Framwellgate Moor Primary School

Maths Policy

There are four main purposes to this policy:

- To establish an entitlement for all pupils;
- To establish expectations for teachers of this subject;
- To promote continuity and coherence across the school;
- To state the school's approaches to this subject in order to promote effective teaching and learning.

Introduction

In September 2019, Framwellgate Moor Primary began trialling a mastery approach to the teaching and learning of mathematics. This was identified as a gradual process which would take several years to embed, particularly with the disruption to children's learning over the last two academic years. The reason for our change in approach followed coordinator work with the NCETM/Maths Hub led Mastery Specialist Programme as well as the 2014 National Curriculum, which states: The expectation is that most pupils will move through the programmes of study at broadly the same pace. 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. To support our mastery approach the school purchased the Power Maths scheme to provide support and guidance with this new approach to teaching and learning. Whilst it is still a valuable tool, as staff gain in confidence and expertise with this approach, they are drawing on a wider range of resources available to compliment their teaching. They plan and teach using a new whole school long and medium term planning tool.

Expectations

By the end of Key Stage 1, the performance of the great majority of the pupils should be within the expected level for Year 2.

By the end of Key stage 2, the performance of the great majority of the pupils should be within the expected level for Year 6.

The aims of mathematics and how these contribute to the school's aims

The school aims to establish the following opportunities for, and attitudes towards, learning in Maths:

- provide a relevant, challenging and enjoyable curriculum for all pupils
- meet the requirements of the New National Curriculum, programmes of study
- promote confidence through an '**Everyone Can**' attitude; if you 'can't do it' you 'can't do it ... yet'
- Maths is about creativity and problem solving
- Mathematics is about making connections and communicating what we think: questions are important; mistakes are valuable
- Depth is more important than speed; encourage pupils to work systematically and to show a respect for accuracy and meaning; encourage logical presentation of work supported, when appropriate, by clear explanations
- encourage pupils to work both independently and with others;

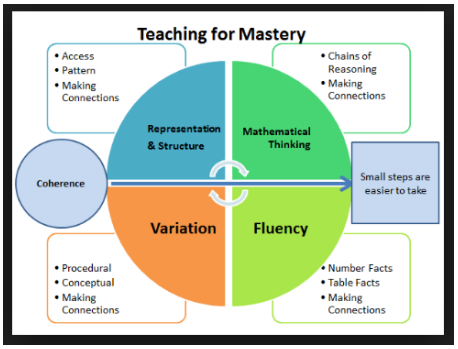
Rationale

At Framwellgate Moor Primary school we have incorporated a mastery approach into the teaching and learning of mathematics. There are 5 'Big Ideas' that underpin this thinking and we endeavour to incorporate them in lessons across the whole school.

Maths is an integral part of everyday life and we aspire to ensure children develop an enthusiastic and positive attitude towards it. Through teaching the tools of logical reasoning, problem solving skills and the ability to think in abstract ways, we aim to equip children for Maths in the 'real world'.

Through the implementation of a concrete > pictorial > abstract approach, we ensure that children can access age-appropriate curriculum through a series of carefully planned, progressive small steps. Teachers are supported through use of a clear planning framework and access to a range of tools and resources as well as on-going Professional Development. There is an emphasis on both mathematical fluency and investigation and problem solving.

The 5 Big Ideas



Our teaching for mastery is underpinned by the NCETM's 5 Big Ideas. Opportunities for Mathematical Thinking allow children to make chains of reasoning connected with the other areas of their mathematics. A focus on Representation and Structure ensures concepts are explored using concrete, pictorial and abstract representations: the children actively look for patterns as well as specialise and generalise whilst problem solving. Coherence is achieved through the planning of small, connected steps to link every question and lesson within a topic. Teachers use both procedural and conceptual variation within their lessons and there remains an emphasis on Fluency with a relentless focus on number and times table facts.

Teaching Principles

1. Teachers believe in the importance of mathematics and that the vast majority of children can succeed in learning mathematics in line with national expectations.

