East Stanley School
Mathematics Policy

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Introduction

'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 mathematical education therefore provides a foundation for understanding the world, the ability to reason mathematically, an appreciation of the power and beauty of mathematics, and a sense of enjoyment and curiosity about the subject.' (DfE 2014)

As can be seen from the above introduction, mathematics pervades all aspects of our lives and helps us to make sense of our world.

At East Stanley School it is our aim to give children a sense of enjoyment and curiosity about mathematics and prepare them to use it in their everyday lives. Lessons are planned with the intention that children become fluent in mathematics, make connections across different mathematical ideas and gain deep conceptual understanding. Children will have the opportunity to reason mathematically, prove ideas and solve problems in a variety of contexts. The aim is that by the time children leave East Stanley School they are ready for their secondary mathematics curriculum.

National Curriculum

Mathematics at our school is based on the National Curriculum for Mathematics (Department for Education, 2014) for year groups 1 to 6.

The programmes of study are used to give a balanced and broad curriculum to all of our pupils.

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.

The National Curriculum provides a framework for mathematics but the school is aware of the need for flexibility and creativity in teaching and learning styles in response to the needs of individual children.

Planning

Long Term Planning

The National Curriculum for Mathematics 2014 and Development Matters (EYFS) provide the long term planning for mathematics taught in the school.

Medium Term Planning

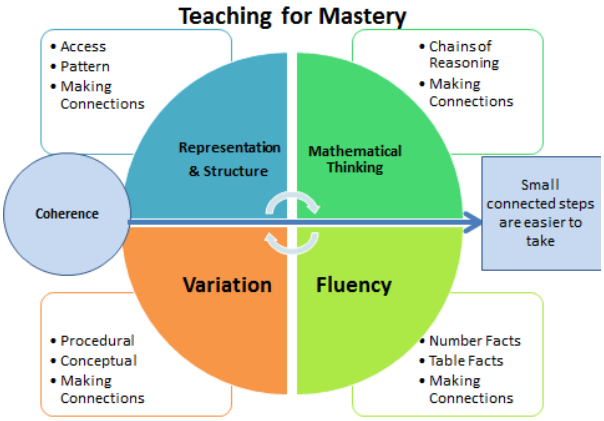
Years 1-6 use the White Rose Maths Hub schemes of learning as a basis for their medium term planning. These schemes provide teachers with exemplification for maths objectives and are broken down into fluency, reasoning and problem solving, key aims of the National Curriculum. They support a mastery approach to teaching and learning and have number at their heart. They ensure teachers stay in the required key stage and support the ideal of depth before breadth. They support pupils working together as a whole group and provide plenty of time to build reasoning and problem solving elements into the curriculum.

Short Term Planning

All classes have a daily mathematics lesson. Lessons are 45-60 minutes long. Teachers of the EYFS ensure the children learn through a mixture of adult led activities and child initiated activities both inside and outside of the classroom. Mathematics is taught through an integrated approach.

A Mastery Approach to teaching and learning

At East Stanley School lessons incorporate the 5 big ideas of teaching for mastery.



Fluency:

- Quick recall of facts and procedures
- The flexibility and fluidity to move between different contexts and representations of mathematics.
- The ability to recognise relationships and make connections in mathematics.

Representation & Structure:

Mathematical structures are the key patterns and generalisations that underpin sets of numbers – they are the laws and relationships that we want children to spot. Using different representations can help children to 'see' these laws and relationships.

Variation:

Procedural variation – This is a deliberate change in the type of examples used and questions set, to draw attention to certain features.

Conceptual variation – When a concept is presented in different ways, to show what a concept is, in all of its different forms.

Mathematical thinking involves:

- Looking for pattern and relationships
- Logical Reasoning
- Making Connections

Coherence:

Teachers should develop detailed knowledge of the curriculum in order to break the mathematics down into small steps to develop mastery and address all aspects in a logical progression. This will ensure deep and sustainable learning for all pupils.

