



MATHS WORKSHOP

Year 3 Parents

The aims of the National Curriculum for Mathematics

The national curriculum for mathematics aims to ensure that all pupils:

- *become **fluent in the fundamentals of mathematics**, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop **conceptual understanding** and the ability to recall and apply knowledge rapidly and accurately.*
- ***reason** mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language.*
- *can **solve problems** by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions.*

Fluency

- *Recall number facts and concepts without thinking (rapid recall – knowing from memory).*
- *Accuracy.*
- *Understanding.*
- *Efficiency (using an appropriate strategy)*
- *Make connections between different mathematical areas.*

Reasoning

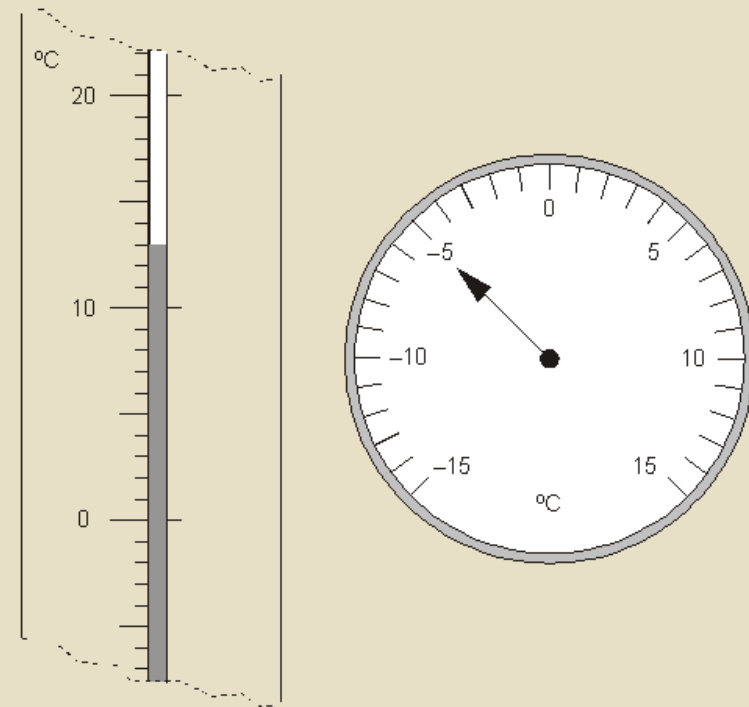
- *It is about using what you already know to help you deduce, reason or predict what will happen and the best way to go about facing a problem, with this knowledge in mind. It can be as simple as 'I know $5 + 5$ is 10, I have to work out $6 + 5$. 6 is one more than 5, so my answer will be larger than $5 + 5$ by 1.'*
- *How would you solve $35 + 29$?*
- *How would you solve $£3.99 + £2.76$?*

