

# HARRINGTON HILL PRIMARY SCHOOL

## MATHS POLICY



REVIEWED:

June 2019

NEXT REVIEW DATE:

June 2020

Adopted: Pending Governor Approval

### Purpose of the policy

This policy seeks to ensure a shared understanding throughout the school community of the aims, principles and strategies of learning, teaching, assessment and professional development in maths at Harrington Hill Primary School. The aims of this document are to outline how efficient provision of maths across the whole school is planned for and implemented.

### Aims in maths teaching

The national curriculum for maths aims to ensure that all pupils:

- Become **fluent** in the fundamentals of maths, including through, varied and frequent practise 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 maths 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.

(National Curriculum, 2014)

### Our curriculum

The content and principles underpinning the 2014 maths curriculum and the curriculum at Harrington Hill Primary School reflects a 'mastery approach' to teaching maths. The principles and features that characterise this approach are:

- Teachers reinforce an expectation that all pupils are capable of achieving high standards in maths.
- The large majority of pupils progress through the curriculum content at the same pace. Differentiation is achieved by emphasising deep knowledge and through individual support and intervention.
- Teaching is underpinned by methodical curriculum design and supported by carefully crafted lessons and resources to foster deep conceptual and procedural knowledge.
- Practise and consolidation play a central role. Carefully designed variation within this builds fluency and understanding of underlying mathematical concepts.

- Teachers use precise questioning in class to test conceptual and procedural knowledge, and assess pupils regularly to identify those requiring intervention so that all pupils keep up.

The intention of these approaches is to provide all children with full access to the curriculum, enabling them to achieve confidence and competence – ‘mastery’ – in maths.

### **Maths Teaching in EYFS**

In The Early Years Foundation Stage ‘mathematical learning...needs to be predominantly social in nature and rooted in ...play activities’ (Williams Report 2009).

Through their planning and practice, teachers, teaching assistants and nursery officers ensure that they:

- Give pupils sufficient time, space and encouragement to discover and use new words and mathematical ideas, concepts and language during child-initiated activities in their own play.
- Encourage pupils to explore real-life problems, to make patterns and to count and match together; for example ask, “How many spoons do we need for everyone in this group to have one?”
- Develop mathematical understanding through all pupils’ early experiences including through stories, songs, games and imaginative play.
- Recognise and exploit the mathematical potential of both the indoor and outdoor environments, for example, for pupils to discover things through practical situations or their physical activity.
- Ensure that mathematical resources are readily available both indoors and outside.
- Develop mathematical understanding through all pupils’ early experiences including through stories, songs, games and imaginative play.
- Provide a range of activities, some of which focus on mathematical learning and some which enable mathematical learning to be drawn out, for example, exploring shape, size and pattern during block play.
- Use mathematical terms during play and daily routines.

### **Planning**

In the Foundation Stage, a weekly mathematics planning sheet is completed: it details the learning objectives and intentions. It is carefully differentiated, with key questions and focus areas from the Developing Early Years document.

## Maths Teaching in KS1 and KS2

Teachers in KS1 and KS2 are supported in their teaching of maths by the Teacher's Guides, textbooks and workbooks published by 'Maths – No Problem!' with a focus on teaching maths for mastery. The scheme complies with the UK's High Quality Textbook guidance published by the NCETM and was selected by the DfE for use in the Maths Hub programme.

### Structure of maths lesson

In Key Stage 1 and Key Stage 2 maths is taught for one hour each day through the following structure:

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| In Focus             | <p>During the 'In Focus' task, a problem is presented to the whole class. Children work collaboratively to explore and attempt to solve, drawing on existing knowledge. Practical equipment (where appropriate) is provided to support all learners. Children are challenged to think of more than one method.</p> <p>A whole class discussion follows. Children explain how they solved the problem, using words, diagrams and/or equipment. The discussion of the varied methods is aimed at:</p> <ul style="list-style-type: none"><li>- recapping previous learning</li><li>- developing children's ability to communicate mathematical ideas</li><li>- enabling those listening to access ideas they may not themselves have thought of</li><li>- evaluating the strengths and weaknesses of different solutions</li></ul> |
| Guided Practice      | <p>Children work through further questions with a partner but under the guidance of the teacher, to practice an idea that has been developed in the 'In Focus' task. Formative assessment is used to assess children's grasp before children practice independently.</p>  |
| Independent Practice | <p>When they are ready to apply their learning independently, the children answer questions in their own workbook. If some children are not ready by this point, they will continue 'Guided Practice' with the teacher in a small group. If some pupils are advanced in this area of mathematics and have completed the questions independently, they will be given extra tasks to consolidate and</p>  |

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|  | deepen their learning, which they will complete in their 'Maths Journal'. |
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In Year's one – six, we have additional fluency sessions to explicitly teach the skills that the children need in order to be able to calculate mentally. In KS1, fluency sessions happen every day for 20 minutes with children being tested every fortnight on a Friday. In KS2, fluency sessions happen every day for 20 - 30 minutes. Fluency sessions in KS2 will alternate weekly, focusing on factual fluency the first week and on procedural fluency in the second week. A factual fluency test will be carried out at the end of the second week.

### Planning

The 'Maths - No Problem!' textbooks and workbooks are arranged in chapters and over the course of the academic year, all units of the National Curriculum 2014 are covered, the progression of which are outlined in our long term plans.

