MORDIFORD C of E PRIMARY SCHOOL

Treasure each individual

NURTURE INSPIRE FLOURISH

Mathematics Policy

Introduction;

'Numeracy is a fundamental life skill. Being numerate involves developing confidence and competence in using number that allows individuals to solve problems, interpret and analyse information, make informed decisions, function responsibly in everyday life and contribute effectively to society. It gives increased opportunities within the world of work and sets down foundations which can be built upon through life-long learning. Whilst numeracy is part of mathematics, it is also a core skill, which permeates all areas of learning, allowing pupils the opportunity to access the wider curriculum.'

'A high-quality mathematics education 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.' (National Curriculum 2014)

We endeavour to provide opportunities for children to develop and apply numeracy and mathematics skills both in discreet Mathematics teaching and through cross curricular projects and wider learning environments and experiences (e.g. workshops and visits, curricular weeks, Forest School) allowing our children to say, write, make and do. They are able to develop their mathematical potential through a rich, engaging curriculum. We want our children to feel confident in using and applying mathematics in a wide range of situations. We believe that mathematics is uniquely powerful in helping us to make sense of, and describe, our world and in enabling us to solve problems, reason logically and think in abstract ways. It is an exciting subject, dealing with the nature of number, space, pattern and relationships. Useful and creative, it requires not only facts and skills, but also understanding gained through exploration, application and discussion. In mathematics we aim to develop lively, enquiring minds encouraging pupils to become self-motivated, confident and capable in order to solve problems that will become an integral part of their future. It is this belief in the pervasiveness of mathematics that is at the heart of what we do here at Mordiford.

This document should be read in conjunction with our School Development Plan for Numeracy and Marking.

Aims;

At Mordiford we are developing a mastery approach to the teaching of mathematics. At the centre of this approach is the belief that all pupils have the potential to succeed. All children should have access to the same curriculum content and, rather than being extended with new content from other year groups, they should deepen their conceptual understanding by reasoning and problem solving.

At Mordiford we strive to offer pupils intellectual excitement and challenge in Mathematics; to provide them with a sense of delight and wonder; to equip them with knowledge and skills and the ability and confidence to use and apply these to meet the needs of present and future society. We aim to ensure that all pupils, irrespective of gender, race and culture, have access to a wide range of stimulating problems and activities which will include the appropriate Programmes of Study of the National Curriculum 2014 and the EYFS curriculum enabling them to become competent and confident young mathematicians.

Aims for our pupils;

• To develop a growth mind set about ability to learn mathematics,
• To develop a positive attitude towards the subject,
• To become confident and proficient with number, including fluency with mental calculation and looking for connections between numbers,
• To create problem solvers, who can reason, think logically, work systematically and apply their knowledge of mathematics,
• To develop mathematical language which children can use appropriately,
• To help children to become independent learners and to work cooperatively with others,
• To give a real life context to learning in Mathematics

Teaching for Mastery;

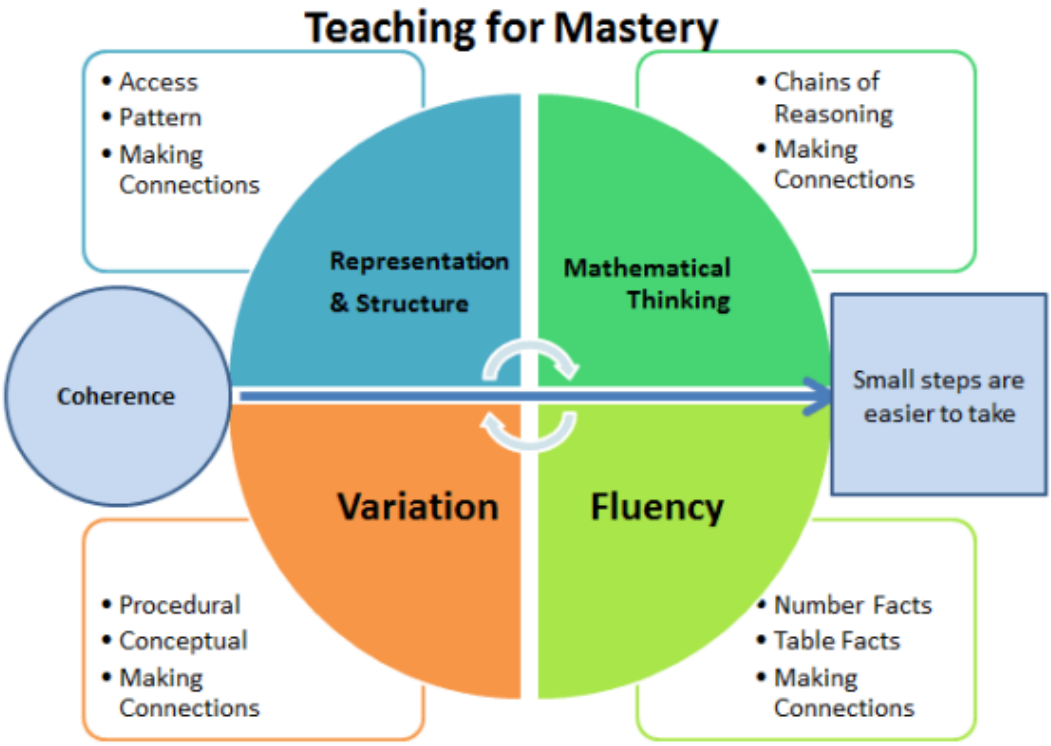
In September 2019, we began moving towards a mastery approach to the teaching and learning of mathematics here at Mordiford. The rationale behind changing our approach to teaching mathematics stems from our participation with the NCETM Maths Hub Programme as well as within the 2014 National Curriculum, 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.

