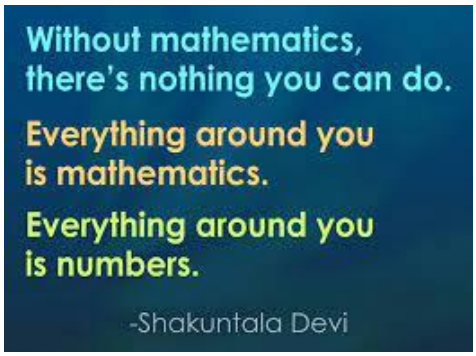
Windmill Hill Primary School

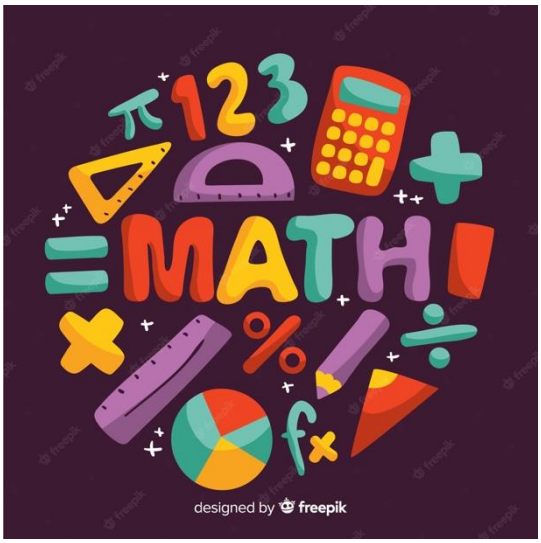
Windmill Hill is committed to lifelong learning within a caring environment. Together we make a difference."

Subject Information
Maths



Skills of a great mathematics student:

- Curiosity to make mathematical statements and investigate them.
- The ability to reason about mathematics.
- Have a good understanding of all the different concrete materials and 'choose to use' them to help with independent work.
- A good understanding of the correct mathematical vocabulary and the ability to use it effectively to explain ideas, thinking and solutions.
- Resilience to be able to see the challenge of overcoming mistakes as important and exciting steps to learning and discovery.
- Perseverance in finding an answer by trying different strategies until the correct answer is found.
- Fluency in number bonds and times tables.
- The ability to make links and apply basic maths skills to all areas of the curriculum and beyond.



About maths at Windmill Hill

We believe that a high quality mathematics education is essential. Our maths curriculum aims to develop children's ability to calculate, reason, problem solve and have a good understanding of the basic fundamentals in every year group.

Intent
At Windmill Hill Primary School, we recognise that Mathematics is essential to everyday life.

We aim to provide a high-quality Mathematics education with a mastery approach so that all children develop:

- A positive attitude towards mathematics and an awareness of the fascination of mathematics.
- Competence and confidence in mathematical knowledge, concepts and skills, an ability to solve problems, to reason, to think logically and to work systematically and accurately.
- Initiative and an ability to work both independently and in cooperation with others.
- The ability to communicate mathematics.
- An understanding of mathematics through a process of enquiry and experiment.

Mathematics at Windmill Hill Primary can be taught cross-curricular (where possible) but mostly taught discreetly. Mathematics is taught daily in each class.

Implementation

EYFS
Early Years Outcomes

Number - Early Learning Goal
Children at the expected level of development will:

- Have a deep understanding of number to 10, including the composition of each number.
- Subsidise (recognise quantities without counting) up to 5.
- Automatically recall number bonds up to 5, including subtraction facts and some number bonds to 10, including double facts.

Numerical Patterns – Early Learning Goal
Children at the expected level of development will:

- Verbally count beyond 20, recognising the pattern of the counting system.
- Compare quantities up to 10 in different contexts, recognising when one quantity is greater than, less than or the same as the other quantity.
- Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.

At our school, pupils spend time exploring individual numbers and their various concrete and pictorial representations. Once knowledge of numbers 1-10 is secure, learning is focused around the links between these numbers (e.g. finding one more or one less or addition/subtraction facts) and beginning to build the children's problem-solving skills through concrete experiences.

Spatial awareness and vocabulary are developed through daily opportunities for exploration and play. Children compare sizes, lengths, weights and capacities etc. verbally, with appropriate mathematical language modelled by adults in a range of different contexts. Children explore shape through opportunities to construct and create and are encouraged to think about the appropriateness of and the reasoning behind the shapes they choose. They begin to model their ideas (in written form) and talk about them.

Key Stage One

National Curriculum Programme of Study
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 (for example, 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.

At our school, pupils work with practical resources such as concrete objects and measuring tools in most lessons. The use of which, in conjunction with lessons from the 'Maths No Problem' scheme, supports the children in developing their mental fluency with whole numbers, counting and place value. Throughout Key Stage 1, this is supported by regular practice of counting, number bonds and place value through 'fluency' sessions and our 'Mastering Number' programme, which we deliver each week. The children work with peers each day to explore mathematical concepts collaboratively and complete journal entries to communicate their learning through representations including drawings, numerals and words.

