

Maths Policy



Introduction

The teaching of mathematics has changed along with the ever-changing needs of society. Children, in preparation for adult life, now need many and varied skills. Numeracy is a key life skill. Through our work at school in mathematics, children will gain the knowledge and understanding to use and apply the skills needed to confidently work within the world today.

Aims

At Hollymount School, we aim to develop:

- A positive and enthusiastic approach towards acquiring mathematical skills
- Mathematical competence, supported by a sound understanding of key concepts
- The importance of using mathematical language as a means of communicating ideas and concepts
- Independence, confidence and logical thinking, with a systematic approach to problem-solving
- An awareness of the uses of mathematics beyond the classroom, able to apply skills in a changing world.

In addition, the 2014 National Curriculum for mathematics, which is statutory for all maintained schools, 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 have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems*
- ***reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justifications 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 smaller steps and persevering in seeking solutions.*

Objectives

1. To develop a greater depth of understanding of mathematical concepts, rather than procedures.
2. Develop a fundamental understanding of the objectives from the National Curriculum 2014.
3. Develop an ability to use and apply mathematical skills to everyday situations.
4. Develop children's confidence when explaining their mathematical thinking.

Planning

Weekly plans must identify learning objectives, activities or tasks and key vocabulary (see example - appendix b). There is an increased emphasis on teaching mathematical concepts through detailed

slides, rather than written planning. Consequently, planning and slides are monitored once a term by the maths coordinator, to ensure progression of skills across the school.

Planning support

Teachers use various resources to enhance their planning. These include the White Rose materials, which provide objectives, example questions and tasks for reception to year 6. As well as supplementing these materials with activities from Nrich and the NCETM. Teachers also refer to the Hollymount Calculation policy to ensure the correct mental and written methods are taught in each year group.

Teaching in the Foundation Stage is based on Early Years Outcomes, with the aim for children at the end of Reception to be working at Early Learning Goal or beyond.

Provision

Each class teacher will provide a daily mathematics lesson. This may vary in length but will usually last for about 45 minutes in Key Stage 1 and up to 60 minutes in Key Stage 2. Some groups of children will be given additional provision according to need. Children in the Early Years have opportunities throughout the day to explore mathematical principles.

Lessons will be planned with these key areas in mind:

- Practical activities and mathematical games
- Selecting and choosing their own concrete resources or pictorial representations to support learning
- Problem solving and reasoning
- Individual, group and whole class discussions and activities, going back and forth between pupils and teachers (Mastery style teaching - see appendix a).
- A range of methods of calculating e.g. mental, jottings (part-part-whole/bar model etc.) and formal written methods.
- Using ICT as a mathematical tool e.g. creating graphs and spreadsheets
- Accessing the class working wall, which is updated regularly to reflect current work

Inclusion

Teachers plan layered tasks for the children's independent activities. The tasks focus on one concept but have three layers that develop and embed fluency and conceptual understanding. Carefully planned tasks will deepen children's understanding as they work through them. Through planning independent activities, which gradually get more difficult in small steps, children can build upon what they already know and make connections.

All children will begin with task one which will be a fluency based task. Those that are more able will move through this quickly on to tasks 2 and 3, which are reasoning and problem solving based activities. In some lessons there may even be a fourth task or challenge to stretch these children further (brain buster/diving deeper). Children in years 5 and 6 are invited to represent Hollymount by taking part in local Maths competitions.

All year groups teach maths in mixed ability classes. However, year 6 stream for part of the year, leading up to SATs.

Special Educational Needs

Pupils with SEN will be included in the daily mathematics lesson, through appropriate differentiation and support, informed by the targets in their Special Education Needs Support Plans.

EAL

Support for children with English as an additional language will be given in the daily mathematics lesson in a variety of ways e.g. repeating instructions, emphasizing key words, using picture cues, counting and chanting, use of vocabulary translations where available and appropriate etc.

Assessment, Recording and Reporting

Formative assessment is an informal part of every lesson to check understanding and give the teacher information about progress and achievement, sometimes requiring an adjustment to the next day's plan. A variety of AFL strategies are used.

At the end of each term, work in Maths books is assessed against the curriculum objectives using the HertsforLearning assessment grids specific to each year group, and sometimes written tests are used to help inform teacher's judgements.

Parents' evenings are held in the autumn and spring terms. Written reports are sent home at the end of the academic year. Informal discussions are held by appointment with individual sets of parents as and when required.

