



Maths

Curriculum Expectations

Intent

We recognise the importance of a secure grounding in mathematics to ensure independence into adulthood. Due to the needs of our pupils we have chosen to use the CPA (concrete, pictorial, abstract) approach, facilitated through Numicon to ensure all of our pupils have a sound knowledge of number, measurement & geometry and statistics and probability. The curriculum content follows the National Curriculum.

Implementation

Maths will be taught through engaging, motivating and progressive units across the school. Maths lessons will:

- ❖ Be motivational and accessible to all pupils
- ❖ Focus on personal progress and development
- ❖ Be led by all adults in the class
- ❖ Use interactive resources to support the delivery
- ❖ Use concrete, pictorial and abstract representations
- ❖ Reflect on the progress and recognition of progress
- ❖ Reinforce and revisit learning to secure learning

Impact

To evidence that our pupils can do more and know more in Maths we will:

- ✓ Collate evidence to monitor progress
- ✓ Interview pupils
- ✓ Monitor teaching
- ✓ Review schemes of work
- ✓ Follow achievements through progression skills maps
- ✓ Accreditation pathways

Area	Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Engage Ladybirds	Same & different size	One to one correspondence weight	Number recognition shapes	Counting patterns	More or less height	Add & subtract Positional language
Engage/Activate Bees (Year1/2)	Engage curriculum/year 1/2 White Rose	Engage curriculum/year 1/2 White Rose	Engage curriculum/year 1/2 White Rose	Engage curriculum/year 1/2 White Rose	Engage curriculum/year 1/2 White Rose	Engage curriculum/year 1/2 White Rose
Activate Hedgehogs (Year 2/Y3)	Place Value	Addition/Subtraction	Multiplication/Division	Money Mass/Length/Perimeter	Multiplication/Division	Time/Shape
Activate Squirrels (Year 3/4)	Place Value	Addition/Subtraction	Multiplication/Division	Mass/Length/Capacity Decimals/Perimeter	Multiplication/Division Money/Time	Time/Shape
Activate Foxes (Year 4/Year 5)	Place Value	Addition/Subtraction	Multiplication/Division	Length/Perimeter/Decimals	Money/Time Position/Direction	Time/Shape
Activate Badgers (Year 5/Year 6)	Place Value	Addition/Subtraction	Multiplication/Division	Decimals%/Fractions/Perimeter	Position/Direction Area/Perimeter	Time
Consolidate Deer	NCFE Entry levels 1-3, Level 1-2, Asdan Lifeskills WTE 1-LV3					

Curriculum Design & Progress

CPA

The CPA method involves using actual objects for children to add, subtract, multiply or divide. They then progress to using pictorial representations of the object, and ultimately, abstract symbols.

Children often find maths difficult because it is abstract. The CPA approach helps children learn new ideas and build on their existing knowledge by introducing abstract concepts in a more familiar and tangible way.

Concrete is the 'doing' stage, using concrete objects to solve problems. It brings concepts to life by allowing children to handle physical objects themselves. Every new abstract concept is learned first with a 'concrete' or physical experience.

Pictorial is the 'seeing' stage, using representations of the objects involved in maths problems. This stage encourages children to make a mental connection between the physical object and abstract levels of understanding, by drawing or looking at pictures, circles, diagrams or models which represent the objects in the problem.

Abstract is the 'symbolic' stage, where children are able to use abstract symbols to model and solve maths problems. Children are introduced to the concept at a symbolic level, using only numbers, notation, and mathematical symbols, for example +, -, x, / to indicate addition, multiplication, or division.

Phase 3 Addition			
Objective / Strategy	Concrete	Pictorial	Abstract
<p>Column Addition—no regrouping (10x1x1) numbers</p> <p>Add two or three 2 or 3 digit numbers.</p>	<p>Tens Ones</p> <p>Base 10 blocks</p> <p>Add together the ones first, then the tens.</p>	<p>Children move to drawing the counters using a ten and one frame.</p> <p>tens ones</p>	$\begin{array}{r} 223 \\ + 114 \\ \hline 337 \end{array}$ <p>Add the ones first, then the tens, then the hundreds.</p>
<p>Column Addition with regrouping.</p>	<p>Base 10 blocks</p> <p>Exchange ten ones for a ten. Model using Numicon and place value counters.</p>	<p>3 4</p> <p>+ 1 7</p> <p>5 1</p> <p>Children can draw a representation of the grid to further support their understanding, carrying the ten underneath the one.</p>	$\begin{array}{r} 20 + 5 \\ 40 + 8 \\ 60 + 13 = 73 \end{array}$ <p>Start by partitioning the numbers before formal column to show the exchange.</p> $\begin{array}{r} 536 \\ + 85 \\ \hline 621 \\ 11 \end{array}$

Numicon

The aim of Numicon is to make numbers real for children through them being able to see and touch them.

Each Numicon shape gives children an image of what a number looks like. They begin to see the relationship between numbers, with each piece having one hole more than the previous one.

It appeals to their strong sense of pattern, and helps them understand how numbers fit together. It also has a multi-sensory approach that's known to help learning.

Children using Numicon typically progress through four stages:
Pattern: for example, finding shapes that match and stacking them on the peg board.

Ordering: putting the shapes into sequence from the smallest to largest number, and vice versa.

Counting: counting each hole one by one to find out what number the piece represents.

Early calculating: using the pieces to solve simple problems, for example working out that a three-piece and a four-piece are equal to a seven-piece.

By giving children something physical that they can get their hands on, not just paper and pen, they develop confidence and a greater understanding, which leads to higher achievement.



White Rose

Adopting a White Rose Maths approach to teaching means making sure all children have the same opportunities to learn and the support they need to fully grasp concepts. The philosophy behind White Rose Maths also focuses on making maths fun for children and helping them to find enjoyment in number problems. Our groups are split into ability groupings, not age. For example we may have an 8 year old following a Year 6 curriculum, or a 12 year old following a Year 3 curriculum. Our coverage focuses on preparing our young people for adulthood. We believe that it is important to have a secure understanding of number fluency with the ability to solve reasoning problems for later life. We will teach time, money, area/perimeter and shape.

We will introduce fractions, decimals and percentages, ratio and probability at the appropriate developmental stage dependent on individual understanding and readiness.

