Mathematics Policy

'A high quality maths education 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.'

Primary National Curriculum 2014

Introduction

At Four Oaks we provide our pupils with the essential knowledge and skills needed to prepare them for their future success. We maximise pupils' potential by creating a stimulating, secure and caring environment in which a broad and balanced education is provided.

This policy outlines the teaching, organisation and management of Mathematics at Four Oaks Primary School and is based on the National Curriculum Programmes of Study. The policy has been drawn up to reflect our whole school approach to Mathematics and has been discussed with staff and has the agreement of the Senior Leadership Team and Governors. The implementation of this policy is the responsibility of all the teaching staff.

We aim to provide the children with a mathematics curriculum, which will allow them to become confident individuals through developing their mathematical skills to their full potential. We also aim to present mathematics as a challenging, exciting, creative and relevant subject in order to promote a positive and confident attitude.

Using the 2014 National Curriculum it is our aim to develop:

- A positive attitude towards mathematics and an awareness of the fascination 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.

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 'Written Calculation Policy'.
- Make sense of number problems and recognise the operations needed to solve them explaining 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.

Mathematics Teaching Time

To provide adequate time for developing mathematics skills, each class teacher will provide a daily 1-hour mathematics lesson. To ensure that children have accurate recall of facts and methods, additional sessions outside of the daily mathematics lesson are planned for (e.g. 'Fluent in Five', 'Flashback 4' and Multiplication and Division facts sessions). During these sessions children will practice and consolidate basic skills. Recall of methods encourages children to select and choose an appropriate method/strategy e.g. mentally, jot or annotate or choosing an expanded or compact written method.

The structure of each mathematics lesson is flexible and will vary depending on the needs of the children and the content of the lesson.

EYFS

We teach mathematics in Nursery and Reception as an integral part of the Early Years Foundation Stage. The format for the daily lesson differs from the rest of the school in that objectives are covered throughout the day in short, focused class sessions, followed up in small group work and explored and applied within enabling environments. Within the EYFS the six main areas of developing a well rounded mathematician are planned, taught and assessed: There are six main areas that collectively underpin children's early mathematical learning and which provide the firm foundations for the maths that children will encounter as they go up the years in primary school.

1. Cardinality and Counting
2. Comparison
3. Composition
4. Pattern
5. Shape and Space
6. Measures

Key Stage 1 and Key Stage 2

During the daily mathematics lessons, there will be a good balance between whole-class, group teaching and individual work. Pupils are typically organised into groups according to their ability in KS2. In KS1 children stay within their own registration group but small ability grouping may be used within a lesson. All groupings are reviewed regularly and the majority of children will have access to the same work with various methods of support and challenge used to cater for the differing needs of children.

Provision of teaching and learning

Yearly objectives are taken from the National Curriculum for Mathematics and the programmes of study are accessed for the appropriate year group. Materials from the White Rose Maths Hub form the basis of the teaching sequences. 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 rather than acceleration through new content. Those who are not sufficiently fluent with earlier material should consolidate their understanding, including through additional practice, before moving on.

Learning mathematics is a process that requires active involvement. At Four Oaks, we aim to provide opportunities for children to become actively engaged in the learning process. Our aim is to inspire children by giving them a lively sense of interest and enjoyment in mathematics, with an understanding of its practical and creative use in everyday life. Therefore, a variety of teaching methods are employed to bring about effective learning with due regard being given to the ability and expertise of the learners, the suitability of resources and the time available to complete activities. The teaching of mathematics at Four Oaks Primary School provides opportunities for:

- group work
- paired work (talk partners)
- whole class teaching
- individual work
- listening, responding to and evaluating their own and others' contributions

Quality questioning underpins our philosophy for teaching mathematics. At the start of every teaching sequence questioning enables teachers to assess where the children are in their learning and provides assessment allowing us to plan effectively for the future needs of the children. Questions are open ended and used as a basis for further questioning, to unpick misconceptions and deepen the children's knowledge and understanding. The questions enable teachers to adapt their teaching to the needs of the children offering them the opportunities to exceed expectations and add depth to their understanding.

