



# The Pier Head Preparatory Montessori School

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## Mathematics Policy

### **The Importance of Mathematics**

Mathematics is a creative and highly inter-connected discipline that has been developed over centuries, providing the solution to some of history's most intriguing problems. It is essential to everyday life, critical to science, technology and engineering, and necessary in most forms of employment. A high-quality mathematics education, therefore, provides a foundation for understanding the world, the ability to reason mathematically and a sense of enjoyment and curiosity about the subject.

Mathematics is a proficiency which involves confidence and competence with numbers and measures. It requires an understanding of the number system, a repertoire of computational skills and an ability to solve number problems in a variety of ways in which information is gathered by counting and measuring and is presented in graphs, diagrams, charts and tables.

Mathematics gives children a way of coming to terms with their environment. Practical tasks and real-life problems can be approached from a mathematical point of view. Mathematics provides children with imaginative areas of exploration and study and gives them the materials upon which to exercise their mathematical skills. These skills are a necessary tool of everyday life. Mathematics should help children to develop an appreciation of, and enjoyment in, the subject itself; as well as a realisation of its role in other curriculum areas.

### **Purpose:**

The purpose of this policy is to describe our practice in Mathematics and the principles upon which this is based.

## Aim(s):

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.

The National Curriculum for mathematics aims 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 have conceptual understanding and are able to recall and apply their knowledge rapidly and accurately to problems
- can 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 routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

## Children deserve

- To be set appropriate learning challenges
- To be taught well and be given the opportunity to learn in ways that maximise the chances of success.
- To have adults working with them to tackle the specific barriers to progress they face.

## Outcomes

In Mathematics education at TPHP Primary School we aim to sustain and develop in all children:

- confidence, understanding and enjoyment in mathematics;
- awareness of relationship and pattern, and how these can bring about a clearer understanding of a situation;
- an appreciation of mathematics as a means of communication through which they can analyse information and ideas;
- the ability to work systematically where the task requires a careful accurate approach, as well as the ability to show imagination, initiative and flexibility when appropriate;

- independence of thought and action as well as the ability to co-operate within a group;
- problem solving skills and strategies;
- the ability to use mathematics effectively as a tool in a wide variety of situations;
- sensible use of factual recall, mental and written methods, calculators, micro-technology and other mathematical aids.

## **School Curriculum - Programme of Study**

### **Foundation Stage**

The programme of study for the Foundation stage is set out in the EYFS Framework 2021. 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 shape, spaces and measures.

### **Key Stage 1 and 2**

The Programmes of study for mathematics are set out year by year for Key Stages 1 and 2 in the new National Curriculum. The programmes of study are organised in a distinct sequence and structured into separate domains. Pupils should make connections across mathematical ideas to develop fluency, mathematical reasoning and competence in solving increasingly sophisticated problems. By the end of each key stage, pupils are expected to know, apply and understand the matters, skills and processes specified in the relevant programme of study.

### **Key Stage 1**

The principal focus of mathematics teaching in Key Stage 1 is to ensure that pupils develop confidence and mental fluency with whole numbers, counting and place value. This should involve working with numerals, words and the four operations, including with practical resources (e.g., concrete objects and measuring tools).

At this stage, pupils should develop their ability to recognise, describe, draw, compare and sort different shapes and use the related vocabulary. Teaching should also involve using a range of measures to describe and compare different quantities such as length, mass, capacity/volume, time and money.

By the end of Year 2, pupils should know the number bonds to 20 and be precise in using and understanding place value. An emphasis on practice at this early stage will aid fluency.

Pupils should read and spell mathematical vocabulary, at a level consistent with their increasing word reading and spelling knowledge at Key Stage 1.

## **Lower Key Stage 2**

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.

Pupils should read and spell mathematical vocabulary correctly and confidently, using their growing word reading knowledge and their knowledge of spelling.

## **Upper Key Stage 2**

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

## **Cross curricular**

Throughout the whole curriculum, opportunities to extend and promote Mathematics should be sought. Within every Science topic, children will also develop their mathematical skills. This will help children appreciate how to *Work Scientifically* but also practise discrete mathematical skills. Nevertheless, the prime focus should be on ensuring *mathematical progress* delivered discretely or otherwise.

## **Teaching and Learning**

The approach to the teaching of mathematics within the school is based on: -

- **A mathematics lesson every day**
- **A clear focus on direct, instructional teaching and interactive oral work with both the whole class and smaller ability groups.**

The curriculum is delivered by class teachers. All work is differentiated in order to give appropriate levels of work and children are taught in ability groups from the end of Year 2. There is one form entry with each class teacher taking responsibility for their year. Planning is based upon the National Curriculum (). Programmes of Study should inform medium term plans and subsequently weekly planning. Class teachers are responsible for the relevant provision of their own classes and individually develop weekly plans which give details of learning objectives and appropriate differentiated activities. Although planned in advance, they are adjusted on a daily basis to better suit the arising needs of a class and individual pupils.

## **Calculation Policy**

The calculation policy (see calculations/progression policy) has been updated in light of the new national curriculum programmes of study and discussion with class teachers.