Starting each academic year with a significant focus on each of the four operations, the scheme guides learning step by step through curriculum areas including length, mass, capacity/volume, time and money. Each of these provides the opportunity for further practice, development and consolidation of the four operation, applied in different contexts.

Lower Key Stage 2

National Curriculum Programme of Study
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.

At our school, pupils continue to work with practical resources in every lesson. Both Year 3 and Year 4 pupils revisit and further develop their understanding of place value, before applying this to problems covering each of the four operations.

Daily lessons incorporate a collaborative exploration as well as time for reflection and communication of ideas and understanding through journaling and independent practice time.

Pupils are encouraged to solve problems using a range of methods, allowing them to develop efficient written and mental methods. Children then begin to consider their own understanding of the available methods, consider their efficiency and select a preferred method to perform calculations accurately.

All lessons focus on the development of problem- solving skills with an initial problem posed at the start and subsequent opportunities to solve a range of problems. A focus on the 'now' and 'why' of solving problems (rather than the answer/solution) provides a daily opportunity for all children to develop mathematical reasoning. They also complete a daily fluency task, where five questions are set. These questions are a mixture of the four operations and/or a time to address any misconceptions or gaps in learning identified through our assessments.

Upper Key Stage 2

National Curriculum Programme of Study

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.

Pupils should read, spell and pronounce mathematical vocabulary correctly.

At our school, daily lessons continue to incorporate collaborative exploration as well as time for reflection and communication of ideas and understanding through journaling and independent practice.

Children's place value knowledge is refreshed and extended to include larger integers in preparation for developing a deeper understanding of fractions, decimals and percentages and the connections between these areas later in the academic year.

Dedicated time focused on the four operations provides practice and opportunity for children to explore, practice and refine calculation method and therefore become increasingly fluent in written methods of all four operations.

All maths lessons begin with collaborative exploration of a problem and end with independent practice of similar content, thus providing a daily opportunity to children to develop their ability to solve a wide range of problems.

They also complete a daily fluency task, where five questions are set. These questions are a mixture of the four operations and/or a time to address any misconceptions or gaps in learning identified through our assessments.

Impact

We measure the impact of our curriculum through the following methods:

- A reflection on standards achieved against the planned outcomes of each lesson.
- Termly assessment alongside formative teacher assessment.
- Pupil discussions and self-assessment of their learning.
- National tests for children in Year 2 and Year 6.

Fluency, Reasoning and Problem Solving:
Reasoning and sense making are the foundation of mathematical competence and proficiency, and their absence leads to failure and disengagement in mathematics instruction

At Windmill Hill Primary School, we ensure that the three main aims of the National Curriculum - fluency, reasoning and problem solving - are included and intertwined in every maths lesson. This will allow our learners to think mathematically, work independently and explain mathematical processes in depth, therefore providing deep and purposeful mathematical learning.

Concrete Resources:
Manipulatives are a key component in the teacher's toolkit, allowing the structure of the mathematics to be uncovered and hence understood more deeply by the children.

To support our children's learning, we introduce concepts by giving pupils the opportunity to build on their abilities by following the concrete, pictorial, abstract approach. We aim to produce learners who are confident in using a range of concrete resources that are provided by examples given to them by their teachers but also independent learners who are able to select their own choice of equipment to support their learning. Each classroom access to a range of concrete resources.

Vocabulary:
Vocabulary can especially support lower attainers, enabling them to build confidence, communicate and problem solve. It is an integral part of every mathematics lesson.

At Windmill Hill Primary School, vocabulary is an integral part of all our maths lessons. We introduce, explicitly teach and revisit key mathematical vocabulary in every lesson. Key vocabulary is also displayed on our maths working walls. By ensuring children deeply understand the key vocabulary, this allows our learners to be confident in using it correctly to explain their mathematical reasoning.

Intervention:
Outside of our Maths sessions, we utilise Teaching Assistants to provide high quality intervention to address targets based on gaps in learning. The targets are developed by class teachers and are regularly reviewed and adapted based on pupil's individual needs. This ensures no child is ever left behind and any gaps in learning are quickly addressed and support is put in place to help every child succeed and progress in mathematics.

Basic skills:
We are committed to ensuring that children leave each year group being able to confidently complete basic mathematical skills. It is essential that children are able to complete and recall basic skills in order to be able to achieve higher level of mathematics. We have developed a basic skills policy that lists the skills pupils need to master at the end of each year group. Teachers use 'Rapid Recall' sessions at the start of each maths lesson and daily questions to practise and recall these skills.

- National Curriculum Programme of Study.pdf

Parental support:
Completing simple Maths at home can really help children to flourish and make progress in school. Activities such as baking and cooking are great for incorporating maths skills and teaching children real life skills. Click the document below to look at the main objectives you can support with at home for each year group. In Key Stage 1 the most important things to focus on are knowing number bonds to 10 and 20 off by heart and telling the time to o'clock and half past. In Key Stage 2 the most important things to focus on are knowing multiplication and division facts up to 12 x 12 off by heart and telling the time to the nearest minute.