



Elton Primary School & Nursery

# Mathematics Policy

*In our school, the wellbeing and education of all our children comes first*

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|-------------------|-------------|
| PPPS<br>Committee | Summer 2020 |
| Review            | Summer 2022 |

## 1 Aims and objectives

- 1.1 Mathematics teaches us how to make sense of the world around us through developing a child's ability to calculate, to reason and to solve problems. It enables children to understand and appreciate relationships and pattern in both number and space in their everyday lives. Through their growing knowledge and understanding, children learn to appreciate the contribution made by many cultures to the development and application of mathematics.
- 1.2 The aims of mathematics are:
- to promote enjoyment and enthusiasm for learning through practical activity, exploration and discussion;
  - to promote confidence and competence with numbers and the number system;
  - to develop the ability to solve problems through decision-making and reasoning in a range of contexts;
  - to develop a practical understanding of the ways in which information is gathered and presented;
  - to explore features of shape and space, and develop measuring skills in a range of contexts;
  - to understand the importance of mathematics in everyday life.

## 2 Teaching and learning style

- 2.1 The school uses a variety of teaching and learning styles in mathematic lessons. Our principal aim is to develop children's knowledge, skills and understanding in mathematics. We do this through daily structured lessons that have a high proportion of whole-class and group-direct teaching. During these lessons we encourage children to ask as well as answer mathematical questions. Mathematical models and images are a crucial part of how we teach. Pupils have the opportunity to use a wide range of resources such as number lines, number squares, digit cards and small apparatus to support their work. ICT also plays a big part in how we teach mathematics. Pupils sometimes use computers and i-Pads and mathematical programmes in mathematics lessons where it will enhance their learning, as in modelling ideas and methods. Wherever possible, we encourage the children to use and apply their learning in everyday situations.
- 2.2 In all classes there are children of differing mathematical ability. It is important that every child gets the most out of every lesson and there are a range of ways that teachers will ensure that this happens. As a direct result of Assessment for Learning (AfL) techniques, teachers may begin the lesson with an 'entry card' strategy to determine how long a pupil actually needs to be on the carpet/seated for whole class instruction for, and whether they are ready to start work independently etc. We provide suitable learning opportunities for all children by matching the challenge of the task to the ability of the child. We achieve this through a range of strategies – in most lessons through differentiated work for ability groups; and in other lessons by organising the children to work in pairs on open-ended problems or games. We use HLTAs to support some children and to ensure that work is matched to the needs of individuals.

## 3 Mathematics curriculum planning

- 3.1 Mathematics is a core subject in the National Curriculum.

[https://www.gov.uk/government/uploads/system/uploads/attachment\\_data/file/335116/Master\\_final\\_national\\_curriculum\\_220714.pdf](https://www.gov.uk/government/uploads/system/uploads/attachment_data/file/335116/Master_final_national_curriculum_220714.pdf).

The school follows the White Rose planning scheme across all key stages. This scheme has a clear yearly overview detailing how each year group's objectives will be **chunked** across each term. Within this yearly overview, each year's curriculum is divided into different units (e.g. fractions, geometry etc.) with each unit being taught over several weeks. Within these units the objectives are broken down into several smaller steps. Each smaller step is then taught to the class in a way that allows the children to become fluent with the skills and to apply them to a range of problem solving and reasoning questions. Although the yearly planning overview will be closely followed in most instances, it will be left to the

teacher's judgement to decide how long and in what order specific skills are covered to suit the individual needs of their classes.

- 3.2 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 involves working with numerals, words and the four operations, including with practical resources [for example, concrete objects and measuring tools]. At this stage, pupils develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching involves 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 aids fluency. Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at key stage 1.
- 3.3 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 develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should 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 ensures 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.
- 3.4 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 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 consolidates and extends knowledge developed in number. Teaching ensures 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. Pupils should read, spell and pronounce mathematical vocabulary correctly.

## **4 The Foundation Stage**

- 4.1 We carry out planning according to the Early Years Foundation Stage Curriculum. 50% of activities in problem solving, reasoning and number is adult led; 50% is child initiated. For the purposes of assessment - 80% of observed assessment is taken during child initiated learning and 20% from adult led activities. We give all children opportunity to develop their understanding of numbers as labels for counting; calculating; and shape space and measure. This is delivered in a broad range of context which the children can explore, enjoy, learn, practise and talk about to develop their understanding.

