

Mathematics Policy

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Signature of Chair of Governors:	
Signature of Headteacher:	

The Five Big Ideas in Teaching for Mastery

At Hollingbourne Primary School, our approach to mathematics is underpinned by the five big ideas of Teaching for Mastery: Coherence, Representation and Structure, Mathematical Thinking, Fluency and Variation. These principles inform the planning, teaching and assessment of mathematics across the school and support our aim that all pupils develop a deep, secure and connected understanding of mathematical concepts.

Coherence

Teaching is carefully structured to enable pupils to make meaningful connections between mathematical ideas and develop a coherent learning progression throughout the curriculum. New learning builds on pupils' existing knowledge and understanding, allowing them to develop increasing depth and sophistication over time.

Lessons are planned to ensure that all pupils have access to the same ambitious curriculum, with appropriate support and challenge provided where necessary. We aim to develop pupils who can apply their mathematical understanding confidently and communicate their thinking in a range of contexts.

Representation and Structure

Teachers carefully select representations and resources to expose the underlying structure and relationships within mathematics. Representations are used to help pupils see and understand the mathematics rather than simply as tools for carrying out procedures. Resources and representations, such as concrete manipulatives, images, diagrams and the bar model, are used purposefully to develop understanding and make connections between different mathematical ideas. Over time, these representations support pupils in developing mental images that they can draw upon when reasoning, explaining and solving problems.

Mathematical Thinking

Mathematical thinking is central to learning mathematics at Hollingbourne Primary School. Pupils are encouraged to look for patterns and relationships, make connections, conjecture, reason, explain and generalise.

All pupils are given regular opportunities to think mathematically rather than simply follow a set procedure. Teachers encourage pupils to explain and justify their ideas, consider different approaches and learn from the ideas of others. Precise mathematical vocabulary is explicitly taught and used so that pupils can communicate their reasoning clearly.

Fluency

Fluency is an essential component of mathematical learning. Pupils develop accurate and efficient recall of key number facts, mathematical relationships and procedures, enabling them to use their working memory to focus on reasoning and problem-solving.

However, fluency is understood as more than rapid recall. Pupils are supported to develop flexibility in choosing and applying methods, moving between different representations and contexts, recognising relationships and making connections. They are encouraged to explain why a method works and to select an efficient strategy appropriate to the problem.

Variation

Teachers use purposeful variation to draw pupils' attention to the essential features of mathematical concepts and structures. By changing some elements of a task while keeping others constant, teachers help pupils identify what is mathematically significant and develop a deeper understanding.

Conceptual variation is used to present mathematical ideas in different ways and through different representations, helping pupils to recognise the critical features of a concept and understand it from multiple perspectives.

Procedural variation is used within sequences of learning to carefully change the way pupils encounter and work through mathematics. Tasks are designed to draw attention to important mathematical features, support logical reasoning and help pupils make connections between methods and concepts.
Through purposeful variation, pupils are encouraged to notice, compare, explain and generalise, rather than simply repeat procedures.

Our commitment

Together, these five big ideas ensure that mathematics at Hollingbourne Primary School is taught for deep understanding rather than just rote procedure. We aim for every pupil to become a confident and resilient mathematician who can make connections, reason mathematically, communicate their thinking and apply their knowledge to unfamiliar problems and contexts.

Maths is:

- A search for patterns and relationships
- A way of thinking - A means of communication
- A creative activity, involving invention, intuition and discovery

Doing maths involves:

- Deciding which questions, problems, investigations, hypotheses
- Gathering relevant information
- Creating mathematical models or an algorithm
- Manipulating models or carrying out algorithms
- Interpreting or explaining results
- Communicating the findings/ showing mathematical thinking

As a result of teaching maths we want

- All pupils to achieve their full potential irrespective of race/gender/class/ability
- To foster a love of maths
- To foster the development, consolidation and application of maths concepts, skills and facts
- To develop quick recall of basic number facts based on understanding
- Pupils to apply mental methods, making jottings in support, visualising to 'see' structures and solutions, testing strategies and developing ideas
- To develop understanding through a process of enquiry and experiment
- To develop the ability to think clearly and logically to find a way through problems and investigations where strategies are not immediately obvious
- To develop pupil's ability to work independently, collaboratively, systematically and with persistence
- To develop pupil's ability to communicate information and ideas, orally, graphically and symbolically, using precise mathematical language
- To build the confidence to challenge others ideas, thoughts and processes
- Pupils to acquire increasing precision in use of language and written procedures interpreting diagrams and notation, providing explanations and reasons for their methods and choices
- Pupils to see the relevance of maths to everyday problems and situations, and its cross-curricular links
- To develop an appreciation of patterns and relationships throughout maths
- To develop an appreciation of the fascination of maths for its own sake, its creative aspects and its aesthetic appeal
- To develop an appreciation of the diverse cultural origins of mathematical ideas
- Pupils to have a positive attitude to maths, a high self-esteem and confidence in their mathematical ability
- Pupils to listen to others and speak with clarity and confidence, persevering and expecting to learn and enjoy the challenge of tackling something new

<u>Broad Guidelines- when teaching maths we:</u>

- Provide equal opportunities for all pupil's to learn maths irrespective of race/gender/class/ability and have high expectations for all. To achieve this, we use a 'Mastery' approach to our lessons whereby children are taught through whole-class interactive teaching where the focus is on all children working together on the same lesson content at the same time to master the content of the National Curriculum September 2013 and White Rose Maths scheme.

