



MARLCLIFFE PRIMARY SCHOOL
Maths Policy

Last Reviewed	June 2019	Next Review	June 2021
		Ratified by Governors	June 2019

Mathematics Policy

‘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.’ (DfES 2014)

Aims:

Our aims for maths at Marlcliffe Primary School are based on the ‘The national curriculum in England - mathematics programme of study, KS1 and KS2 framework’ document which is to ensure that all pupils:

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

To achieve these aims, we strive to:

- Develop a numerate environment where mathematical risk-taking, creativity and logical thought are encouraged in order to develop independent learners.
- Secure fluency with numbers and the number system;
- Develop the ability to solve problems through decision-making, reasoning and logic in a range of contexts;
- Promote a positive and confident attitude to mathematics through celebrating achievement, supporting and challenging all pupils
- Develop mathematical communication through speaking and listening, practical activities and recording work.

TEACHING and LEARNING: Mathematics Mastery Approach

At the centre of the mastery approach to the teaching of mathematics is the belief that all children have the potential to succeed. They should have access to the same curriculum content and, rather than being extended with new learning, they should deepen their conceptual understanding by tackling challenging and varied problems. Similarly, with calculation strategies, children must not simply rote learn procedures but demonstrate their understanding of these procedures through the use of concrete materials and pictorial representations.

At Marlcliffe School, we believe maths learning builds from a concrete understanding of concepts when children are manipulating objects. When children are able to see concepts this way they then need to understand that the same concepts can be represented pictorially. Children are then ready for abstract representation, before being able to apply their knowledge to different situations. Children should be encouraged at all times to communicate their understanding of maths so that it clarifies their thoughts.

Children's fluency in arithmetic remains of great importance, with number facts, times table facts and various strategies for calculation taught and practiced at school with support sought from parents through homework activities. A progression of skills towards efficient written calculations is developed and applied consistently in each year-group – please see Calculation policy for more details.

Equal Opportunities

At Marlcliffe Primary School we teach mathematics to all children whatever their ability. Maths forms part of the school curriculum policy to provide a broad and balanced education for all children. Teachers provide learning opportunities matched to the needs of children. Work in maths takes into account the targets set for individual children in their Support Plans. Teachers provide help with maths through:

- Adapting materials to suit the needs of the child.
- Using visual and written materials in different formats.
- Providing different concrete and pictorial materials to support children's understanding
- Using ICT and other technological aids.
- Working in small groups led by teaching assistant/teacher.

Mathematical Language

The 2014 National Curriculum is explicit in articulating the importance of children using the correct mathematical language as a central part of their learning (reasoning). It is therefore essential that teaching using the strategies outlined in this policy is accompanied by the use of appropriate and precise mathematical vocabulary. New vocabulary should be introduced in a suitable context (for example, with relevant real objects, apparatus, pictures or diagrams) and explained carefully. High expectations of the mathematical language used are essential, with teachers only accepting what is correct.

Early Years

In the Foundation Stage, children are given the opportunity to develop their understanding of number, shape, space and measurement through a combination of short, formal teaching sessions as well as a range of planned structured play situations, where there is plenty of scope for exploration. Children will become competent 'counters' so that their fluency with the number system provides a foundation for mathematical understanding. They will count reliably with numbers from one to twenty, place them in order and say which number is one more or one less than a given number. Using concrete objects, they add and subtract two single-digit numbers and count on or back to find the answer. Mastery is key in the Foundation stage to set up the platform for further learning.

Homework-

Foundation Stage set homework each week relating to the previous weeks learning. Parents/carers are encouraged to use concrete objects rather than pictures or numbers to solve the problems.

Marking and Assessment

The Foundation Stage use an online learning diary called 'Tapestry'. Staff will upload photo evidence and observations of maths learning taking place during the continuous provision and during teacher focus activities. This informs future teacher led planning and maths activities for the enhanced provision. At the end of Reception children are assessed against the maths aspects of the early learning goals; this is shared with parents/ carers and Y1 staff.

Planning

All teachers follow a termly overview plan and are encouraged to design lessons using a range of resources, including, but not limited to, the scheme of work from the White Rose Maths Hub. In keeping with the 'Teaching for mastery' approach, teachers are required to keep the class working together on the same topic, whilst at the same time addressing the need for all pupils to master the curriculum and for some to gain greater depth of proficiency and understanding. Challenge is provided by going deeper rather than accelerating into new mathematical content. Therefore, teachers are required to base their planning around their year group objectives and not to move onto a higher year group's scheme of work. Lessons should be designed and delivered to include opportunities for pupils to 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.

