



MATHS POLICY

Reviewed	November 2021
Next Review Date	February 2023

Harrington Hill Primary School MATHS POLICY

Striving for Excellence. Achieving Together.

Striving for excellence. Inspiring to achieve collaboratively through respect, happiness and creativity. We are independent and reflective for continuous improvement.

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 mathematics 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

- Establish a broad and balanced mathematical curriculum.
- Make mathematics interesting and exciting through bringing maths to life.
- Foster a positive and confident attitude to mathematics.
- Ensure continuity and progression throughout the school.
- Maintain an inclusive ethos.
- Employ effective differentiation strategies to support and extend all pupils.
- Encourage development of a range of visual, auditory and kinaesthetic learning styles.
- Develop pupil's own awareness of their achievements and the next steps in their learning.
- Engage pupils in dialogue to communicate their mathematical reasoning using appropriate vocabulary.
- Provide investigative opportunities for pupils to use and apply mathematics, to think logically and to solve problems in real-life and cross-curricular situations.
- Ensure pupils have a repertoire of mental and written strategies and are able to select the most appropriate for a given calculation.
- Create a stimulating maths environment which supports pupils' mathematical learning.

Our School Vision

- Effectively planned, engaging lessons
- Embedding challenge at every level

- Vocabulary building and talk opportunities
- Problem solving and mastery elements
- CPA approach (Concrete, pictorial, abstract)
- Child-led enquiry based, practical elements and real life contexts
- Cross-curricular approach, celebrating diversity in maths
- Incentivised, linked through praise and rewards
- Fostering strong links with our community and parents

Structure of Maths Teaching

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

- At the beginning of every maths lesson, the children are given a green pen question, which is linked to the previous days learning. Or they will make green pen corrections, these will be targeted based on their understanding from the previous day.
- The main teaching session includes a balance of teacher modelling, independent and group work. The children will get a chance to explore mathematical concepts with a focus on bringing maths to life. Well-planned questioning will take place, which informs continuous teacher assessment, and partner-talk.
- The independent and teacher focus group sessions are appropriately differentiated and provide an opportunity for pupils to practise and apply knowledge, skills and understanding. Teacher focus groups provide an opportunity for the teachers and teaching assistants to match teaching more precisely to pupil's starting points and needs. Where there is a focus on more practical activities to support the children's mathematical learning, adult deployment will need to be planned carefully.
- The plenary activities provide opportunities to consolidate learning, address misconceptions and evaluate and extend understanding.
- In Year's Two-Six, we have extra sessions for fluency to explicitly teach the skills that the children need to be able to calculate mentally.

In **the Foundation Stage**, teachers ensure they follow the EYFS statutory framework, teaching maths through a mixture of discreet sessions and play, alongside daily maths lessons, timings are reduced for appropriate learning and teaching sessions.

In the Early Years Foundation Stage Teachers ensure that pupils 'develop a strong grounding in number so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers. In addition, it is important that the curriculum includes rich opportunities for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measures.' (Development Matters 2021)

Through their planning and practice, teachers, teaching assistants and nursery officers, follow the 'Development Matters Guidance', ensuring that they:

- Provide frequent and varied opportunities to build and apply their understanding – such as using manipulatives, including small pebbles and tens frames for organising counting – children will develop a secure base of knowledge and vocabulary from which mastery of mathematics is built.
- Children develop positive attitudes and interests in mathematics, look for patterns and relationships, spot connections, 'have a go', talk to adults and peers about what they notice and not be afraid to make mistakes.

Planning

EYFS:

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.

Key Stage One and Two:

At Harrington Hill, we believe that it is about the process of planning rather than the paperwork. In Year's one-six, we use flipchart planning for each subject area. Flipchart plans must include:

- Clear learning intentions
- Details of activities
- Models for learning
- Key vocabulary
- Differentiation
- Use of addition adults
- Clear success criteria

Flipchart plans for each subject do not need to be in place at the start of each term. They can be completed on a weekly basis; however, they do need to be in place and uploaded by 9am Monday to the SharePoint.

Medium term plans are amended every half term in light of recent assessments in order to meet the needs of the children in each class.

