Maths at Downview Primary

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

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.

Curriculum Intent:

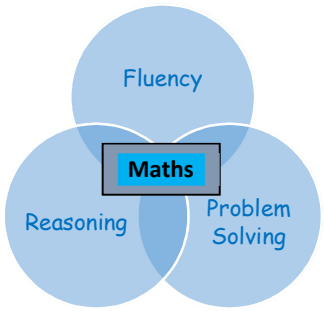
Why do we teach this? Why do we teach it in the way we do?

At Downview, we follow the National Curriculum. This aims to ensure that children are proficient in 3 areas:

Fluency – the children should 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.

Reasoning – the children should be able to reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.

Problem solving – children 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.



These areas are inter-related and our lessons reflect this. We recognise that Mathematics is important in our everyday lives. It is integral to all aspects of life and, with this in mind, we endeavour to ensure that children develop a healthy and enthusiastic attitude towards mathematics that will stay with them and enable them to draw upon throughout their lives. Our policy outlines our aims for maths and what we want the children to be able to understand, know and do.

At Downview, we have adopted a Mastery approach to the teaching of maths:

According to the NCETM, Mastering maths means pupils acquiring a deep, long-term, secure and adaptable understanding of the subject.

The phrase 'teaching for mastery' describes the elements of classroom practice and school organisation that combine to give pupils the best chances of mastering maths.

Achieving mastery means acquiring a solid enough understanding of the maths that's been taught to enable pupils to move on to more advanced material.

Implementation

What do we teach? What does this look like?

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.

Our Mathematics Policy details how Maths is taught across EYFS, KS1 and KS2 at Downview:

Reception

In Reception, emphasis is placed on practical activities and informal recording, working towards a more formal recording. Children are given opportunities to work through a variety of planned practical experiences that develop mathematical understanding, language and skills. Children use a wide range of practical resources to gain the deeper understanding of a concept. Children are immersed with basic mathematical vocabulary and learn this through stem sentences and displays. Activities are adult led but also used within the area are bump backs to cement their understanding.

Key Stage 1

In Key stage 1, emphasis is placed on practical activities and informal recording, working towards a more formal recording. Children are given opportunities to work through a variety of planned practical experiences that develop mathematical understanding and skills. Children should be developing the ability to explain their reasoning (this will be recorded by an adult or by the child themselves, depending on their age and stage).

Key Stage 2

At Key Stage 2, children are provided with practical experiences and problems, set in a context which will help them to understand concepts and deal with Mathematics in an abstract form. The children will use a range of concrete and pictorial methods alongside abstract forms. Children will continue to develop the ability to explain their reasoning (this will be recorded by an adult or by the child themselves, depending on their age and stage).

Learning and Teaching in both Key Stages is in accordance with our Written Calculation Policy, alongside the primary framework. There is also a version of the Calculations policy for parents on the school website.

The mathematics lesson

In the course of the week, each child will receive a daily session of mathematics teaching and regular Target Time to practise learning or to address misconceptions from previous lessons.

This will include:

Oral work/mental calculation/arithmetic practise in which the whole class works to rehearse, sharpen and develop mental and oral skills.

Main teaching input and pupil activities in which:

- A new topic is introduced, or previous work is consolidated or extended.
- Vocabulary is developed, using correct notation and terms and using new ones.
- New concepts and skills are used and applied.
- Children will develop their fluency, reasoning and/or problem solving skills.

As we are developing a Mastery approach to mathematics, the lessons will often follow a 'ping-pong' approach particularly in KS2. This is where the learning is introduced, the children will try an activity, they are then brought back together to check work and then move on. This process is repeated throughout the lesson enabling teachers to identify any common misconceptions and to ensure that children are 'keeping up' rather than needing to 'catch up.' Teachers and TAs will ensure that all children are accessing the learning, providing additional support or extension when appropriate. In KS1, most lessons will begin with a whole class input, followed by group work where groups will be supported by Teacher or TA alongside some independent activities. The learning is carefully structured in small steps, considering variation theory, using a range of representations and structures. Children will be encouraged to reason throughout their lessons, explaining what they have learnt.

Impact

What will this look like? By the time children leave our school they will:

Our belief is that all children can achieve in mathematics given the appropriate teaching and support. Our aim is to enable children to 'keep up' not 'catch up.' Therefore, the majority of our lessons are whole class lessons with appropriate support and extension for individual children. Interventions, preferably the same day, are provided, enabling children to be able to access the next day's learning. We want all children to develop a 'can do' attitude towards maths which all teachers are expected to model. 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.

At the start of a unit, children are encouraged to use a traffic light colour to indicate where they are. They then also assess their own learning each session with a system that works for their age group e.g. traffic light system or the smiley face system. The child (or TA, if more appropriate) will also write a comment about their learning at the end of a unit of work (Year 2 upwards). The teacher will deep mark children's work in their books once a week providing the children with feedback about what they have done well and some next steps.

All the children are assessed half-termly by the class teacher and this data is recorded centrally. Assessments can be recorded on the Insight tracking system – each term, teachers record whether children are below, working towards, working within or working at greater depth of the expected standard. We have a system of Key Performance Indicators for each year group which are stuck inside the child's book.

These will be assessed during termly data meetings and recorded on Insight. Parents will receive a copy of what the child has achieved of these alongside their annual report.
Children in Years 2 and 6 will undertake SATs tests in maths during May. Year 4 pupils will take the Multiplication Tables Check in June.

Attainment targets

By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.