## **Inclusion and equal opportunities**

All children are provided with equal access to the mathematics curriculum. We aim to provide suitable learning opportunities regardless of gender, ethnicity or home background.

## **Entitlement**

At TPHP Primary School, we teach mathematics to all children, whatever their ability or individual need. Through our mathematics teaching, we provide learning opportunities that enable all pupils to make good progress. Every child has an equal right to receive the maths curriculum in daily maths lessons of approximately one hour. There may be times when it is more appropriate for Foundation Stage or Key Stage 1 sessions to be approximately 45 minutes in length and for Key Stage 2 sessions to be over an hour.

## **Special Educational Needs**

All children will have their specific needs met through differentiated work in conjunction with targets. TA support time is planned for and provided in relation to identified needs for individuals and groups.

## **Implementation**

We carry out curriculum planning in mathematics in three phases (long-term, medium-term and short-term). Our mathematics curriculum is delivered using the Early Years Learning goals and the Mathematics Programmes of Study as a tool to ensure appropriate pace, progression and coverage of the subject. This coverage is reviewed continually by class teachers and planning is adjusted accordingly to ensure appropriate coverage of all mathematical strands. Once they understand a mathematical concept

required to solve problems and carry out investigations to deepen their conceptual understanding while also becoming more sophisticated in their Mathematical approach.

## **Resources**

All classrooms have a number of mathematical, age-appropriate resources. Resources which are not used or required regularly are stored centrally and accessed by teachers at the beginning of a topic.

## **Displays**

Each classroom / resource area should have a maths display relating to current work. The maths display should be presented to the pupils as a 'maths working wall' in classrooms from Reception to Year 6 and as a 'maths area' for children in Nursery, accessing our larger Early Years space. Displays should be accessible to both teaching staff and the pupils and should be updated regularly to reflect pace of learning. All teaching staff follow a list of 'non-negotiables' to inform them of what should be included on their 'working walls' to ensure that they are useful, purposeful and effective in promoting children's independence and progress in the subject. This list includes key vocabulary, resources and the four operations, (after they are known to the children), current learning objectives, (that should be updated at least weekly), examples of methods and calculations, higher order questions, challenges, examples of the children's work and interactive opportunities.

## **Assessment**

1. Tapestry is used in all year groups from the Early Years up to Year 3 Data is collected every half-term. Early Years Outcomes and learning objectives from the National Curriculum are highlighted based on a child: 'Working Towards', 'Mostly Achieved', 'Achieved' and 'Working at Greater Depth'.
2. Using Tapestry children who are significantly behind in terms of attainment and/or progress will be highlighted for staff to diminish the difference.
3. Marking – See section below
4. SAT's – These take place in Years 2 and 6 and should be analysed to inform planning.

Summative assessment – at the end of every term, children will undertake SAT-style tests from Test base. Data will help to inform planning and be compared to Target Tracker data.

### **Marking and presentation**

Teachers are expected to adhere to the school's marking policy when marking books and presentation policy when guiding children as to how to present their work. Highlighters are used to mark the objective (green and pink).

### **Monitoring and Evaluation**

The Curriculum leaders, alongside SLT, are responsible for monitoring and evaluating curriculum progress. This is done through book scrutiny, planning scrutiny, lesson observations, pupil interviews, staff discussions and audit of resources.

### **Developments in September 2020**

Due to the Coronavirus, (COVID 19) pandemic and the impact this has had on children's progress and learning during 'lockdown' and partial school closure, there have been changes made to address the need for a 'recovery curriculum' of which mathematics has been identified as a crucial subject for consideration.

Staff will undertake further training in the first few weeks of the autumn term to assist them with their ongoing planning of a 'recovery curriculum' for mathematics, led by a member of the SLT and leader of Mathematics. The training will focus upon the non-statutory guidance for Key Stages 1 and 2 published by the DFE in June 2020 as well as other recommendations set out by the Local Education Authority.

This will be explained within the corresponding year-group meetings chapter so teachers will have a good understanding of the 'starting points' for their children. In most cases it is anticipated that children will need to revisit mathematics objectives from their previous year group to ensure that they have achieved mastery of these key areas before moving forward successfully onto the next stage of their learning in the subject. These objectives will be identified within their weekly planning.

The six areas of priority include:

### **Number and Place Value**

### **Number Facts**

### **Addition and Subtraction**

### **Multiplication and Division**

### **Fractions**

### **Geometry**

Whilst we will be prioritising these areas and spending the necessary time required to secure children's learning and mastery of these 'ready to progress' criteria, **we will continue to follow the whole curriculum for Mathematics, which remains a statutory requirement.** However, by meeting the ready-to-progress criteria, pupils will be able to more easily access many of the elements of the curriculum not included in the DFE guidance.

Teachers and practitioners in the Early Years will continue to follow The Early Years Foundation Stage curriculum while adopting the same philosophy and approach in their assessments and teaching during this 'different year.' Children will be taught to meet their needs and varying stages of development which will be 'driven by' ongoing assessment in a range of contexts.

### **Review**

The mathematics policy will be reflected in our practise. The policy will be reviewed September 2022