



Hillside Primary School

Maths Policy

Updated: June, 2019

Our Aims and Ethos

Our Ethos

Mathematics equips pupils with the uniquely powerful set of tools to understand and change the world. These tools include logical reasoning, problem solving skills and the ability to think in abstract ways. Mathematics is integral to all aspects of life and with this in mind, we endeavour to ensure that children develop a positive and enthusiastic attitude towards mathematics that will stay with them.

The National Curriculum for mathematics (2014) describes in detail what pupils must learn in each year group. Combined with our Calculation Policy, this ensures continuity, progression and high expectations for attainment in mathematics. It is vital that a positive attitude towards mathematics is encouraged amongst all of our pupils in order to foster confidence and achievement in a skill that is essential in our society. At Hillside, we use the National Curriculum for Mathematics (2014) as the basis of our mathematics programme. We are committed to ensuring that all pupils achieve mastery in the key concepts of mathematics, appropriate for their age group, in order that they make genuine progress and avoid gaps in their understanding that provide barriers to learning as they move through education. Assessment for Learning, an emphasis on investigation, problem solving, the development of mathematical thinking and development of teacher subject knowledge are therefore essential components of the Hillside approach to this subject.

Our Aims Are:

- To foster a positive attitude to mathematics as an interesting and attractive part of the curriculum.
- To develop the ability to think clearly and logically, with confidence, flexibility and independence of thought.
- To develop a deeper understanding of mathematics through a process of enquiry and investigation.
- To develop an understanding of the connectivity of patterns and relationships within mathematics.
- To develop the ability to apply knowledge, skills and ideas in real life contexts outside the classroom, and become aware of the uses of mathematics in the wider world.
- To develop the ability to use mathematics as a means of communicating ideas.
- To develop an ability and inclination to work both alone and cooperatively to solve mathematical problems.
- To develop personal qualities such as perseverance, independent thinking, cooperation and self-confidence through a sense of achievement and success.

- To develop an appreciation of the creative aspects of mathematics and an awareness of its aesthetic appeal.

Principles of Teaching and Learning in a Mastery Curriculum

At Hillside, we use a variety of teaching and learning styles in mathematics lessons. Children are taught in year group classes and are not set in ability groups as we believe ability groupings reinforce a child's status as a low, middle or high ability child. We believe children of all abilities can learn together, working together on the same mathematical theme with the same success criteria for the skill being explored. Our children are taught using the mastery approach to teaching maths where the whole class is taught together about the main ideas, and those who need additional support are given this through guidance and discussion by an adult. Those who are early graspers are kept on the same material but are expected to work on aspects of greater complexity and depth. For this we use a bronze, silver, gold and platinum approach which enables children to choose their starting point, this will be different depending on the concept being taught. The differentiated activities ensure children have the practise and consolidation they require, whereas those children who need it can deepen their learning through using and applying, reasoning and fluency tasks. 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. Teachers ensure that concepts are modelled to pupils using multiple representations.

Our Curriculum

A detailed, structured curriculum is mapped out across all phases, ensuring continuity and supporting transition. Effective mastery curricula in mathematics are designed in relatively small carefully sequenced steps, which must each be mastered before pupils move to the next stage. Fundamental skills and knowledge are secured first. This often entails focusing on curriculum content in considerable depth at early stages.

As a school, we are passionate about children acquiring the basic skills of mathematics that will be valuable to them as they move on to further education and beyond.

We hold the following skills in high regard and children are encouraged to:

- have a well-developed sense of the size of a number and where it fits into the number system (place value)
- know by heart number facts such as number bonds, multiplication tables, doubles and halves
- use what they know by heart to figure out numbers mentally
- calculate accurately and efficiently, both mentally and in writing,
- draw on a range of calculation strategies
- make sense of number problems, including non-routine/'real' problems and identify the operations needed to solve them
- explain their methods and reasoning, using correct mathematical terms
- judge whether their answers are reasonable and have strategies for checking them where necessary
- suggest suitable units for measuring and make sensible estimates of measurements
- explain and make predictions from the numbers in graphs, diagrams, charts and tables
- develop spatial awareness and an understanding of the properties of 2D and 3D shapes

To provide adequate time for developing mathematics, maths is taught daily and discretely. However, application of skills are linked across the curriculum where appropriate and staff are keen to capitalize on opportunities in subjects such as science and geography where learning becomes purposeful and encourages application.

