Hartford Infant and Preschool

Maths Policy

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In the teaching of Maths at Hartford Infant and Preschool we wanted our policy and practice to reflect the school's vision for all the children.

We believe in bringing out the best in everyone.

We want all our children to be curious, confident learners who can communicate effectively.

We want all children to be:

- articulate, using a rich vocabulary,
- independent, active learners who are self-motivated,
- happy, with a love of learning,
- resilient problem solvers,
- respectful members of the community, with high standards of behaviour.

We offer high standards of teaching and learning in an enabling, inclusive environment where each child is nurtured and valued as an individual and encouraged to reach their potential.

We have a bold and engaging curriculum that develops the following **core skills**:

- Curiosity
- Confidence
- Communication

School's vision

We want children at Hartford Infant School to be confident mathematicians. This confidence will come from a deep and sustained understanding of concepts and procedures. We adopt the 'Teaching for Mastery' approach so that children can acquire a deep, long-term, secure and adaptable understanding of maths. We believe that this will enable them to become competent mathematicians because they are able to build on and make connections with previous learning. This approach will ensure more children find maths accessible and engaging as it develops their mathematical understanding in small and coherent steps. Teachers will move all children through using concrete resources, appropriate pictorial representations, before finally moving onto abstract methods. Children who have mastered quickly will be challenged to go deeper into a concept. We want children to develop oracy skills in mathematics so they can articulate their reasoning and answer in full sentences.

What is Mastery Mathematics?

The content and principles underpinning the 2014 maths curriculum reflect those found in high performing education systems, particularly those in the south-east Asian countries such as Singapore and China. Although there are many differences between our education systems, we can learn from the 'mastery' approach to teaching that is commonly followed in these countries. Hartford Infant School has adopted the principles and features which characterise this methodology to address the three main aims of the National Curriculum – **Fluency – Reasoning – Problem Solving.**

Since mastery is what we want children to acquire, rather than for teachers to demonstrate we use the phrase 'teaching for mastery' to describe the range of elements of classroom practice and school organisation that combine to give children the best chance of mastering maths.
Our approach is based on key principles:

- **Developing Number Sense** – Develop fluency in number facts so facts are recalled with automaticity.

- **Developing flexibility with number** - Employs deep conceptual understanding of mathematical structure and relationships so that children use number sense when solving problems.

- **Problem solving** – Children are encouraged to identify and apply relevant principles and make connections between concepts.
- **High expectations –** We believe that no child should be left behind. The focus is on 'keeping up, rather than catching up'. By making high expectations, learners build on their confidence and resilience.
- **Concrete, pictorial, abstract –** Our approach incorporates all of these to help children explore and demonstrate mathematical ideas. Together, these elements help to cement knowledge so pupils truly understand what they have learnt.

- **Depth before breadth –** All learners benefit from deepening their conceptual understanding of maths, regardless of whether they have struggled or excelled. We believe children need to be given time to fully understand, explore and apply ideas – rather than accelerate through new topics.
- **Growth mind-set –** We believe that our 'abilities' are not fixed, but can be developed through practice, support and hard work. This belief encourages a love of learning and resilience that enables everyone to achieve. As practitioners we
- **Mathematical language and Stem sentences –** the way that pupils speak and write about maths transforms their learning. We use full sentences in our lessons, encouraging children not just to give their answer but explain their reasoning behind it.

Maths lessons

In our **Early Years**, the key principles of Mastery for Maths is adopted. Children will be introduced to key concepts, ideas and strategies to enable them to reach their Early Learning Goal by the end of Reception year. The maths will be practical; with both direct teaching and independent activities available for children to access in the continuous provision. Children will use many of the models used in mastery mathematics. As in KS1, children will be encouraged to use the correct mathematical language and to speak using stem sentences. Teachers skilfully use questioning to develop understanding and reasoning. Teachers use the Mastering Number Programme, NCETM and Power Maths planning as a basis for the maths lessons. Number Blocks is also used to support number of the week.

