Langmoor Primary School

Policy for the teaching of Mathematics

May 2020

This policy outlines the teaching, organisation and management of mathematics taught and learnt at Langmoor. Our policy is based on the '*Key Stage 1 and 2 Mathematics Programmes of Study*' which forms part of the 2014 National Curriculum in England.

This policy has been drawn up as a result of staff discussion, as well as wider consultation with our MAT, The Teaching Schools Network and the Local Subject Leader Support Group. It has the full agreement of the Governing Body. The implementation of the policy is the responsibility of all the teaching staff. There is a separate policy outlining the calculation methods that will be taught and practised.

Our Vision for Mathematics at Langmoor

Mathematics equips pupils with a powerful set of tools to understand and change the world. These tools include logical reasoning, problem solving skills and the ability to think in abstract ways. Mathematics is important in everyday life, critical to science, technology and engineering and necessary for financial literacy and most forms of employment. We endeavour to ensure that children develop a positive and enthusiastic attitude towards mathematics that will stay with them.

At Langmoor Primary School, we are committed to ensuring that all pupils achieve mastery in the key concepts of mathematics, appropriate for their age group. The aims of our teaching is that children become **fluent** in the fundamentals of mathematics, are able to **reason** mathematically and can **solve problems.**

Introduction

This policy should be read in conjunction with the following school policies:

- Calculation policy
- Curriculum Policy
- Assessment Policy
- Marking and Feedback Policy
- SEN and More Able/Gifted and Talented Policies

Context/History

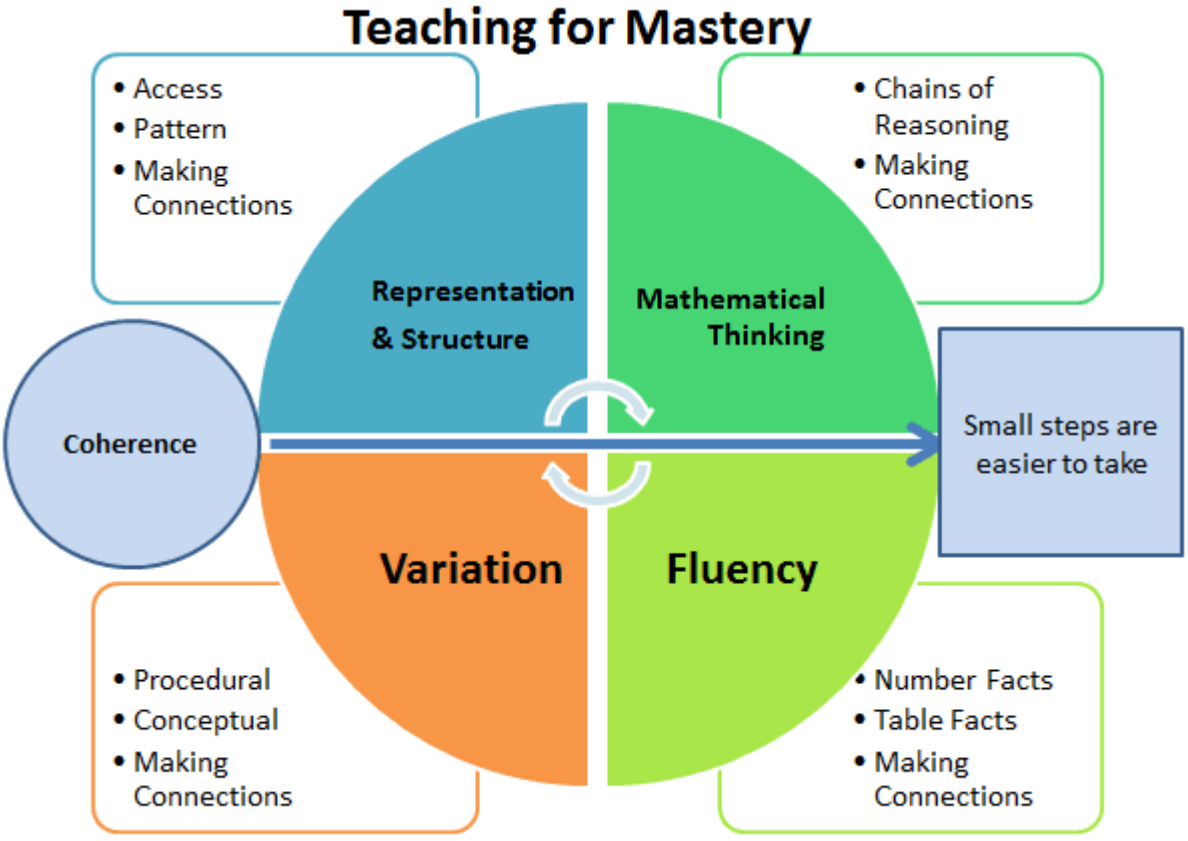
In September 2014, Langmoor Primary School began transitioning towards a mastery approach to the teaching and learning of mathematics. This process has taken about 5 years to embed and we have been supported through the Mathematics Specialist Teacher Programme and the NCETM/Maths Hubs.

