

Highwood Primary School



Promoting Resilience – Achieving Potential

Mathematics Policy

September 2014
(Revised March 2016)



This policy has been impact assessed against protected characteristics (race, gender and disability) and no adverse impact has been identified.

1. INTRODUCTION (based on National Curriculum 2013)

Mathematics is a creative and highly interconnected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary for financial literacy and most forms of employment. 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.

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas. The programmes of study are, by necessity, organised into apparently distinct domains, but pupils should make rich connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. They should also apply their mathematical knowledge to science and other subjects.

The national curriculum for mathematics reflects the importance of spoken language in pupils' development across the whole curriculum – cognitively, socially and linguistically. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. They must be assisted in making their thinking clear to themselves as well as others, and teachers should ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions.

2. AIMS

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

- become fluent in the fundamentals of mathematics, including through varied and frequent practise with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification 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 simpler steps and persevering in seeking solutions.

As a school we aim to develop:

- ❖ a positive attitude towards mathematics and an awareness of the fascination of mathematics
- ❖ an appreciation of the structure, patterns and relationships of mathematics
- ❖ competence and confidence in mathematical knowledge, concepts and skills
- ❖ an ability to solve problems, to reason, to think logically and to work systematically and accurately
- ❖ initiative and an ability to work both independently and in cooperation with others
- ❖ an ability to communicate mathematics
- ❖ an ability to use and apply mathematics across the curriculum and in real life
- ❖ an understanding of mathematics through a process of enquiry and experiment.
- ❖ an ability to present their written work neatly and logically according to the school Progression in the Four Rules of Number Policy (agreed Dec 2013).

Our specific aims are that our pupils should:

- Have a sense of the size of a number and where it fits into the number system
- Know by heart and develop rapid recall of number facts such as number bonds, multiplication tables, doubles and halves
- Use what they know by heart to figure out numbers mentally developing an understanding of number patterns and relationships
- Calculate accurately and efficiently, both mentally and in writing, drawing on a range of calculation strategies, following the school's Progression in the Four Rules of Number Policy (agreed Dec 2013)
- Make sense of number problems and recognise 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 data in graphs, diagrams, charts and tables
- Develop spatial awareness and an understanding of the properties of 2d and 3d shapes.

3. STATUTORY REQUIREMENTS

Statutory requirements for the teaching and learning of mathematics are laid out in the Mathematics sections of the National Curriculum in England Key Stages 1 and 2 Framework Document (2013) and in the Mathematics (Specific Area) section of the Statutory Framework for the Early Years Foundation Stage (2014).

In the Early Years Foundation Stage (Nursery and Reception) children are given opportunities to develop their mathematical understanding through interaction with a stimulating and rich learning environment both indoors and outdoors. Resources are easily accessible and children's interests are fostered and developed through a range of adult led and child initiated activities.

Teachers in the Foundation Stage follow the guidance in the mathematics strand of the Early Years Foundation Stage (EYFS) Framework. Children are supported in developing their understanding of Mathematics (Number and Shape, space and measure) in a broad range of contexts through which they can explore, practise, talk and extend their learning. Opportunities are provided to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems; and describing shapes, spaces, and measures.

By the end of the EYFS most children will be able to:-

- Count from 1 to 20
- Order numbers and say one more or one less than a given number
- Add and subtract two single digits
- Count on or back to find a final number
- Solve problems including doubling, halving and sharing
- Talk about size, weight, capacity, position, distance, time and money
- Compare quantities and objects
- Recognise, create and describe patterns
- Explore characteristics of everyday objects and shapes and use mathematical language to describe them.

(EYFS profile 2013)

Key Stage One (Years 1 and 2) and Key Stage Two (Years 3-6) children are taught using the programme of study for their year group. Teachers provide opportunities for wider and deeper learning to encourage mastery for more able pupils and consolidate content from the year group below with children who are taking longer to reach age related expectations. By the end of each key stage, most pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study in the National Curriculum in England Key Stages 1 and 2 Framework Document (2013).