Embedding challenge at every Level

In Years 1 and 2 we adapt the 'Hamilton Trust Maths' scheme of work to meet the needs of our pupils through small step planning. The Hamilton Trusts planning documents and resources ensure continuity and progression of mathematics skills using a range of concrete resources.

The weekly plans ensure that there is a continuity of teacher's model, manipulatives and vocabulary. Teachers planning is supported and ensures that pitch and differentiation is adequately met so that teachers can focus on quality first teaching and high-quality AFL.

In Years 3-6, we plan and teach our engaging maths lessons using 'Challenge by Choice'. Teachers utilise White Rose During these lessons our children are in control of their own learning within the structure of the national curriculum, enabling each child to 'learn without limits'. Children are encouraged to become autonomous thinkers who choose the level of learning that is right for them that day.

Using assessment for learning and quality first teaching, we plan for the individual needs of our children. We teach exciting maths concepts, which are designed so that everyone can succeed, using concrete resources and problem-solving challenges to deepen understanding. We ensure our lessons are child-led, practical and celebrate diversity in maths.

Our curriculum is carefully designed and organised to ensure that children fully master key concepts in a visual and practical manner. Pupils will explore concepts using concrete materials, before progressing to pictorial and abstract methods (the CPA approach).

Working collaboratively, in mixed attainment groups, children will support each other in mastering key concepts. All pupils have the opportunity to 'master' concepts, whilst ensuring that support is always readily available.

Please also see our 'Calculation Policy' following the CPA approach.

Teaching and Learning

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

- The oral mental starter is used to rehearse and revisit objectives rather than for direct teaching. Engaging resources and interactive activities set the brisk pace and tone for the whole lesson. This is five to 10 minutes of the lesson time.

- The main teaching session includes a balance of teacher modelling, well-planned questioning which informs continuous teacher assessment, and partner-talk.
- The 'challenge by choice', my turn your turn, sessions are appropriately differentiated and provide an opportunity for pupils to practise and apply knowledge, skills and understanding to the given maths area.
- It also allows the teacher to develop a marking dialogue with the pupil and engage the children in green pen dialogue.

The plenary activities provide opportunities to consolidate learning address misconceptions and evaluate and **extend** understanding.

In the Foundation Stage, all elements of the session are present; timings are reduced for appropriate learning and teaching sessions. 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?" Value pupil's own graphic and practical explorations of each area.
- 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.

Our mental maths sessions are used to explicitly teach the skills that the children need in order to be able to calculate mentally. Engaging resources and interactive activities set the brisk pace and tone for the session.

Practical resources are used throughout different stages of the lesson to support teaching and learning, to engage pupils and in order to bring maths to life.

Times tables tests occur on a weekly basis. In Year's 2-6, classes will focus on a specific times table each week and this will be differentiated according to the needs of the children. The times tables focus each week will be added on to medium term plans every half term.

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. The teacher uses a range of Assessment for learning strategies to ensure all pupils participate in the sessions.

Teacher focus groups are used to assess pupil's understanding and move their learning forward. This should be rotated to give relevant support and extend all pupils to make progress. This allows the teacher to develop an understanding of each pupil's ability and learning needs and therefore informs future planning. Where there is a focus on more practical activities to support the children's mathematical learning, adult deployment will need to be planned carefully.

The teaching assistant is directed by the teacher, as indicated on the planning, to support pupils during different phases of the lesson, planning is discussed on Monday mornings. This could include working with an ability group who is below or above the pitch of the main teaching. In Key Stage 1 and 2 mathematics books are used. In the Foundation Stage - work is displayed in pupil's profile books.

Problem Solving

It is important that at Harrington Hill we develop the classroom culture needed to enable children to become successful problem solvers. For example, a classroom where:

- Questioning and deep thinking are valued.
- Mistakes are seen as useful.
- Being stuck is seen as honourable.

