

Moorside Primary School



Mathematics policy

MOORSIDE PRIMARY SCHOOL

PURPOSE, VISION & VALUES

Our Purpose

Moorside Primary is a school at the heart of our diverse community in the West End of Newcastle.
We pride ourselves in being a caring school community where everyone is welcome.
We strive to deliver an outstanding education for all our children.
We help everyone to become caring and active citizens
We encourage everyone to thrive and achieve their full potential.

Our Vision

We want everyone in our school to work together to make us as good as any school can be.
We want to create new opportunities for everyone to succeed.
We want to create a culture which broadens all of our horizons.
We want everyone to be able to tackle the challenges we will face in an ever changing world.
We want all of our children to effectively engage with each other and with our community.

Our values

We all believe that

Our local community deserves a school they can be proud of
We are a caring community where everyone is welcome
We all value, respect and support each other
Our community has the right to be safe and healthy.
Our children should have the chance to enjoy and be enthused by their time in our school

We all work together to make sure that

Everyone always tries their best and take pride in all that they do
Everyone demonstrates good manners at all times
Everyone respects each other and show consideration
Everyone respects and cares for our environment and resources
Everyone celebrates each other's successes and achievements

Introduction

Mathematics equips pupils with the uniquely 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. It is integral to all aspects of life, and with this in mind we endeavour to ensure that children develop a positive and enthusiastic attitude towards mathematics that will stay with them.

The National Curriculum order for mathematics describes in detail what pupils must learn in each year group. Combined with our Calculation Policy and, for our younger pupils, the EYFS Development Matters, this ensures continuity, progression and high expectations for attainment in mathematics across the school.

Early Years Foundation Stage

Mathematics is one of the four specific areas of the Early Years Foundation Stage. The specific areas include essential skills and knowledge. They grow out of the prime areas and provide important contexts for learning.

Mathematics involves providing children with opportunities to develop and improve their skills in counting, understanding and using numbers, calculating simple addition and subtraction problems; and to describe shapes, space and measures. (EYFS DfE 2012)

This area of learning is divided into two aspects

1. Numbers
2. Shape, space and measure

Problem Solving Skills

Although problem solving is a feature of teaching and learning across all areas of learning, and is important within the Characteristics of Effective Learning, it is important that this aspect is not lost in mathematical development.

In mathematics young children should be:

- using their curiosity and questioning
- thinking logically
- making simple estimates and predictions
- solving simple problems/puzzles in a practical context
- sorting/matching objects, pictures or themselves, talking about decisions made
- talking about, recognising and recreating simple patterns
- interpreting information
- recording information in a variety of ways
- developing mathematical ideas and methods to solve practical problems

Opportunities

Early mathematics is an important part of the Early Year's Foundation Stage. It is down to practitioners to fully embrace this area of the EYFS and promote mathematics throughout the learning environment.

Principles of nurturing mastery in mathematics in the Early Years

The **characteristics of effective learning** are essential to learning and development within mathematics.

- Quality play is essential within a mastery approach in early years
- Differentiation is achieved by emphasising deep knowledge and through individual support and intervention.
- Communication (verbal and nonverbal) is modelled and encouraged in a variety of ways including the careful and precise use of mathematical vocabulary.
- Reasoning mathematically is modelled, planned for and assessed within the child's holistic mathematical development.
- Mathematical thinking is highly valued with an emphasis placed upon the child's own thought processes within differing learning activities.
- Concrete, practical experiences underpin mathematical learning.

- Engagement with a range of resources and representations support children to think flexibly and to see multiple ways to approach and solve problems.
- We aim to achieve mastery in Early Years through quality time, repetition and extended periods on an aspect of mathematics to enable deeper and more connected thinking (both provided by the practitioners and self-selected by the children).
- Children are provided with carefully chosen examples and problems that help them to see connections and relationships.
- Children are encouraged to approach mathematical challenges with positivity and confidence.

Recommended approach for developing progression in the conceptual and procedural aspects of calculation across Key Stages 1 and 2.

