



Maths at Newbold School

Newbold School wants children to develop confidence and fluency in mathematics throughout their time with us. From the Early Years phases, where children are just beginning to understand numbers as a concept, right through to year 6, when children begin to embark on algebra and undertake multi-step written calculations, children are supported to develop and grow in their mathematical understanding. At Newbold School we follow the latest '2014 National Curriculum' for mathematics and the subsequent Mathematics Guidance, June 2020, which describes what must be taught in each key stage and how to ensure children are ready to progress. This allows continuity and progression in the teaching of mathematics for children within our school; for those who join us part way through their education; and ensuring our pupils have successful transitions to secondary education. The foundation stage curriculum is guided by the Early Learning Goals and 'Development Matters', July 2021, guidance.

Pupils are provided with a variety of opportunities to develop and extend their mathematical skills across each phase. The expectation is that pupils move through the programme of study at an individual pace with teachers using the ready to progress documents to help guide children in their maths journey. Able children deepen their knowledge by applying it to a range of contexts and solving problems using their skills rather than racing through learning at a superficial level. Those struggling are given opportunities to work with scaffolds, including concrete resources, speaking frames and additional reinforcement work to aid understanding.

The New Curriculum forms the basis of what is taught in each key stage, and Herts for Learning mixed age essentials programme outlines the recommended sequence in which these objectives are covered at Newbold to best meet the needs of our mixed age classes. Teachers may make changes and adjustments to this sequence where necessary, with guidance from the mathematics lead, and this is reviewed yearly. Teachers model new procedures before children 'have a go' themselves; maths learning walls are used to display common procedures the children need to refer back to. Prior learning is recapped regularly through targeted starter activities or through Purple Feedback comments. In addition, this learning sequence is supplemented to meet the needs of our children through a range of resources, for example electronic devices and digital platforms, such as TimeTablesRockStars, kinaesthetic activities, including singing and dancing to aid fundamental fact recall, and paper based activities to practise and explore learning.

Children should:

- Understand the importance of mathematics in everyday life.
- Represent calculations and numbers using concrete, pictorial and abstract systems.
- Have a sense of the size of a number and where it fits into the number system, within their age and/or ability-related range.
- Reason mathematically by following an enquiry, making generalisations and proving and justifying findings.
- Make connections in their learning to develop ability to problem solve, applying known mathematics with perseverance.
- Calculate fluently, accurately and efficiently using a range of calculation strategies, including mental strategies.
- Use appropriate language structures to explain their methods and reasoning using correct mathematical terms.
- Know by heart (through practice at school and home) number facts such as number bonds, multiplication tables, doubles and halves and be able to use these facts to solve problems.
- Use a calculator effectively and know when it is appropriate to do so.
- Suggest suitable units for measuring and make sensible estimates of measurements.
- Explain and make predictions from the numbers in graphs, diagrams, charts and tables.
- Develop spatial awareness and an understanding of the properties of 2d and 3d shapes.

Since numbers are abstract ideas - children are taught through representations of them. These are called concrete, pictorial and abstract representations.

- 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.

Assessment

We regularly assess children informally, through their class work and carefully selected tasks, 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 (i.e. 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 assessments 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 (i.e. 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 the correct use of mathematical vocabulary. 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.'

Maths across the curriculum and at home

Newbold school wants children to see and appreciate maths in their everyday lives. For example, links to cooking projects where children may weigh or calculate ingredients; measuring in design activities; rhythms in music. These types of activities help children to see the maths in the world around them.

We know how important it is for children to have this same exposure at home too and we encourage our parents to support their children in this journey. Parent maths workshops are provided by the maths leader and these are tailored to a specific focus, such as written calculations, bar modelling, online activities for maths or using concrete resources at home.

Number Day

This is a fabulous, once a year activity, in which children undertake a range of mathematical activities as a school. In 2023 each class had a go at, "This is the answer, what is the question..." See some pictures below.

2 barks $\frac{1}{2} = 2$

The answer is 2!
What is the question?

How many eyes?
 2

2 cats 2

2 jumpz 2

2

$2+2$ $1+2+1$
 $4+1 \neq 2 = 4$ $2+1 \neq 1$
 $= 4$

The answer is 4!
What is the question?

$3+1=4$

$4+0=4$

$0+4=4$

$6-2=4$ $5-1=4$

The answer is 10!
What is the question?

$20-10=10$
 $10-10=10$
 $2-2 \times 10 = 10$
 $16-6=10$
 $11=10$
 $14-4=10$
 $20-10=10$
 $10+0=10$
 $5+5=10$
 $5 \times 2 = 10$
 $15-6=10$
 $11-2=10$
 $13-3=10$
 $2+8=10$

Number Day '23

What is C in Roman numerals?
 $200-100=100$

$50+50=100$

The answer is 100!
What is the question?

$100 \times 10 = 1000$

$1000-900=100$

$10-2 \times 20 = 10$

$50+50=100 \div 1 = 50+20=70+20=90+10=100$

$200-100=100$

Oak

$8 \times 8 = 64$
 $8^2 = 64$
 $60+4=64$
 $70-10+4=64$
 $30+30+4=64$
 $70-6=64$
 $70+20+34=64$

$52+12=64$
 $60+4=64$
 $68-4=64$
 $100-36=64$
 $40+20+4=64$
 $60+2+2=64$
 $50+10+2+2=64$
 $50+10+4=64$

$128 \div 2 = 64$
 $\frac{64}{2} = 32$
 $\frac{64}{4} = 16$
 $\frac{64}{8} = 8$

The answer is 64!
What is the question?

$640 \div 10 = 64$
 $6400 \div 100 = 64$
 $64000 \div 1000 = 64$
 $640000 \div 10000 = 64$
 $6400000 \div 100000 = 64$
 $64000000 \div 1000000 = 64$

$10-74=64$

$2 \times 4 \times 8$

$8 \times (16 \div 2) = 64$

$\frac{64}{2} = 32$
 $\frac{32}{2} = 16$
 $\frac{16}{2} = 8$