EYFS

Mathematics within the EYFS is developed through purposeful, play based experiences and is enabled throughout the indoor and outdoor provision. The learning will be based on pupil's interests and current themes and will focus on the expectations from Development Matters. Pupils develop a strong grounding in number. They are taught to count confidently and develop a deep understanding of numbers to 10, the relationships between them and the patterns within those numbers. Frequent opportunities are provided to build and apply understanding, including use of manipulatives,. In addition opportunities are provided for children to develop their spatial reasoning skills across all areas of mathematics including shape, space and measure. The development of a positive attitude towards mathematics is fostered; children are encouraged to 'have a go' and talk to adults and peers about what they notice and are encouraged to not be afraid to make mistakes.

Key Stage 1 Maths

The principal focus of mathematics teaching in Key Stage 1 is to ensure pupils develop confidence and mental fluency. The essential idea behind the mastery approach is that all children have a deep understanding so that future learning continues to build on solid foundations. If the subject is represented using concrete materials, pictorial representations and abstract symbols, it will allow children to visualise maths in varied ways, see connections and to independently explore and investigate a topic. Practical activities and resources offer the children a deeper mathematical understanding of more complex concepts. Providing children with visual representations also offers a scaffold when developing a more robust understanding of maths. Throughout Key Stage 1, it is important that children gain a secure knowledge of number and place value and become confident when using the four operations in both formal methods as well as problem solving where often the approach is not immediately evident. Alongside number work, pupils begin to identify fractions using shapes, objects and quantities and make connections to equal sharing and grouping. Pupils are taught to count to ten in fractions, recognise equivalent fractions and develop their understanding of fractions on a number line. At this stage, pupils will also develop their ability to recognise, describe, draw, compare and sort different shapes. Pupils have the opportunity to use a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money and are expected to use related vocabulary for all topics. Other subjects may have strong links to some maths topics allowing cross-curricular teaching. For example, shape through art or computing, measures through science or coordinates in geography. This is to ensure we continually maximise learning opportunities for all pupils across an entire curriculum.

Key Stage 2 Maths

Lower Key Stage 2 – Years 3-4.

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.

Upper Key Stage 2 – Years 5-6

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.

SEND

Where possible, through the use of appropriate support and differentiation, children with SEND will be working towards the same learning objectives as their peers. From time to time, those working well below the level of the whole class may be working towards related objectives chosen from the relevant progression strand from an earlier year. Those children with SEND may have specific targets relating to mathematics where appropriate. They may be given additional support or extra teaching in small groups to help them achieve these targets. The lower attaining pupils should have access to a wide range of practical resources to help develop mathematical thinking and understanding.

Gifted & Talented

Children who are working above the level of the class will be given a range of experiences designed to deepen their understanding while working on the same learning objectives as their peers.

Parental Involvement

We encourage parents to be involved by:

- Providing an opportunity to meet the teacher at the beginning of each academic year to discuss teaching and learning in mathematics.
- Inviting them into school twice yearly to discuss the progress of their child and view their child's work in mathematics.
- Inviting them into school at the end of the academic year to view their child's work in mathematics.
- Providing an annual written report outlining their child's achievements in mathematics

Assessment

Assessment for learning should occur throughout the entire maths lesson, enabling teachers and teaching assistants to adapt their teaching/input to meet the children's needs. This feedback should be incisive and regular.

On a daily basis, children should self-assess against learning objectives and success criteria, giving them a sense of success.

Pupil's work should be marked regularly and teachers should model how corrections should be made, giving children a chance to learn from their misconceptions or incorrect methods.

Termly assessments are completed for each year group to assess where the children are in their learning. Teacher assessments are supported by White Rose end of unit tests and with Test Base summative tests at the end of Summer Term in Years 3, 4 and 5.

Termly pupil progress meetings ensure that pupils can be targeted for support. What that support will be and how intensive, depends upon the child's need and it may be a simple strategy within whole class teaching that is needed.

Monitoring and Review

The monitoring of maths teaching and pupil progress is the shared responsibility of teachers, subject leader and the senior leadership team. The work of the subject leader includes supporting colleagues in the teaching of maths, keeping up to date with current developments as well as providing a strategic lead and direction for the subject. The school's governing body receive regular updates to inform them of the vision for continually driving forward teaching for mastery.

We observe lessons, speak to children/staff, analyse books/marking and ultimately come together as a staff to critique what we are doing well and what we want to improve.