The 2014 National Curriculum states that:

- *The expectation is that most pupils will move through the programme 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.*

Our teaching for mastery is underpinned by the NCETM's 5 Big Ideas:



Teaching at Langmoor also follows 6 teaching principles:

1. Teachers believe in the importance of mathematics and the vast majority of children can succeed in learning mathematics in line with national expectations. Everyone can learn mathematics to the highest levels. This is linked to our work on Growth Mindsets and Routes to Resilience: "It's not that you can't do it… it's that you can't do it, *yet*!" Pupils learn that mistakes are valuable.
2. The whole class is taught mathematics together, with no differentiation by acceleration to new content. In most lessons, pupils are not grouped by ability. 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 or did not work and what might be the most efficient strategy.
4. Precise mathematical language, often used in 'stem sentences' is modelled by the teacher 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. Questions are very important. Teachers ask open-ended, thought-provoking, targeted questions but also encourage the pupils to ask questions too.
5. Conceptual variation and procedural variation are used to help present the mathematics in ways that promote deep, sustainable learning. Conceptual variation is where the concept is varied and there is intelligent practice; procedural variation is where different procedures and/or representations are used to bring about understanding.
6. Sufficient time is spent on key concepts to ensure learning is well developed and deeply embedded before moving on. Focus on depth and applying what they have learnt through reasoning and problem solving.

Features of lesson design

1. Lessons at Langmoor last around 45 – 60 minutes. Lessons are daily in Years 2-6. In EYFS and Year 1, pupils participate in 2 maths mornings a week. This allows the children to access continuous provision activities based on the area of maths that they are learning.
2. A typical lesson will provide a good balance between whole-class teaching, group work and individual practice as well as reasoning and problem solving.
3. Lessons are sharply focused with one new objective introduced at a time.
4. Misconceptions and difficulties are identified in advance and planned for.
5. Key questions are planned to challenge thinking and develop learning for all pupils.

6. High quality images and examples are chosen and children are encouraged to use manipulatives or draw images to support their understanding. Pupils move between concrete, pictorial to abstract to gain a deeper understanding.
7. Children are encouraged to make comparisons, using phrases, "What's the same?" "What's different?". They are encouraged to make links and spot patterns.
8. Formative assessment is carried out, throughout the lesson. The teacher checks pupils' knowledge and understanding, adjusting the lesson accordingly.

Planning

All teachers plan lessons using the White Rose Scheme of Work. They may adapt these slightly to suit their classes and the school year. This clearly sets out the small steps needed for each unit and there is guidance for fluency, reasoning and problem solving. They have many other resources available to them to enrich their lessons, such as Maths No Problem text books, NCETM spines, NRich problems, Deepening Understanding, Twinkl etc.

Learning at home

Regular homework opportunities will provide opportunities to consolidate skills and apply learning in real-life situations. Where homework tasks are set, feedback will be given, and work completed will be valued.

