



MATHS POLICY

July 2016

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REVIEW DATE: July 2019

SIGNED: CHAIR OF GOVERNORS

SIGNED: HEAD TEACHER

Maths Curriculum

Learning Together, Learning Forever

Hazel Grove Primary School has been fully engaged with the new Mathematics curriculum since September 2014. The children and staff have embraced the new approach to deepening their understanding of Maths.

At H.G.P.S we believe that Mathematics is essential to everyday life as it equips children with a 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. It can also stimulate moments of happiness and wonder when a child solves a problem for the first time, discovers a more efficient solution to a problem or suddenly sees hidden connections. A high-quality mathematics education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the beauty and power of mathematics, and a sense of enjoyment and curiosity about the subject.

Aims

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

- Become fluent in the fundamentals of mathematics, including the varied and regular practice of increasingly complex problems over time.
- Reason mathematically by following a line of enquiry, understanding relationships and generalisations, and developing an argument, justification or proof using mathematical language.
- Can solve problems by applying their mathematics to a variety of problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Maths Curriculum at H.G.P.S

EYFS

Work undertaken within the Foundation Stage is guided by the requirements and recommendations set out in the Early Years 'Development Matters' EYFS document. All children are given ample opportunity to develop their understanding of mathematics. Lessons in the Early Years aim to do this through varied activities that

allow children to use, enjoy, explore, practise and talk confidently about mathematics.

By the end of the foundation stage our children will be expected to be confident and competent in learning and using key skills. The areas of learning include:

- Counting
- Sorting
- Matching
- Seeking patterns
- Making connections
- Recognising relationships
- Working with numbers, shapes space and measures

Mathematical understanding is also developed through stories, songs, games and imaginative play so that the children enjoy using and experimenting with numbers, including numbers larger than ten.

KS1 and KS2

Mathematics is an interconnected subject in which pupils need to be able to move fluently between mathematical ideas. In Years 1 to 4 we follow the **'Singapore Maths' Programme** of study (which has full coverage of the 2014 Maths Curriculum). In subsequent years, this will be rolled out to Years 5 and 6. The programmes of study are, by necessity, organised into distinct areas, but pupils will make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They will also apply their mathematical knowledge to science and other subjects.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress will always be based on the security of pupils' understanding and their readiness to progress to the next stage. Pupils who grasp concepts rapidly will be challenged through being offered rich and sophisticated problems before any acceleration through new content.

Those who are not sufficiently fluent with earlier material will consolidate their understanding, including additional practice, before moving on.

Key stage 1 – years 1 and 2

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 [for example, 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 related facts to 100 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 – years 3 and 4

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 – years 5 and 6

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.

Planning

Mathematics is a core subject in the National Curriculum, and we use the **'Singapore Maths'** programme of study in Years 1 to 4 (which follows the 2014 Primary Curriculum for Mathematics) as the basis for implementing the statutory requirements for mathematics.

We carry out the curriculum planning in mathematics in three phases (long-term, medium-term and short-term). We have developed our own detailed outline of what we teach long term which is taken from the 2014 Maths Curriculum. These give a detailed outline of what we teach in the long term, and identifies the key objectives we teach to in each year. They are available on our Staff Drive, in teachers planning files and on our school website.

Our medium-term mathematics plans in Years 1 to 4 are taken from the 'Singapore Maths' Programme of Study. They give details of the main teaching objectives for each phase of learning and define what we teach. We have developed our own medium-term mathematics plans in Years 5 and 6 which follow the National Curriculum 2014. Years 5 and 6 use the year group specific objectives, and plan appropriate lessons to support all pupils to achieve these objectives. They are available on our Staff Drive, in teachers planning files and on our school website.

In some cases, some children will require the objectives or 'Singapore Maths' from the year groups below their chronological age and will be working towards their year group related objectives. Where children are working consistently above their year group related objectives, there will be planned opportunities for their knowledge to be deepened through varying applications of their skills.

Each year group produces weekly plans. In Years 1 to 4 these follow the 'Singapore Maths' Programme of Study. In Year 5 and 6, each lesson, taken from the 2014 National Curriculum objectives, gives details of how the lessons are to be taught. These are annotated working documents, showing differentiation when appropriate, targeted adult support and extensions. Planning makes links to our Creative Curriculum and to promote cross-curricular links wherever possible.

