



Waterloo
Primary Academy

Maths Policy

Approved: 27 February 2020

Responsible Personnel: Mrs K. Robinshaw

Review Period: Annual

Review Date: September 2023

Waterloo Primary Academy Maths Policy

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

- Calculation Policy
- Assessment Policy
- Marking Policy
- SEND Policy

Our Vision

At Waterloo:

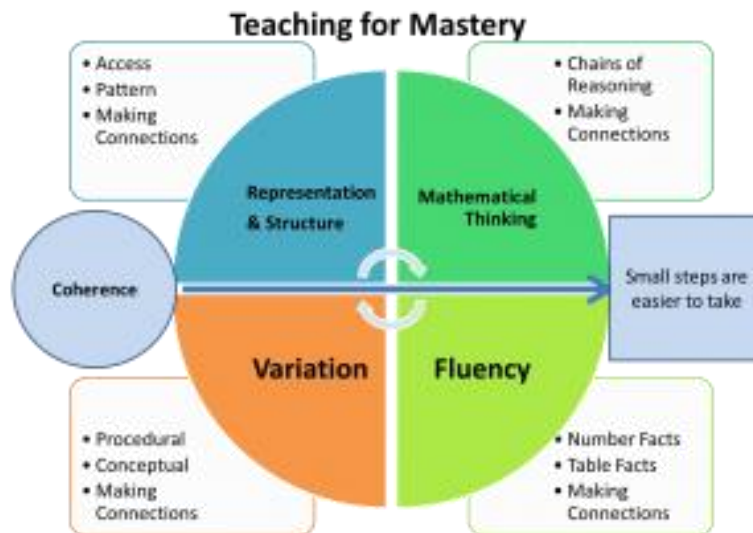
- we aim to promote children's **curiosity** and enable them to safely risk take and learn from first-hand experiences wherever necessary
- our primary focus is to support the children to become **fluent in mathematical understanding** from the most basic level so that they can build upon their own understanding
- we aim to enable our children to develop conceptual understanding, **recall** of number facts and patterns and apply their knowledge rapidly and accurately
- we aim to promote children's ability to **reason** through opportunities to discuss their thinking and understanding. This emphasis may result in less written work, but a much deeper understanding.
- we promote **problem solving** and solution finding. This is not only true in mathematical learning but in almost all aspects of school life.
- we aim to support children to make **progress at their own pace**. Often misconceptions cause greater difficulties at a later stage of learning. We will promote smaller group learning opportunities whenever possible and appropriate, and encourage children to revisit their thinking to ensure they feel secure in their understanding and able to move confidently on to next steps and challenges.

National Curriculum Links

The programmes of study for mathematics are set out year-by-year for key stages 1 and 2. Schools are however only required to teach the relevant programme of study by the end of the key stage. Within each key stage, schools therefore have the flexibility to introduce content earlier or later than set out in the programme of study. In addition, schools can introduce key stage content during an earlier key stage, if appropriate. All schools are also required to set out their school curriculum for mathematics on a year-by-year basis and make this information available online. The expectation is that the majority of pupils will move through the programmes of study at broadly the same pace. However, decisions about when to progress should be based on the security of the pupils' understanding.

Our aim is that pupils will be able to meet the key aims of the National Curriculum for maths. Therefore, Waterloo Primary Academy have decided to adapt a **Mastery Approach to Mathematics**.

What is teaching for mastery?



Fluency involves:

- quick recall of facts and procedures
- the flexibility and fluidity to move between different contexts and representations of mathematics
- the ability to recognise relationships and make connections in mathematics

Representation & Structure

Mathematical structures are the key patterns and generalisations that underpin sets of numbers – they are the laws and relationships that we want children to spot. Using different representations can help children to ‘see’ these laws and relationships.

Variation

Procedural variation – This is a deliberate change in the type of examples used and questions set, to draw attention to certain features. Conceptual variation – When a concept is presented in different ways, to show what a concept is, in all of its different forms.

Mathematical thinking involves:

- looking for pattern and relationships
- logical reasoning
- making connections

Coherence

Teachers should develop detailed knowledge of the curriculum in order to break the mathematics down into small steps to develop mastery and address all aspects in a logical progression. This will ensure deep and sustainable learning for all pupils.

EYFS

Mathematics within the EYFS is developed through purposeful, play based experiences and is represented throughout the indoor and outdoor provision. The learning is based on pupil's interests and current themes and focuses on the expectations from Development Matters / Early Years Outcomes. At Waterloo, we also follow the guidance given by the NCETM Early Years Typical Progression Charts and Reception use the White Rose Schemes of Learning. Mathematical understanding is developed through stories, songs, games, imaginative play, child-initiated learning and structured teaching. As pupils progress, they are encouraged to record their mathematical thinking in a more formal way.

