



# Hagley Primary School

## Maths Policy

**Date:** September 2021

**Date of review:** September 2022

**Responsible member of staff:** Miss Susie Wilson and Miss Hannah Taylor

**Signature:** .....

*(Chair of governors)*

**Signature:** .....

*(Head Teacher)*

## Our principles and beliefs

At Hagley Primary School, we strive to ensure that all children enjoy mathematics and have the confidence to apply their knowledge and skills to their everyday lives. Our mathematics teaching is fun and engaging, fosters positive 'can-do' attitudes and develops fluency, reasoning and problem solving skills.

To achieve this, mastery forms the basis of our approach to teaching mathematics. Teaching for mastery promotes the idea that **all pupils should develop a deep understanding of the mathematics they are learning** as opposed to accelerating through curriculum content. As a result, we are committed to spending a longer time exploring key concepts, especially number, to develop fluency, promote mathematical reasoning and encourage pupils to make connections in their learning. In order to support this, we have adopted the concrete-pictorial-abstract model, giving all children the opportunity to explore key ideas and build a solid understanding of the mathematics that they are learning.

As a school, we believe that the vast majority of pupils can master the key ideas in mathematics and we have the confidence to take learning at a steadier pace and greater depth in order to achieve this. In our lessons, the whole class work together on the same key idea ensuring that no child is left behind. During every lesson, we assess the children's understanding and plan greater depth activities and teacher-led support to ensure all children make progress. We focus on all children having a deep and sustainable understanding of their year group targets and not accelerating beyond this. In this way, we believe pupils will become true masters of mathematics, applying and reasoning with new knowledge and skills in multiple ways.



## Our Mastery Curriculum

The national curriculum for mathematics (2014) 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

In order to achieve these aims, our curriculum is mapped out across each term and ensures more time is spent on teaching key mathematical ideas and concepts. This allows for the development of depth and sustainable learning. In addition, our curriculum maps are supported by a detailed scheme of learning, which ensures year group objectives are covered in depth, and incorporates fluency, reasoning and problem solving skills in to all lessons.

## Lesson design

Our lessons are carefully designed to ensure a coherent, step-by-step journey, where key learning points are identified and the misconceptions are swiftly addressed. A typical lesson often follows all or part of the following format:

Recall and Hook	Teach and learn	Apply	Challenge and Review
<p>Lessons start with a Fast Four to recap previous learning and embed mathematical understanding.</p> <p>A problem solving 'hook' often begins a lesson, introducing a new concept or consolidating learning. The 'hook' should promote maths talk, develop children's ability to reason and encourage them to make connections in their learning. Possible solutions are shared, explained, analysed and discussed to deepen understanding. Concrete and/or pictorial images should be used during this stage.</p>	<p>Concrete resources and pictorial images are often used to help build procedural and conceptual understanding. Worked examples and high-quality modelling ensure the children's learning is scaffolded. Children work together to develop their understanding through reasoning and drawing conclusions. The teacher uses targeted questioning to encourage children to think deeply about mathematical concepts. Variation is important for practising the thinking process and encouraging children to apply their understanding.</p>	<p>Once the concept has been taught, children apply their understanding independently.</p> <p>Independent intelligent practice forms the basis of this part of the lesson – carefully chosen questions that enable the children to apply their understanding and expose the structure of what they are learning.</p> <p>Support is given to the children where appropriate.</p>	<p>Children are challenged through tasks which are aimed to deepen their mathematical understanding and develop their reasoning and problem-solving skills.</p> <p>An opportunity to peer or self-assess learning, discussing knowledge learned or skills applied during the lesson.</p> <p>Higher level questioning allows for formative assessment and mathematical dialogue.</p>

### Calculation Guidance

In addition to this document, please refer to our Written Calculation Policy where you will find an in-depth guide to the calculation strategies taught at our school.

