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Mathematics Policy

2024

Downview School: Mathematics Policy

Introduction

Mathematics in our school complies with the requirements of 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.

Aims

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.

In our teaching of mathematics at Downview Primary School, we aim to:

- Indicate an enjoyment and love of maths
- Ensure numeracy
- Enable children to have opportunities for mathematical thinking and discussion
- Provide opportunities for children to demonstrate and use their mathematics
- Provide a role-model, by using mathematics for practical purposes, organisational and administrative tasks
- Give children opportunities to use mathematics in everyday situations
- Help children to understand that mathematics is a powerful tool for communication
- Instil confidence in using mathematics
- Ensure that children use mental methods as a first resort
- Teach children to think and be able to explain their thinking, to ask questions and make suggestions about their work
- Help children recognise that mathematics is a search for pattern and relationship
- Instil a fascination for mathematics and the manipulation of number
- Encourage children to take responsibility for their own learning

The children at Downview Primary School should:

- Have a sense of the size of a number and where it fits into the number system
- Know by heart number facts, such as number bonds, multiplication tables, doubles and halves
- Be able to use concrete, pictorial and abstract approaches (build it, draw it, write it). This will include a range of representation and structures such as: use of manipulatives, bar modelling or part-part-whole diagrams, formal written calculations.
- Use what they know to figure things out mentally first

- Calculate accurately and efficiently, both mentally and in writing, drawing on a range of calculation strategies (also see the school's calculation policy and guidance for parents)
- Make sense of number problems, including non-routine problems, and recognise the operations needed to solve them
- Explain their methods and reasoning using correct mathematical language.
- Judge whether their answers are reasonable and have strategies for checking them where necessary
- Suggest suitable units for measuring and make sensible estimates of measurements
- Explain and make predictions from the numbers in graphs, diagrams, charts and tables
- Develop spatial awareness and an understanding of the properties of 2D and 3D shapes

Through Mathematics we can also:

- Improve pupils' skills in Literacy, Numeracy and ICT
- Develop pupils' critical thinking skills
- Promote pupils' awareness and understanding of gender, cultural, spiritual and moral issues
- Develop pupils as active citizens

Organisation of Mathematics within the Curriculum

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 there is also continuous provision in the area and weekly morning activities 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).

Planning For Mathematics

Long term plans: Based upon the Primary Framework for Mathematics
Medium term plans: Plans are based upon White Rose Premium resources and Number Sense. The NCETM spines and Curriculum Prioritisation Materials can also be referred to and used to provide additional support.

Short term plans: Format of planning is non-prescriptive, as long as it contains the essential elements, showing:

- Learning objectives
- Daily sessions/lessons being taught.
- Clear learning objectives which can be assessed
- Stem sentences, based on what children have said, regularly repeated during the lesson
- Resources and vocabulary listed
- Mental starter
- Intro to the lesson
- Differentiation: support, core and extension (however, all children should have access to the whole lesson)
- Outcomes
- Plenary

<u>Teaching & Learning - Strategies for the teaching of Mathematics</u>

Teaching and Learning in all 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 other opportunities to practise learning or to address misconceptions from previous lessons.
This will include:
Oral work/mental calculation/arithmetic practice 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.

The learning intentions are made clear to the children in the form of an 'I can'/ 'Can I' and this is referred to throughout the lesson.
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.

Activities can be:

- Investigative and problem solving tasks, that may be open ended and enable children to see a variety of options for completing tasks.
- Mathematics games, which are enjoyable and allow children to extend and consolidate mathematical and collaborative skills.
- Consolidation, which provides an opportunity to practise and extend mathematical learning.
- ICT based.

Recording Mathematics

The children spend a significant amount of time developing mental strategies and investigating mathematical concepts to clarify their own thinking and to communicate their ideas. Evidence is provided through recording their work, sometimes this may be in the form of photographs or photocopies of group work or whiteboard work.