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

As mathematics is such an important life skill, we embrace a 'Mastery' approach to our lessons. The 'White Rose' scheme of learning is taught across the school, allowing pupils to spend longer on key mathematical concepts, most noticeably number. During these longer units, pupils will see mathematics in a real life context, before moving at an appropriate pace from the concrete/pictorial approach (supported by manipulatives including Numicon, Base 10, number tracks and number lines and place value charts) to the abstract.

The White Rose Maths Hub materials form the basis of the teaching sequences from EYFS to Year 6 at Four Oaks. This underpins our maths philosophy and ensures that ***fluency***, ***reasoning*** and ***problem solving*** are taught through a concrete, pictorial and symbolic methodology. Problem solving strategies are explicitly taught and modelled before children apply them to real life situations.

Developing fluency, reasoning and problem solving Mathematicians

The Mathematics curriculum at Four Oaks Primary School embraces the Primary National Curriculum to ensure that all our children, from EYFS to Y6 are fluent in the fundamentals of maths, can reason mathematically and become confident problem solvers.

Fluency is a fundamental of mathematics, including through varied and frequent practice with increasingly complex problems over time. We ensure that pupils have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems.

In our school we ensure that children become confident in the two types of fluency:

- Conceptual fluency (e.g. exploring the five strands of place value, what an equivalent fraction is and identifying key features of different representations of data.)
- Procedural fluency (e.g. +- x ÷ calculation methods linked to whole numbers, fractions and decimals and exploring step by step mental and written methods.)

Children at Four Oaks will be given regular opportunities to recall known facts, develop number sense, know why they are doing what they are doing and know when it is appropriate and efficient to choose different methods and will apply skills to multiple contexts e.g. multiplying and dividing by 10 to convert units of measurements.

Reasoning mathematically means following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.

In our school we ensure that children become confident in mathematical reasoning through providing opportunities for them to:

- Conjecture relationships and generalisations (e.g. if I add an odd and an odd number it will always result in an even number or all quadrilaterals have 4 right angles – true or false?)
- Developing an argument, justification or proof using mathematical language (e.g. prove it, justify, convince me, how can you work it and how did you work it out?)
- Explore a variety of reasoning challenges such as: alike and different, odd one out, true or false, spot the mistake and sometimes, always or never true. These reasoning challenges can be adopted or adapted for any strand of mathematics: number, measurement, statistics, geometry.

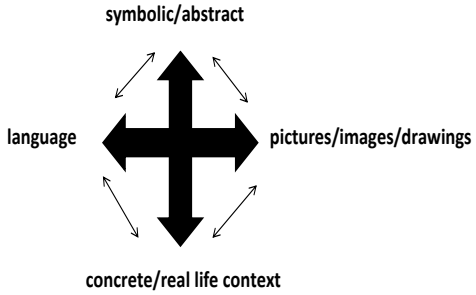
To ensure that our children are confident in mathematical reasoning we model and encourage children to consider and choose what sort of working out is required linked to different reasoning questions e.g. verbally explaining, using words or numerals and symbols, pictorial representations such as ten frames, place value charts or tables and use of concrete equipment such as Numicon, Base 10 and ten frames. Reasoning is explicitly taught during maths lessons and is continually visited through reasoning challenges in all strands of maths.

Problem solving requires the children to be secure in and build upon conceptual understanding (***fluency***) and mathematical thinking and language (***reasoning***) to help solve sophisticated problems in unfamiliar contexts. Problem solving means 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. There are five different types of problem solving which we teach in each year group and explore through different strands of Mathematics. These are: word problems, working systematically to find all possibilities, visual and diagram puzzles, finding rules and describing patterns and logic problems.

Children demonstrate their knowledge and understanding by being provided with the opportunity to use and apply the skills and knowledge they have gained. It should be presented through a context, which is meaningful and stimulating for all children at their own level. Children should be confidently able to apply their skills and knowledge to imaginatively solve problems.

Effective teaching and learning of Mathematics

Haylock and Cockburn's Cognitive Connections, which is based upon Bruner's Theory of Learning, underpins our mathematical rationale to the effective teaching and learning of Mathematics. Bruner's theory of learning is based upon the principle that new concepts (regardless of the age of the learner) are taught *enactively (concrete)*, *iconically (pictorial)* and *symbolically* as ways of capturing experiences in the form of knowledge and understanding in the working and long-term memory.