Guidance on Mathematics homework is given to parents in knowledge organisers also provided at Parents' Evenings and Open Evenings; particularly in using our calculation methods and strategies. Further guidance is provided on the school website and through calculation workshops.

Cross Curricular Links

It is expected that mathematics will contribute to many other curriculum areas, and opportunities will be sought to draw mathematical experience out of a wide range of activities, most especially where these apply skills to real life, purposeful contexts. Examples may include:

- Interpreting and presenting data for science, historical or geographical statistics, and in ICT units of work;
- Involvement of children in calculating costs and numbers for visits, dinner money, attendance, etc;
- Awareness of shape and angle within Art and DT, or in control and modelling in ICT;
- Practical measuring of length, mass, capacity and time, in science, DT, geography and PE.

Calculations

In our calculation policy we outline the route most children will be able to follow successfully and with understanding. The policy was developed to match the methods that we teach, following the progression in the White Rose Scheme of Work. All members of staff have a copy of this and it is also available on the website.

More Able and Gifted Children/High Potential Learners

Children identified as having high potential in Maths should be brought to the attention of the maths subject leader and the gifted and talented co-ordinator. Criteria for identification may be as follows:

Children who have high potential in maths may:

- Learn and understand mathematical ideas quickly;
- Work systematically and accurately;
- Are more analytical;
- Think logically and see mathematical relationships;
- Make connections between the concepts that they have learned;
- Identify patterns easily;
- Apply their knowledge to new or unfamiliar contexts;
- Communicate their reasoning and justify their methods;
- Ask questions that show clear understanding of, and curiosity about mathematics;
- Take a creative approach to solving mathematical problems;
- Sustain their concentration throughout longer tasks and persist in seeking solutions;
- Are more adept at posing their own questions and pursuing lines of enquiry.

The updated record will state whether individuals are achieving their potential, (achieving greater depth), or not, the barriers to them achieving their potential and strategies that can be implemented to overcome these. Although the mastery approach means that the content taught is the same for all pupils, high potential pupils can be extended through more in-depth questioning, use of more demanding problems which will deepen their knowledge of the same content.

Special Educational Needs and Inclusion

Mastery offers all pupils access to the full maths curriculum. This inclusive approach, and its emphasis on promoting methods of solving a problem, builds self-confidence and resilience in pupils. Teachers still use differentiation through support or intervention, and scaffolding. Intervention is usually rapid/grab so longer term interventions are not generally needed. If a pupil is working at a pre year group level, particularly in KS2, it sometimes may be necessary for them to access objectives from previous year groups.

Foundation Stage and Year 1

In Reception a class will be organised to promote social skills and the development of mathematical language and understanding through stories, songs, rhymes, sand, water, cooking, imaginative, observing numbers in the environment, board games and outdoor play. The play-based experiences will be based on pupils' interests. In the Foundation Stage Numeracy objectives are taught through integrated activities that are linked to the Early Learning Goals.

There is greater emphasis on oral and mental calculations to develop confidence and mental fluency with whole numbers, counting and place value. This is called 'Number Sense'. Pupils explore the 'story' of numbers using a concrete, pictorial, abstract approach, supported by the Numberblocks resources from NCETM/CBBC and Ten Town. The activities can often by of an active and practical nature. By the end of the Reception year, the children are used to doing focused teacher-led or independent activities of a mathematical nature and are encouraged to record their mathematical thinking in a more formal way. This style of

planning and learning has also been adapted by Year 1, but by the end of Year 1, the children are prepared for a structured daily maths lesson.

Resources

All classrooms are fully equipped with the necessary resources needed to deliver the daily mathematics lesson. The shared resources are stored centrally and there is an inventory of these resources that is updated yearly. The calculation policy highlights the resources that should be used to support particular methods across the school. The curriculum co-ordinator purchases necessary resources in conjunction with discussion with teachers.

ICT

ICT will be used in a number of ways to support teaching and learning, where it is the most efficient way of meeting the lesson objectives. All classrooms have an interactive whiteboard on which to use software and interactive programs with the whole class or a group. Each class now has a visualizer which is a good tool to share pupils' work or to model manipulatives being used. Each class also has timetabled access to the ICT suite we have laptops and ipads with mathematical programs loaded on.

