



Pilgrims' Way Primary School

Mathematics Policy

Reviewed: Autumn Term 2022

Next Review Date: Autumn 2023

Intent

Mathematics is a tool for everyday life. It is a whole network of concepts and relationships which provide a way of viewing and making sense of the world. It is used to analyse and communicate information and ideas and to tackle a range of practical tasks and real-life problems. It also provides the materials and means for creating new imaginative worlds to explore.

Aims and Objectives

- An in-depth understanding of mathematical concepts through teaching a mastery curriculum.
- A positive attitude towards mathematics and an awareness of the fascination of mathematics.
- Competence and confidence in mathematical knowledge, concepts and skills.
- To 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.
- 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.

Teaching and learning style

We follow *The Essence of Teaching for Mastery* by the NCETM.

- Mathematics teaching for mastery assumes everyone can learn and enjoy mathematics.
- Mathematical learning behaviours are developed such that pupils focus and engage fully as learners who reason and seek to make connections.
- Teachers continually develop their specialist knowledge for teaching mathematics, working collaboratively to refine and improve their teaching.
- Curriculum design ensures a coherent and detailed sequence of essential content to support sustained progression over time.
- Lesson design links to prior learning to ensure all can access the new learning and identifies carefully sequenced steps in progression to build secure understanding.

- Examples, representations and models are carefully selected to expose the structure of mathematical concepts and emphasise connections, enabling pupils to develop a deep knowledge of mathematics.
- Procedural fluency and conceptual understanding are developed in tandem because each supports the development of the other.
- It is recognised that practice is a vital part of learning, but the practice must be designed to both reinforce pupils' procedural fluency and develop their conceptual understanding.
- Pupils are taught through whole-class interactive teaching, enabling all to master the concepts necessary for the next part of the curriculum sequence.
- In a typical lesson, the teacher leads back and forth interaction, including questioning, short tasks, explanation, demonstration, and discussion, enabling pupils to think, reason and apply their knowledge to solve problems.
- Use of precise mathematical language enables all pupils to communicate their reasoning and thinking effectively.
- If a pupil fails to grasp a concept or procedure, this is identified quickly, and gaps in understanding are addressed systematically to prevent them falling behind.
- Significant time is spent developing deep understanding of the key ideas that are needed to underpin future learning.
- Key number facts are learnt to automaticity, and other key mathematical facts are learned deeply and practised regularly, to avoid cognitive overload in working memory and enable pupils to focus on new learning.

As a school, we use a dialogic teaching approach to check pupils understanding. This involves teacher led questioning that is designed to draw as much information as possible. Furthermore, probing questions are asked to deepen children's understanding. These could include questions such as "what if.." "will it always work that way?" and "how does this work?"

Mathematics curriculum planning

Mathematics is a core subject in the 2014 National Curriculum. Teachers use White Rose and White Rose Premium resources to plan for progress and coverage. These are used across the school to ensure consistency of teaching methods and of representations.

We carry out the curriculum planning in mathematics in three phases (long-term, medium-term and short-term). Our whole school long term curriculum plan details the objectives to be taught across the year. This is detailed on the school website and is available to parents and children online. Medium term plans show where different maths topics are taught each term. Teachers personalise these based around materials provided from White Rose Premium.

Short term plans are personalised by teachers and show how they will teach maths across the week. It is the class teacher who completes the weekly plans for the teaching of mathematics. These weekly plans list the specific learning objectives for each lesson and give details of how the lessons are to be taught.

Contribution of mathematics to teaching in other curriculum areas

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.

Science

During science lessons, children can use and apply their data handling skills when creating tables and graphs of scientific measurements. Whole class discussion of data also highlights the importance of clear recording of information. Children are also able to use a wide range of measuring devices in a real-life context. Children are required to read the scales on Newton meters, measuring cylinders, weighing scales and a variety of other instruments.

Computing (ICT)

Children use and apply mathematics in a variety of ways when solving problems using ICT. When working on control, children use standard and nonstandard measures for distance and angle. They use simulations to identify patterns and relationships.

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.

Inclusion

Pilgrims' Way Primary school is an inclusive and diverse primary school in the centre of Canterbury, which teaches pupils from the ages of 3-11. We provide an irresistible, broad and balanced curriculum to meet the needs of all our pupils.

The curriculum is designed to make learning relevant and meaningful by embedding context and activating pupil's prior knowledge. Pupils are given opportunities to demonstrate their learning through cultural and personal links. Mainstream Core Standards are used to support all children's access to the curriculum with learning scaffolded to support learners' diverse needs. Teaching opportunities across the curriculum are designed to develop language and literacy so that pupils become fluent in the academic language of the primary curriculum.

We actively liaise with parents to help them support their children's learning.

Assessment and recording

We assess children's work in mathematics regularly using both formative and summative assessment techniques. Teachers make short-term formative assessments both during and after lessons, which they use to help adjust their daily plans. Our dialogic teaching approach also allows for a large proportion of our assessment to be completed live during lessons.

Summative assessment tests are used formally three times a year to measure progress and to help teachers plan the next unit of work from gaps identified in the tests. These assess both arithmetic and reasoning skills. We use termly assessments as a way of recording children's progress in objectives covered across that specific (long) term. Teachers may choose to use informal summative assessments during and after discrete units of work to gauge children's understanding and inform next steps in learning.

Formal statutory tests (SATs) take place in May each year in Year 2 and 6. Outcomes from these tests are used to assess progress against school and national targets. We can then set targets for the next school year and make a summary of each child's progress before discussing it with parents.

Resources

There is a range of resources to support the teaching of mathematics across the school. We use manipulatives to support the practical development of the learning; such as Numicon, Base 10, interlinking cubes and place value counters and grids. Maths displays are used primarily to support children's learning. Teachers use maths learning walls to clearly demonstrate progression and deepening of learning through a topic of work. The CPA (Concrete, Pictorial and Abstract) approach is used regularly across the maths curriculum, meaning that resources play an important role in all that the children learn.

Monitoring and review

Monitoring of the standards of children's work and of the quality teaching in mathematics is the responsibility of the mathematics subject leader – supported by the maths team. 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. The mathematics subject leader gives the head teacher an annual summary and annual action plan in which s/he evaluates strengths and weaknesses in the subject and indicates areas for further improvement. Progress in maths is analysed at regular points during the year and in the Headteacher's report to the governing body which is produced three times per year. Challenge is provided through feedback meetings to SLT and governor monitoring visits as appropriate. As an academy we have built a Maths peer group across the trust, acting as a *critical friend*, to support, challenge, mentor and work together to ensure an irresistible maths curriculum is delivered and children make suitable progress.