## **5 Contribution of mathematics to teaching in other curriculum areas**

### **5.1 English**

Mathematics contributes significantly to the teaching of English in our school by actively promoting the skills of reading, writing, speaking and listening. For example, we encourage children to read and interpret problems in order to identify the mathematics involved. The children explain and present their work to others during plenary sessions. Younger children enjoy stories and rhyme that rely on counting and sequencing. Older children encounter mathematical vocabulary, graphs and charts when using non-fiction texts. We develop speaking and listening skills during the mental oral starters.

## **5.2 Information and communication technology (ICT)**

Children use and apply mathematics in a variety of ways when solving problems using ICT. Younger children use ICT to communicate results with appropriate mathematical symbols. Older children use it to produce graphs and tables when explaining their results or when creating repeating patterns, such as tessellations. When working on control, children use standard and non-standard measures for distance and angle. They use simulations to identify patterns and relationships. Each year group also uses the Maths Whizz computer programmes relevant to their class. i-Pads play a significant role in the teaching of mathematics. Children can play games that involve all four operations of number. They can also practise sequencing by using the wide variety of programming apps available.

## **5.3 Personal, social and health education (PSHE) and citizenship**

Mathematics contributes to the teaching of personal, social and health education, and citizenship. The work that children do outside their normal lessons encourages independent study and helps them to become increasingly responsible for their own learning. The planned activities that children do within the classroom encourage them to work together and respect each other's views. We present older children with real-life situations in their work on the spending of money.

## **5.4 Spiritual, moral, social and cultural development**

The teaching of mathematics supports the social development of our children through the way we expect them to work with each other in lessons. We group children so that they work together, and we give them the chance to discuss their ideas and results.

## **6 Including all Learners**

Inclusion involves the identification and minimising of barriers to learning and participation, and the maximising of resources to support learning and participation. We believe in giving children strategies to be successful.

**6.1** 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. Progress is measured using the Target Tracker Assessment Tool which measures how successfully each child has met every objective for their year group. These scores are monitored using the Target Tracker system, which allows the school to identify children who are not progressing at the desired pace. Staff meetings take place during the year to moderate assessment.

**6.2** When progress falls below the expected range, the child will receive an intervention designed by the teacher to match specific objectives. These interventions often take place during afternoon sessions or in after school booster clubs. If the child falls well below the expected level then they will then receive support through further targeted interventions and will be placed on our Red Alert Register.

**6.3** If the child is recognised as having a barrier to their learning they may be placed on our SEND Register and a SEND Child Profile completed for them, highlighting specific outcomes for them to meet.

**6.4** The needs of gifted and talented children in mathematics are met by providing tasks that are common and involve different responses and outcomes. We provide opportunities for entering at a higher level and taking the task further, with emphasis on investigative, problem solving and exploratory approaches.

## **7 Assessment and recording**

**7.1** We assess children's work in mathematics from three aspects (long-term, medium-term and short-term). We make short-term assessments, which we use to help us adjust our daily plans. These assessments are made by class teachers and teaching assistants, through direct group teaching and marking. These short-term assessments are closely matched to the teaching objectives.

**7.2** We make medium-term assessments to measure progress against the key objectives, and to help us plan the next unit of work at the end of each term using teacher assessment and/or optional NFER tests. These judgements are recorded on Target Tracker for each year group. It is through these assessments that cohorts are monitored and any individuals, or groups, that are not progressing can be

identified. Action plans will be created by staff for each child in their class who has been identified as not progressing fast enough.

- 7.3 Long-term, we assess annually to ensure that progress has been made overall during the year and to make predictions on age related expectations for future cohorts.

## **8 Resources**

- 8.1 There are a range of resources to support the teaching of mathematics across the school. All classrooms have number lines, digit cards and a wide range of appropriate small apparatus. Mathematical dictionaries are available in classrooms. A range of software is available to support work with the iPads and computers. One of the main apps the school uses is 'Times Table Rockstars'. This app allows the children to become fluent with their times table skills in a fun way. Each child in school has a password that allows them to log into an app or web based version of the programme.

## **9 Monitoring and review**

- 9.1 Monitoring of the standards of children's work and of the quality of teaching in mathematics is the responsibility of the mathematics subject leader. The work of the mathematics subject leader 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. Children's work is monitored regularly, to ensure all teachers are in line with their assessments. Planning and book scrutiny by the Numeracy co-ordinator and SLT occurs regularly and is overseen by Governors.