In **Early Years and Key Stage 1** recording is done through:

- Pictures
- Numerical facts
- Visual displays
- Graphs
- Real objects i.e. sorting trays, peg boards
- Writing
- Interactive displays
- Number lines/bar models/part-whole diagrams/tens frames
- Children's own recording methods
- ICT e.g. digital photographs

At **Key Stage 2** the following are some ways of recording:

- Charts
- Plans
- Diagrams
- Written accounts
- Pictures
- Number lines/bar models/part-whole diagrams/tens frames
- Children's own recording methods
- Formal written calculations
- ICT e.g. digital photographs.

Plenary

This part of the lesson can be used by the teacher and children to assess and discuss what has been learned. It can be used as a period of consolidation. Mini-plenaries can be used through the lesson.

Homework
The mathematics lessons will provide opportunities for children to practise and consolidate their skills and knowledge, to develop and extend their techniques and strategies, and to prepare for their future learning. These will be extended through homework tasks. These activities will be short and focused and will be referred to and valued in future lessons. In KS1, the majority of homework tasks will develop children's knowledge of number facts. In KS2, the majority of tasks will be to develop children's knowledge and quick recall of times tables. Mathematical ICT programs are available, and all children have login details, to support their learning. This is monitored by the class teacher.

The role of the Mathematics co-ordinator is to:

- Support colleagues in teaching the subject content and developing their skills in planning, teaching and assessing Maths.
- Renew, update and oversee the audit of resources needed to deliver the curriculum
- Monitor and evaluate the learning and teaching of Maths
- Develop assessment and record keeping ensuring progression and continuity
- Keep abreast of developments in the teaching and learning of Maths

Assessment

In class, children regularly mark their own work with guidance from the teacher. This is so that the children receive immediate feedback on how well they have done in achieving the Learning Objective. The teacher will mark children's work according to the school's Marking and Feedback policy.
In KS2, the children are assessed termly using Star maths. Information from this is then used to inform planning and interventions. In KS1, the White Rose assessments are used regularly and in EYFS, adults observe and assess children throughout, keeping running records and using Tapestry for some recordings. 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. Children in 6 will undertake a SATs test in Maths during May. Optional tests are available for Year 2 children who are working at Key stage level. Year 4 pupils take the Multiplication Tables Check in June.

SEN

When children have struggled with a concept, teachers should consider what has caused the problem and what the child needs to be able to do/understand for the next lesson. Intervention, preferably same-day, will be needed to enable that child to keep up.
We are aware, that for a small minority of children, they will not be able to do this and another programme will be provided considering where that child is.

GDS
Some children are able to grasp mathematical concepts more rapidly than others and could be working at GDS (Greater depth at the expected standard). At Downview we define this as:
Children working at GDS will be able to apply their understanding of mathematical concepts in different contexts when problem solving. These children choose their own effective strategy selecting from a range of those taught. These children will explain reasoning

confidently and independently. Children will be resilient and motivated learners when challenged.
Additional challenges and greater depth questions/dive deeper challenges will be given to children when required.

Equal Opportunities

All pupils at Downview have equal access to the facilities available, regardless of gender or nationality. When working in groups, the teacher ensures that children take turns and share the equipment fairly. Teachers also give pupils opportunities to work individually to complete tasks by themselves.

Resources

- The school uses the mathematics scheme of work laid out in the Primary Framework for Mathematics.
- Each classroom has a basic stock of mathematics equipment. Maths boxes have been prepared for each year group and these are available so that all children have access to relevant resources. There is additional equipment in the resources cupboard. All classrooms have a Maths board which will display vocabulary and resources relevant to Maths being taught in the class.

Health and Safety

This policy needs to be read alongside our 'Health and Safety Policy'. Consideration needs to be given to conducting appropriate Risk Assessments and ensuring the safeguarding of children and staff when planning and carrying out mathematical activities.

- Children will be taught to use resources responsibly.
- We will aim to develop the children's resilience through problem solving.

Monitoring and Evaluation

Monitoring and Evaluation for Maths will be undertaken by the co-ordinator alongside SLT. This may take the form of drop-in observations, learning walks, book scrutinies.

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