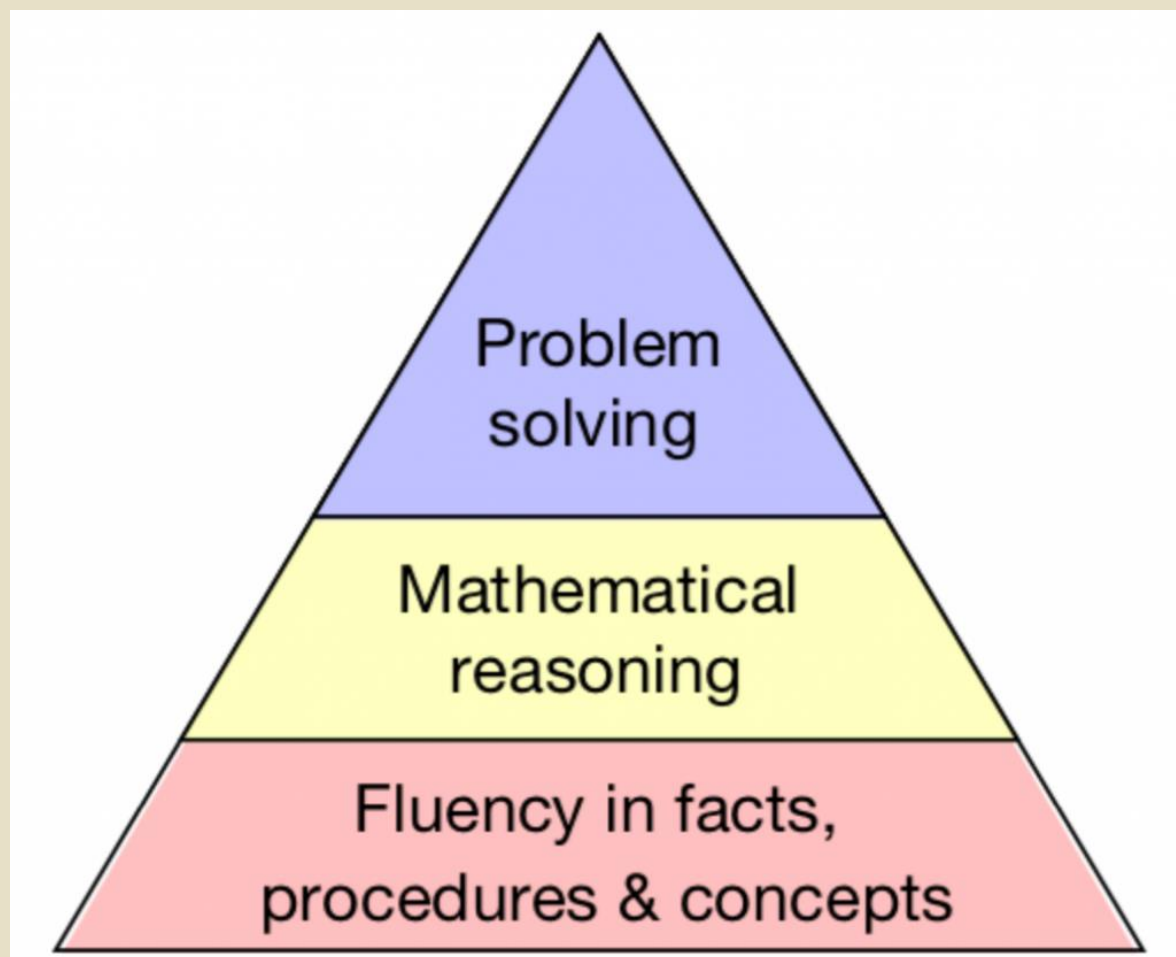
Problem Solving

- The ability to apply the concepts and skills that they have learned to solve an unfamiliar problems, including being able to break the problem down into smaller steps and persevering in seeking solutions.

Here are two thermometers. They show two different temperatures.

What is the difference between the two temperatures?



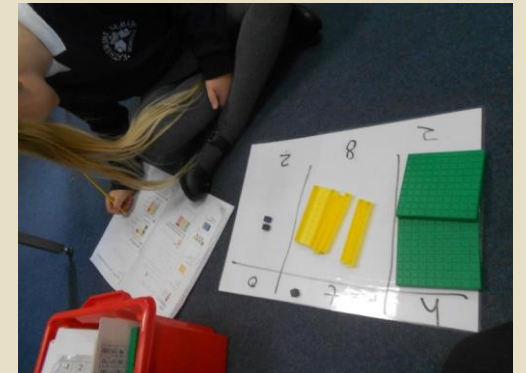


Mathematics Mastery

At Katherine Semar, we teach for mastery. We aim to ensure all pupils master the curriculum at the appropriate stage of their learning.