The new National Curriculum sets out what is to be taught within each year group or phase; the descriptors for reporting to parents about their children are now as follows:	
Below (B)	Is consolidating elements of the previous year's standard but may also be starting to achieve in areas of this year's standard
Working Towards (T)	Is emerging in their understanding of the requirements of the year and shows signs of working towards the expected standard for their year group.
Working At (At)	Is secure in most objectives for the end of the academic year and is achieving well within the expected standard.
Working at Greater Depth (GD)	Is confidently achieving all objectives at the end of the academic year and has a deep and thorough understanding of the subject, able to apply his/her skills in a range of different contexts.

At the end of KS1

Teacher assessment (TA) is the main focus for end of key stage 1 assessment and reporting, and is carried out as part of teaching and learning. Although KS1 SATs are no longer a statutory requirement, we will continue to use these assessments informally to help us benchmark our internal data.

Year 4

From June 2020, all pupils at the end of year 4 in England will take an online multiplication tables check (MTC).

The national curriculum specifies that pupils at this stage should be able to recall the multiplication tables up to and including 12x12.

The check aims to support pupils to master multiplication skills, which are essential for future success in mathematics. It will help to identify pupils who have not yet mastered this mathematical concept, so additional support can be provided. (DfE, 2018)

At the end of KS2

From 2016, KS2 national curriculum test outcomes will no longer be reported using levels. Scaled scores will be used instead.

The KS2 tests consist of:

Mathematics, Paper 1: arithmetic test (30 minutes)

Mathematics, Paper 2: fluency, problem-solving and reasoning (40 minutes)

Mathematics, Paper 3: fluency, problem-solving and reasoning (40 minutes)

Continuous assessment will be an informal part of every lesson to check understanding and give the teacher information about progress and achievement, sometimes requiring an adjustment to the next day's plan. A variety of AFL strategies will be used in class to assess this.

For medium and long-term assessment procedures, please refer to the schools Assessment Policy. Please also refer to 'Feedback and Marking' policy.

Monitoring and Evaluation

Policy and practice will be monitored and evaluated by the Maths Co-ordinator and the Headteacher. Teachers are observed as part of the SDP and Appraisal cycle with feedback given as per the school's Monitoring Policy. Other means of evaluating teaching and learning in mathematics may include scrutiny of work, monitoring planning, analysis of progress and attainment data and lesson studies (see appendix c).

Role of Maths Subject Leader

The Maths Co-ordinator is responsible for: ensuring staff are kept up to date with good practice in mathematics teaching, offering advice, organising inset sessions and appropriate CPD to support teachers, analysing data and giving assistance with target-setting. The Maths Co-ordinator will also be responsible for organising special events related to mathematics as and when appropriate, such as Enterprise week. This is a cross-curricular week that encourages the use of mathematics in a real-world context. Each class aims to raise the most money for charity by planning, making and selling a product at a market stall at the end of the week.

Resources

Maths resources are located in the storeroom adjacent to the Year 5 classrooms. Individual teachers also have a mathematics resource area within their classes so that these are readily available for the children, as well as a working wall that is updated regularly.