Early Years Foundation Stage (EYFS)

Mathematics within the EYFS is developed through purposeful, play based experiences and is represented throughout the indoor and outdoor provision. The learning is based on pupils' interests and schemas or current themes and focuses on the expectations the Early Years Outcomes. As the pupils progress through, more focus is placed on representing their mathematical knowledge through more formal experiences. Pupils are encouraged to record their mathematical thinking when ready and this increases throughout the year. Assessment in the Foundation Stage is carried out through planned observations; incidental observation during child initiated activities and during teacher directed activities, which are informed through planning. All information obtained from these assessment strategies is transferred into the children's individual profiles and recorded against the relevant Early Learning Goals. All assessment evidence is stored within the individual learning journeys. This includes observations, photographs and children's work.

Key Stage 1 and 2

The Programmes of study for mathematics are set out year by year for Key Stages 1 and 2 in the new National Curriculum (2014). The programmes of study are organised in a distinct sequence and structured into separate domains. Pupils should make connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

Key Stage 1

The principal focus of mathematics teaching in Key Stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources (e.g. concrete objects and measuring tools). At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money. By the end of Year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency. Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

Lower Key Stage 2

The principal focus of mathematics teaching in lower Key Stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large whole numbers. At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with

accuracy and make connections between measure and number. By the end of Year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work. Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

Upper Key Stage 2

The principal focus of mathematics teaching in upper Key Stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio. At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them.

By the end of Year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages. Pupils should read, spell and pronounce mathematical vocabulary correctly.

Assessment

This section details the various assessment methods and practices used at Hillside through which we ensure that children are making appropriate progress and that the activities they take part in are suitably matched to their ability and level of development.

Formative Assessment (AfL) - (monitoring children's learning)

Assessment is an integral and continuous part of the teaching and learning process at Hillside and much of it is done informally as part of each teacher's day-to-day work. Teachers integrate the use of formative assessment strategies such as: effective questioning, clear learning objectives, the use of success criteria, effective feedback and response in their teaching and marking and observing children participating in activities. Findings from these types of assessment are used to inform future planning.

Summative Assessment – (evaluating children's learning)

More formal methods are used to determine the levels of achievement of children at various times during the school year. At Hillside, we use termly assessments as a way of recording children's progress in objectives covered across that specific term. This information is then updated online on O Track – the online tracking tool available to teachers. These termly assessments are used throughout the year to aid planning and to identify the children's areas of strengths and developments.

Statutory End of Key Stage Assessment.

The National Curriculum requires that each child is assessed at the end of KS1 and KS2. Statutory tests determine whether the children are working below, at or above the expected standard. In KS1, the assessments coupled with teacher assessment form the overall standard the children reach. In

KS2, teachers submit a separate teacher assessment judgement based on the interim frameworks. To show that pupils have met the standard, teachers provide evidence that a pupil demonstrates consistent attainment of all the statements within the standard.

Assessment for Learning – Self and peer assessment

All children from Nursery to Year 6 are asked to make judgements about how they can improve their own work, through a range of self-assessment techniques (e.g. marking codes, thumbs up – thumbs down etc). Children are also given the opportunity to take part in peer-to-peer assessment where they support their peers in looking at how to improve their work. At the end of every lesson, each child uses the code A, B or C to demonstrate the effort they have shown within the lesson and 1,2 or 3 to demonstrate their understanding of the learning objective. In response to this, after the teacher has marked the child's work, they also use a marking code to show how much the child has understood. Discrepancies between child and teacher assessments are then addressed if necessary.