The document covers:

- Mastery at Moorside Primary School
- Fluency, reasoning and problem solving
- Securing Greater depth

Children should work towards being able to use, by the end of Key Stage 2:

- A range of strategies for mental calculations *appropriate to the numbers involved*.
- One formal written method (for each number operation) for calculations that cannot be done mentally.

Mastery

At Moorside Primary School, mastery means delivering the content of the National Curriculum to all pupils with appropriate differentiation. It means ensuring all pupils are secure in maths skills and have the opportunity to apply these in different contexts.

Developing short term into long term memory

At Moorside Primary School, teachers will ensure maths skills are embedded in at least four different ways. This will ensure pupils are secure with their understanding in Maths.

Fluency

The National Curriculum refers to all pupils becoming '**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.'

Put <, > or = in each circle to make the statements correct.

$$\begin{array}{ccc}
 28 & \bigcirc & 30 \\
 90 & \bigcirc & 70 + 28 \\
 30 + 23 & \bigcirc & 40 + 13 \\
 20 + 14 & \bigcirc & 24
 \end{array}$$

True or false –

$$34 + 17 = 42$$

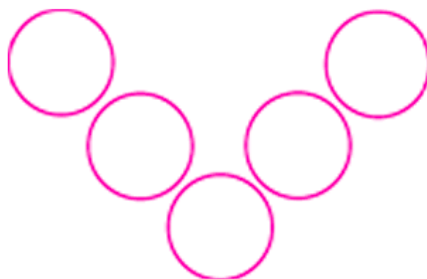
Reasoning

The National Curriculum aims to ensure that all pupils '**reason mathematically**' by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.'

For pupils to be able to reason mathematically, they need to:

- Draw on their understanding of number value and calculations in which they are fluent
- Encounter a new challenge
- Be able to use logical thinking
- Have exposure to a range of starting points
- Use different strategies to solve a problem
- Select a problem-solving skill
- Evaluate a solution in appropriate context
- Understand there can be more than one solution.

Place each of the numbers 1 to 5 in the V shape below so that the two arms of the V have the same total.



How many different possibilities are there?
What do you notice about all the solutions you find?

Problem Solving

The National Curriculum aims to ensure that all pupils 'can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.'

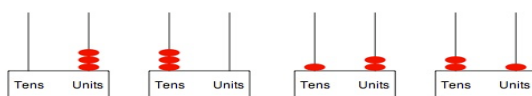
In order to solve a problem, pupils need to be able to draw on one or more problem-solving skills.

To do this pupils need to be able to:

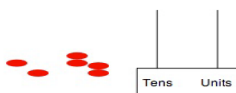
- Work systematically
- Carry out trial and improvement strategies
- Logical reasoning
- Identify patterns
- Visualise

It is important that teaching staff are aware that word problems are not the only way of addressing problem solving skills. Some word problems are still fluency but in a word context.

If you put three beads onto a tens/units abacus you could make the numbers 3, 30, 12 or 21.



Explore the numbers you can make using six beads.



Teachers need to model both problem solving and reasoning skills in order for pupils to be able to adopt these skills. All pupils regardless of their mathematical ability will have access and exposure to fluency, reasoning and problem solving.

Problem solving may need to be differentiated in order for skills to be taught and applied. This can be done in a variety of ways including:

- 1) Teach the problem-solving skill using knowledge children have. For example if the pupils are secure in their 2 times tables, teacher to teach/un pick how to solve a problem based on the 2 times table. Pupils are then able to think about their problem solving skills logically as the mathematical skills are already embedded.
- 2) Year group expectations - Through clear modelling and scaffolding, pupils will be taught to apply their skills to a problem using a variety of strategies appropriate to their year group. This can be differentiated by support and equipment to aid learning.

Greater Depth

Within assessment, pupils will achieve greater depth if they can apply fluency, reasoning and problem-solving skills in a range of contexts. The challenge alongside greater depth will allow pupils to think about their answers in a logical way and explain their thought processes verbally. This will enable pupils to understand that there is more than one answer, enabling progression to be made.

For calculations and teaching methods, please refer to the Calculation policy.

Date to be implemented	May 2019
Date to be reviewed	January 2020