

Mathematics at Llantilio Pertholey VC Primary School

Vision

At Llantilio Pertholey VC Primary School we believe that good mathematics teaching is lively, engaging and involves a carefully planned blend of approaches that direct children's learning. Mathematics teaches how to make sense of the world around us through developing a child's ability to calculate, to reason and to solve problems. It enables children to understand and appreciate relationships and pattern in both number and space in their everyday lives. The pitch and pace of the work is sensitive to the rate at which children learn while ensuring expectations are kept high and progress is made by all children.

We aim for the children to:

- **Foster positive attitudes**, fascination and excitement of discovery through the teaching and learning of mathematical concepts through practical activities, exploration and discussion.
- Develop a '**can do**' attitude and perceive themselves as mathematicians.
- Become **fluent** in the fundamentals of mathematics so that they develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately.
- **Reason** mathematically by following a line of enquiry and develop and present a justification, argument or proof using mathematical language.
- **Solve problems** by applying their mathematics to a variety of problems with increasing sophistication, including in unfamiliar contexts and to model real-life scenarios.

Beliefs

We believe that ability within Mathematics is not fixed. We are developing the mindsets of children and adults alike to develop a Growth Mindset and a 'We Can' attitude to Mathematics. We believe that through 'quality first teaching' using the CPA approach and intelligent practice, children learning together and immediate intervention that **all** children have the potential to 'go deeper' and broaden their understanding of mathematical concepts. We use a variety of teaching and learning styles to develop children's knowledge, skills and understanding in mathematics. We do this through lessons that have a high proportion of whole-class and group teaching. During these lessons we encourage children to ask as well as answer mathematical questions and give explanations. They have the opportunity to use a wide range of resources such as number lines, number squares, number cards and small apparatus to support their work. Children use ICT in mathematics lessons where it will enhance their learning, as in modelling ideas and methods. Wherever possible, we encourage the children to use and apply their learning in everyday situations. We believe that the key ideas and building blocks are important for everyone; therefore, we use AfL strategies to ensure that there is immediate intervention to address gaps in learning where necessary.

The Concrete – Pictorial – Abstract (CPA) approach

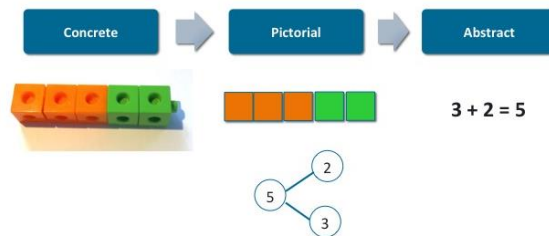
Concrete, pictorial, abstract (CPA) is a highly effective approach to teaching that develops a deep and sustainable understanding of maths. Developed by American psychologist, Jerome Bruner, the CPA approach is the mainstay of maths teaching in Singapore.

Children and adults can 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. The approach is so established in Singapore maths teaching, that the Ministry of Education will not approve any teaching materials which do not use the CPA approach.

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 experience.

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.

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.



Teaching and learning

In every Mathematics lesson you will see the following:

- ‘Quality first’ teaching; tailored to meet the needs of the learners in each class, and immediate intervention to address gaps in learning where necessary.
- Teachers using a range of methods to explore key Mathematical concepts which appeal to pupils’ different styles of learning, employing concrete/pictorial/abstract representations of Mathematical concepts.
- Resilient learners with Growth Mindsets and a ‘We Can’ attitude to Mathematics, whatever their previous level of attainment
- Pupils learning together.
- Teachers using high-quality questioning to explore children’s understanding and develop it further.
- Teachers making use of misconceptions to further understanding of key concepts.
- Learners being given the opportunity, through careful planning, to ‘linger longer’ on and ‘go deeper’ in mathematical concepts.
- After developing fluency, children show that they can apply their knowledge in mathematics and then move on even further to prove they have mastered the concept by being **“challenged through rich and sophisticated problems.”**

We believe that every child can master an understanding and love of maths with the right kind of teaching and support

The mastery method of teaching mathematics develops pupils' mathematical ability and confidence without having to resort to memorising procedures - making mathematics more engaging and interesting.