Mastery of the curriculum requires that all pupils:

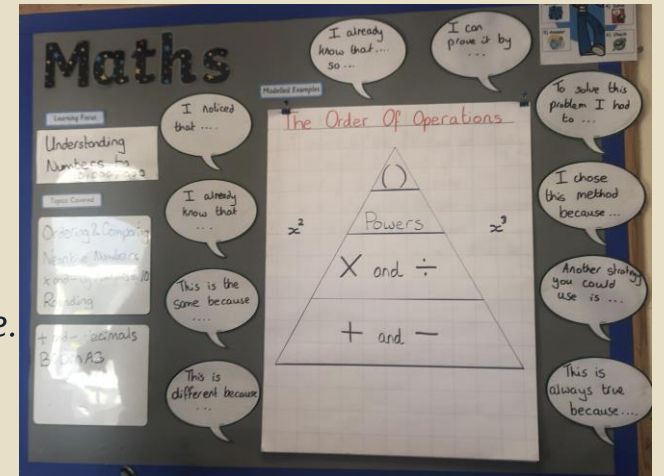
- can use their knowledge of the concept to solve unfamiliar problems and undertake complex reasoning;*
- use mathematical concepts, facts and procedures appropriately, flexibly and fluently;*
- recall key number facts with speed and accuracy and use them to calculate and work out unknown facts;*
- have sufficient depth of knowledge and understanding to reason and explain mathematical concepts and procedures and use them to solve a variety of problems.*



We provide opportunities to support pupils to develop a long-term, deep understanding of mathematics by securing each topic securely before moving on and building upon it. This is through slower but deeper learning through small steps.

Mathematics Vision and Values

- At Katherine Semar Schools, we believe that every child can do Mathematics.
- These skills will engender a sense of enjoyment and curiosity about the world in which we live.
- Our Mathematics curriculum is delivered to support children to master mathematics which through opportunities to explore and deepen their understanding using fluency, variation, representation and structure, and mathematical thinking which is underpinned by coherence.
- Our children are encouraged to reason and problem solve in every lesson. Teachers and children use full sentences and STEM sentences throughout their lessons to verbalise their learning and understanding e.g. *The answer can't be _____ because _____.*
- We highlight the importance of mathematics in everyday life, surrounding us in all that we do.
- The children are engaged and interested by mathematics in real-life contexts, making links across the curriculum, providing them with skills to prepare them for life as they grow.



Year 3 Subtraction Learning Objectives

- * Subtract numbers mentally, including:
 - a three-digit number and ones
 - a three-digit number and tens
 - a three-digit number and hundreds
- * Subtract numbers with up to three digits, using formal written methods of columnar subtraction
- * Estimate the answer to a calculation and use inverse operations to check answers
- * Solve problems, including missing number problems, using number facts, place value, and more complex subtraction.



Calculation Policies







Our calculation policies have been created to reflect the methods we use to teach for Maths Mastery. We follow a CPA approach:

Concrete – the children establish their understanding of mathematics through carefully chosen concrete materials which they can use to help them to ‘see’ the maths as they progress through the curriculum. These materials are available at all stages of learning from EYFS right through to Year 6.

Pictorial – Children are encouraged to begin to illustrate maths using images that represent the mathematics. This can be used at any stage of their learning and helps to secure and deepen understanding of the processes which underpin the mathematical concepts.

Abstract – once children are secure with the use of concrete and pictorial approaches to their calculation, reasoning and problem solving, they move on to the abstract form of calculation. They are still able to use supporting materials or images if they want to but at this point they are able to show that their depth of fluency and understanding is more secure and they are able to work effectively with standard written methods.