Five Big Ideas of Mastery;



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 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 for Mastery Principles;

- **It is achievable for all** – we have high expectations and encourage a positive 'can do' mind set towards mathematics in all pupils, creating learning experiences which develop children's resilience in the face of a challenge and carefully scaffolding learning so everyone can make progress.
- **Deep and sustainable learning** – lessons are designed with careful small steps, questions and tasks in place to ensure the learning is not superficial.
- **The ability to build on something that has already been sufficiently mastered** – pupils' learning of concepts is seen a continuum across the school.
- **The ability to reason about a concept and make connections** – pupils are encouraged to make connections and spot patterns between different concepts (E.g. the link between ratio, division and fractions) and use precise mathematical language, which frees up working memory and deepens conceptual understanding.

- **Conceptual and procedural fluency** – teachers move mathematics from one context to another (using objects, pictorial representations, equations and word problems). There are high expectations for pupils to learn times tables, key number facts (so they are automatic) and have a true sense of number. Pupils are also encouraged to think whether their method for tackling a given calculation or problem is Appropriate, Reliable and Efficient (A.R.E).
- **Problem solving is central** – this develops pupils' understanding of why something works so that they truly have an appreciation of what they are doing rather than just learning to repeat routines without grasping what is happening.
- **Challenge through greater depth** - rather than accelerated content, (moving onto next year's concepts) teachers set tasks to deepen knowledge and improve reasoning skills within the objectives of their year group.

Teaching and Learning;

We aim for all our pupils to experience success in mathematics, develop the confidence to take risks, ask questions and explore alternative solutions without fear of being wrong. They have opportunities to explore and apply mathematical concepts to understand and solve problems, explain their thinking and present their solutions to others showing this in a variety of ways.

- Learning is broken down into small, connected steps, building from what pupils already know.
- Difficult points and potential misconceptions are identified in advance and strategies to address them planned.
- Key questions are planned, to challenge thinking and develop learning for all pupils.
- Contexts and representations are carefully chosen to develop reasoning skills and to help pupils link concrete ideas to abstract mathematical concepts.
- The use of high quality materials and tasks to support learning and provide access to the mathematics, is integrated into lessons. These may include White Rose Maths Schemes of Learning and Assessment Materials, Power Maths textbook activities, NCETM Mastery Assessment materials, NRICH, visual images and concrete resources.
- Opportunities for extra fluency practice (instant recall of key facts, such as number bonds, times tables, division facts, addition and subtraction facts) are provided outside mathematics lessons e.g. morning starters.

The Foundation stage;

Mathematical thinking and early vocabulary are developed through observation – profile information, communication, listening, reading, recording, manipulating, comparing and classifying, estimating and measuring, prediction, choosing and testing and drawing conclusions. Pupils have opportunities to initiate their own mathematical learning through carefully planned play based opportunities and by using engaging resources both inside and outside of the classroom. A balance of directed time activity and detailed observations inform class teachers of the next steps for learning for individual Reception pupils.

Key Stages 1 and 2;

We ensure that the statutory requirements of the National Curriculum 2014 are planned for and delivered, and so too are their aims, thereby enabling children to:

Become **fluent** in the fundamentals of mathematics, including the varied and regular practice of increasingly complex problems over time.

Reason mathematically by following a line of enquiry, understanding relationships and generalisations, and developing an argument, justification or proof using mathematical language.

