Maths

The Tilstock Way

What is our intent?

We want all Tilstock pupils to:

- know more and remember more.
- to develop number sense in the early years of school
- to enjoy and achieve within their learning so that they develop confidence in mathematics.
- Have the best possible start for our pupils' by closing the gap in knowledge through teaching pupils core facts, formulae and concepts which form the building blocks for the next stages of education.
- to develop 'automatic recall' of key concepts to prevent their working memory from becoming overloaded.
- To achieve the age-related expectations.

How will we implement this?

Though our intent of pupils ***knowing more and remembering more***, pupils' mathematical knowledge is split into three types:

1. 'I know that' - facts and concepts.
2. 'I know how' - the sequence of steps.
3. 'I know when' - strategies to reason and problem solve.

Within each topic, pupils will use these three types, so that their knowledge of the relationships between mathematical concepts will develop over time.

We will do this by ensuring that

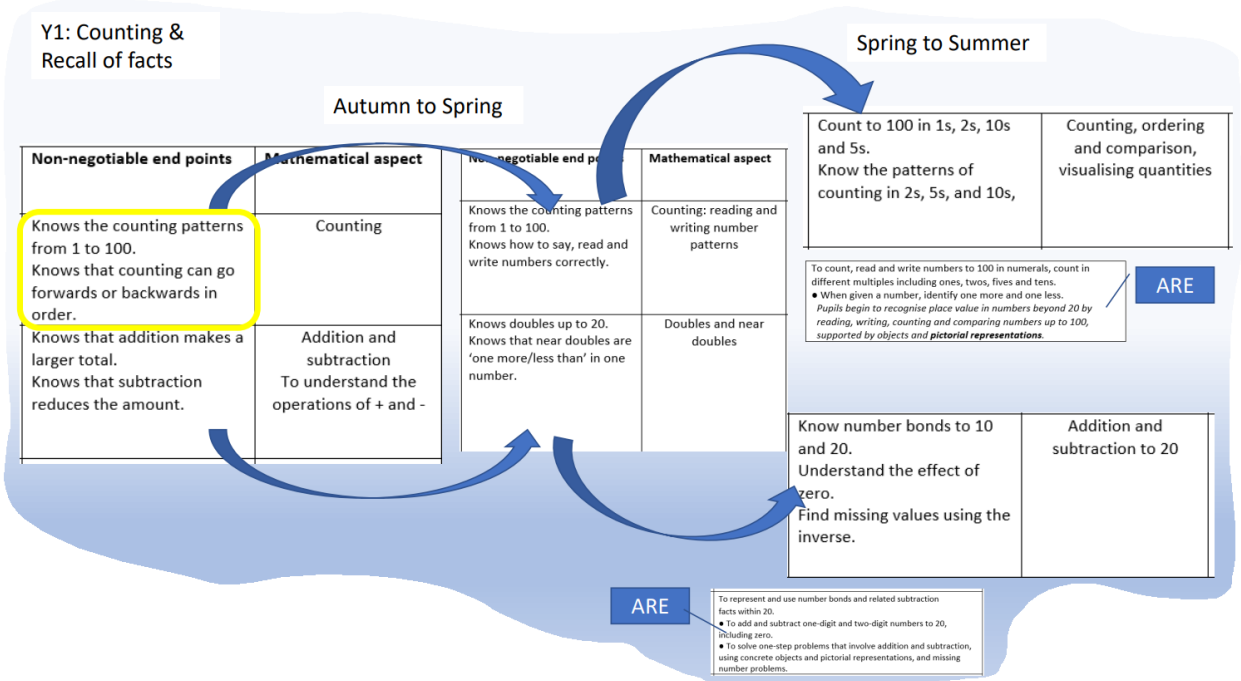
- Pupils are not rushed through a topic, as some pupils may need more time than others.
- We adapt the curriculum to the needs of our learners.
- We have a spiral curriculum that revisits topics of work throughout the year.
- Teach in small steps, following a teaching sequence of concrete, pictorial, abstract.
- We follow the Rosenshine's principles to ensure that we do not overload our pupil's working memory

Our Maths Medium Term Planning

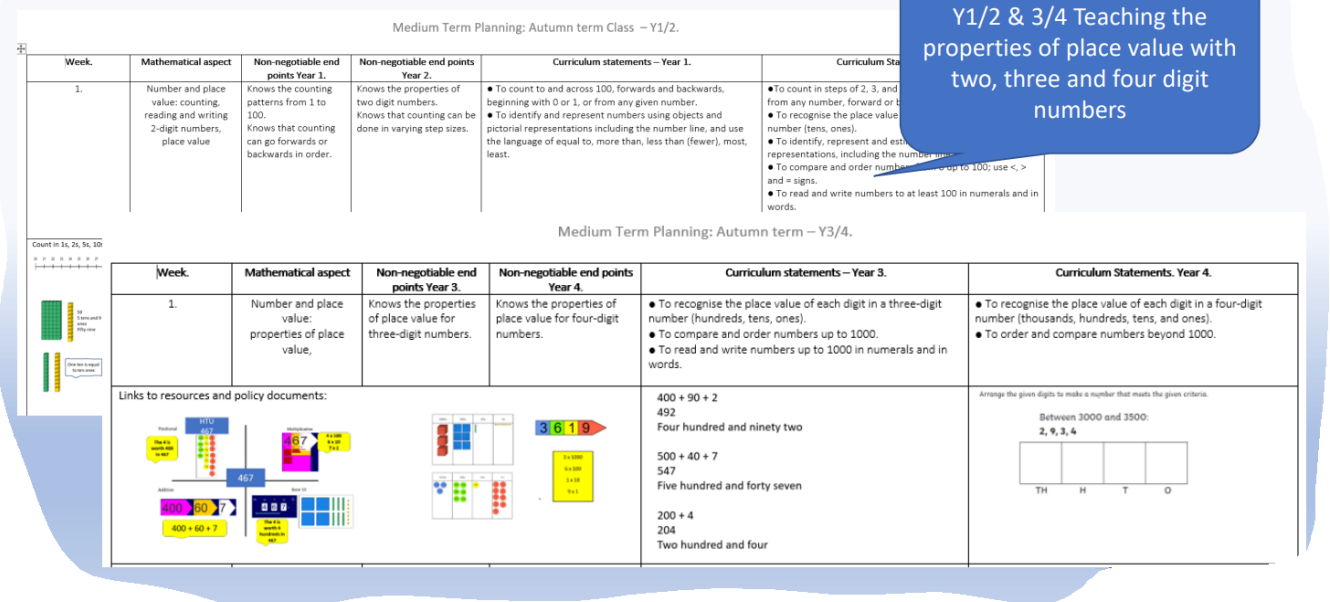
Our Maths planning ensures that we

- know what order to teach the content in.
- are able to focus on curriculum goals (non-negotiable end points)
- are able to track progress across the terms to meet ARE
- are able to allow for returning to themes and topics for knowing more and
- remembering more
- are able to allow for professional judgment on how long to spend on aspects that require more /less teaching time
- pair useful facts and efficient and accurate methods within a topic sequence.
- teach strategies for solving problem types once pupils can recall and deploy facts and methods with speed and accuracy