New concepts (regardless of the age of the learner) are taught *enactively*, then *iconically* and, finally, *symbolically* as ways of capturing experiences in the memory. We also believe that it is important to include practical activities and discussion as an integral part of mathematics lessons; and the use of pictorial recording and the classroom environment are also important.

New mathematical concepts:

- Involve the use of structured **concrete** materials (e.g structural apparatus such as cubes, counters, 3D shapes or weighing scales as well as contextual objects such as teddies or coins for counting or sorting)
- Are enhanced by imagery with **pictorial representations** (e.g. children's own mark making and simple drawings, sketches, number lines and diagrams)
- Are recorded in the **abstract/symbolic** (e.g. young children's emergent graphics, early number formation, number sentences and written expanded methods such as 'grid' method multiplcation.)

We believe that mathematics is best learned through activities that allow children, no matter what age or ability, to explore and understand the mathematical concepts with concrete apparatus. Using equipment helps to deepen understanding and creates visual and concrete images from abstract concepts. All classes from EYFS to Y6 use equipment in lessons. Children will be provided with opportunities to explore ***varied representations*** of the same concept using a variety of different equipment to support connections in their learning.

We aim to develop mathematicians who are confident to choose to use the most appropriate concrete, pictorial or symbolic resources for all aspects of fluency, reasoning or problem solving. A wide variety of carefully chosen resources are available in each classroom. Children are encouraged to 'choose the most effective resources to explain, justify, prove and convince.'

In our school we use a variety of ways of recording the children's work. With the focus on using concrete apparatus much of the children's work can be very practical. In Y1 and Y2 this approach is recorded in whole class 'Floor books'. The work within these books exemplifies the process undertaken in learning a mathematical concept.

Resources

Mathematics is well resourced at Four Oaks Primary. Each class has a general bank of resources for day-to-day Mathematics lessons. Further shared resources are stored centrally. Each classroom is equipped with an interactive whiteboard and a range of interactive teaching programmes are available.

Resources are audited on a regular basis by the subject leader and monies are allocated to the purchase of new resources as required to ensure that the curriculum can be delivered in an exciting and stimulating manner.

Inclusion in Mathematics

The needs of all children are considered carefully when planning and teaching mathematics at Four Oaks Primary. We want children to reach their full potential and where necessary, teachers identify which children are not making adequate progress and take steps to improve their progress and attainment in.

Teachers will involve all pupils through carefully planned support, scaffolding and challenge. Pre-teach and Keep-Up interventions are used to help support lower attaining children continue to make progress and access the daily lessons with their peers. Catch- Up interventions are used to narrow the attainment gap between lower attaining pupils and those working at age related expectations. These interventions are planned and delivered according to the needs of individual pupils.

Higher attaining pupils are provided with challenges within the lessons to deepen their learning and are provided with opportunities to apply their knowledge and understanding across other subjects.

Pupils with Special Educational Needs and Provision Maps

Teachers include all pupils in their daily mathematics lessons including those with SEND. Where appropriate, this will be achieved through differentiated work and, in exceptional circumstances, an individualised curriculum. Work in mathematics considers the targets set for individual children in class Provision Maps which are reviewed termly with the school SENDCO.

Links between Mathematics and other subjects

Mathematics contributes to many subjects and it is important the children are given opportunities to apply and use mathematics in real contexts. At Four Oaks, staff are encouraged to make cross-curricular links where possible to provide meaning and context to the teaching. This will allow the children to gain an understanding of how mathematics fits in to everyday life and make connections with the real world e.g. data representations to support Science investigations.

Computing

Computing may be used in various ways to support teaching and motivate children's learning. Computing will involve the computer, audio-visual aids, movie making software, laptops and iPads. They are only used in a daily mathematics lesson when it is the most efficient and effective way of meeting the lesson objectives.

