

**Maths Policy**

Our school policies reflect Edenthorpe Hall’s commitment to an inclusive, creative and exciting curriculum, based around high quality teaching and learning.

**Purpose of Study**

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.

**Aims**

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

* become **fluent** in the fundamentals of mathematics, including through varied and frequent practice 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

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 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.

**Information and communication technology (ICT)**

Calculators should not be used as a substitute for good written and mental arithmetic. They should therefore only be introduced near the end of key stage 2 to support pupils’ conceptual understanding and exploration of more complex number problems, if written and mental arithmetic are secure. In both primary and secondary schools, teachers should use their judgement about when ICT tools should be used.

**Spoken language**

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.

**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 4 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 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 4 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 4 operations, including long multiplication and division, and in working with fractions, decimals and percentages.

Pupils should read, spell and pronounce mathematical vocabulary correctly.

**Teaching for Mastery at Edenthorpe Hall Primary School**

The essential idea behind mastery is that all children need a **deep** understanding of the mathematics they are learning so that:

* future mathematical learning is built on solid foundations which do not need to be re-taught;
* there is no need for separate catch-up programmes due to some children falling behind;
* children who, under other teaching approaches, can often fall a long way behind, are better able to keep up with their peers, so that gaps in attainment are narrowed whilst the attainment of all is raised.

**What does Maths Teaching for Mastery look like?**

* It rejects the idea that a large proportion of people ‘just can’t do maths’
* All pupils are encouraged by the belief that by working hard at maths, they can succeed – growth mindset
* Pupils are taught through whole-class interactive teaching, where the focus is on all pupils working together on the same lesson content at the same time.
* All children can master concepts before moving to the next part of the curriculum sequence, allowing no pupil to be left behind
* If a pupil fails to grasp a concept or procedure, this is identified quickly and early intervention is provided
* Lesson design = identifies the new mathematics, they key points, the difficult points and a carefully sequenced journey through new learning.
* Significant time is spent developing deep knowledge of the key ideas that are needed to underpin future learning.
* Key facts such as multiplication tables and addition facts within 10 are learnt to automaticity to avoid cognitive overload in the working memory.

**Organisation of Teaching and Learning**

**Planning**

All teachers create a long term plan which identifies the required coverage for each half term. These plans ensure that topics are covered and that key concepts are required throughout the year. However, teachers ensure that there is sufficient time for children to master concepts and deepen their understanding.

We use the National Curriculum, White Rose Maths Hub, NCETM, Focus Maths, Times Tables Rock Stars and Nrich as a basis for implementing the statutory requirements for the study of mathematics. Within each maths lesson, teachers ensure there are opportunities for children to practise their fluency, reasoning and problem solving.

In KS1, the children will be provided with opportunities to practise number bonds to ensure that by the end of year 2, they are confident in knowing the number bonds to 20 and are precise in using and understanding place value.

In KS2, children will use Times Tables Rock Stars. They will complete the paper tests three times a week as well as having access to the website, in school and at home, to further consolidate their times tables learning. It is expected that children are fluent in their multiplication tables up to and including 12 x 12 by the end of Year 4.

**Teaching**

At the start of a lesson, teachers hook the children into new learning by sharing a relevant thought-provoking task such as a reasoning or problem solving question. The children and teacher unpick the problem together which reveals new mathematical content. The teacher will share the learning objective with the children and this will be written into their maths book. Throughout the lesson, the teacher will guide the children through small steps, leading back and forth interaction, including questioning, short tasks, demonstration and discussion. Children should be sat in mixed-ability pairs so that effective questioning and peer support can happen.

When children are ready to practise what has been taught and start their independent learning task, they will write down what task they are completing. This will either be fluency, reasoning or problem solving.

Pre-learning tasks will support teachers in ensuring that they are continuously assessing children’s learning and are aware of the needs in their class. Children who appear to be struggling with concepts receive speedy and effective intervention to ensure that they are reading for the next lesson.