Through the 'Maths – No Problem!' scheme, teachers have access to online planning tools. Lessons are structured logically and progressively. Teachers supplement the 'Maths - No Problem!' scheme with additional challenges for those that grasp the concept more quickly. Challenges do not accelerate learning. Instead, they offer further opportunities for problem solving and/or reasoning at a more complex level.

In Year's one-six, we use weekly flipchart planning for each lesson. Flipchart plans must include:

- Learning intentions
- Models for learning
- Key vocabulary/sentence stems to help children explain their thinking
- Clear success criteria

### Resources

At Harrington Hill, mathematical concepts and skills are taught through the Concrete-Pictorial-Abstract approach. We believe that these 3 representations are all vital in the development of a child's understanding of a skill or concept and its application to problem solving.

Concrete objects should be used when introducing, revising or extending a new skill or concept. The use of concrete objects in a 'hands on' way is vital in building the foundations of understanding. As confidence grows, a child should be given opportunities to represent their understanding pictorially. Abstract notation should be used alongside concrete and pictorial representations.

We believe that children develop a deep understanding of the maths they are learning when they are given opportunities to use concrete materials and diagrams to develop conceptual understanding along with continual opportunities to communicate their mathematical explanations, reasoning and ideas.

Standard resources multi-link cubes, dienes, hundred squares, place value discs, bead strings etc. are located within individual classrooms and are accessible to all pupils. Further resources (often larger items shared by the whole school) are located in the maths resource area.

### Journaling

Journaling should take place at the end of the 'In Focus' section. It is the point of the Maths lesson where children record one or more methods/ideas from their 'In Focus' investigation. For more information see the Journaling Guidance.

### Differentiation

Differentiation and support in a mastery approach, occurs in the support and intervention provided to different pupils, not in the topics taught. There is no differentiation in content taught, but the questioning and scaffolding individual pupils receive in class as they work through problems will differ. Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with rapid intervention – ideally through individual or small group support later the same day or as soon as feasibly possible.

Differentiated questioning (including open ended and probing questions) is used throughout our maths teaching to inform 'Assessment for Learning' and address pupils' misconceptions. During

whole class teaching, talk partners are used to allow pupils to support one another and clarify their own understanding.

### **Calculation Strategies**

Teaching of calculation strategies should be used according to the school's calculation policy. The purpose of this calculation policy is to ensure consistency and progression in the teaching of the different calculation methods across the school. It aims to give an overview of the key written calculation strategies that will be taught in all year groups. All members of staff are expected to be familiar with this policy and apply it consistently across the school (See Calculation Policy for more information).

### **Inclusion**

During planning and teaching, activities should be planned to cater for all pupils; ensuring access for pupils with Special Educational Needs and children with English as an Additional Language. If the needs of the children are best met following an alternative plan, which deviates from the National Curriculum 2014, then the class teacher and the SENCO/Phase/Subject Leader discuss this and decide on a way forward.

### **Assessment (including Marking and Feedback)**

Marking should be completed in accordance with the whole school marking and feedback policy. Formative assessment should be used to evaluate lessons and inform future teaching and learning. Throughout the lesson, assessment for learning strategies will support ongoing evaluation. Every term, children (years two – six) will sit the NFER maths test. At the end of Autumn 1, all year groups will complete an assertive mentoring test. Year 1 children will continue to sit the Assertive mentoring test in the Spring and Summer terms. This allows teachers to identify misconceptions, which will inform future planning. Assessment data is used during pupil progress meetings at the end of each term, to review class attainment and progress.

## **Environment**

The maths environment in each classroom should be engaging and stimulating with a wide variety of visual and kinaesthetic resources available. Each class should have a mathematics learning wall linked to current learning. Maths learning walls in each classroom will show the following:

- Consistent learning wall signs
- OLI and Success Criteria
- Key Vocabulary/sentence stems to help children explain their mathematical thinking
- teacher models.

## **CPD**

All staff involved with the teaching of maths will be entitled to professional development opportunities. These will include:

- in-school Inset or staff meetings (for both teachers and teaching assistants)
- support with planning
- in-school sharing of learning (for example, observations, peer observations or development meetings)
- training, which may be out of school (for example, to deliver a particular programme, or develop an area of Mathematics teaching and learning).

These opportunities will be agreed by each staff member, with the person in charge of professional development and the maths Leader and will always be in line with the School Development Plan and appraisal agreed targets.

## **Role of Subject Leader**

- To lead the teaching of maths, demonstrating excellent practice.
- To advise and support colleagues in all aspects of the implementation of maths throughout the school.
- To lead or to organise appropriate INSET where necessary, in line with the School Development Plan.
- To keep up to date with mathematical publications and research, as well as maintaining contact with agencies outside the school, and to feedback to staff as and where appropriate.

- To monitor and assess progress in mathematics, informing colleagues, and acting on areas where further progress is needed.
- To conduct planning and book reviews and feedback to colleagues and the senior management team and give support where needed.
- To carry out regular learning walks to monitor provision and give clear feedback to staff.
- To review the use of mathematical resources, and to organise ordering within the budget designated for mathematics.

### **Monitoring of Subject**

Mathematics is monitored through planning and book scrutiny, regular learning walks and lesson observations. The outcome of the monitoring is recorded on the school's monitoring formats and this is sent to the head teacher and discussed at SMT meetings. In light of monitoring, clear feedback is given to staff and this is regularly reviewed by the subject lead.