Throughout **KS1**, all children will participate in 4 main maths lessons per week and 4 maths fluency lessons. There is also an opportunity at school and at home to use the Numbots KS1 App which focuses on addition and subtraction. Each lesson will be a 'small step' through the area of maths that they are learning about. Children will get the chance to explore their new learning, practice concepts and develop their understanding before moving on to independent work. In maths lessons the following practices may be observed:

- **Whole class teaching –** We teach maths to a whole class and children are encouraged to believe that by working hard they can succeed. At the planning stage, teachers consider what scaffolding may be required for some children who may struggle with the concepts being demonstrated which we refer to as *Strengthening Activities* and also suitable challenges for children who may grasp the concept quickly. We call this *Going Deeper/Challenge.*
- **Longer and deeper –** Our plans allow for longer to be spent on topics and a slow pace moving through the curriculum. Teachers make use of Active Learn Power Maths and NCETM resources when designing lessons or planning activities. Each lesson focuses on fluency, problem solving and reasoning. This may appear that the pace of the lesson is slower, but progress and understanding are enhanced.
- **Use of CPA –** Children need to understand the mathematical concept they are practising. Using manipulatives initially helps children to develop this understanding; though the move to pictorial representations should be fairly rapid. Whenever a new concept is introduced, teachers should ensure they understand how to model and teach the steps using concrete and pictorial representations. There is guidance on progression through each of the four operations using CPA approach from the Calculation Guidance (Appendix 1)
- **Talk partners –** Teachers will often pair children with a partner of mixed ability; this is of benefit to both children. There will be ample time in the lesson for children to discuss their ideas and explore concepts together. There is an expectation that children will vocally join in with stem sentences to articulate their learning.
- **Modelling** – Teachers should make use of a teacher's maths book and visualiser to model not only the procedure the children will be using; but also the expectation for the presentation of their work.
- **Questioning -** Children's understanding will be probed by open questions, expecting answers in full sentences and using precise maths vocabulary. Use of the maths working wall to display key vocabulary will support this.
- **Marking –** When children are completing their work staff will tick learning in line with the school's marking and feedback policy. Should staff feel that intervention is needed during the lesson, this will be annotated accordingly. All maths books are marked over lunch time, to enable quick intervention and reflection time. This will help to keep the classes' learning together, so they can all move on at the same pace.

As fluency is one of the three main aims of the National Curriculum, EYFS and KS1 has a time- tabled fluency sessions each week. Referred to as 'Maths Gym' in Key Stage One and Maths in EYFS the sessions are based around both factual and procedural fluency using **the Mastering Number Programme** developed by The National Centre for Excellence in the teaching of Mathematics (NCETM). When planning these sessions, teachers consider the following:

- Recalling known facts and strategies for them
- Problem solving sessions based on fluency
- Active learning using manipulatives
- Carefully chosen mathematical structures to make representations clear
- Suitable stem sentences to encourage mathematical thinking and generalised statements

The Maths Medium Term Plan and Mastering Number Plan will show the objective for fluency sessions.

In EYFS, fluency is embedded everyday through counting money for snack and matching to the correct numeral. Children also engage with the Number Block series through number of the week. Teachers use the Number Blocks planning resources from the NCETM. Parents are also encouraged to watch the episodes at home with their child.

Lesson design

The Maths Long and Medium Term Plan in Key Stage One is based on the units from Power Maths and NCETM spines. There is some flexibility for year 2 to ensure coverage before Statutory Assessment Tests (SATS) and end of Key Stage One Teacher Assessment Frameworks. Flexibility is built into the Autumn Term in Year One to allow for a continuous provision style of teaching following on from EYFS. Teachers need to consider the journey the children will make through each topic area and individual lessons as part of their planning procedure. Staff have been encouraged to use the subject knowledge planning guidance from Power Maths and NCETM. In Key Stage One a typical maths lesson may include:

1. **Maths Story** – A problem is presented to explore - children try to solve it using manipulatives with their talk partners. They join in with stem sentences.
2. **Misconceptions** - Teacher sometimes models a misconception and talk partners discuss, drawing out key vocabulary and reasoning.
3. **Problem Solving** – Children discuss with talk partner with opportunities to go deeper. Teacher using conceptual variation to represent a problem in a different way and models suitable structures to support the maths.
4. **Practise Independently** - Children complete independent work in their books. Silence is encouraged during this point of the lesson to allow children to concentrate and stay focused. Adults at this point can sweep the room to target children who need to strengthen their learning (strengthening activities) or those who have grasped a concept quickly and need to broaden their understanding (Going Deeper).
5. **Reflect/Reasoning**- Children are presented with a scenario which may entail a true or false question or convince me question. Stem sentences are provided and displayed to facilitate reasoning and the recording of such in books.