2. Where appropriate, the whole class is taught mathematics together, with no differentiation by acceleration to new content. The learning needs of individuals are addressed through careful scaffolding, questioning and appropriate rapid intervention where necessary, to provide the appropriate support and challenge.

3. The reasoning behind mathematical processes is emphasized. Teacher/pupil interaction explores **how** answers were obtained as well as **why** the method worked and what might be the most efficient strategy.

4. Precise mathematical language, often couched in full sentences, is used by teachers so that mathematical ideas are conveyed with clarity and precision. We value 'mathematical talk' and children get lots of opportunity to talk about and evaluate their mathematics during lessons.

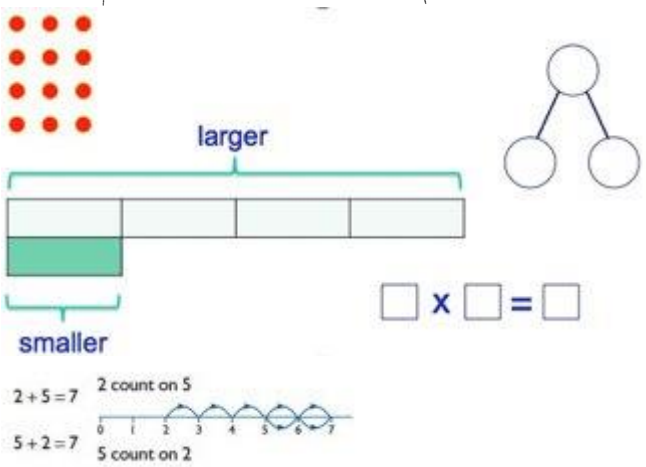
5. The basic procedural variation is that keeping some things the same and only varying the important concept or idea that you want your pupils to focus on, gives a greater likelihood of them understanding the concept or idea. (Ref https://www.broadbentmaths.com/pages/teaching_maths_with_variation_to_help_understanding_259468.cfm)

6 + 9 =
16 + 9 =
26 + 9 =
36 + 9 =
46 + 9 =
56 + 9 =

7 x 4 =
7 x 4 =
70 x 4 =
70 x 40 =
700 x 4 =
700 x 40 =

When presented in practice exercises they may appear repetitive, but it aims to highlight the essential features of the concepts to the children through varying the non-essential features. The fewer the number of differences and the clearer the aspect that changes, the more chance that the children will focus their attention on that intended concept.

6. Another important type of variation is conceptual variation. This time, instead of varying the problem, the problem stays the same and the representation of the problem is varied. This is generally through the use of models or images.
As shown here, a multiplication problem, say 3 x 4, could be represented in an array or using a bar model. The numbers within the problem could be arranged in a triangular arrangement or in a standard multiplication format. By keeping the question the same and showing it in different ways, the underlying structure of the operation (or whatever skill, concept or procedure is being learnt) can be explored and help the child make sense of the maths.



An example using concrete materials for the sum 6+3= might involve providing children with a range of materials with which to solve/model the problem:

- some cubes and counters
- a number line
- paper and a pencil

Variation, both conceptual and procedural, is an important element of a mastery approach.

7. Sufficient time is spent on key concepts to ensure learning is well developed and deeply embedded before moving on.

Key Features of a Lesson

1. Lessons start with a focus on mathematical fluency. This may be related to the next part of the lesson or may provide the opportunity to develop greater fluency in an unrelated concept.

2. Lessons are sharply focused with one new objective introduced at a time.

3. Teacher input provides opportunity for children to develop their understanding of a new concept, where appropriate, through the use of concrete and pictorial resources to aid understanding. Learning and a deeper knowledge is embedded through the use of effective questioning and reasoning strategies e.g. "What's the same, what's different?" questions. What is a triangle? What it isn't... What it is... 6 7,
"Convince me"/"Prove it"/"Explain your thinking"
(See 'Reasoning Statements' in Maths policy folder)

4. During the course of a lesson, children should also have the opportunity to develop higher order thinking skills through the teachers' use of, for example; open ended questioning, additional challenges, opportunity to give explanation.

