



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

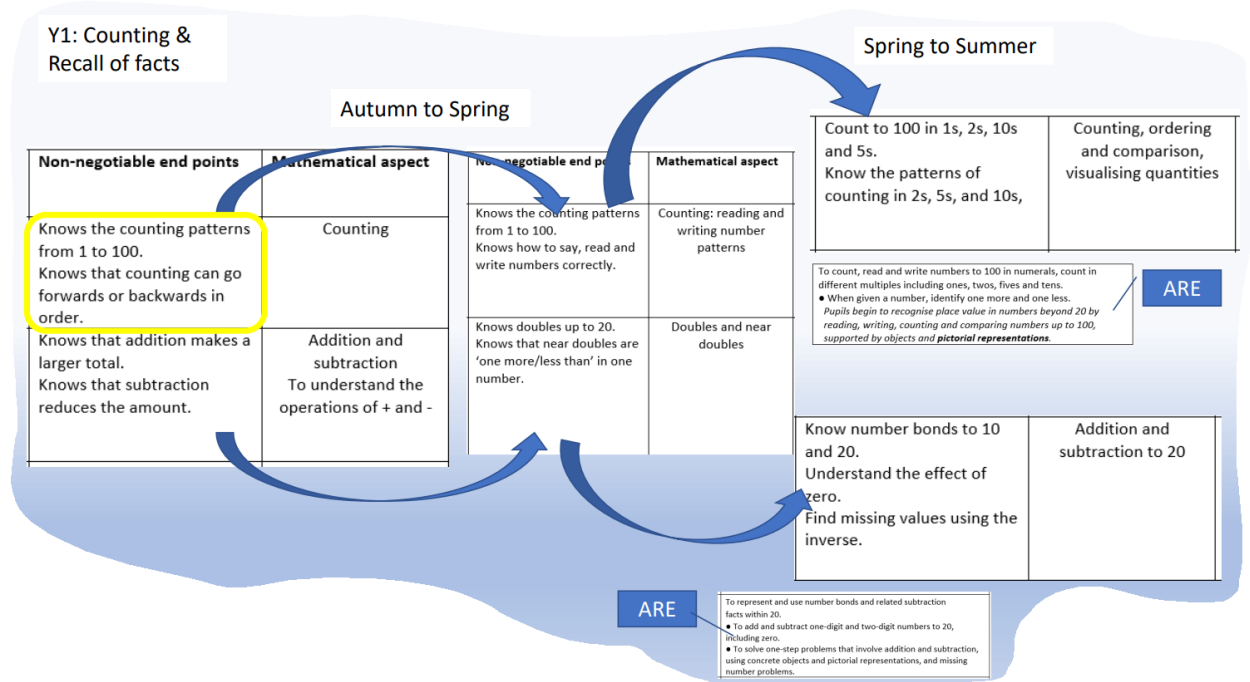
- Pupils are not rushed through a topic, as some pupils may need more time than others.
- We adapt the curriculum to the needs of our learners.
- We have a spiral curriculum that revisits topics of work throughout the year.
- Teach in small steps, following a teaching sequence of concrete, pictorial, 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

Y1/2 & 3/4 Teaching the properties of place value with two, three and four digit numbers

Medium Term Planning: Autumn term Class – Y1/2.

Week.	Mathematical aspect	Non-negotiable end points Year 1.	Non-negotiable end points Year 2.	Curriculum statements – Year 1.	Curriculum Statements – Year 2.
1.	Number and place value: counting, reading and writing 2-digit numbers, place value	Knows the counting patterns from 1 to 100. Knows that counting can go forwards or backwards in order.	Knows the properties of two digit numbers. Knows that counting can be done in varying step sizes.	<ul style="list-style-type: none"> To count to and across 100, forwards and backwards, beginning with 0 or 1, or from any given number. To identify and represent numbers using objects and pictorial representations including the number line, and use the language of equal to, more than, less than (fewer), most, least. 	<ul style="list-style-type: none"> To count in steps of 2, 3, and from any number, forward or backward, including zero. To recognise the place value of each digit in a number (tens, ones). To identify, represent and estimate, using concrete objects and pictorial representations, including the number line, the number of objects in a group. To compare and order numbers up to 100; use <, > and = signs. To read and write numbers to at least 100 in numerals and in words.

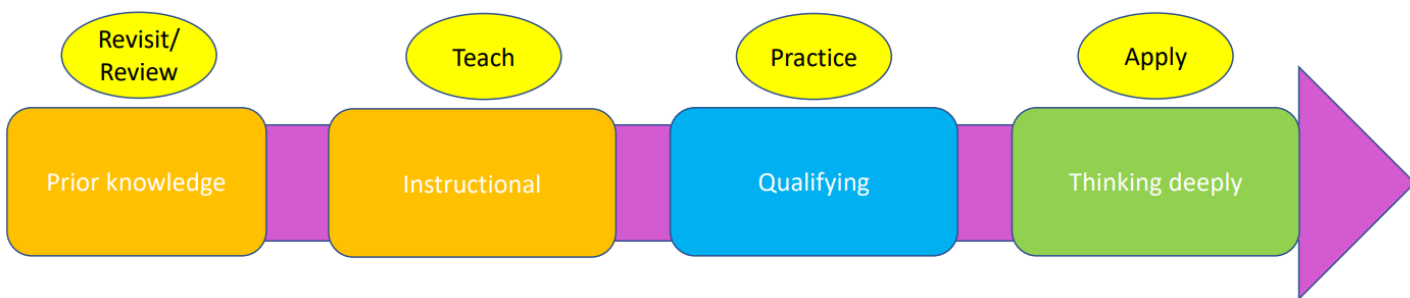
Medium Term Planning: Autumn term – Y3/4.

Week.	Mathematical aspect	Non-negotiable end points Year 3.	Non-negotiable end points Year 4.	Curriculum statements – Year 3.	Curriculum Statements. Year 4.
1.	Number and place value: properties of place value,	Knows the properties of place value for three-digit numbers.	Knows the properties of place value for four-digit numbers.	<ul style="list-style-type: none"> To recognise the place value of each digit in a three-digit number (hundreds, tens, ones). To compare and order numbers up to 1000. To read and write numbers up to 1000 in numerals and in words. 	<ul style="list-style-type: none"> To recognise the place value of each digit in a four-digit number (thousands, hundreds, tens, and ones). To order and compare numbers beyond 1000.
Links to resources and policy documents:				$400 + 90 + 2$ 492 Four hundred and ninety two $500 + 40 + 7$ 547 Five hundred and forty seven $200 + 4$ 204 Two hundred and four	Arrange the given digits to make a number that meets the given criteria. Between 3000 and 3500: 2, 9, 3, 4 TH H T O

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

The Teaching Sequence – the lesson journey



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

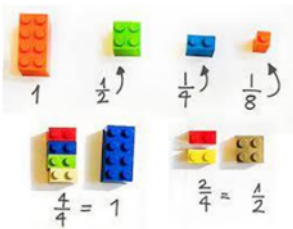
Concrete, Pictorial, Abstract

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



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

Pictorial representations

Apply the concept
Recall from long term memory



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.

Abstracts

Match the concrete/
pictorial to mathematical
symbols and language

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

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.