Teaching and Learning

The concept of teaching mathematics to mastery is to ensure that topics are well developed. In Years 1 to 4, we follow the 'Singapore Maths' method of teaching and learning. '

'The Singapore method of teaching mathematics develops pupils' mathematical ability and confidence without having to resort to memorising procedures to pass tests - making mathematics more engaging and interesting.'

In order to develop mastery through 'Singapore Maths' children will spend enough time to fully explore a concept before moving on to a different topic. As idea is well formed they reinforced by ample practice. New knowledge is then used on subsequent lessons so that all ideas build on top of each other and pupils have ample opportunity to develop relationships between the topics. Ideas are revisited in a spiral as pupil'19/05/2016s progress through the years, each time at a higher level.

Through 'Singapore Maths' and planned daily lesson in Year 5 and 6, we include whole-class, group-directed teaching and paired or individual work. During these lessons we encourage children to ask as well as answer mathematical questions. Children are also encouraged to 'Reason' both orally and in writing (see Green Pen Marking). We also encourage this by discussing and developing their ideas with a 'Learning Link' before sharing them with a group or whole class. We are developing resources so that children have the opportunity to use a wide range such as number lines, number squares, digit cards, bead strings, base ten and small apparatus to support their work. Children use ICT in mathematics lessons where it will enhance their learning, as in modelling ideas and methods. Our Creative Curriculum actively encourages the children to use and apply their mathematical knowledge and understanding in a cross curricular way and in everyday situations, within the daily maths lesson, start the day activities and within creative sessions.

In all classes children have a wide range of mathematical abilities. We recognise this fact when appropriate, provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child, including working in mixed ability pairs. We achieve this through a range of strategies - in some lessons through differentiated group work, and in other lessons by organising the children to work in pairs on open-ended problems or games. We use Learning Support Assistants to support some children and to deliver high quality intervention.

Contribution of mathematics to teaching in other curriculum areas

Where ever possible, mathematics is linked to other subjects within our Creative Curriculum, contributing to their learning.

English

Mathematics contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. For example, we encourage children to read and interpret problems in order to identify the mathematics involved. The children explain and present their work to others during plenary sessions. Younger children enjoy stories and rhymes that rely on counting and sequencing. Older children encounter mathematical vocabulary, graphs and charts when using non-fiction texts.

Information and Communication Technology (ICT)

We use a whole school on-line system to support children's maths learning at home and in school. 'Mathletics' allows children to log into their individual page that is set to work for their age range. They can choose to either work through tasks related to their class based learning, or play live Mathletics quick fire mental challenges against children from across the globe. They earn points and certificates for their Mathletics achievements, which are celebrated in school. Some year groups in Key Stage 2 also set homework tasks on Mathletics, relating to their in-class learning. This allows parents at home to see what is being taught and support their child accordingly (to be developed in Spring Term).

Spiritual, Moral, Social and Cultural development

Throughout all learning in school, we promote the '**Growth Mindset**' Skills: Respect, Independence, Resilience, Co-operation, Confidence, Enthusiasm. We give children opportunities to lead their own learning, by selecting the way they want to learn. For example, by providing equipment that may support their learning but letting the children choose what they want to use; By offering to work with the Teacher, or Independently but giving children the power to choose what suits themselves best.

Science

Mathematics is used extensively within our Science curriculum. Children use and apply their knowledge and understanding of Mathematics when recording and presenting data, creating charts and graphs and when predicting and calculating results.

Mathematics and inclusion

Mathematics forms part of the school curriculum policy to provide a broad and balanced education to all children, whatever their ability and individual needs. We strive hard to meet the needs of those pupils with special educational needs (SEND), those with disabilities (SEND), those who are 'High

Achievers' and those learning English as an additional language. For further details see separate policies: Special Educational Needs & Disability; High Achievers; English as an Additional Language (EAL).

When progress falls significantly outside the expected range, several factors are considered - classroom organisation, teaching materials, teaching style, differentiation - so that we can take some additional or different action to enable the child to learn more effectively. H.G.P.S 'Assessment without Levels' and 'ITAF's' allows us to consider each child's attainment and progress against expected levels. The latter new assessment procedures inform our planning and ensures teaching is matched to the child's needs.