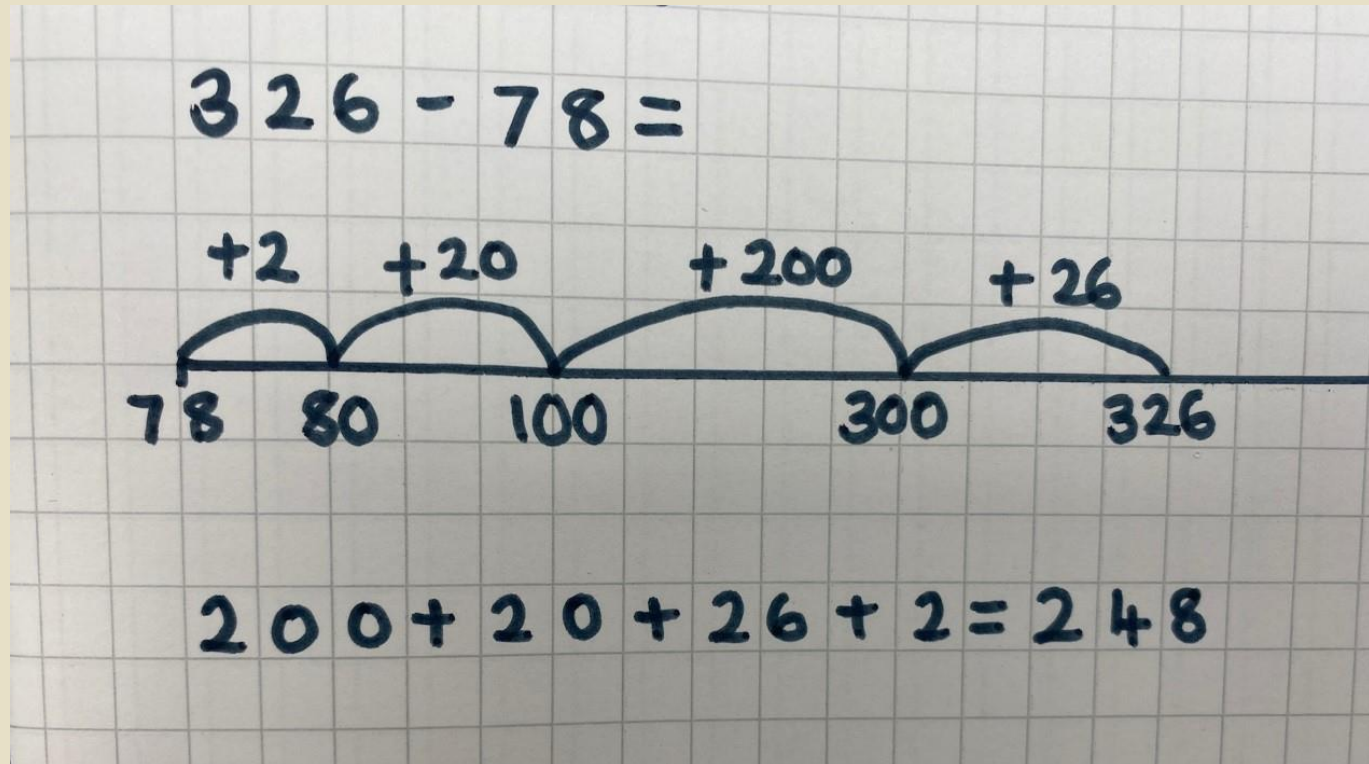


Hundreds (H)	Tens (T)	Ones (O)
 1	 4	 8
—	3	7
 1	 1	 1

	H	T	O
	1	4	8
-		3	7
	1	1	1

Formal Written Calculations and Strategies

Subtracting by counting on, using a number line. With three-digit numbers the number of steps can again be reduced, enabling children to work out answers to calculations such as $326 - 78$ first in small steps and then more compact by using knowledge of complements to 100. The most compact form of recording becomes reasonably efficient.



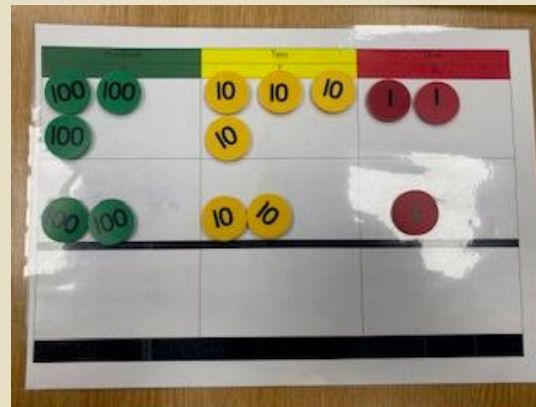
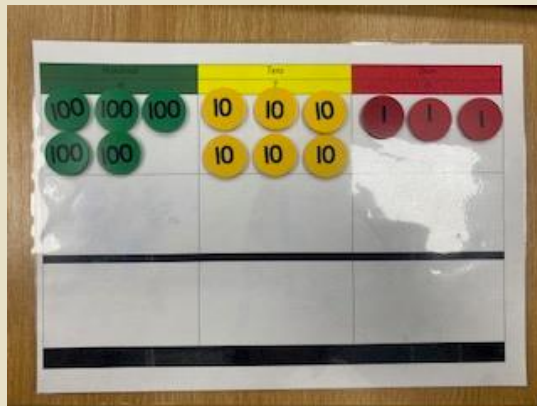
Here's one to try...

