

*“Grow, shine and succeed in maths through making sense of maths, demonstrating understanding and thinking mathematically”*

*We believe that all pupils, regardless of background, should enjoy mathematics and succeed in the subject, becoming competent and confident mathematicians. We aim for our pupils to acquire a deep, long-term and secure understanding of mathematics. We are committed to developing pupils' curiosity about the subject, enabling them to make meaningful and rich links to real life contexts that will be relevant and useful in the world of work.*

At Silver End Academy, we believe that pupils should:

**Make sense of mathematics and demonstrate understanding** through exposure to different representations using the principles of CPA – **Concrete, Pictorial, Abstract**:

- **Concrete** – the doing: children use manipulatives (counters, base-10 equipment) to represent the concept they are being taught. This ‘hands on’ component using real objects is the foundation for conceptual understanding
- **Pictorial** – the seeing: children can use pictures and models to represent the concrete manipulatives
- **Abstract** – the symbolic: this is the concept in the abstract form which is more readily understood once children have explored the concrete and pictorial. Pupils’ are now capable of representing problems by using mathematical notation. This is the most formal and efficient stage of mathematical understanding. Abstract representations can simply be an efficient way of recording the maths, without being the actual maths.

**Think mathematically** and build resilience to the challenges they face within and across the subject by having the opportunity to:

- Explore, wonder, question and conjecture- feeling safe to make mistakes and learn from these through exploring their own understanding and application of maths
- Compare, classify, sort- using clear verbal reasoning as to how or why they have classified their objects- again with the confidence to explain and discuss their thoughts with their peers and their teachers
- Experiment, play with possibilities, vary an aspect and see what happens- similar to how children learn to play with language in literacy- explore what happens when the changes are made, are there patterns that appear- if so what is happening and from this can they predict what will happen as the sequences continue?

- Make theories and predictions and act purposefully to see what happens- making generalisations and exploring them both independently, with peers and with adults alike.

It is important that we support all pupils in developing their mathematical thinking, both in order to improve the way in which they learn, as well as the learning itself. Good questioning can be used to develop pupils' ability to compare, modify and generalise, all building a deeper understanding of mathematics.

### Implementation

The content and principles underpinning the Mathematics curriculum at Silver End Academy reflect those found in high-performing education systems internationally, particularly those of east and south-east Asian countries. These principles convey how our curriculum is implemented.

At Silver End Academy, we use *The National Centre for Excellence in the teaching of Mathematics (NCETM)* as a basis of our maths lesson to achieve the aims set out by the National Curriculum.

At the heart of this programme is the idea that all children can achieve and be successful mathematicians with the right growth mind-set.