**Assessment**

Maths is assessed before, during and after the children have engaged with maths learning. Teachers aim to assess and provide feedback for children whilst they are working during the lesson so that children are provided with meaningful feedback. After teachers have marked children’s work, children are expected to respond in purple pen ideally within the lesson, during same day intervention or the following day.

In addition to this, we use summative assessment throughout the year including PUMA, Test-Base and Reach 4 Milestones. Test-Base assessments are completed half termly with PUMA tests completed termly. In addition, in line with statutory guidance, formal assessments are completed at the end of Y2 and Y6.

**The difference between Mastery and Greater Depth**

**A pupil really understands a mathematical concept, idea of technique if he or she can:**

* Describe it in his or her own words;
* Represent it in a variety of ways (e.g. using concrete materials, pictures and symbols – the CPA approach);
* Explain it to someone else;
* Make up his or her own examples (and non-examples) of it’
* See connections between it and other facts or ideas;
* Recognise it in new situations and contexts;
* Make use of it in various ways, including in new situations.

**A pupil presenting a mastery understanding with greater depth is characterised by pupils’ ability to:**

* Solve problems of greater complexity (i.e. where the approach is not immediately obvious);
* Demonstrating creativity and imagination;
* Independently explore and investigate mathematical contexts and structures, communicate results clearly and systematically explain and generalise the mathematics.

**Inclusion**

Teachers recognise that in all classes children have a wide range of ability and we seek to provide suitable learning opportunities for all children. We aim to match the challenge of the task to the ability of the child, yet strive to move all learners through the curriculum at the same pace.

We achieve this by:

* Changing the learning methods to suit the learning needs of different children
* Providing resources
* Using adults to support children individually or in groups
* Same day intervention
* Low threshold high ceiling tasks
* Peer support
* Questioning

**Maths in the Foundation Stage**

Mathematics is taught each day in the foundation stage as a direct input session and also during continuous provision. The focus at this stage is to develop early Mathematics, including the development of number, shape and reasoning. There are mathematical opportunities throughout the environment, as well as clearly displayed numbers, shapes, colours and a range of concrete resources available at all times.

**Equal Opportunities**

## Equality of opportunity is about providing equality and excellence for all, in order to promote the highest possible standards of achievement and progress.

## The content of our Maths is planned to incorporate the principles of equality and to promote positive attitudes to diversity. In our feedback, we take account of each pupil’s starting points and our comments are differentiated appropriately to ensure the inclusion of:

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* Boys and girls
* Children with special needs, including gifted, talented & more able
* Children from all social, cultural and ethnic backgrounds
* Looked After children

**SEND**

Differentiated learning strategies support pupils with special needs. This applies to children who need additional support and also those who are more able. This support is usually given in class. The level of support given to children with SEND and their targets are detailed in their support plan. Each child with a support plan has a purple book which is used to record progress towards their targets through the collection of evidence.

**Management**

It is role of the Maths Subject Leader to maintain an overview of the Maths curriculum, monitor progress throughout school, keep colleagues well-informed and offer support, to lead new initiatives and deliver INSET when required. The subject leader will also maintain the Maths budget, organise resources and update school policy as required.

**Monitoring and Evaluation**

The role of the Senior Leadership Team is for strategic lead and direction for the teaching of Maths. As such, SLT rigorously monitors the quality and effectiveness of the teaching and learning of Maths across school. Strategies include: Drop-ins, formal observations, learning walks, learning pokes, planning and work scrutiny and pupil progress meetings. The SLT will provide timely, constructive and positive feedback to individuals, the staff as a whole and governors to inform them of current judgements and ways in which we can improve further. Where identified, individual/peer coaching will be offered to support the professional development of colleagues and the sharing of best practice is welcomed and encouraged.

We recognise the need to regularly evaluate and review out policy and practice in order to provide and maintain high standards of provision for all the children in our school.

**Review date: September 2018**

**Next review: September 2019**