The Canterbury Academy Trust
Schools for all the Talents

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Numeracy Policy The Canterbury Primary School

Purpose

Mathematics is a creative and highly inter-connected 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

Using the Programmes of Study from the National Curriculum 2014, it is our aim 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.

Decisions about when a child will 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.

Teaching for Mastery

Teaching for mastery is an approach based on Asian models of maths teaching. Attainment in mathematics in Asian countries, such as Singapore, is amongst the highest in the world. The mastery approach to maths, which has become more prominent in Britain, is built on several key principles and supposes that all children have the ability to succeed mathematically.

- There is an emphasis on fluency, reasoning and problem-solving throughout lessons.
- Concrete, pictorial and abstract forms of Maths are vital for the understanding of all learners.
- Learners in different classes and year groups move together through the programme of study with an emphasis on pupils' depth of understanding.

Mastery is understood to be:

'A mathematical concept or skill has been mastered when, through exploration, clarification, practice and application over time, a person can represent it in multiple ways, has the mathematical language to be able to communicate related ideas, and can think mathematically with the concept so that they can independently apply it to a totally new problem in an unfamiliar situation.'

Helen Drury from *Mastering Mathematics: Teaching to transform achievement* (Oxford University Press 2014, page 9)

Planning for Teaching for Mastery

In Years One to Six, the school follows the 'White Rose' mathematics programme which sets out the teaching sequence to be followed across the school and supports teaching for mastery. The various year groups' schemes of learning can be found at the following address: https://whiterosemaths.com/resources/schemes-of-learning/primary-sols/

Teachers in the Early Years' Foundation Stage (Reception) base their teaching on "Development Matters" to ensure that the children are working towards the "Early Learning Goals for Mathematical Development". Additional documentation provided by the Maths and Early Years' Coordinators is also used.

Concrete, pictorial and abstract

Mathematics is an interconnected subject in which pupils need to be able to move fluently between representations of mathematical ideas (National Curriculum 2014). Children's progress in maths is supported by the concrete, pictorial and abstract (CPA) approach to teaching. It is our belief that pupils learn best when given the opportunity to experience a range of CPA opportunities and are encouraged to draw upon varied strategies to solve problems. Further details of calculation strategies can be found in our 'Calculations Policy'.

- **Concrete** – the use of concrete objects and manipulatives to help understanding.
- **Pictorial** – the use of pictorial representations to help solve problems.
- **Abstract** – abstract methods of calculation that are supported by pupils' use of both concrete and pictorial representations.

Variation and fluency

As skills are taught, there is also an emphasis on both variation and fluency.

- **Variation** – Problems are presented in different ways to encourage children to think systematically by, for example, looking for what has changed between different calculations, identifying patterns and making links.
- **Fluency** – Pupils are encouraged to become fluent in key facts, such as their times tables and number bonds, to support their learning.

Mathematical talk

Mathematical talk is seen as the means by which concrete, pictorial and abstract representations are given meaning and it lies at the heart of the mastery approach. 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.

Knowledge Skills and Understanding

Through careful planning and preparation, we aim to ensure that throughout the school children are given opportunities for:

- practical activities and mathematical games
- problem-solving
- individual, group and whole-class discussions and activities
- open and closed tasks
- a range of methods of calculating (recalling a known fact, mental, a jotting, a formal written method)
- working with computers and calculators as mathematical tools

Special Educational Needs

Children with SEN are taught within the daily mathematics lesson and are encouraged to take part when and where possible. Where applicable children's personalised or provision plans incorporate suitable objectives (SMART targets) and teachers keep these objectives in mind when planning work.

When additional support staff are available to support groups or individual children, they work collaboratively with the class teacher. The teacher and support staff liaise in detail before and after each session.

Equal Opportunities

We incorporate mathematics into a wide range of cross-curricular subjects and seek to take advantage of multi-cultural aspects of mathematics.

In mathematics lessons, we support children with English as an additional language (EAL) in a variety of ways. For example, repeating instructions, speaking clearly, emphasising key words, using picture cues, playing mathematical games, encouraging children to join in counting, chanting, finger games, rhymes etc.

Marking

The school recognises that high-quality next-steps marking of maths is an essential tool to enhance children's learning. Marking should be both diagnostic and summative and school policy believes that it is best done through conversation with the child. All teachers employ a policy of next-steps marking regularly in each child's book at an appropriate level for the child's understanding. For younger children, this will more often be in the form of verbal feedback. In the older year groups, children are expected to respond to the marking themselves.

For further information, see the school marking policy.

Assessment

In Years 1- 6, the children are informally assessed throughout the year; there are formal tests at the end of terms two, four and six and a level is given using teacher judgment with the tests providing additional evidence. Gaps in pupils' knowledge are analysed and worked on in subsequent learning, including through interventions and during lesson starters. Weekly times tables' tests take place from Year Two onwards. The tests are based on the year group's statutory expectations (see table below). However, some pupils who have mastered their year group's times tables may be challenged to use a variety of multiplication and division facts.

Year 2	Year 3	Year 4	Year 5	Year 6
2s, 5s, 10s	3s, 4s, 8s	All up to 12 x 12	Revision of all	Revision of all

Reporting to parents

Parents are given termly updates on children's progress in all core curriculum subjects and have the opportunity to discuss their child's progress on two separate occasions at Parents' Evenings during the year. Written reports are distributed at the end of each year.

Parental Involvement

Sessions are held occasionally to inform parents about how to enhance their child's learning in maths and to inform them of some of the alternative methods of calculation.

Monitoring and Evaluation

The Maths Subject Leader generates and follows an annual action plan. The Mathematics Subject Leader monitors standards of planning and teaching and carries out a book scrutiny of children's work and teachers' planning. Support is given, if necessary, to ensure all staff are adhering to the agreed written calculations policy and planning format. Findings from any monitoring are discussed initially with the Senior Leadership Team and are also shared with teaching staff as appropriate. Staff are also trained in teaching for mastery and updated as required during the academic year.

Resources

Practical resources to support learning are stored both in individual classrooms where they are easily accessible to all children and additional resources are stored centrally.

Each classroom has a maths 'working wall' showing examples of the topic currently being covered and has a permanent display of mathematical symbols, numbers, times tables and vocabulary appropriate to the age range.

The Governing Body

Governors are invited to attend any maths workshops or training days.

Policy Review

This policy will be reviewed annually.