Approved by STL Committee on 13th June 2018

Review Date: Summer term 2021



Appendix A - Mastery Teaching in Mathematics at Hollymount

What will you see in our maths lessons?	What does this look like?	Why is it important?
CPA	<p>Rather than focusing on <i>procedures</i>, teachers will carefully select concrete, pictorial and abstract representations and use real life contexts that will best expose the lesson's <i>concept</i> and/or mathematical structure. These are not ability or age restricted. Teachers use these categories of representations together and move back and forth between different forms to connect them and support understanding.</p> <p>Teachers will not select <i>one</i> relevant representation to expose the lesson's concept or mathematical structure, but will select a <i>variety</i> of relevant representations (at and within concrete, pictorial and abstract categories). They will regularly interchange between concrete and contextual ideas and their abstract and symbolic representations. Children will be exposed to examples of the concept and the non-concept.</p>	<p>We believe that teachers' skillful use of representations will enable all children to represent abstract mathematical concepts in different ways. Doing so will facilitate children's ability to link concrete ideas to abstract mathematical concepts.</p> <p>If children see concepts in a range of different representations, their ability to explain, make connections and see patterns will develop.</p> <p>We want to provide an opportunity for children to visualise abstract mathematical concepts.</p>
Layered Tasks	<p>When teaching, teachers will employ procedural variation by carefully selecting the questions they will pose to encourage further conjecture, generalisation, explanation and deeper understanding (see next section for examples of questions).</p> <p>Teachers will carefully prepare exercises for children's independent learning time that employ variation (intelligent practice). They will not provide children with tasks that are simply a mechanical exercise where no understanding is required. Exercises will be focused on one concept. They will plan exercises to contain three varied layers (fluency, reasoning, problem solving) that develop and embed fluency and conceptual understanding.</p>	<p>Carefully planned independent tasks will deepen children's understanding as they work through them.</p> <p>Through planning independent activities that gradually get more difficult in small steps, children can build upon what they already know and make connections.</p>
Mathematical Thinking	<p>Teachers and children will explore in detail how answers are obtained, why methods and strategies work and which are the most efficient methods and strategies. This can include children working at the board and encouraging children to explain the responses of their peers or suggest an alternative. As concepts are explored, mathematical generalisations will emerge and will be emphasized.</p> <p>The following types of questions will be asked: 'Odd One Out', 'What's The Same and What's Different', 'True or False', 'Prove It', 'Another, Another, Another', 'Explain your reasoning', 'Do you agree?', 'Why isn't it?', 'How do you know?', 'Can you prove it?', 'Are you sure?', 'Is that right?', 'Can you explain that?', 'What does your partner think?', 'Can you imagine?'</p> <p>Teachers will expect children to communicate responses using full sentences that include appropriate specific mathematical language/vocabulary. They will provide scaffolds such as: I solved the problem by...The strategy I used was...I discovered that...I noticed that...I agree or disagree...I compared...I knew that...I know my answer is correct because...</p>	<p>Questioning allows children to think about what they are doing and why. In turn, their use encourages children to verbalise their thinking.</p> <p>To develop a conceptual understanding, rules and patterns are focused on more than techniques and procedures for finding solutions.</p> <p>Children need to be able to identify patterns so that they can make connections to other problems and calculations. By understanding what happens to numbers they can explain why patterns occur. This will support their ability to spot mistakes and understand when they are wrong and why.</p>



<p>Mathematical Language</p>	<p>Precise vocabulary, couched in full sentences, will be used by teachers (and children) to convey mathematical ideas with clarity and precision. Teachers will use non-statutory guidance within the national curriculum to identify concepts around which children are required extend their language. New vocabulary will be introduced within a suitable context and explained carefully.</p>	<p>Use of precise vocabulary will enhance the quality of children’s reasoning and conceptual understanding. Use by teachers provides children with a lexicon from which to form sophisticated explanations, justifications and rich mathematical talk.</p>
<p>Microscopic Progression</p>	<p>The school will teach units for more time and in greater depth. Each unit’s set of objectives will be carefully sequenced. Objectives will be broken down into a series of small, connected steps, each building on the children’s prior learning. Each lesson will be focussed on one small step, part of a series of steps that together provide a coherent journey over a unit, digression from the focus step will be avoided. New learning points will be identified explicitly and key prior learning steps will be returned to.</p>	<p>This will ensure learning is well developed and deeply embedded before moving on. It will develop a coherent and comprehensive conceptual pathway through the mathematics. Grouping key concepts and patterns will support children making connections to other areas of maths and applying skills to a range of problems.</p>
<p>Differentiation (read with layered tasks)</p>	<p>Teachers will plan for whole class teaching with no acceleration to new content. To provide necessary support and challenge, the learning needs of individuals will be addressed through: careful scaffolding, skilful questioning, rapid intervention, on-going intervention, carefully designed enriching exercises, mixed ability pairings and adult support within lessons.</p> <p>Teachers will challenge children during the whole class teaching using skilful questioning and short reasoning tasks that take the children deeper and encourage mathematical thinking (see above).</p> <p>Teachers will prepare Brain Buster/Diving Deeper activities to provide further challenge and to stretch and deepen learning of rapid graspers. This will be a particularly challenging and enriching activity.</p> <p>Children will work on carefully planned mixed ability tables and in mixed ability pairs. Adults will float between tables to support and question children to deepen their understanding. If a group has been identified as having struggled in a previous lesson, an adult may support them.</p> <p>Teachers will plan separately for children working significantly below ARE.</p>	<p>We believe that the vast majority of children can succeed in learning mathematics in line with national expectations for the end of each key stage. To achieve this and provide for the individual needs of our children, we will provide the necessary support and challenge.</p> <p>Our national curriculum states: The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. <i>Pupils who grasp concepts rapidly should be challenged through being offered rich and sophisticated problems before any acceleration through new content.</i> <i>Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.</i></p> <p>Children are very aware of ability groups. This can lead to low self-esteem. By mixing children, higher ability children can develop their communication skills and ability to explain what they are doing and why. This also allows lower ability children to have a good role model and the support of another child.</p>
<p>Recitation</p>	<p>Teachers will use repetition (I Say, You Say, We All Say) of key ideas with their classes.</p> <p>Teachers plan stem sentences that will support the children’s learning. The sentences will often express key conceptual ideas or generalities.</p>	<p>We believe that this provides children with a shared language to think about and communicate mathematics. It will provide a framework to embed conceptual knowledge and build understanding.</p>