At Harrington Hill, problem solving opportunities are provided for the children within all our daily maths lessons. However, it is important that the children are given the chance to develop specific problem solving skills. Therefore, every Friday, the children will have a maths lesson where they will learn how to use key problem solving skills. Over the course of the year the children will work on how to use and apply the following problem solving skills:

1. Trial and improvement
2. Working systematically

3. Pattern spotting
4. Working backwards
5. Reasoning logically
6. Visualising
7. Conjecturing

(See problem solving in mathematics overview)

Calculation Strategies

Teaching of calculation strategies should be used according to the school's Written 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)

Inclusion

During planning and teaching, activities should be planned to cater for all pupils; ensuring differentiation for pupils with Special Educational Needs, children with English as an Additional Language and the needs of different learning styles are met. Pupil progress meetings focus on individual pupil achievement. For some pupils, interventions are provided e.g. precision teaching. Where relevant, pupils have maths targets on their IEP's. In Year 5 and 6 maths tutorials are used to support targeted pupils.

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 half term, the children will sit the assertive mentoring maths test. 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.
- Teacher models.
- Challenge questions.
- Examples of children's work.

Homework

For Year's 3-6, appropriately differentiated homework is set every week on Times table Rockstar's and should link to the multiplication tables that are the focus that week.

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 termly 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.

Roles and Responsibilities

Leadership

The maths lead works closely with other members of the maths team in order to:

- Set high expectations and monitor teaching, learning and progress to ensure, secure and sustain improvement in teaching, learning and assessment of mathematics offering support as required.

- Use, analyse and present data e.g. from Arbor; use this to inform whole school and key stage priorities and identify strengths and areas to develop for the whole school action plan
- Ensure the National curriculum is being covered across school and that, although the majority of pupils will move through the programmes of study at broadly the same pace, there is appropriate pitch and differentiation
- 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 conduct learning walks, planning and book looks and feedback to colleagues and the senior management team and give support where needed.
 - Encourage an academy wide approach, keeping parents, governors and all support staff well informed
 - Lead by example, showing a thorough understanding of how children learn mathematics
- Deliver INSET and CPD, both to individuals and whole school as well as model good practice in mathematics teaching to ensure motivated, respected and effective teaching staff

The role of teachers

Teaching of maths should be at least good across the school, we expect every teacher to have a sound knowledge and understanding of the curriculum so that they can:

- Use effective formative assessment to ensure every lesson counts and every child makes good progress
- Value the achievements and progress of all pupils, developing a depth wherever possible
- Use a variety of teaching and learning approaches including the use of practical equipment and models and images.
- Use teaching methods and styles to take account of the needs of all pupils and that foster the understanding of new concepts and that require children to think and reason for themselves
- Provide practice of skills, ensuring pupils become fluent in the fundamentals of mathematics including through varied and frequent practice

- Ensure problem solving and reasoning are a key component in all areas of mathematics and in many lessons and is not just taught in restricted instances.
- Consistently follow the procedures laid down in the schools 'Maths and Calculations Policies'

The role of support staff

Support staff play a vital part in identifying and dealing with children who require further assistance or further challenge in sessions, it is vital that they:

- Be engaged in staff training for Mathematics where appropriate
- Be aware of planning including key vocabulary and have a clear understanding of their role in each part of the lesson
 - Consider ways to break down a learning objective when needed, utilising resources to provide a concrete example of a concept
- Ask questions to promote children's independence and further deepen children's understanding of concepts.
- Deliver interventions to meet the needs of children to close gaps

The Role of Parents and Carers

We recognise that parents / carers make a significant difference to children's progress in mathematics and encourage this partnership. We ask all parents to:

- Develop positive attitudes to Mathematics and actively support their children to access to TTRS (Times Table Rockstars) or complete home learning tasks
 - Use the parents evening feedback to support their child in progressing further
- Attend workshops and parents' meetings, wherever possible to understand the expectations, strategies and skills used in the teaching of mathematics.

The Role of the Children

Children are our reason for everything we do, we would like them to:

- Gain confidence in Mathematics and see its relevance to real life
- Develop an enjoyment of learning through practical activity, investigation, exploration and discussion
- Develop mental calculation strategies (alongside written arithmetic) so that their first reaction to a question is 'Can I do this in my head?'
- Understand a wide range of mathematical vocabulary and use it confidently
- Use their knowledge to solve problems, see patterns, make predictions, present information clearly, interpret data and reason mathematically
- Give oral and written explanations of their methods and reasoning as appropriate
- Have access to TTRS (Times Table Rockstars) and other online resources for use in and out of school time