Assessment, Recording and Reporting

Assessment will take place in four levels, as follows:

Formative Assessment

These will be an informal, but planned part, of every lesson, as teachers check children's understanding, making notes in lesson evaluations for personal reference, to inform future planning needs. These assessments are to help the teacher and it is unlikely that they will be transferred at the end of the year.

The involvement of the children in the process of assessment is a key part of this and the children-friendly objectives, (WALTs), along with success criteria,(WILFs), helps them to recognise the progress they are making. Gaps can quickly be identified and narrowed through Grab and go/rapid intervention. The school's Assessment and Marking Policies

inform high quality feedback to address misconceptions and move children on.

End of Unit Assessment

At the end of each White Rose Unit, pupils complete a short assessment to check their understanding and progress. Again, it may highlight that some pupils need to revisit certain objectives.

End of Term Assessment

At the end of each term, pupils complete a longer assessment, comprising of an arithmetic paper and a reasoning paper, (similar in style to the KS1 and KS2 SATs). This enables teachers to check whether pupils have retained the learning from earlier in the term and are able to apply it to new problems and contexts. This informs the teacher assessments to track if pupils are on target to reach their expected end of year level. These 'levels' are submitted to the head teacher and discussed in pupil progress meetings

End of Year Assessments

EYFS submit a score for number and shape and space as part of the ELG Profile. Year 2 and Year 6 sit more formal SATs tests. The data from these is submitted nationally and the Local Authority may visit to moderate the teacher's judgements. Other year groups sit informal end of year SATs style tests to inform their teacher assessments. Children are assessed to be working towards the expected level, working at the expected level or working beyond the expected level. These pupils are deemed to be working 'at greater depth'. A small number of children will also be pre year group. These pupils may need, on occasion, to be taught different content to the rest of the class or be taught separately to ensure that their needs are being met.

All parents will receive a written comment, together with indicators of attainment and effort as part of the individual child's report in the summer term.

A. Management of Mathematics

The Subject Leader

The subject leader will:

- Ensure teachers understand the requirements of the National Curriculum and support them to plan lessons; Lead by example, setting high standards in their own teaching.
- Prepare, organise and lead CPDL as required, with the support of the Headteacher; Facilitates joint professional development – such as lesson studies and coaching.
- Monitor and evaluate teaching and learning by observing teaching, analysing assessment data, conducting work scrutinies and conducting pupil interviews in order to plan whole school improvement in mathematics.
- Take responsibility for managing own professional development by participating in external training, private study, educational research and scholarly reading. Disseminates this to the necessary parties.
- Keep parents informed about mathematical issues.
- Ensure SLT and governors are kept informed about the standards and quality of teaching and learning in mathematics.
- Work co-operatively with the SENCO, More Able Co-ordinator and ICT Co-ordinator to ensure that the learning needs of all pupils in mathematics are met effectively;
- Liaise with other Subject Leaders within the MAT/Teaching Schools/Local Network Group to share good practise.

The Role of the Headteacher

The Headteacher will:

- Lead, manage and monitor the implementation any new initiatives, including monitoring the quality of teaching, learning and planning.
- With the curriculum governor and subject leader, keep the governing body informed about the standards of mathematics in the school;

- Ensure that mathematics retains a high profile in the school's Development Plan;
- Deploy staff to maximise support for the teaching of mathematics;

The Role of the Curriculum Governor

The Curriculum Governor with responsibility for Numeracy will:

- Meet with the Headteacher and Mathematics subject leader to discuss progress and issues arising;
- Talk with teachers and children and observe some daily mathematics lessons as part of the Annual Monitoring Visit;
- Agree a section for the Annual Governors' Report on mathematics with the Headteacher and Subject Leader;
- Support school initiatives to raise the profile of mathematics;
- Be aware of and monitor actions of the school Development Plan.

Reviewed: