Maths at Newport CE

The National Curriculum for mathematics aims to ensure that all pupils:

- become **fluent** in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately

- **reason mathematically** by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language

- can **solve problems** by applying their mathematics to a variety of routine and non- routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.

We focus on using a concrete, pictorial, abstract (CPA) approach to the teaching of maths. A teacher will go back and forth between each progression to reinforce concepts.

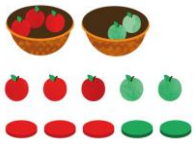
Concrete:

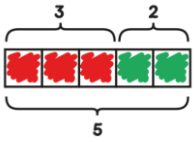
Concrete is the “doing” stage, using concrete objects to model problems. Instead of the traditional method of maths teaching, where a teacher demonstrates how to solve a problem, the CPA approach brings concepts to life by allowing children to experience and handle physical objects themselves. Every new abstract concept is learned first with a “concrete” or physical object.

For example, if a problem is about adding up four baskets of fruit, the children might first handle actual fruit before progressing to handling counters or cubes which are used to represent the fruit.

Pictorial:

Pictorial is the "seeing" stage, using representations of the objects to model 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. Building or drawing a model makes it easier for children to grasp concepts they traditionally find more difficult, such as fractions, as it helps them visualise the problem and make it more accessible.





$3 + 2 = \boxed{5}$

Abstract:

Abstract is the "symbolic" stage, where children are able to use abstract symbols to model problems.

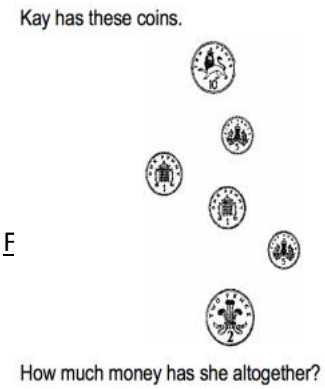
Only once a child has demonstrated that they have a solid understanding of the "concrete" and "pictorial" representations of the problem, can the teacher introduce the more "abstract" concept, such as mathematical symbols. Children are introduced to the concept at a symbolic level, using only numbers, notation, and mathematical symbols, for example +, –, x, / to indicate addition, multiplication, or division.

4 x 5 =20 25 ÷ 5 = 5 56 + 27 = 83 194 – 56 = 138

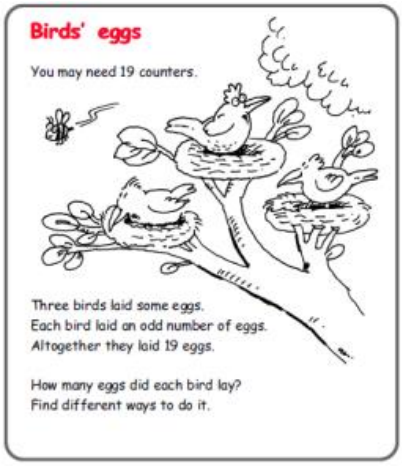
Problem Solving:

At Newport, we teach maths through rich problem solving which is threaded throughout a unit. The aim is to help children to construct a deep understanding of mathematical ideas and processes through creating, conjecturing, exploring, testing and verifying. There are three main types of problem solving: word problems, rich mathematical tasks and 'real life' problems. These can focus on routine or non-routine problems. Routine problem solving typically involves using one or more of the four operations to solve problems that are practical in nature. They have a closed answer. Non-routine problem solving also involves real-life problems using one or more of the operations but often has an open answer which has multiple answers or possibilities.

Routine:



Non-Routine:



Flexible Groupings:

With the change in curriculum, we group children flexibly to ensure that the work set for them offers the correct level of challenge. This also offers the opportunity to move between groups in lessons so every child is continually moving forward in their learning.

Verbal Feedback:

Verbal feedback is given within lessons to clear up misconceptions at the point of learning, to further develop understanding of a concept and to offer challenge.

Keep Up Catch Up / Pre-Teaching:

If a child needs further support after the lesson, we offer 'Keep Up Catch Up' sessions to ensure they have no gaps in their learning before moving on. In some cases, we may provide pre-teaching of a concept so that a child is able to enter a lesson with increased independence and confidence.

Learning Together