Cross curricular

Throughout the whole curriculum, opportunities to extend and promote Mathematics are sought. Mathematic skills are taught in discrete lessons; however, afternoon subject are utilised to provide valuable learning opportunities for children to apply their understanding. These meaningful cross curricular links help to embed maths and provide real life relevance to the concepts and skills they are acquiring. They provides a real-life context for the application of skills maths developed during. Opportunities to do this are on going and may be identified.

In science, mathematics is an essential element of scientific enquiry and provides a great opportunity to embed skills and apply to a useful and practical purpose. Teacher carefully plan where maths skills for measurement and data handling are applicable and these lessons allow the teacher to assess children using and applying of these skills.

In English lessons, we expect children to read and interpret problems and pick out the key information in order to identify the mathematics involved. They are also improving their command of English when they explain and present their work to others during sessions- particularly when reasoning in their mathematical explanations. In English lessons, too, maths can contribute: younger children enjoy stories and rhyme that rely on counting and sequencing, while older children encounter mathematical vocabulary, graphs and charts when reading non-fiction texts.

Mathematics contributes to the teaching of Personal, social and health education (PSHE). Children are aware of how to apply their mathematic skills to enhance their social and economic wellbeing. The work that children do outside their normal lesson also encourages independent study and helps them to become increasingly responsible for their own learning. The planned activities that children do within the classroom encourage them to work together and respect each other's views.

Information and communication technology enhances the teaching of mathematics significantly. There is a variety of software available to present information visually, dynamically and interactively, so that children understand concepts more quickly. Children use computing to communicate results with appropriate mathematical symbols and use it to produce graphs and tables when explaining their results. When working on control, children

can use both standard and non-standard measures for distance and angle. They can also use simulations to identify patterns and relationships.

Reporting to Parents

Parents are regularly informed of their child's progress. Progress and targets are also shared during parent consultation meetings twice a year. In addition, a written report is sent home at the end of each academic year where the end of year attainment of each child is recorded to parents, alongside the targets of the new year group.

Moderating and Review

Moderation of the standards of children's work and of the quality teaching in mathematics is the responsibility of the mathematics subject leader alongside members of the senior leadership team. The work of the mathematics subject leader also involves supporting colleagues in the teaching of mathematics, being informed about current developments in the subject, and providing a strategic lead and direction for the subject in the school. A named member of the school's governing body is briefed to oversee the teaching of maths. This governor meets regularly with the subject leader to review progress.

Times Tables

Times tables are taught throughout the school in a consistent manner which focuses on recall, fluency and eventually speed. An online programme is used to enable children to practise their times tables online at home and at school. The children record and monitor their own progress and have a full awareness of the times tables they need to secure. Each child from Year 2 upwards has their own Times Tables record sheet, which shows their progress when learning times tables. Children are tested on a regular basis to ensure that they know all of their times tables by the expected stages in their education. It is expected that children will know all of their times tables to 12 x 12 by the end of Year 4. Children beyond Year 4 focus on learning multiples of larger numbers, square numbers and cube numbers and they continue to consolidate their knowledge of division and multiplication facts up to 12 x 12.

Please find attached the calculation policy for addition, subtraction, multiplication and division also.

Displays

Each classroom has a maths display relating to current work. The maths display is updated regularly (with each new topic) to reflect the pace of learning. Displays can include key vocabulary, children's work, teacher modelling, visual prompts and questions to develop reasoning skills. Each classroom also has a maths gallery that displays a piece of maths work completed by the children in that class based on one of their year group objectives. This is updated regularly throughout the year and offers a showcase of work the children are proud of.

Growth Mindset

It is common to hear children say they are, 'no good at maths' or state that they, 'can't do maths!' At Hillside we aim to foster a 'can do' attitude towards maths. We encourage the children to change their mind set and think positively about their learning. The children have been taught to believe that they can 'do maths.' So instead of saying 'I can't do it!' they children follow the sentence with YET! The children know that once they have learnt all the

skills that they will eventually solve the problem. This growth mind-set approach towards maths helps us all to achieve more than we believe we can.