By the end of Key Stage 2 most children will:

- have a secure knowledge of number facts and a good understanding of the four operations
- be able to use this knowledge and understanding to carry out calculations mentally and to apply general strategies when using single-digit and two-digit numbers and particular strategies to special cases involving bigger numbers
- make use of diagrams and informal notes to help record steps and partial answers when using mental methods that generate more information than can be kept in their heads
- have efficient, reliable, compact written method of calculation for each operation, which they can apply with confidence when undertaking calculations that they cannot carry out mentally.

3. SUBJECT ORGANISATION

In the EYFS children have daily opportunities to develop their mathematics skills. In Key Stages 1 and 2 children have daily mathematics lessons which usually take place in the morning. In all Key Stages teachers ensure that mathematical skills are also applied in other curriculum areas through the themed curriculum topics.

Yearly objectives are taken from the National Curriculum for Mathematics and the programmes of study are accessed for the appropriate year group. 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 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 being offered rich and sophisticated problems before any acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

Numeracy lessons will routinely include an activity using the four operations, review of prior learning, main teaching activity, skills practise/application opportunity, guided group work with an adult and a review/plenary session. Teachers use their professional judgement to determine the activities, timing and organisation in each lesson in order to suit the teaching objectives. In all lessons, there will be an appropriate amount of differentiation in the work to meet the needs of individual learners. Independent learning tasks are presented as 'challenges' and pupils are encouraged to self-select the challenge that is most appropriate for them and their stage of learning and understanding within each unit. Groupings are flexible and based on needs within each theme.

The children are provided with a 'Mathematics Journal' to record their work. This exercise book has the child's targets visible on the first page or as a target card inside the front cover. Children are provided with feedback marking and next step tasks at least once a week. In KS2 pupils are asked to read and respond to this marking during morning registration. In KS1 timings for response to marking are decided by the teacher.

The teaching of mathematics at Highwood Primary School provides opportunities for:

- group work
- paired work
- whole class teaching
- individual work

Pupils engage in:

- the development of mental strategies
- written methods
- practical work
- investigational work
- problem solving
- mathematical discussion
- consolidation of basic skills and number facts.

At Highwood Primary School we recognise the importance of establishing a secure foundation in mental calculation and recall of number facts before standard written methods are introduced as outlined in the Progression in the Four Rules of Number Policy (agreed Dec 2013). We use the correct mathematical vocabulary when planning to help determine the appropriate terminology to use in our teaching and children are expected to use it in their verbal and written explanations.

Mathematics contributes to many subjects and it is important the children are given opportunities to apply and use mathematics in real contexts. Staff make cross curricular links where possible in order to provide meaning and context to the teaching. This allows the children to gain an understanding of how mathematics fits in to everyday life and make connections with the real world.

4. PLANNING

The school uses the National Curriculum in England Key Stages 1 and 2 Framework Document (2013) and the Statutory Framework for the Early Years Foundation Stage (2014) as the basis of its curriculum. Teachers adapt and develop them into teaching sequences suitable for classes or groups.

We carry out our curriculum planning in mathematics in two phases (long-term and short term). The long term planning makes links between areas of the curriculum so that the children experience a connected curriculum that gives mathematics purposeful setting.

The class teachers are responsible for writing the weekly/daily plans for these lessons (short-term plans). These plans list the specific learning objective of each lesson, the activities, guided group foci, differentiation and the success criteria/learning outcomes. The class teachers are supported by members of the SLT in the production of these plans and members of the SLT often discuss them on an informal basis and as part of the monitoring process.

5. ASSESSMENT, RECORDING AND REPORTING

Assessments are made in line with the school assessment systems which are based on the Herts for Learning (HfL) assessment documents. Ongoing formative assessment takes place during planning, teaching and marking and a formal summative assessment of each child's progress and learning is made once a term using the HfL criteria. These summative assessments are recorded on SIMS as 'steps' and show whether a child is 'working towards', 'working within' or 'working beyond' age related expectations.