$$245 - 71 =$$

Formal Written Calculations and Strategies

Expanded layout, leading to column method (Decomposition) Partitioning the numbers into hundreds, tens and ones and writing one under the other mirrors the column method. It relies on secure mental skills.

Concrete



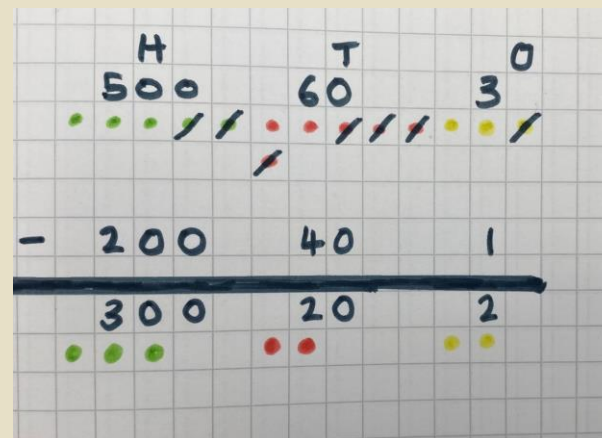
Expanded
Method

Here's one to
try...

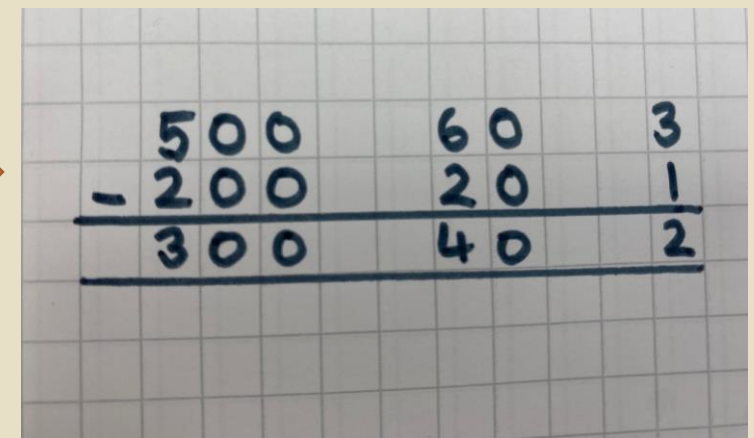
$$548 - 216 =$$

$$563 - 241$$

Pictorial



Abstract



Formal Written Calculations and Strategies



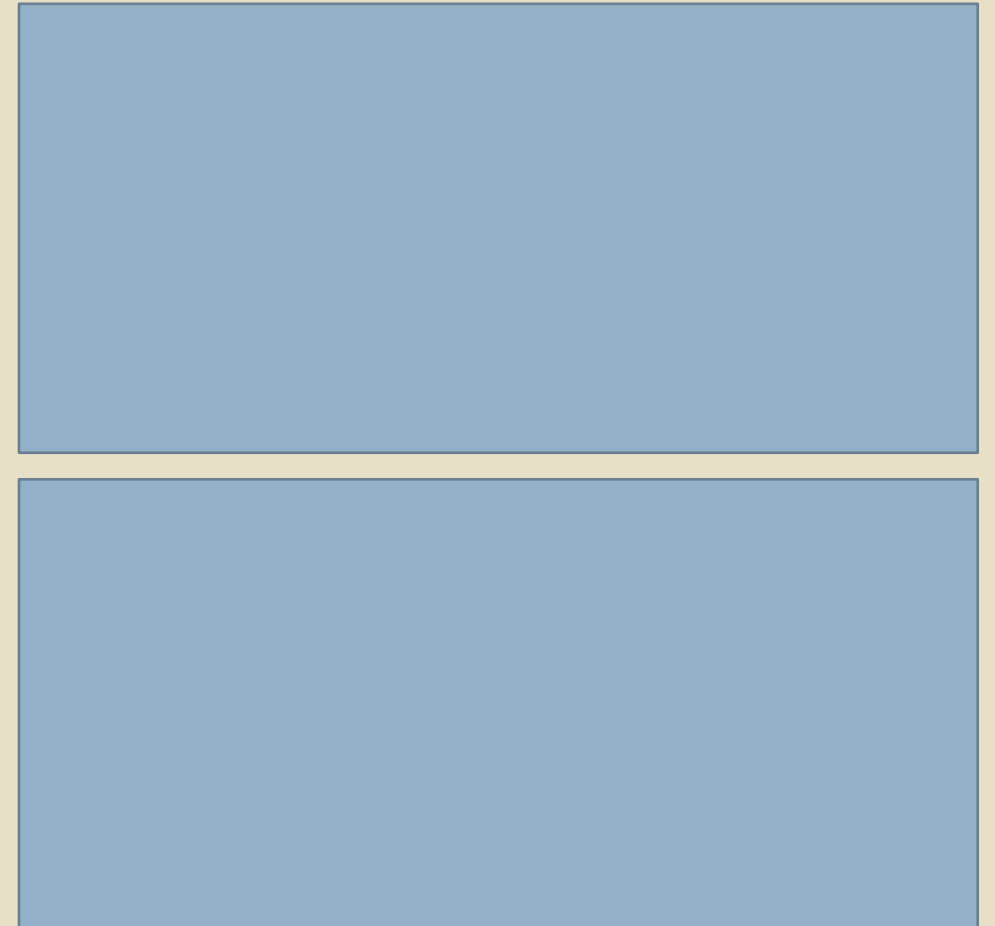
Expanded Method

Here's one to try...

$$548 - 216 =$$

The expanded method leads children to the more compact method so that they understand its structure and efficiency. The amount of time spent teaching and practicing the expanded method will depend on how secure the children are in their recall of number facts and with partitioning.

We start by subtracting the ones, then the tens, then the hundreds. We refer to subtracting the tens, for example, by saying 'forty take away ten', not 'four take away one'.



Formal Written Calculations and Strategies

Column subtraction is then taught through the CPA approach to ensure children have a deep understanding of the method and process opposed to being simply fluent with the method.

Concrete - with place value counters (Dienes could be used for those who need a less abstract representation)

For some children this will lead to exchanging, modelled using place value counters (or Dienes).

A number line and expanded column method may be compared next to each other.

Pictorial – Children may use visuals and images, or drawings to support their learning before moving onto the abstract.

Abstract - The formal method should be seen as a more streamlined version of the expanded method, not a new method.

