

## Maths at Foxmoor Primary School

At Foxmoor Primary School we follow the national curriculum, which partitions mathematics into ten distinct domains, between which pupils are supported to make connections: number and place value; addition and subtraction; multiplication and division; fractions; ratio; algebra; measurement; properties of shapes; position and direction; and statistics. We aim to adhere to the purpose of study established in the national curriculum, which states:

'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 for financial literacy and most forms of employment. A high-quality mathematics education therefore 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.'

Through a variety of experiences pupils have the opportunity to develop the three aims of the national curriculum: to become **fluent** in the fundamentals of mathematics; to be able to **reason mathematically** by following a line of enquiry, developing an argument, justification or proof; and to be able to **solve problems** by applying mathematics to a variety of problems.

This has led to some core principals in how we structure the teaching and learning of mathematics at Foxmoor:

- We teach mathematics through both discrete lessons and exploring links within other curriculum areas.
- We promote a 'growth mindset' by asserting **all** people are able to achieve in mathematics and become mathematicians. We encourage children to recognise that mistakes are an essential part of learning and it is important to stretch your thinking through a variety of rich and challenging problems.
- We expect children to be able to work collaboratively with a mixture of different partners, which provides opportunities for focused mathematical discussion where they are encouraged to justify and challenge their own thinking and that of others.
- The children will have the opportunity to model new ideas with physical materials (items known as 'manipulatives' such as *Cuisenaire* or *Numicon*), pictorial representations (such as *bar modelling*) and abstract representation (using symbols such as digits or algebraic representation).
- It is important to challenge the children with examples of 'what it is' and 'what it is not' to ensure that they have a complete understanding of all aspects of a mathematical concept.

- We provide regular opportunities to develop fluency in core number skills, such as mental addition and subtraction, or rehearsing times tables facts, for example.
- We also plan opportunities for 'intelligent practice', which extends pupils' thinking through careful variation between questions. Learning activities enable pupils to first secure their understanding of new concepts and then take their thinking progressively deeper until they have fully mastered a concept.
- We encourage a positive home-school link to support with wider opportunities in all of the above. A core aspect of this is supporting your child to secure core facts and skills such as times tables recall, for example, but also by helping them recognise the many varied places that mathematics is used in everyday life.

Below are a selection of useful links to websites. Some you can use with your children to help them practice core maths skills. Others provide further information about the key principals explained above to help you find out more about our approach to the teaching and learning of mathematics at Foxmoor.

#### **Fluency practice:**

[Hit the Button](#) is an interactive maths game with quick fire questions on number bonds, times tables, doubling and halving, multiples, division facts and square numbers.

[Maths Chase](#) helps children gain confidence in a range of core number skills.

Upper school pupils all have personal login details for [Times Tables Rock Stars](#).

The [CGP Times Tables Tester](#) provides an alternative platform to practise times table recall against the clock.

#### **Problem solving and reasoning:**

The [NRICH website](#) provides high quality examples of the types of problems used in school to help develop your child's mathematical reasoning and problem solving skills.

NRICH explains the importance of four [mathematical habits of mind](#): being curious; being resourceful; being collaborative; and being resilient.

[NRICH: Be a Mathematician!](#) explains the different skills a successful mathematician is able to employ:

- [Working Systematically](#)

Mathematicians try to work systematically so they can see how they worked something out, and see patterns which messy work might not reveal.

- **Saying What You See**  
Imagining things and seeing things in lots of different ways. Talk about what you notice or imagine what might happen.
- **What If . . . ?**  
What happens if you change something? What if you change one of the questions? You may be able to change it more than just once!
- **Convince Me!**  
Can you convince someone that your solutions are right! Have a go!
- **What's Your Plan?**  
Sometimes it's not easy to know how to start a problem. Try talking to a friend about how to start, and what sort of plan you'll have to carry on.
- **Practice Makes Perfect**  
Make use of things you probably already know, and through practice understand them even better for solving problems!

#### **The national curriculum:**

The [national curriculum for mathematics](#) outlines the key principals and programme of study we follow.

#### **The mastery approach:**

The [NCETM provides guidance on what mastery is](#) and how to develop the approach successfully.

This [Cuisenaire rods](#) video provides an example of the power of being able to use the same physical apparatus flexibly to model ideas in mathematics and therefore take thinking deeper. (You may notice a mistake at 3:20 when the person removes one of the orange rods leaving 9 instead of 10!)

The [Thinking Blocks](#) website is one example of how the bar model approach can help children identify the mathematical relationships within problems.

We work closely with the [GLOW Maths Hub](#) which provides the opportunity for collaboration between local schools and access to the latest academic research into the teaching and learning of mathematics. The [Maths Hubs](#) are sponsored directly by the Department for Education (DfE) to help schools and colleges lead improvement in mathematics education in England. They seek to harness all the maths leadership and expertise within an area, to develop and spread excellent practice, for the benefit of all pupils and students.

Amongst a large range of varied resources, Foxmoor uses resources from [CanDoMaths](#), which further explains the principals behind developing mastery in mathematics.

### **Growth Mindset:**

Jo Boaler is a British author and academic who is Professor of Mathematics Education at Stanford University, in the USA. She is the director of [youcubed](#), which further explains the principals behind developing a healthy attitude towards mathematics learning. [This document](#) provides an overview of her seven core messages, whilst [this page](#) outlines the importance of parental attitude towards mathematics and how it can impact on classroom success.