The use of 'cold tasks' at the start of each unit of learning allows teachers to assess where there are individual gaps in learning and also to set short term targets with the pupil. Each unit ends with a 'hot task' where children are assessed against their targets and progress within the unit. The Mathematics Journals are therefore an indication of progress and learning for each child. Cross curricular mathematics is also assessed through the Learning Journal where children may record learning in Science and the foundation subjects. Children are also assessed termly using the White Rose Assessment papers. Analysis of these test scores supports teachers in their assessments of pupils. Children are assessed at the beginning of reception through a Baseline assessment, during the year through Early Years Outcomes and at the end of their reception year using the Foundation Stage Profile.

Children are also formally assessed at the end of each Key Stage (in Year Two and Year Six) through the Statutory Assessment Tests (SATs). Formal external tests take place to assess calculation and reasoning skills and the results of these (including teacher assessments) are submitted to the Local Authority and the DfE.

Teachers use assessment to ensure planning is based on prior attainment and that pupils know what they are to do to achieve the next step.

Parents are invited to discuss their child's progress twice a year and are sent an annual end of year report, detailing the child's mathematics development and targets for next steps. 'Book Looks' are held after school on the first Monday of each month where parents are invited to come into the classroom to view their child's learning journals.

6. MONITORING AND REVIEW

It is the responsibility of the class teachers, Phase Leaders, the Maths Subject Leadership Team, SLT and Governors to monitor the standards of children's work. The Maths Subject Leadership Team monitors the quality of teaching in mathematics and is also responsible for supporting colleagues in the teaching of mathematics, for being informed about current developments in the subject and for providing a strategic lead and direction for the subject in the school. Having identified priorities, the Maths Subject Leadership Team constructs an action plan. This will form the basis for monitoring and will identify how this is to be implemented. Mathematics is monitored in accordance with the school's monitoring policy.

7. INCLUSION

At our school we teach mathematics to all children, whatever their ability. Mathematics forms part of the school curriculum policy to provide a broad and balanced education to all children. Through our mathematics teaching we provide learning opportunities that enable all pupils to make progress. We do this by setting suitable learning challenges and responding to each child's different needs.

Assessment against the National Curriculum allows us to consider each child's attainment and progress against age related expectations. Opportunities are found for more able children to extend their understanding. Intervention programmes are used with children who are finding it more difficult to access the mathematics curriculum where appropriate. When progress falls significantly outside the expected range, the child may have special educational needs. Our assessment process looks at a range of factors or barriers to learning: classroom organisation, teaching materials, teaching style, differentiation and the child – so that we can take some additional or different action to enable the child to learn more effectively. This ensures that our teaching is matched to the child's needs. We enable pupils to have access to the full range of activities involved in learning mathematics. Where children are to participate in activities outside the classroom, we carry out a risk assessment prior to the activity, to ensure that the activity is safe and appropriate for all pupils. All children receive quality

mathematics teaching on a daily basis and activities are differentiated accordingly. Where identified pupils are considered to require targeted support, to enable them to work to age appropriate objectives, a variety of interventions are available. These include the use of Personal Plans, TA support, and intervention programmes. More able pupils are planned for in line with our Inclusion Policy. This is supported by our Equal Opportunities Policy.

8. EQUAL OPPORTUNITIES

It will be ensured that equal opportunities in mathematics are addressed as follows: Pupils with special needs have equal access to the mathematics curriculum through the use of differentiated learning strategies and tasks. These are based on individual needs. Specific teaching strategies are used to maximize access to the curriculum for pupils learning EAL.

9. PARENTAL/COMMUNITY INVOLVEMENT

We value parent involvement in children's learning of mathematics and promote a home school partnership in the following ways:

- Sharing information – newsletters, parent consultation evenings, Parentview meetings, parents' leaflets, email, reading diaries, home learning grids and books
- Celebrations – assemblies, school performances, displays, Open Evening, Monthly Book Looks
- Home Learning- in line with our Home Learning Policy
- Parent helpers

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