Solve problems by applying their mathematics to a variety of problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

Lesson Structure;

- Lessons are sharply focused.
- Key new learning points are identified explicitly.
- There is regular interchange between concrete/contextual ideas, pictorial representations and their abstract/symbolic representation.
- Mathematical generalisations are emphasised as they emerge from underlying mathematics, which is thoroughly explored within contexts that make sense to pupils.
- Maths vocabulary forms part of every lesson and high expectations are set that it is used correctly in order to develop children's knowledge. Stem sentences are used where appropriate.
- Making comparisons is an important feature of developing deep knowledge. Questions such as "What's the same, what's different?" are used to draw attention to essential features of concepts.
- Repetition of key ideas (for example, in the form of whole class recitation, repeating to talk partners etc.) is used frequently. This helps to verbalise and embed mathematical ideas and provides pupils with a shared language to think about and communicate mathematics.
- Teacher-led discussion is interspersed with short tasks involving pupil to pupil discussion and completion of short activities.
- Formative assessment is carried out throughout the lesson; the teacher regularly checks pupils' knowledge and understanding and adjusts the lesson accordingly.
- Gaps in pupils' knowledge and understanding are identified early by in-class questioning. They are addressed rapidly through individual or small group intervention which may be separate from the main mathematics lesson, to ensure all pupils are ready for the next lesson.
- Teachers discuss their mathematics teaching regularly with colleagues, sharing teaching ideas and classroom experiences in detail and working together to improve their practice.

Basic Skills;

We recognise the importance of establishing a secure foundation in mental calculation and recall of number facts before standard written methods are introduced. In addition to daily Numeracy lessons we also deliver fifteen minute Basic Skills sessions in all classes to further support the development of fluency of fundamental mathematical knowledge and skills.

Marking

See Marking Policy and Marking Action plans for further details.

The Environment

At Mordiford, we aim to provide a mathematically stimulating environment:

- through displays that promote mathematical language, thinking and discussion
- through displays of pupils' work that celebrate achievement
- by providing a good range of resources for teacher and pupil use. In every classroom, resources such as number lines, hundred square, place value charts and multiplication squares are displayed as appropriate and used as resources for whole class or individual work, for children to become confident in their use and understanding of the number system

Homework

Homework is set to support mathematical work undertaken in class, at home and also serves to help develop parental involvement in pupils learning and enjoyment of the subject. This can take the form of written activities, games, investigations or online activities which aim to stimulate interest and reinforce understanding of topics.

Intervention

Interventions are provided to boost children's progression in maths and are tightly planned, with success criteria set and assessments made frequently to ensure progress is being made. There are also opportunities for Gifted and Talented children to exceed and achieve their full potential e.g. through Numeracy Booster Sessions, entry to the UK Maths Challenge, Games 24 etc.

Data analysis of School Tracking is used to identify children and groups who require additional support in specific areas and ensure at least good levels of attainment and progress.

We offer a range of additional maths intervention resources including:

- The Power of One/Two
- Mathletics
- Springboard
- Talking maths

Assessment, Recording and Reporting

Formative assessment is used in the learning & teaching process in order to:

- Share learning intentions and success criteria to meet the needs of all learners.
- Assess understanding through skilful questioning.
- Give pupils high quality, clear and regular feedback both orally and written (also see Marking Policy).
- Assist learners and teachers to identify the next steps in the learning process, which ensures progression

Summative assessments are completed by class teachers at least termly. Teacher Assessment information is recorded onto the schools tracking system and then used to inform future planning,

and to identify children for intervention and support. The Class Teacher, Assessment Co-ordinator, Mathematics Co-ordinator, SENCO review and analyse records of assessments.

In the EYFS, pupils are observed and assessed against the Early Learning Goals throughout the Reception Year. Records are kept in each child's Learning Journey and The Foundation Stage Profiles.

In KS1 and KS2 Statutory Assessment Tasks (SATs) are administered in accordance with current DFE guidance at the end of KS1 and KS2. Pupil, group and class targets are set and reviewed regularly. Parent's consultations are held twice yearly where the teacher discusses children's targets and progress in mathematics. In accordance with statutory requirements an Annual Report is sent to parents towards the end of the Summer Term and an interim report in the Spring Term. These reports cover progress and achievements in mathematics, setting targets for future improvement and include the level achieved in the SATs if appropriate.

Subject Management

Class Teachers have the responsibility for:

- effective planning, delivery and assessment of maths and numeracy work
- developing a variety of motivating and challenging activities
- creating a maths rich environment
- promoting maths across the curriculum
- disseminating good practice to colleagues

The Maths Co-ordinator has responsibility for:

• Reviewing and monitoring planning
• Monitoring teaching and evaluating pupils work
• Work alongside staff to support when required
• Attend relevant courses to be aware of new ideas and disseminate these to all staff and to arrange appropriate inset for colleagues
• Be responsible for ordering all maths resources
• Carry out curriculum review and relay findings to the Governors and staff
Update the policy document and schemes of work as necessary
• Provide workshops for parents
• Evaluation of The mathematics policy will be reflected in our practice. This will also be monitored and evaluated by the Head Teacher, the Senior Leadership Team and the Maths Co-ordinator in the form of lesson observations, discussion and regular scrutiny of planning and of pupil's work.

Link Governor;

A named member of the Governing Body has responsibility for meeting regularly with the Numeracy Co-ordinator to discuss and monitor teaching and standards in the subject.