In EYFS children will have 2 main lessons each week which begins with a maths input. Throughout the week adults work with children in the maths continuous provision, on an adult led activity. At times the teacher may wish to target learning through a guided group. Observations of the learning are recorded on the online journal ‘Tapestry’. Staff may record child initiated maths learning using Tapestry.

Learning Environment

Children will have access to concrete resources in lessons; it should be the ‘norm’ for all children to use them.

Each classroom should have a maths display, which is regularly updated and changed. This ‘working wall’ should show representations that the children have been using for their reference. It should also include the mathematical language and sentences that the children have been using in their learning.

Each class has a maths shelving unit for displaying resources and engaging manipulatives. To encourage counting. a game with dice is always available. Children are encouraged to use the maths area during morning ‘Ready to Learn time’.

Assessment

- In Key Stage One formative assessment takes place in every classroom during every lesson. Through questioning and marking of books, staff can identify which children need extra support or challenge in that lesson. With books being marked during or soon after lessons, it provides time for immediate feedback to a child. Marking within the lesson also allows for a teacher to decide if there are any pupils that would benefit from support during ‘Ready to Learn’ or weekly reflection time. Teachers can respond promptly by using the strengthening ideas in their plans to catch children up. They can also add any difficult points into their daily morning routine.
- In EYFS staff can assess whilst they are teaching a guided group. They closely observe children when they are accessing maths in the continuous provision. In the Spring Term EYFS staff conduct individual assessments to identify any gaps in learning and small group work for children who still need to grasp a concept.

- In Key Stage One at the end of each half term children will demonstrate their application of maths by completing an assessment of the subjects, that have been taught that term (written by the teacher and Maths Coordinator). The Power Maths end of unit assessment will be used to support the teacher in writing their own assessment. Children who have not grasped a concept will be exposed to more strengthening activities and children who have grasped a concept quickly will have the opportunity to deepen their learning.
- At the end of Key Stage One staff use descriptors from the Teacher Assessment Framework 2019 onwards to assess. This includes working towards the expected standard, working at the expected standard and working at greater depth. For children working below the national curriculum expected standard we use the Pre-key Stage One standards 1-4.

Intervention and Progression

For some children instantly recalling numbers and key facts can be a barrier to their maths learning. They may have cognitive overload when solving mathematical problems because they do not have the automaticity of key fats. In EYFS and Key Stage One our curriculum ensures children are exposed to regular subitising, numeral recognition and composition of number through our morning routine, maths fluency and maths lessons. We have a planned progression document to ensure all children are making progress.

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Children with SEND

The overriding belief at Hartford Infant School is that children all work together to master one objective at a time. There are some children who will find various aspects of maths a challenge. Whilst staff will try to support these children within the normal maths lessons along with their peers, it may be necessary to adjust, for those children. This can be done in various ways:

- Clearly defined support on plans – adult to work with selected children.
- Task differentiated in some way for that child
- Resources prepared for that child to help support them
- Securing cardinality and conservation of number (see Early years maths progression document)
- Use of PIVATs
- Use of Pre-Key Stage One standard objectives

Resources

Every class will have resources that will support the day-to-day teaching of maths. Resources such as 2- sided colour counters, part-whole models, ten frames and place value manipulatives should be accessible to all children to support their learning. Resources linking to other areas of the maths curriculum are in a central cupboard in the Nest room. Maths display shelving units will have a maths story book, loose parts, money, games, dice, worksheets, number lines and any other relevant current maths topic resources. Children can access these at any time. During mathematical fluency lessons children have access to rekenreks, cubes, counters, ten frames, Hungarian and part-part-whole models.

Where possible, teachers should use concrete resources to introduce a new concept to children.