



Silverhill Primary School
Policy for Mathematics

Curriculum

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Introduction

The purpose of Mathematics education is to develop pupils' ability to make sense of the world around them through the application of mathematical knowledge and reasoning. It aims to instill in pupils a sense of excitement about the subject and a spirit of curiosity which encourages them to explore patterns and relationships in both number and space. It provides an essential foundation for later development of skills across all aspects of science, technology and engineering and, more generally, relevant to most areas of employment.

Aims

The aims of our Mathematics curriculum are:

- to promote enjoyment and enthusiasm for learning through practical activity, exploration and discussion
- to develop a solid understanding of the key concepts underpinning the number system
- to promote fluency and flexibility in choosing and applying calculation methods
- to develop the ability to solve problems through resilience, decision-making and reasoning in a range of contexts
- to explore features of shape and space and develop measuring skills in a range of contexts
- to create, explore and explain patterns and relationships across in number and space
- to develop a practical understanding of the ways in which information is gathered and presented to understand the importance of mathematics in everyday life

Approach to teaching and learning

Daily Mathematics lessons use a range of approaches to engage pupils, develop their ability to reason and build their conceptual understanding and mathematical fluency.

Engagement

Each lesson combines whole-class teaching with time for the pupils to work in groups or individually. A range of activities is provided to cater for different styles of learning (visual, aural and kinaesthetic) and for the range of abilities within the class. Frequent use is made of games, puzzles and problems which encourage participation and which have open-ended outcomes to stimulate pupils' exploration.

Reasoning

Pupils are encouraged, wherever possible, to discover solutions to mathematical problems for themselves. In doing so, they develop their ability to think logically, to approach problems systematically and to be resilient in the face of difficulty. They are prompted to break problems down into smaller steps, to employ trial-and-improvement methods and to reflect on their work. Pupil talk is encouraged as this is an essential component in helping children develop and clarify their mathematical thinking; as pupils progress, they are increasingly expected to explain, as well as describe, what they have done. These skills are applied across a wide range of contexts covering number, shape and space and real-world problems.

Understanding

A number of key concepts underlie Mathematics and it is essential that children develop a sound understanding of these at an early stage. Examples include the base-10 place value system, the relationship between multiplication and addition, and the connection between fractions and division. Conceptual understanding is initially built through ample use of concrete objects, starting with toys for developing early counting. Pupils then move on to visual representations, such as number lines or sketches, before they encounter and use the concepts in abstract form. It is important that these stages are not rushed; short-cuts taken here result in insecure understanding which leads to problems further on.

Fluency

Children learn by-heart the basic addition, subtraction, multiplication and division facts. These give them confidence to approach harder calculations as well as serving as building blocks to help solve them. A range of written and mental calculation methods are learnt. Pupils are encouraged to develop decision-making skills, thinking flexibly about how to apply what they know in the most effective way in the context of specific problems. Mental Mathematics is practised daily throughout Key Stages 1 and 2 through Counting, Learn-Its and Its Nothing New (Big Maths). Regular practice, through weekly skills checks allows pupils to build speed, reliability and confidence and provides essential support to the parallel development of written calculation skills.

Teaching arrangements- The Challenge Approach

Pupils are taught in classes which include a range of mathematical attainment. We recognise this and provide suitable learning opportunities for all children by matching the challenge of the task to the child. In September 2016 Silverhill developed a Challenge Approach to the delivery of the 2014 National Curriculum for Maths. The intention of this approach is to provide all children with full access to the curriculum, enabling them to achieve confidence and competence – ‘mastery’ – in mathematics, rather than many failing to develop the maths skills they need for the future.

High Expectation of New Curriculum – encouraging a growth mindset.

Teachers reinforce an expectation that *all* pupils are capable of achieving high standards in mathematics.

Process of Delivery – all stages of understanding should be taught through reasoning activities.