Working Walls and Displays

The learning environment is key to supporting pupils learning and a mathematics working wall is a key part of this. Working walls are evident in our classrooms as a display of the learning process and a reference point to support learning. They may include modelled examples, steps to success, visual aids, challenge, vocabulary or examples of good work. Children are encouraged to use the working wall to support learning and develop independence.

Assessment

Assessment is an integral part of the teaching process. Assessment is purposeful, allowing teachers to match the correct level of work to the needs of the pupils, thus benefiting the pupils and ensuring confidence and progress. Assessments are used to inform teaching in a continuous cycle of planning, teaching and assessment.

Summative assessment

Summative assessment occurs at pre-defined periods of the academic year such as SATs tests, NFER standardised tests or end of White Rose unit tests. At the end of Key Stage 1 and 2, Y2 and Y6 teachers make formal end of Key Stage Assessments. Summative tests help teachers to benchmark pupils, track progress and to make mid-year and end of year judgements on a child's attainment against a year group's programme of study objectives.

Internal summative assessment data is collected at key points in the year (see assessment timetable) and provides information about the impact of our mathematics curriculum on children's progress and attainment.

Formative assessment
Formative assessment is the ongoing assessment carried out by teachers both formally and informally during mathematics lessons. This type of assessment is used to assess knowledge skills and understanding and is used to identify gaps and misconceptions. The results of formative assessments have a direct impact on the teaching materials and strategies employed immediately following the assessment. It enables teachers to provide scaffolding, support or challenge to pupils as appropriate.

Methods of formative assessment include:
- Quality questioning
- Talking to the children
- Marking and feedback of pupils' work (see marking policy for details)
- Self and peer assessment against specific learning objectives

All class teachers are committed to raising standards of attainment through AFL and are responsible for the assessment of all pupils in their class.

Marking and Feedback

Consistently high quality marking and constructive feedback from teachers ensures pupils make progress in their learning. A marking code that the children recognise gives guidance for development and improvement. Quality marking provides opportunities for children to respond and develop the learning from a session the class teacher has selected. 'Quality marks' are succinct and focus on consolidating or extending learning. This is in accordance with school marking policy.

Recording and reporting
Parents and carers are updated with their child's achievements and encouraged to be involved in different ways:
- Inviting them into school twice yearly to discuss the progress of their child.
- Providing parents with an end of year report in the summer term.
- Providing explanations of mathematical methods used.

Management of Mathematics

The Mathematics subject leader and the senior leadership team are responsible for ensuring that all staff are adequately trained so that they can deliver the curriculum effectively. Regular communication with staff is sustained throughout the year.

Role of the Subject Leader
- Support colleagues in the implementation of the National Curriculum.
- Monitor progress in mathematics throughout the school by lesson observations, scrutiny of children's books, scrutiny of planning and exploring pupil voice.
- Lead by example in the way they teach in their own classroom.
- Teach demonstration/ team-teaching lessons where necessary.
- Prepare, organise and lead INSET, with the support of the Headteacher and external consultants.
- Work co-operatively with the SENDCOs.
- Attend training provided and disseminate to colleagues.
- Have regular discussions with the Headteacher and Curriculum Governor.
- Inform parents and carers of new developments in the subject.
- Provide an annual mathematics action plan, which will form part of the School Development Plan.

- Review the action plan twice a year.
- Be responsible for the purchase and organisation of resources.

Role of the Headteacher

- Lead, manage and monitor the implementation of the National Curriculum, including monitoring teaching plans, books and the quality of teaching in classrooms.
- Ensure that mathematics remains a high profile in the school's development work.
- Deploy support staff to maximise support for the school.

Role of the Governors

- The Governing Body has general responsibility for the conduct of the school with a view to promoting high standards of educational achievement. The Governing Body shares responsibility for making sure that the National Curriculum is taught and assessed. The Curriculum Committee will be consulted in detail, regarding the National Curriculum delivery.

Documents to be read in conjunction with this policy include:

- Written Calculation Policy
- National Curriculum 2014
- White Rose Maths Hub Schemes of Work
- Marking Policy
- Assessment Policy
- Teaching & Learning Policy
- Special needs Policy

Reviewed – May 2025
Review Date – April 2028