<u>Assessment</u>

- Analyse data to inform teaching and learning
- Continually assess pupils against their session learning objectives
- End of term assessments

- Pupil Progress Meetings
- Interventions to close the gaps in knowledge
- Times table baseline and subsequent check-ins each long term (Term 2, Term 4 and Term 6)
- Multiplication Tables Check (Year 4- Summer Term)

Planning

- Structure progression in learning, modelling and integrating talk together with use of procedures, diagrams and notation to secure pupils' oral, mental and recording skills
- Maths planning is based on the 2014 National Curriculum and enhanced by a wide range of resources (White Rose Maths, Times Tables Rockstars, NCETM Matstery in Number, NCETM Teaching for Mastery). This ensures a progressive and thorough curriculum in every year group. Teachers know which objectives must be taught and assessed in each year group and can follow progressive small steps to ensure pupils have a comprehensive understanding of maths.
- Times tables activities, interventions, quick recall and homework
- Ensure maths is taught as a daily maths lesson and therefore receives a specific time allocation of 5 hours per week, flexibly organised
- Ensure Mastery in Number is taught daily in a stand alone session for EYFS and KS1
- Adapt planning and teaching to address any misconceptions and to raise expectations plans. Introduce correct mathematical terminology as appropriate (refer to Maths curriculum Map for year 1-6 key vocabulary).
- Address as many misconceptions during the maths session

Teaching

- Continuously revisit concepts where when building upon previously taught concepts, procedures and knowledge.
- Use purple pens so pupils know how to improve their work
- Adopt a holistic approach to number i.e. encouraging mental work and the development of the child's own algorithms as well as pencil and paper routines
- Explore new mathematical concepts using a CPA (Concrete, Pictorial and Abstract) approach to allow pupils to spend longer on key mathematical concepts in particular number to develop a deep knowledge of key ideas. This may be seen over a series of lessons to meet the needs of the children.
- In so far as possible, keep the class together, provide more-able pupils with challenging activities to deepen their understanding. Pupils who find maths difficult benefit from plenty of practical work, discussion, repetition, small group and 1-1 support.
- Encourage pupils to explain their maths orally as well as on paper. Develop the oracy skills within maths which include explanation, discussion, reasoning, challenging and questioning as well as written maths

- Secure recall and mental skills, developing imagery, thinking, reasoning, language and precision.
- Teachers use stem sentences where appropriate within the lesson and these are displayed on working walls. Children are encouraged to use these to help with their understanding of different concepts.
- Ensure all pupils participate in whole-class, group and independent activities that involves: speaking and listening, practice, application, challenge and reflection.
- Develop fluency by providing daily mental maths opportunities to ensure quick recall of bonds/tables/x ÷ by 10 100 1000 …
- Provide opportunities for children to explore using concrete objects and manipulatives to help them understand the Maths concept, and then make use of pictorial representations (diagrams, graphs) to help children reason and problem solve. Both concrete and pictorial representations should support children's understanding of abstract methods.

<u>Classroom</u>

- Pupils should be aware of the available resources, encouraged to use them appropriately, possess the necessary skills to do so, treat them with care, and return them to their correct place
- Update Maths learning walls regularly to match current learning including key vocabulary, WALTs, explanations and models including visuals.
- Require pupils to record some their work in maths books, where appropriate, which are accessible in the class maths area. Some work will be recorded on White Rose Maths sheets, whiteboards and with photos.
- Create a rich mathematical environment which includes a learning wall and the use of display areas in each classroom, and the school in general, in order to support the pupil's learning Cross-curricula
- Value the role played by mathematical games - Plan which elements of the programmes of study can be delivered through cross curricular topic work, remembering the need for continuity and progression
- Chanting
- Numicon
- Visual aids
- egg boxes, wrapping paper etc
- 100 square patterns
- BBC super movers
- Making it real life
- Number blocks BBC

- Seeing patterns with the numbers Parents
- Have a dual role of informing and involving parents, as their attitudes have a major influence on their children
- Update parents and carers on their children maths attainment and progress during parents meetings in Term 4 and on their end of year report
- Update parents and carers of ways to support their children at home if there are gaps in knowledge
- Set home learning throughout the term using popular home learning tools (TTRockstars/pruplemash/ hit the button). These online resources encourage the children to continue to develop their mathematical skills outside of school.