	Emerging understanding	2 preliminary steps if pupils require the support to achieve the year group objective.
	Developing understanding	
MUST	Secure understanding	Year group objective
SHOULD	Using the understanding	Using understanding of Secure objective to solve word problems. <i>Pupils should be encouraged to adopt Bar Method to solve word problems.</i>
	Applying the understanding	Applying understanding of Secure objective to answer Test questions.
COULD	Investigating the understanding	STEM, Nrich and NCETM websites are good for investigative maths challenges.
	Mastered the understanding	NCETM Mastery Assessment documents for challenge guidance.

Differentiation – Up after Secure – NOT DOWN!

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.

The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. When to progress should always be based on the security of pupils' understanding and their readiness to progress to the next stage.

Pupils who grasp concepts rapidly should be challenged through rich and sophisticated problems before any acceleration through new content. Those pupils who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

Taking a Challenge Approach, differentiation occurs in the *support and intervention provided* to different pupils, *not in the topics taught*, particularly at earlier stages. There is no differentiation in content taught, but the questioning and scaffolding individual pupils receive in class as they work through problems will differ, with higher attaining pupils challenged through more demanding problems which deepen their knowledge of the same content. Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with rapid intervention – commonly through individual or small group support later the same day: there are very few “closing the gap” strategies, because there are very few gaps to close. Higher-attaining pupils are stretched through provision of extension work as well as through use of activities which allow for open-ended outcomes. Lower-attaining learners are supported through provision of concrete and visual resources and, where appropriate, additional teacher input and immediate same day intervention. A range of strategies, including directed questions and guided group work, are used to engage and involve all pupils. Within each class, pupils may be grouped by attainment for some activities and may remain in mixed-attainment groups for others, depending on the requirements of each activity.

Mathematics Curriculum Planning

Early Years Foundation Stage

We teach mathematics daily in our Reception classes. As the classes are part of the Foundation Stage of the National Curriculum, we relate the mathematical aspects of the children's work to the objectives set out in the Early Learning Goals, which underpin the curriculum planning for children aged three to five. We give all the children the opportunity to develop their understanding of number, measurement, pattern, shape and space through play and structured activities that allow them to enjoy, explore, practice and talk confidently about mathematics. 'Little Big Maths' is introduced to encourage mental fluency of number facts.

Key Stages 1 and 2

Mathematics is a core subject in the National Curriculum and we use the Primary National Strategy as the basis for implementing the statutory requirements of the programme of study for mathematics.

We carry out curriculum planning in mathematics in three phases: long-term, medium-term and short-term. The Primary National Strategy revised Framework for Teaching gives a detailed outline of learning objectives for each year and acts as the long-term element of our planning.

Our medium-term mathematics plans, which are adapted from the revised Framework, define the learning objectives to be addressed over each half-term. They ensure an appropriate balance of work and, taken as a whole, suitable coverage over the year. These plans are drawn up by class teachers and reviewed by the subject leader.

Class teachers complete the short-term plans, usually weekly, for the teaching of Mathematics. These record the specific learning objectives and success criteria for each activity and give details of the mental and oral starters, the main teaching input, including key questions, independent and group activities and plenary sessions. The class teacher keeps these plans in an electronic planning folder and the subject leader monitors them on a regular basis.

Teaching Assistants and Special Needs Assistants

Weekly plans are shared with additional adults who will be working in the Mathematics classroom no later than the beginning of each week. This allows Teaching Assistants and Special Needs Assistants the opportunity to discuss with the class teacher any issues arising from the plans prior to the relevant lesson. Where necessary, additional adults will be provided with specific guidance as to their role in each stage of the lesson, including the extent of support which they should provide during independent and group work.

Contribution Of Mathematics To Other Curriculum Areas

English

Mathematics contributes significantly to the teaching of English by actively promoting the skills of reading, writing, speaking and listening. Pupils learn the importance of precise use of correct vocabulary. They read and interpret problems in order to identify the mathematics involved. Children explain and present their work to others, challenging and justifying their reasoning.

