

## Maths at Newbold School

Newbold School challenges children to develop a sense of curiosity and appreciation of the beauty and power of mathematics. Through the positive 'I can' and 'I can't YET' statements, learners are taught to embrace concepts and problem solving with a growth mindset. Children are taught to engage in challenges with motivation, resilience and a critical, creative and enquiring mind. Through a rich and broad curriculum, learners are taught to reflect on the knowledge and experience they have gained, to master key concepts, build links and make rich connections across mathematical ideas. Our successful learners use their mathematical confidence to develop their fluency, mathematical reasoning and competence in solving increasingly sophisticated problems.

Newbold School's mathematics teaching provides a foundation for understanding the world and the ability to reason mathematically. Mathematics is taught as being integral to everyday life and is therefore taught with cross curricular links especially with science and technology. Meaningful and purposeful lessons are taught to engage and inspire the children to see maths in action.

In response to the 2014 changes to the curriculum we have worked closely and trained with Herts for Learning to embrace 'essential mathematics' throughout the school. Essentials Maths is a progressive framework which is built on a concrete - pictorial - abstract approach, ensuring secure foundations and deep understanding of mathematical concepts. Concepts are introduced in a highly scaffolded way, enabling all children to develop critical thinking skills, make mathematical connections and become confident mathematicians. Activities then incorporate 'rich' tasks rather than worksheets and textbooks. They are often differentiated by outcome and therefore give children the opportunity to develop skills to a greater depth.

Since numbers are abstract ideas - all we can do is show representations of them.

- Concrete - Children are taught to see 'pictures of numbers'. Patterns of objects, Dienes, Cuisenaire rods, arrow cards and other manipulative equipment is used to give children a confident sense of 'number'. The experience and understanding of 'pattern' is essential for successful mental and written arithmetic, and for understanding algebra.
- Pictorial - Using patterns and equipment to represent each numeral can then develop into using imagery; representing the equipment through drawings and symbols. The patterns are structured so number relationships can be seen and experienced. This encourages an understanding of numbers and their relationships. Understanding numbers is reinforced through conversation and

use in real-life contexts. This generalises learning and the meaning of mathematical concepts.

- Abstract – Children progress to develop fluency between representations of mathematical ideas, reasoning, problem solving and conceptual understanding for mastery. They are encouraged to develop enquiring minds and become more independent through being reflective. The word 'yet' is used to encourage resilience.

Newbold learners are able to develop their understanding and practice skills at a pace suited to their learning. They generally work through programmes of study at the same pace; however, those who grasp concepts rapidly are challenged through being offered rich and sophisticated problems and those who are not sufficiently fluent with earlier material are supported in consolidating their understanding through additional practice, before moving on. Planning is customised to the children in the class.

### **Assessment**

We regularly have checkpoints for children to be informally assessed to ensure they are ready to explore new concepts and develop skills further. These checkpoints, as well as teachers' marking of pupils' work, allow pupils' strengths and weaknesses to be quickly identified and decisions to be made about planning future mathematics teaching (Formative assessment).

Termly PUMA assessments (Progress in Understanding Mathematics Assessment) support us in assessing and tracking progress and learning under the new national curriculum. These inform teaching and flag areas where children need further support. They ensure that pupils are on track to meet the new end-of-year and end-of Key-Stage expectations. (Summative assessment).

All year groups use both termly and topic-focused assessment in order to monitor the progress of each child.

### **Spoken language**

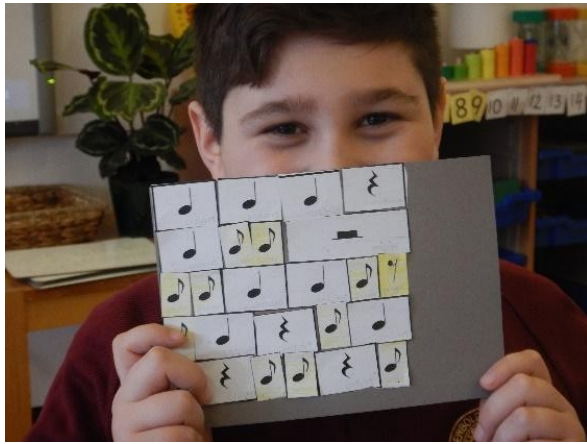
At Newbold we actively encourage and demonstrate 'Maths talk'. The quality and variety of language that pupils hear and speak are key factors in developing their mathematical vocabulary and presenting a mathematical justification, argument or proof. Talking assists in making their thinking clear to themselves as well as to others. Teachers ensure that pupils build secure foundations by using discussion to probe and remedy their misconceptions. Each year group reinforces the need for 'maths talk.'

Mrs Chilvers maths challenge of the week encourages children to choose how to challenge themselves and develop personally, based on a starter question. Efforts and enthusiasm are rewarded and shared to help promote the 'I can' attitude towards maths throughout the school.

Our problem-solving day was an exciting time with children working collaboratively and independently to push themselves to solve engaging puzzles and problems. A 'Maths talk' environment was created and has since been developed in each class.



Cross Curricular fractions in music, measuring in cooking



Number representation

