



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 PE we will:

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

Coverage

The national curriculum for maths is extensive and for each of our pupils they will progress along this at the most appropriate pace to them. Our assessment system allows staff to baseline and develop their pathway in respect of what 'Step' they are working on. These steps mesh from Early Years through to post -14 and accreditation routes.

Engage

Activate

Consolidate

Counting
Comparison
Composition of Number
Shape & Space
Patterns & Mathematical relationships
Measures
 (delivered through focussed sessions & continuous provision)

Number

- Number & Place Value
- Addition, Subtraction, Multiplication & Division
- Fractions (inc. decimal & percentages)
- Ration, proportion & algebra

Measurement & Geometry

- Weight, length, capacity, temperature, time & money
- Properties of shape, position & direction

Probability & Statistics

- Statistics
- Probability

Working mathematically

- Fluency, reasoning & problem solving

Using numbers and the number system
Using common measures, shape & space
Handling information & data
Solving mathematical problems & decision making
 (Step 1-7, Entry 1-3, Level 1-2)

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.

Objective / Strategy	Concrete	Pictorial	Abstract
<p>Column Addition—no regrouping (friendly numbers)</p> <p>Add two or three 2 or 3digit numbers.</p>	<p>Tens Ones</p> <p>45 24</p> <p>20 10 5</p> <p>20 10 5</p> <p>40 10 5</p> <p>50</p>	<p>Children move to drawing the counters using a tens and one frame.</p> <p>tens ones</p> <p>●●●● ●●●●</p>	<p>2 2 3</p> <p>+ 1 1 4</p> <hr/> <p>3 3 7</p>
<p>Column Addition with regrouping.</p>	<p>Move to using place value counters.</p> <p>39 15</p> <p>30 10 5</p> <p>20 10 5</p> <p>40 10 5</p> <p>50</p>	<p>Children can draw a representation of the grid to further support their understanding, carrying the ten underneath the line</p> <p>3 4</p> <p>+ 1 7</p>	<p>20 + 5</p> <p>40 + 8</p> <p>60 + 13 = 73</p> <hr/> <p>536</p> <p>+ 85</p> <hr/> <p>621</p> <p>11</p>

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.



Bsqured

Our assessment platform Bsqured maps out the progression and allows staff to track the depth of learning across the core areas of maths.

Staff take the focus areas/maths statements and evidence these in the planned learning. The depth of learning is also clearly mapped which helps identify if pupil are working more at the concrete or abstract phases of learning.

Where possible the maths statements are written in pupil friendly ways.