Teachers will also provide an additional daily maths session following The NCETM Mastering Number Programme which is aimed at **strengthening the understanding of number, and fluency with number facts, among children in the first three years of school.**

Key Stage 1 Maths

The principal focus of mathematics teaching in Key Stage 1 is to ensure pupils develop confidence and mental fluency. The essential idea behind the mastery approach is that all children have a deep understanding so that future learning continues to build on solid foundations. If the subject is represented using concrete materials, pictorial representations and abstract symbols, it will allow children to visualise maths in varied ways, see connections and to independently explore and investigate a topic. Practical activities and resources offer the children a deeper mathematical understanding of more complex concepts. Providing children with visual representations also offers a scaffold when developing a more robust understanding of maths. Throughout Key Stage 1, it is important that children gain a secure knowledge of number and place value and become confident when using the four operations in both formal methods as well as problem solving where often the approach is not immediately evident. Alongside number work, pupils begin to identify

fractions using shapes, objects and quantities and make connections to equal sharing and grouping. Pupils are taught to count to ten in fractions, recognise equivalent fractions and develop their understanding of fractions on a number line. At this stage, pupils will also develop their ability to recognise, describe, draw, compare and sort different shapes. Pupils have the opportunity to use a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money and are expected to use related vocabulary for all topics. Our Learning Means the World Curriculum allows teachers to develop strong links to some maths topics allowing cross-curricular teaching. For example, shape through art or computing, measures through science or coordinates in geography. This is to ensure we continually maximise learning opportunities for all pupils across an entire curriculum.

Teachers will also provide an additional daily maths lesson following The NCETM Mastering Number Programme which is aimed at **strengthening the understanding of number, and fluency with number facts, among children in the first three years of school.**

Key Stage 2

Maths Lower Key Stage 2 – Years 3-4.

The principal focus of mathematics teaching in lower Key Stage 2 is to ensure that pupils become increasingly fluent with whole numbers and the four operations, including number facts and the concept of place value. This should ensure that pupils develop efficient written and mental methods and perform calculations accurately with increasingly large, whole numbers. At this stage, pupils should develop their ability to solve a range of problems, including with simple fractions and decimal place value. Teaching should also ensure that pupils draw with increasing accuracy and develop mathematical reasoning so they can analyse shapes and their properties, and confidently describe the relationships between them. It should ensure that they can use measuring instruments with accuracy and make connections between measure and number. By the end of Year 4, pupils should have memorised their multiplication tables up to and including the 12-multiplication table and show precision and fluency in their work.

Upper Key Stage 2 – Years 5-6

The principal focus of mathematics teaching in upper Key Stage 2 is to ensure that pupils extend their understanding of the number system and place value to include larger integers. This should develop the connections that pupils make between multiplication and division with fractions, decimals, percentages and ratio. At this stage, pupils should develop their ability to solve a wider range of problems, including increasingly complex properties of numbers and arithmetic, and problems demanding efficient written and mental methods of calculation. With this foundation

in arithmetic, pupils are introduced to the language of algebra as a means for solving a variety of problems. Teaching in geometry and measures should consolidate and extend knowledge developed in number. Teaching should also ensure that pupils classify shapes with increasingly complex geometric properties and that they learn the vocabulary they need to describe them. By the end of Year 6, pupils should be fluent in written methods for all four operations, including long multiplication and division, and in working with fractions, decimals and percentages.

Parental Involvement

At Waterloo, we encourage parents to be involved by:

- inviting them into school twice/three times a year to discuss the progress of their child
- issuing a yearly report outlining their child's achievements
- issuing weekly times tables homework that can be completed by or with their child. This will include online access to Numbots, TT Rockstars and paper activities.

Inclusion

Teaching maths for mastery is different because it offers all pupils access to the full maths curriculum. This inclusive approach, and its emphasis on promoting multiple methods of solving a problem, builds self-confidence and resilience in pupils. The whole class goes through the same content at the same pace, but there is still plenty of opportunity for differentiation. Taking a mastery approach, differentiation occurs in the support and intervention provided to different pupils, not in the topics taught, particularly at earlier stages. There is no differentiation in content taught, but the questioning and scaffolding individual pupils receive in class as they work through problems will differ, with higher attaining children, or those pupils who grasp concepts quickly, challenged through more demanding problems which deepen their knowledge of the same content. Those children who are not sufficiently fluent are provided additional support to consolidate their understanding before moving on. Pupils' difficulties and misconceptions are identified through immediate formative assessment and addressed with intervention – commonly through individual or small group support before the next maths lesson.

Organisation:

- all children receive a daily maths lesson, although **mathematical skills** run through many other areas of the curriculum
- each lesson focusses on **clear learning objectives** which all children are expected to **master**; extension activities enable those children who grasp the objective rapidly to extend their learning by **exploring it at greater depth**
- each lesson includes elements of: **fluency**, to practise skills; **reasoning**, to deepen understanding; and **problem solving**, to apply skills
- teachers plan lessons, to incorporate the above elements, using the NCETM spines and resources whilst enhancing them with other mastery resources
- whole class teaching is adopted and children work in mixed ability groups OR children are placed into ability groups within their class (after teacher assessment, ready for the next lesson)
- all classrooms have **maths working walls** with key vocabulary clearly displayed
- every classroom has a range of **practical apparatus** to support children's learning, with additional resources stored centrally
- learning in every lesson is assessed using our **Waterloo Learning Evaluation Forms** which inform future planning and any interventions
- **additional daily arithmetic** and problem-solving questions will be provided for all children during morning or afternoon registration

Monitoring and Review

The monitoring of maths teaching and pupil progress is the shared responsibility of teachers, subject leader and the senior leadership team. The work of the subject leader includes supporting colleagues in the teaching of maths, keeping up to date with current developments as well as providing a strategic lead and direction for the subject. The school's Academy Council will receive regular updates to inform them of the vision for continually driving forward teaching for mastery.