5. A range of high-quality tasks are planned and materials used. There is regular interchange between concrete/contextual ideas and their abstract/symbolic representation.

6. Independent practice, over the course of a lesson or series of lessons, includes opportunities for reasoning, problem solving and higher order thinking activities.

7. Difficult points and misconceptions are addressed, throughout a lesson, as required.

8. Formative assessment is carried out throughout the lesson; the teacher regularly checks pupils' knowledge and understanding and adjusts the lesson accordingly.

Weekly Number/Keeping Skills Sharp Challenge

Twice a week, a maths number 'Quick 10' will be given – separate to the daily maths session - to build upon, and improve, the speed and confidence with number skills. Teachers will refer to skills taught in previous year groups as well as their current year group. Additional questions/open ended number challenges will be provided to extend more able mathematicians. The first day time will be spent

discussing/marking each question; the second day will be used an informal assessment.

Assessment

Formative assessment

This takes place on a daily basis throughout Maths lessons. It is used to identify misconceptions, which can then be addressed through targeted intervention, as well as readiness for next steps. Marking and feedback also contribute to formative assessment, providing immediate opportunities for reinforcement or extension.

Ready to learn resources (NCETM) can also be used before the start of a topic to provide information for future learning.

Summative assessment

National Curriculum tests are used at the end of Key Stage 1 and 2; teachers use past and sample papers to inform their assessments as they prepare pupils for these tests.

In Years 1-6, end of unit assessments are given approximately two weeks after a unit has been completed. These assessment tasks are created by staff and the questions set are adapted from questions the children have been exposed to during the unit taught.

All of the above assessments can be used alongside daily monitoring to inform teacher judgements at the end of each term and to highlight any areas of weakness that need addressing in lessons in the near future.

Pupils' written work

Work should be neat and well-presented e.g. one digit per square, use of ruler etc. and children should be encouraged to record their methods of working where appropriate. In key stage 1, reasoning opportunities should be maximised and this may require a more scaffolded approach for some children.
In key stage 2, there is a requirement, at times, for children to demonstrate their understanding by recording clear steps of working and / or written explanations. They should be encouraged to display this in an organised way e.g. placed alongside the original question.

Marking and feedback

Marking and feedback should be ongoing throughout the lesson as well as when work is completed in books. Feedback can take the form or verbal or written responses but should not become excessively lengthy or onerous for the teacher. It should be seen as an ongoing and integral part of learning by the children, an opportunity to address misconceptions and extend their learning.

EYFS

We follow EYFS curriculum guidance for Mathematics. However, we are committed to ensuring the confident development of number sense and put emphasis on mastery of key early concepts. Pupil's explore the 'story' of numbers to twenty and the development of models and images for numbers as a solid foundation for further progress. Teachers use the concrete – pictorial – abstract approach creating a variety of resources for indoor and outdoor learning.

Resources

A variety of teacher resources are used as a planning aid for teachers. These include: Power Maths, White Rose, NCETM, Third space Learning, "I see Reasoning', Classroom Secrets plus a number of online maths sites.
A bank of practical, age appropriate maths resources are kept in each classroom. These include: Numicon, Dienes, Place Value counters and a variety of other equipment to aid the learning of number concepts. Further resources are kept in a central area and updated on an annual basic as required.

Information and Communication Technology

ICT is used in various ways to support teach and motivate children both within a whole class lesson and in independent tasks.

Role of the Subject Leader

- To attend regular CPD and lead staff meetings to inform teachers share good practice

- To monitor and evaluate teaching and learning, in line with maths policy,

by observing classroom practice, conducting learning walks and work scrutiny

- To ensure that the schools senior leaders are kept informed about developments in the mathematics curriculum

Louise Lewis Sept 2023