	Number and Place Value		Fractions (and Decimals)	
Step 1	<p>I can distinguish between 'four' and 'ten', when shown an example of a single object and a group of objects (PK3S)</p> <p>I can assist with one-to-one matching activities, e.g. setting the table</p> <p>I can indicate one brick on request</p> <p>I can make a group of 'tens'</p> <p>I can pick up and put down single objects</p> <p>I can respond to 'Give me some of [named item]'</p> <p>I can join in actions in number rhymes</p> <p>I can play games which use one cup</p> <p>I can use counting in play situations</p>	<p>I can demonstrate an understanding of the concept of 1:1 correspondence, e.g. giving one cup to each guest (PK3S)</p> <p>I can communicate 'four' or 'All gone' appropriately</p> <p>I can join in number rhymes</p> <p>I can make a group of 'ten'</p> <p>I can respond to 'Find one the same'</p> <p>I can use term 'lots' appropriately</p> <p>I can join in 'broken number' rhymes</p> <p>I can select object from choice of three</p> <p>I can demonstrate an understanding of the concept of more, e.g. indicating that more cups are required so that everyone has a cup</p> <p>I can compare two sets of (up to 5) counters pointing to the group that contains less/more</p> <p>I can compare two sets of (up to 5) counters pointing to the group that contains smaller/larger</p> <p>I can demonstrate an understanding of the concept of numbers up to 5 by putting together the right number of objects when asked (PK3S)</p> <p>I can copy and continue simple patterns using real-life materials, e.g. apple, orange, apple, orange, etc. (PK3S)</p> <p>I can count up to five 1p coins correctly</p> <p>I can count up to five objects correctly</p> <p>I can compare two sets of (up to 5) counters pointing to the group that contains fewer/greater</p> <p>I can count up to five without objects</p> <p>I can insert numerals to five</p>	<p>I can ask for some more of something with words, signs, or symbols</p> <p>I can hold up a single finger on request</p> <p>I can join in repetitive verse (jointed pattern)</p> <p>I can make groups of objects with assistance</p> <p>I can respond to 'Give me some more of [named item]'</p> <p>I can use term 'one' appropriately</p> <p>I can join in new number rhymes with encouragement</p> <p>I can understand the difference between the concepts one, more, and all</p> <p>I can join in role counting to five</p> <p>I can join in role counting to ten</p> <p>I can match numerals to five on a calculator</p> <p>I can match numerals to three</p> <p>I can find out quantities for the member of staff as they count</p> <p>I can read numerals to five on a computer screen</p> <p>I can record numbers counted using dimes or dots</p> <p>I can sequence numerals to five</p> <p>I can trace numerals up to five</p> <p>I can identify whether there are one, two, or three objects in a group of objects</p>	<p>I can share concrete objects so that everyone has one (in a group of three people)</p> <p>I can find cardboard in two roughly equal parts, e.g. to make a card</p> <p>I can share concrete objects between people (not necessarily correctly)</p> <p>I can complete one-to-one matching, e.g. gives an object to each person</p> <p>I can demonstrate sharing in play situations</p> <p>I can demonstrate some understanding that 'share' requires them to distribute some of a group of objects</p> <p>I can share concrete objects so that everyone has five (in a group of people)</p> <p>I can share concrete objects so that everyone has four (in a group of people)</p>
Step 2	<p>I can say the number names to 5 in the correct order (e.g. in a song or by joining in with the teacher) (PK4S)</p> <p>I can demonstrate an understanding of the concept of numbers up to 5 by putting together the right number of objects when asked (PK3S)</p> <p>I can copy and continue simple patterns using real-life materials, e.g. apple, orange, apple, orange, etc. (PK3S)</p> <p>I can count up to five 1p coins correctly</p> <p>I can count up to five objects correctly</p> <p>I can compare two sets of (up to 5) counters pointing to the group that contains fewer/greater</p> <p>I can count up to five without objects</p> <p>I can insert numerals to five</p>	<p>I can compare two sets of (up to 5) counters pointing to the group that contains less/more</p> <p>I can compare two sets of (up to 5) counters pointing to the group that contains smaller/larger</p> <p>I can demonstrate an understanding of the concept of numbers up to 5 by putting together the right number of objects when asked (PK3S)</p> <p>I can copy and continue simple patterns using real-life materials, e.g. apple, orange, apple, orange, etc. (PK3S)</p> <p>I can count up to five 1p coins correctly</p> <p>I can count up to five objects correctly</p> <p>I can compare two sets of (up to 5) counters pointing to the group that contains fewer/greater</p> <p>I can count up to five without objects</p> <p>I can insert numerals to five</p>	<p>I can join in role counting to five</p> <p>I can join in role counting to ten</p> <p>I can match numerals to five on a calculator</p> <p>I can match numerals to three</p> <p>I can find out quantities for the member of staff as they count</p> <p>I can read numerals to five on a computer screen</p> <p>I can record numbers counted using dimes or dots</p> <p>I can sequence numerals to five</p> <p>I can trace numerals up to five</p> <p>I can identify whether there are one, two, or three objects in a group of objects</p>	<p>I can share concrete objects so that everyone has five (in a group of people)</p> <p>I can share concrete objects so that everyone has four (in a group of people)</p>

Termly Focus

Autumn 1	Autumn 2	Spring 1	Spring 2	Summer 1	Summer 2
Number & PV	Calculation		Geometry	Measurement	Statistics