Our Medium Term Plans

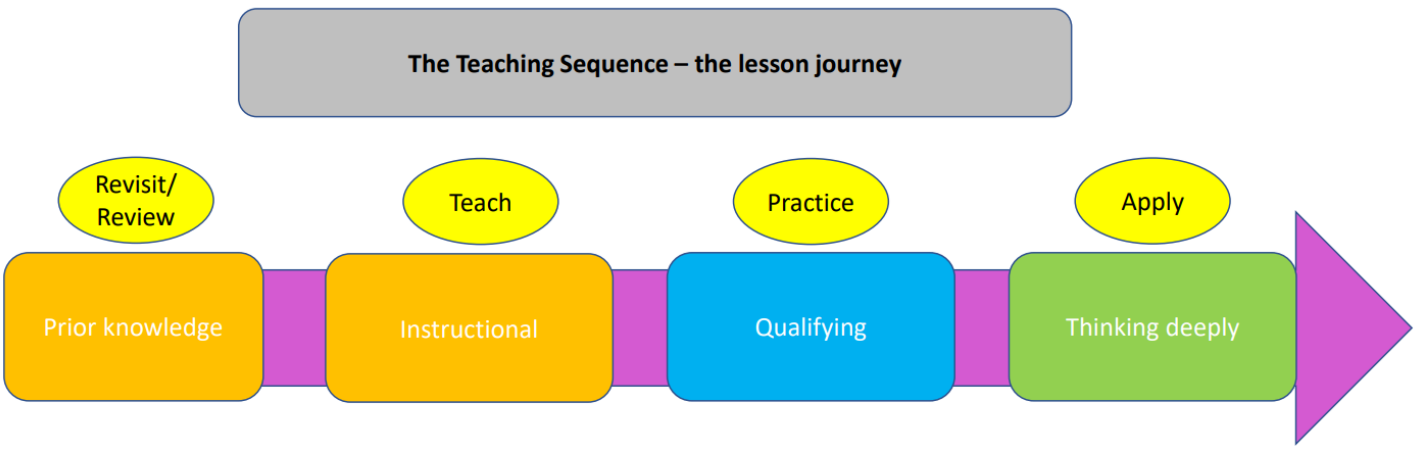


Mixed age planning



It is important for every topic that teachers know what pupils already knew and understood, have a clear purpose of the lesson and how it fits into a sequence of lessons over time.

Our teaching sequence



1. Effective modelling of the mathematics to secure fluency, technical vocabulary and notation - instructional
2. An emphasis on learning through practice, with regular opportunities for pupils to talk both individually and in groups - qualifying
3. An expectation that pupils will accept responsibility for their own learning and work independently – thinking deeply

Concrete, Pictorial, Abstract

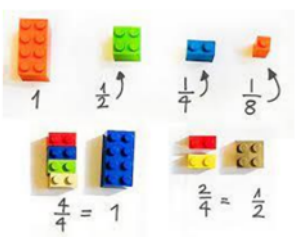
Learning a new idea

Concrete, Pictorial, Abstract (CPA) is a highly effective approach to teaching that develops a deep and sustainable understanding of maths in pupils. Often referred to as the concrete, representational, abstract framework, CPA was developed by American psychologist Jerome Bruner.

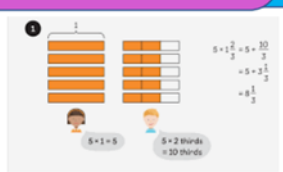
Concrete models
Understand the concept
Fix in the long term memory

Pictorial representations
Apply the concept
Recall from long term memory

Abstracts
Match the concrete/ pictorial to mathematical symbols and language



Concrete is the "doing" stage. During this stage, students use concrete objects to model problems.



Pictorial is the "seeing" stage. Here, visual representations of concrete objects are used to model problems. This stage encourages children to make a mental connection between the physical object they just handled and the abstract pictures, diagrams or models that represent the objects from the problem.

$$\frac{6}{7} + \frac{3}{5}$$

Abstract is the "symbolic" stage, where children use abstract symbols to model problems. Students will not progress to this stage until they have demonstrated that they have a solid understanding of the concrete and pictorial stages of the problem.

Impact

- Teachers will plan frequent, low-stakes assessments throughout the ‘learning journey’ to help pupils prepare for assessments that focus on what pupils have actually learnt.
- Using low stakes testing will not only increase knowledge retention, but also improve pupils confidence in maths.
- Using lessons to incorporate timed testing (The 99 club) can help pupils to develop fluency and give teachers the reassurance that ‘pupils are not reliant on derivation’ to calculate their answers.
- By planning regular assessments to ‘engineer proficiency’ and promote success, pupils can see tests as ‘moments to shine’ and even look forward to them.