### Classroom practice

When visiting our classrooms, you will see confident children who are engaged in their learning and able to reason and explain their understanding. This is achieved in a number of ways, including:

- The use of well-chosen practical resources, models and images e.g. bar modelling
- Paired and group work to support exploration and promote maths talk
- Reasoning and problem solving by children discussing, sharing and reflecting on their learning
- 'Ping pong' style teaching - to share ideas, misconceptions, pose questions and create opportunities for stretch and challenge
- A real focus on precise mathematical language
- Positive use of mistakes/misconceptions, developing a 'Growth Mindset' learning environment
- Teachers and teaching assistants supporting learning, asking skilful, thought-provoking questions and capturing children's reasoning skills through effective formative assessment
- Open ended investigations incorporating low threshold/high ceiling tasks
- Arithmetic fluency activities that promote number sense across the 4 operations
- Displays that support learning through the use of key vocabulary and models and images
- Intelligent practice and carefully planned tasks

### Meeting the needs of all our learners

*'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.'* (NC 2014)

As the majority of children access the same curriculum content at the same time, some will grasp it more quickly while others may require additional support. Formative assessment is used throughout our lessons to ensure these children are identified and the appropriate support and challenge is put in place. It is important to recognise that support and challenge will be directed to different children due to the breadth of the maths curriculum.

Rapid graspers are challenged through:	We support children by:
<ul style="list-style-type: none"> <li>• 'Differentiation by depth'</li> <li>• Explaining their reasoning to others</li> <li>• Challenges and questioning</li> <li>• Open-ended tasks</li> <li>• Generalising and testing rules</li> <li>• Individual maths projects</li> </ul>	<ul style="list-style-type: none"> <li>• Identifying misconceptions prior to the lesson so they can be addressed</li> <li>• Explaining the same key idea in different ways (finding the explanation that is most relatable for the child)</li> <li>• Rapid, same day intervention</li> <li>• Small, connected steps in learning</li> </ul>

## Assessment

Teachers plan lessons using progression grids. These have been taken from the National Curriculum statements and enable the children to progress with both their knowledge and skills across the primary phase. Alongside this, teachers will assess the children's understanding of key knowledge and skills throughout a unit of work. These will often be in the form of informal activities such as quizzes, questioning and through the children's work itself. As a school, we promote responsive teaching and learning through formative assessment strategies. At the end of each term, summative assessments are used to assess the children and inform planning. The key skills and knowledge to be taught and assessed will be identified by the teacher during the planning stage of a unit of work. At the end of the year, parents will receive information about their child's progress.

## Home Learning

In order to ensure that learning is embedded in the long-term memory, the children's home learning will reflect what they are currently learning about in school. Home learning may include online activities, written tasks or investigations. In addition, KS2 children are encouraged to practice their times tables and number bond facts in order to develop their fluency.

## Opportunities for Use of Technology

Children are given access to a variety of computer programmes which inform their knowledge and understanding and assist in handling, classifying and presenting evidence. Internet connection and interactive whiteboards are available in every classroom to enrich the teaching of the subject. Classes can also make use of iPads and laptops to research, collect and present their work. When conducting research, or using the internet, the children will be reminded of the importance of online safety relevant to the task.

At times, the children may want to present their work via the school's online platform or the school website. This will be monitored by the class teacher. When using this platform, the children will use a resource deemed appropriate for primary aged children with relevant safeguarding measures such as content filters and blocks. The children will be reminded of how to post appropriately and respectfully, delivering the consistent messages gained from their computing and online safety lessons.

## Monitoring and Evaluation

The subject leader is responsible for monitoring the standards of the children's work and the quality of the teaching. This will be alongside a member of SLT. Monitoring and evaluation will include pupil learning conversations and book looks in order to see the impact of the curriculum and what a child has understood. Staff are encouraged to evaluate their curriculum on a termly basis in order to ensure coverage of the National Curriculum and long term planning. This will often tie into monitoring and evaluation reported by the subject leader.