Assessment, marking and recording

Each child's progress should be continually assessed and should inform day to day planning.

Teachers assess by:

- Observation whilst children are engaged in a task or are specifically asked to work through a question or problem;
- Questioning and discussions with the class or group, throughout the lesson.
- Formal assessment tasks;
- Termly assessments in arithmetic and problem solving and reasoning (White Rose tests);
- Ongoing curriculum objective assessments;

At the end of each term, teachers from Years 1 to 6 record children's achievement in any standardised tests as well as their progress as seen in their books. Teacher assessment against National Curriculum objectives are entered onto School Pupil Tracker, These are used to inform target setting and pupil progress meetings are held termly to discuss how to support, challenge and target individual children's needs in mathematics and identify focus groups.

At the end of Year 2 and 6 the children sit standard assessment tasks (SATs). These are marked internally in Year 2 and externally in Year 6.

Assessment for Learning is integral to teaching and learning and should feed into teacher's planning. It should also inform any focus groups for the following day's teaching.

Marking is an important part of assessment and feedback. Wherever possible, the child should be present when given feedback. The most important 'marking' is informal diagnostic assessment during the lesson. In Maths, marking symbols will be used following the whole school marking policy. Also included in marking there should be an indication of whether the child has worked independently, with support, or using resources.

Presentation

Work should always start with a date and learning intention (WALT). Books are to be seen as 'work' books and the recording of working and thinking is encouraged! We encourage clear layout of calculations to minimise errors in accordance with the calculation policy when using written methods. Squared maths books are used. Worksheets must be dated and where possible, stuck in books, if not stored in a maths folder.

Resources

Each class should have a well-maintained stock of core resources:

- Numicon including boards, pegs and shapes
- Cuisenaire rods
- Dice and counters
- Rapid recall boards

Other mathematical resources are kept centrally.

Children will have access to these in all lessons and have the choice of when to use the concrete resources to provide visual and kinaesthetic support. We also have access to computer software such as the Numicon Whiteboard program, White-rose interactive flipchart and ITPs.

There should be a maths working wall in every class which should reflect current learning and be actively used in maths lessons.

Homework

A weekly homework task is set throughout the school. In Key Stage 1, activities are set weekly for children to work alongside parents on current objectives. In Key Stage 2, maths homework is set weekly in a homework book that supports in class learning. Children who find it difficult to complete homework are supported in school through clubs.

Monitoring and review

Monitoring of the standards of the children's work and the quality of teaching is the responsibility of the Maths Subject Leader and SLT. The Math Subject Leader also supports colleagues in teaching Maths, keeping up to date in current developments in the subject, and providing a strategic lead and direction for the subject.

Progression in Calculations

The calculation policy provides clear examples of methods which show progression in calculations.

This calculation policy is based on the CPA (concrete-pictorial-abstract) approach - a key component of the mastery approach.

Concrete - we use physical resources to bring the maths to life e.g. numicon, base 10, counters.

Pictorial - we use pictorial representations of the problem to help pupils to 'see the maths'.
Abstract - when we are ready we move on to using numbers and key concepts confidently

The focus for EYFS / Reception should be on the understanding of early number concepts and number sense through the use of concrete manipulatives and practical experiences, as exemplified in the programmes of study. Progression guidance for the Foundation Stage is therefore not provided in this document. This document focuses on progression of calculations from Year 1 to Year 6.

This calculation policy is a guide for all staff at Marlcliffe Primary School and has been adopted from work by the National Centre for Excellence in the Teaching of Maths (NCETM) and White-rose Maths Hub documents. It is purposely set out as a progression of mathematical skills and not into year group phases to encourage a flexible approach to teaching and learning. It is expected that teachers will use their professional judgement as to when consolidation of existing skills is required or if to move onto the next concept. However, **the focus must always remain on breadth and depth rather than accelerating through concepts**. Children should deepen their conceptual understanding by tackling challenging and varied problems. For each of the four rules of number, different strategies are laid out, together with examples of what concrete materials can be used and how, along with suggested pictorial representations. Please note that the concrete and pictorial representation examples are not exhaustive, and teachers and pupils may well come up with alternatives when necessary.

The principle of the concrete-pictorial-abstract (CPA) approach is that for pupils to have a true understanding of a mathematical concept, they need to master all three phases. Teachers can use any teaching resources that they wish to use and the policy does not recommend one set of resources over another, rather that, a variety of resources are used.