Intervention through School Monitoring and School Support will lead to the creation of an Individual Education Plan (IEP) for children with special Educational needs. The IEP may include, as appropriate, specific targets relating to mathematics.

Assessment and Recording

We assess children's work in mathematics from three aspects (long-term, medium-term and short term). We make short-term assessments which we use to adjust our daily plans. In Years 1 – 4, these short-term assessments are part of the 'Singapore Maths' programme of study (see **pre- and post learning tasks**). In Year 5 and 6 these have been created by the Maths Coordinator (see **Learning Journeys**). Children can see their progress and if appropriate, receive 'Next Steps' in their books as an instant feedback of how they can move their learning forwards, or what they need to consolidate, and are given time and support in order to act on their individual next steps (see Green Pen Marking).

Hazel Grove Primary School uses '**O'Track**' and '**Step up to the Challenge**' to record the achievement of objectives in maths, in order to form longer term assessment judgements, firmly based on evidence shown within lessons, in using and applying contexts, and through assessments. Formal written assessments are being developed and will be used alongside a teacher judgement form a child's work throughout the half term. This close monitoring of children's progress half-termly allows interventions to be put in place quickly when children require extra support in making progress.

At Hazel Grove Primary we make long-term assessments towards the end of the school year, and we use these to assess progress against school and national targets. We can then set targets for the next school year and make a summary of each child's progress before discussing it with parents. We pass this information onto the next teacher at the end of the academic year, so that they can plan for the new school year. We make the long-term assessments with the help of 'Clive Davis – Assessment without Levels' resources, 'Rising Stars Arithmetic Tests' and teacher assessments. We use the national SAT tests in Years 2 and 6.

Marking and Target Setting

At Hazel Grove Primary School we use 'Green Pen Marking' (see marking policy) in order to give children feedback and next steps in mathematics. Feedback on the children's learning in maths is given during the lesson where possible, through marking children's work as they progress and by giving verbal feedback to the children. Children in Key Stage 2 are given opportunities to mark tasks that involve routine practice with support and guidance from the teacher, along with peer assessment. And where appropriate, children are encouraged to check computational exercises with a calculator. Where verbal feedback has been given, the children's work will be marked with a 'V', in accordance with the school's marking policy. Through verbal and written feedback, children are given 'next steps' for learning, and are given time and/or support in order to act upon these next steps.

Children from years 1 to 6 have a whole school agreed, maths target which is year group appropriate. These targets are usually based on specific number skills appropriate to the year group objectives, such as times tables, number bonds etc, but could also have a presentational accuracy element too, where necessary. When the child has achieved a target five times independently, their target is then changed. In years 4, 5 and 6, children begin to take on more ownership of their targets, identifying when they themselves have met their target.

The Governing Body

The Governing Body is informed about standards in maths through presentations and data summaries. The Chair of Governors is present at all meetings regarding pupil achievement with the external School Evaluation Partner (SEP).

Links with Secondary Schools

High achievers from Year 5 are invited to attend inter school challenges organised by our main feeder school. We have close links with HGPSH who also provide further opportunities for able and exceptional students from across the school.

Parental and Community involvement

Parents receive individual progress reports for their children twice yearly, and have the opportunity to look at their children's work at parents' evenings and discuss their child's progress. We set maths homework across the school and we encourage parents to support their children with their homework and with basic skills such as number bonds and multiplication tables. Parents have access to mathletics and can monitor their child's progress on this online resource.

At the start of the academic year, Parents will receive a maths parent booklet, created by the teachers, that gives an overview of the maths objectives within the

year group, examples of written calculation methods used in school, ideas of how to support maths at home, and mathematics information.

Throughout the school year, parents will be invited in to see their children in action in maths (see 'Look at Learning Morning').

Monitoring and review

Monitoring of the standards of children's work and of the quality of teaching in mathematics is the responsibility of the mathematics subject leader, Key Stage Phase leaders and Head Teacher. 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. The mathematics subject leader gives the Head teacher regular updates in which strengths and weaknesses in the subject are evaluated and areas for further improvement indicated. There is an action plan for maths, to ensure that issues from reported Data (attainment and progress), as well as advice from the latest OFSTED school inspection are being acted upon, and to ensure there is parity across the whole school. Regular learning walks are conducted to look at maths across the school. These provide an insight into the children's engagement and enthusiasm, level of challenge and quality of teaching and learning in a 'snapshot'.