

Developing understanding through the CPA-V approach

In our school, we use the Concrete, Pictorial, Abstract – Vocabulary (CPA-V) approach to teaching maths. This method uses physical manipulatives and visual representations to build the children’s understanding of abstract mathematical concepts and gives them the vocabulary to explain their thinking and reasoning. Children are introduced to the concepts through the use of **concrete** resources (e.g. place value counters, Base 10 etc). When they are comfortable solving problems with physical aids, they are given problems with pictures – usually **pictorial representations** of the concrete objects they were using and are encouraged to draw these representations themselves to support problem solving. Eventually, children are asked to solve problems where they only have the **abstract** (e.g. numbers or symbols). Throughout teaching, children are taught the **vocabulary** needed to discuss and explain their learning. This not only embeds mathematical concepts, processes and reasoning but also develops high-level mathematical oracy. Building these steps across a lesson, or series of lessons, can help pupils better understand the relationship between numbers and the real world, and therefore helps secure their understanding of the mathematical concept they are learning.

The CPA-V approach is used across the school but may vary due to the age or needs of the children. In EYFS and KS1, the concrete manipulatives are used to introduce all new concepts and may be required throughout teaching of a specific unit however, the aim is to build independence and understanding through pictorial then abstract activities as children’s understanding becomes secure. In planning at KS2, teachers identify the concrete manipulatives and pictorial representations that will support learning which may be for the whole class at the start of a unit but only be needed by some pupils as the unit develops. Vocabulary builds as children progress through the school in the form of specific words and as stem sentences.

Where learning is not secure, teachers should revisit concepts making use of manipulatives and representations where appropriate. Children are encouraged to see the concrete manipulatives and pictorial representations as a tool for deepening their understanding and a method for proving their thinking.