Computing

Computing and Mathematics intersect in a variety of ways. Interactive whiteboard software allows the display of a wide range of visual models to support understanding as well as providing an opportunity to explore games in a whole-class setting. Older children use Computing to produce graphs and tables to display their results and to create repeating patterns, such as tessellations. Control software allows pupils to develop their use of standard and non-standard measures for distance and angle. They use simulations to predict and identify patterns and relationships. Children are introduced to a range of software and websites which provide a wealth of mathematical games, puzzles and problems; many of these can also be accessed at home. Abacus homework is set weekly which allows children to reinforce both their Computing and Maths skills at home.

Themed Topic work

The thinking skills that children develop in Mathematics lessons form a key part of themed topic work and are applicable to every subject. Whilst the daily Mathematics lesson is a discrete session, many opportunities exist for linking it to each year group's current topic, including in the selection of contexts for mathematical problems. We plan for these cross-curricular opportunities in each year group, both through the long term curriculum map and through medium term planning. The subject leader supports class teachers in identifying these opportunities.

Teaching Mathematics To Children With Special Educational Needs

Some pupils have special educational needs which impact their mathematical learning. For these children, Individual Learning Plans are developed by the class teacher to ensure progress at an appropriate level.

Assessment and Recording

We carry out both formative and summative assessment of pupils' learning. In the short term, we make diagnostic evaluations of how well each child has met the learning objectives for each lesson. These are used to adjust daily lesson plans to match pupils' needs. The class teacher maintains an assessment spreadsheet for Mathematics. This is made up of statements of attainment linked to the learning objectives of the revised Framework for Mathematics. Evidence for this may come from work in Mathematics books, contributions to classroom activities or from tests. Tests are used diagnostically to provide an additional source of evidence of a pupil's attainment.

At least termly, class teachers review the spreadsheet and use it to make a judgement on pupil progress and attainment. Children are assessed on objectives that have been taught and a judgement of Working Towards, Expected Standard or Greater Depth is given. Pupil information is passed termly to the Senior Leadership Team for review and form the basis of teachers' reports to parent's on their child's progress.

In the Foundation Stage, teachers work in collaboration with the Early Years Professionals to carry out ongoing observations and records of achievement for individual children throughout the year. Formative assessments are made, based on each of the Development Matters statements. Teachers use the EXatt Tracker to monitor children's progress throughout the year. At the end of Reception, a summative assessment is made against the Early Learning Goals and children are given an attainment grade of Emerging, Expected or Exceeding in the FS curriculum.

In Years 2 and 6, pupils are also assessed by the National Curriculum Tests (SATs.) These are compulsory for most children in maintained schools and provide a National Curriculum Level of attainment for each pupil in addition to that which has been assessed by the class teacher.

See the Assessment Policy for further information.

Homework

Mathematics homework is given to pupils regularly from Year 1 to Year 6. We aim to provide purposeful, practical activities and consolidation activities through Abacus Active Learn games, which encourage parent/child interaction and enable parents to help reinforce concepts taught in class. Parents are also encouraged to help their child practise quick recall of mathematical facts, such as number bonds and times tables probes.

Teachers in Year 6 may send home examples of SATs questions to give the children further experience.

Monitoring and Review

Monitoring of the standards of children's learning and the quality of teaching is the responsibility of the Mathematics Subject Leaders (MSL) and Senior Leadership Team (SLT). The work of the MSL 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 MSL carry out regular book scrutinies, planning scrutinies, Learning walks and lesson observations to ensure the Maths policy and procedures are being adhered to.

Silverhill Calculation Policy

We have developed our Calculation policy in the form of prompt sheets that act as guidance for teachers to teach, children to learn and parents to support. Prompt sheets are available to children during lessons to help scaffold their learning where necessary and available on the website for parents to access.

Staff Responsible for Implementation of the Mathematics Policy;

Katy Brundish (KS1) and Lisa Minifie (KS2) - Mathematics Subject Leaders
Steve Burley- Deputy Headteacher and Specialised Leader of Education for the DTSA (SLE)
Kate Nash – Headteacher