreciate pattern and relationship in mathematics.
- ✓ Be able to communicate with peers and adults, ideas, experiences, questions, clearly and fluently, using the appropriate mathematical vocabulary.

- ✓ Be able to explore problems using the appropriate strategies, predictions and deductions.
- ✓ Be aware of the use of mathematics beyond the classroom.
- ✓ Encourage the use of mental calculations and efficient strategies to work out solutions to enable them to develop procedural fluency alongside their conceptual understanding.

For Parents to:

- Be actively involved in their children's mathematical learning both in school and at home.

### Approaches to Teaching

At Hayfield Lane each class moves through topics at broadly the same pace. Each topic is studied in depth and we allow time for children to think deeply about maths and really understand concepts and how they relate to one another rather than a set of rules or steps.

To provide adequate time for the development of mathematical skills each teacher will provide a daily maths lesson. This may vary in length but will usually be between 45 minutes and 1 hour. Links will also be made to mathematics within other subjects so pupils can develop and apply their mathematical skills (e.g. through topic work.)

### Class Organisation

Pupils are taught as a whole class and learning is differentiated based on pupils' needs. Pupils may access the same learning content but learning may be differentiated by teacher questioning, use of concrete and pictorial support and representations and developing depth of understanding. Pupils who display a secure understanding of learning will be challenged to deepen their understanding by being able to apply their knowledge using problem solving skills. All pupils will have a maths partner who they work with within each maths lesson.

### Working walls

Each class Maths display should include the following:

- ✓ Key vocabulary for concept
- ✓ Reflect current learning and show the sequence of learning
- ✓ Model methods linked to the CPA approach
- ✓ Examples of children's worked models
- ✓ Access to manipulatives
- ✓ Opportunities for children to interact with the working wall

### Planning

Long term planning is based on the White Rose planning and adjusted accordingly to reflect the needs of cohorts using data trends.

A Calculation Progression Policy for numerical written methods is used throughout the school to ensure that number operations are taught in an agreed format, consequently ensuring progression and continuity across the school.

### A Typical Lesson

Different lessons require different structures and these may be subject to change within lessons depending on assessment within each session. Such structure is subject to teachers' own professional judgement within the lesson.

The following items are the format of standard lessons at Hayfield Lane Primary:

**REVIEW**- opportunity for children to connect to prior learning from previous learning. The connection to prior learning (and comparable themes within curriculum areas) is drawn attention to by teachers and staff/children recall previous learning with links explained by pupils. This helps to ensure that items are retained by children in the longer term. Each unit has been crafted to ensure that underlying connections can be explicitly made-these are called the 'schema'. Examples of this are evident in the DAILY REVIEW which provides opportunities to recap concepts and address misconceptions from formative assessments.

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**EXPLAIN**- teachers then explain the small step teaching point, previous gaps and deeper understanding elements of the lesson - we call these our LEARNING STARS. These are the criteria for the children to work to, with the 3 star aspect being a deepening of understanding aspect. 1 star is the gap in knowledge from previous journeys for the class. These are progressive and enable children to build to a final outcome. Within this section, misconceptions from formative assessments are discussed with children.

**MODEL**-Pupils are given a variety of high quality examples via teacher modelling. The modelling of the example also requires lots of active practice of the pupil. In these mini 'chunk and chew' active elements, children are able to develop critical thinking and collaborative learning aspects which are then embedded further by the class teacher. They are given time to verbalise and refine their thinking in collaboration with others. Quality worked examples are created and added to the classroom working walls to support learning across sequences of lessons. Misconceptions are also addressed.

**APPLY**- This is the element of the lesson where pupils/collaboration partners begin to undertake the task set. Additional scaffolds and methods of support within this aspect- working wall support, manipulatives, targeted support will be used to allow children to succeed.

**DEEPEN**- throughout the lesson teachers build in opportunities for children to problem solve and reason about their learning. The star grids are used to examine how effectively the children have met the intended outcome. **DEEPENING LEARNING** is present in the REVIEW, EXPLAIN, MODEL and APPLY stages.

## Fluency

Fluency is developed as an integral part of daily teaching and routines to support pupils to confidently make mathematical links. As a school we have invested in Mathletics and all pupils have access to this. It is an online programme that develops mental mathematics skills and provides revision topics for all areas of maths. Rapid recall of multiplication tables is taught within the appropriate year groups using Times Table Rockstars and is embedded through links within the Daily Review.

## Assessment

Short term assessments will be an informal part of each lesson to check understanding and give the teacher information, which will help to adjust day to day planning and inform Daily Review content. Medium term assessments will take place in the form of 'cold' and 'hot' tasks at the beginning and end of units. PUMA are assessments that take place termly and are used to identify gaps and assess progress. Long term assessments will take place towards the end of the school year to assess and review pupils' progress and attainment. These are currently made through compulsory National Curriculum tests for pupils in Year 2 and 6. Teachers will also draw upon the above data to produce a termly summative record. Timely and informative reporting to parents occurs at the end of the academic year, in July.

## Resources

Each class is well resourced with appropriate equipment, with many additional resources kept centrally for all to use regularly. Many different types of physical apparatus are used including Numicon, Base 10 apparatus, number rods (Cuisenaire), bead strings, Dienes, counting sticks and number lines to aid pupils' learning by the use of models and images.

## Roles and responsibilities

This policy has been developed through consultation between staff and between the subject leaders, head teacher and governing body. The head teacher, deputy and subject leaders monitor and evaluate the subject. The leaders liaise with the link governor about their visits to school. The link governor will also keep the governing body informed about developments in this area.

## Monitoring

The monitoring and evaluation of the achievements made in this area of the curriculum is carried out through the guidelines in Leadership with a Moral Purpose document.

*This policy is supported by a range of whole school policies on, for example, Learning Feedback policy and Special Education Need and Disabilities policy.*