Difficult points and potential misconceptions	When planning the input/modelling part of a lesson, teachers reflect on the connections to prior learning required for success in that lesson. When considering what constitutes as a connected prior learning step, teachers reflect on what the children may find difficult with the lesson's concept and will plan opportunity to expose/work through those difficult points during the modelling.	Mathematics is a highly interconnected discipline. For effective teaching and learning to occur, teachers must draw out those connections.
Intervention	<p>Immediate Intervention: when a difficulty is spotted within a lesson, adults will quickly intervene. When a difficulty is spotted after the lesson or intervention within the lesson has not been possible, adults (ideally the teacher) will hold an immediate/same day intervention. To support identifying children within a lesson, adults aim to mark the first layer practise activity within the lesson.</p> <p>On-Going Intervention: for children working significantly below ARE and for other children who require the support, on going intervention groups are planned with counting and place value, addition and subtraction facts and multiplication and division facts as a focus.</p>	Identifying gaps in understanding and closing those gaps before the next lesson, keeps children moving through the curriculum at the same pace.
Ping-Pong	During the lesson input and as the lesson's concept is explored, ideas and activities will regularly move from teacher to children and back again.	<p>Working in this way maintains children's engagement and allows them to take ownership of their learning.</p> <p>Children will have the opportunity to spot patterns independently of the teacher.</p>



Appendix B – Sample Hollymount Mathematics Planning

Year: 4

Term: Autumn 2

Week: 4

Date:

Teachers:

Day/Starter	Learning Objective/Resources	Activities/Tasks	Key Vocabulary
Monday	L.O – To multiply by 10 PV chart PV counters	White Rose Block 4 - pages 3 and 4	Multiply Lots of Groups of 10 times bigger/greater
Tuesday	LO: To multiply by 100 Deines PV chart	Fluency from white rose – page 5 Task 2 and 3 on IWB	
Wednesday	L.O – To divide by 10 PV chart	White Rose Block 4 – Pages 7 and 8	Divide Sharing equally Groups of
Thursday	L.O – To divide by 100 PV chart	White Rose Block 4 pages 9 and 10 Challenge: NCETM/nrich	
Friday Times table race	L.O – To multiply and divide by 10 and 100	Mixed questions from Testbase	



Hollymount Primary School

Appendix C: Teaching for Mastery Lesson Study

Lesson study format

Before: class teacher provides relevant contextualising remarks about the class. They outline the lesson aims and focus point. They highlight particular features the observers may wish to focus attention to/provide feedback on.

During: observers keep a running record of the lesson; focussing on the elements below (including those highlighted by the class teacher). The elements are explained in detail in the document 'Mastery Teaching in Mathematics at Hollymount'.

Afterwards: observers, in turn, use the sentence starter 'I noticed...' to highlight one aspect of the lesson that was significant to them. The group then reflect on describing the coherent journey through the lesson. More in depth discussion on features the class teacher highlighted or the observers noticed follows.

To end: observers share one thing, that as a result of the meeting, they will try in their own practice.

1. One objective for all (unless a child is significantly below ARE)	2. Use of concrete and pictorial representations (CPA)	3. Emphasis on accurate use of mathematical vocabulary
4. Small steps within the lesson	5. Ping Pong: activities and discussion going back and forth between pupils and teacher	6. Intelligent practice – carefully designed questions and tasks
7. The teaching of a concept, not a procedure.	8. Opportunities for depth not acceleration	9. Speaking in full sentences



Running record of the lesson, focusing on the mastery elements above

Something I noticed/one thing I will try in my own practice:

I noticed...