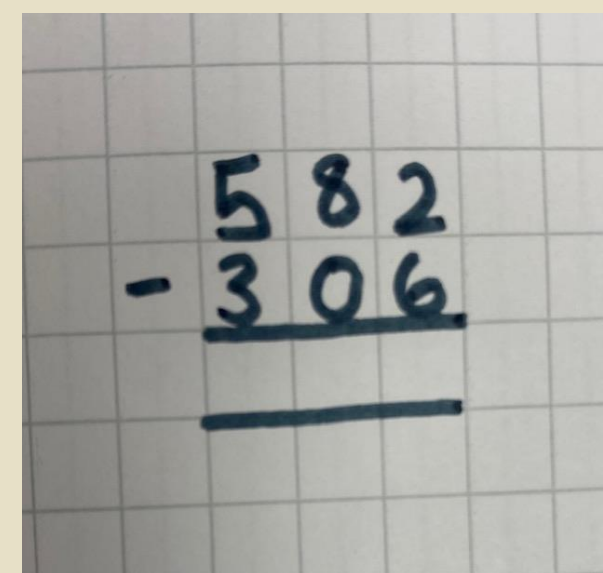
Concrete



Pictorial



Abstract



Formal Written Calculations and Strategies

$$364 - 234 = ?$$

Column subtraction

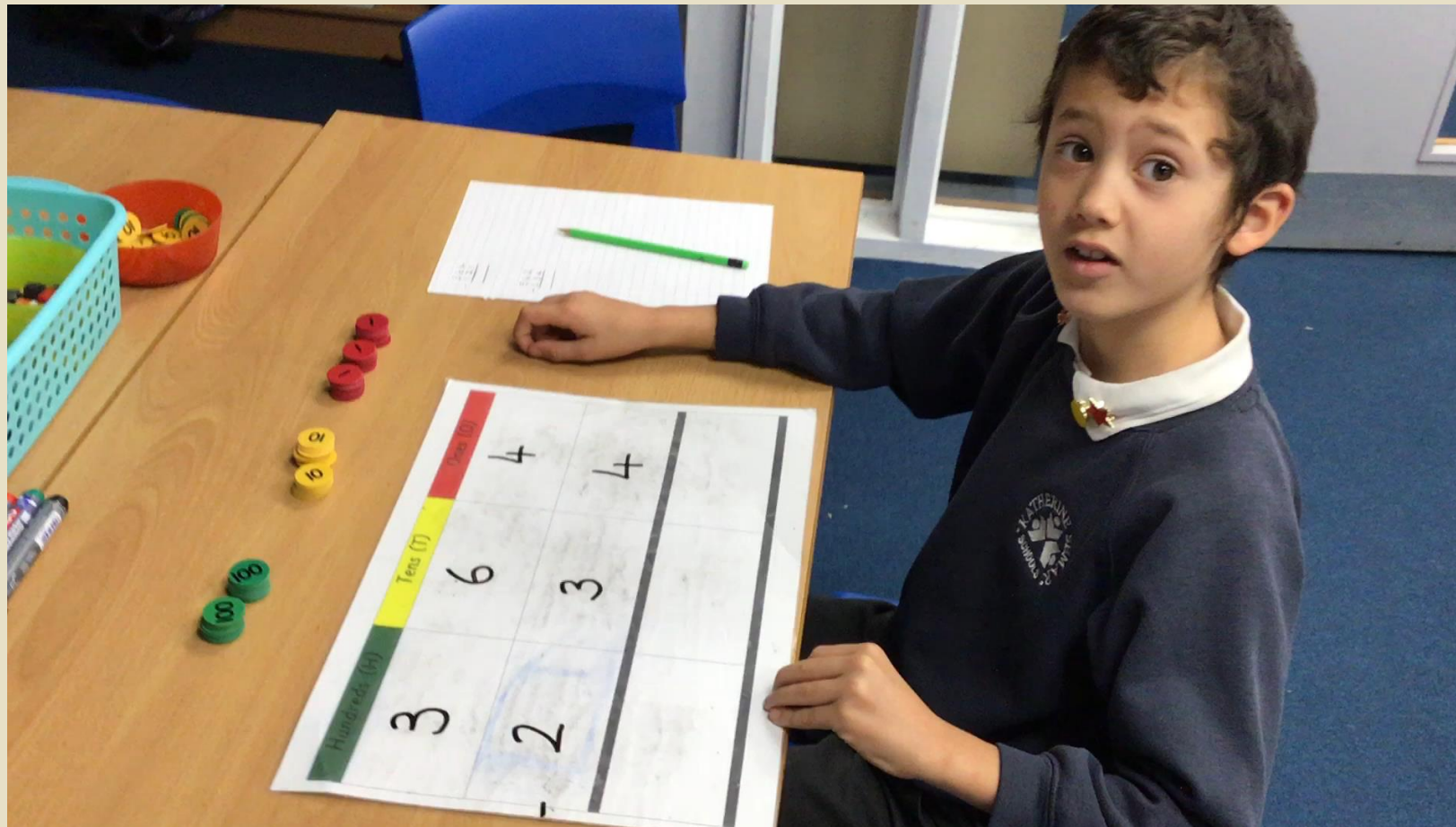
Concrete



Pictorial



Abstract



Formal Written Calculations and Strategies

$$364 - 234 = ?$$

Column subtraction

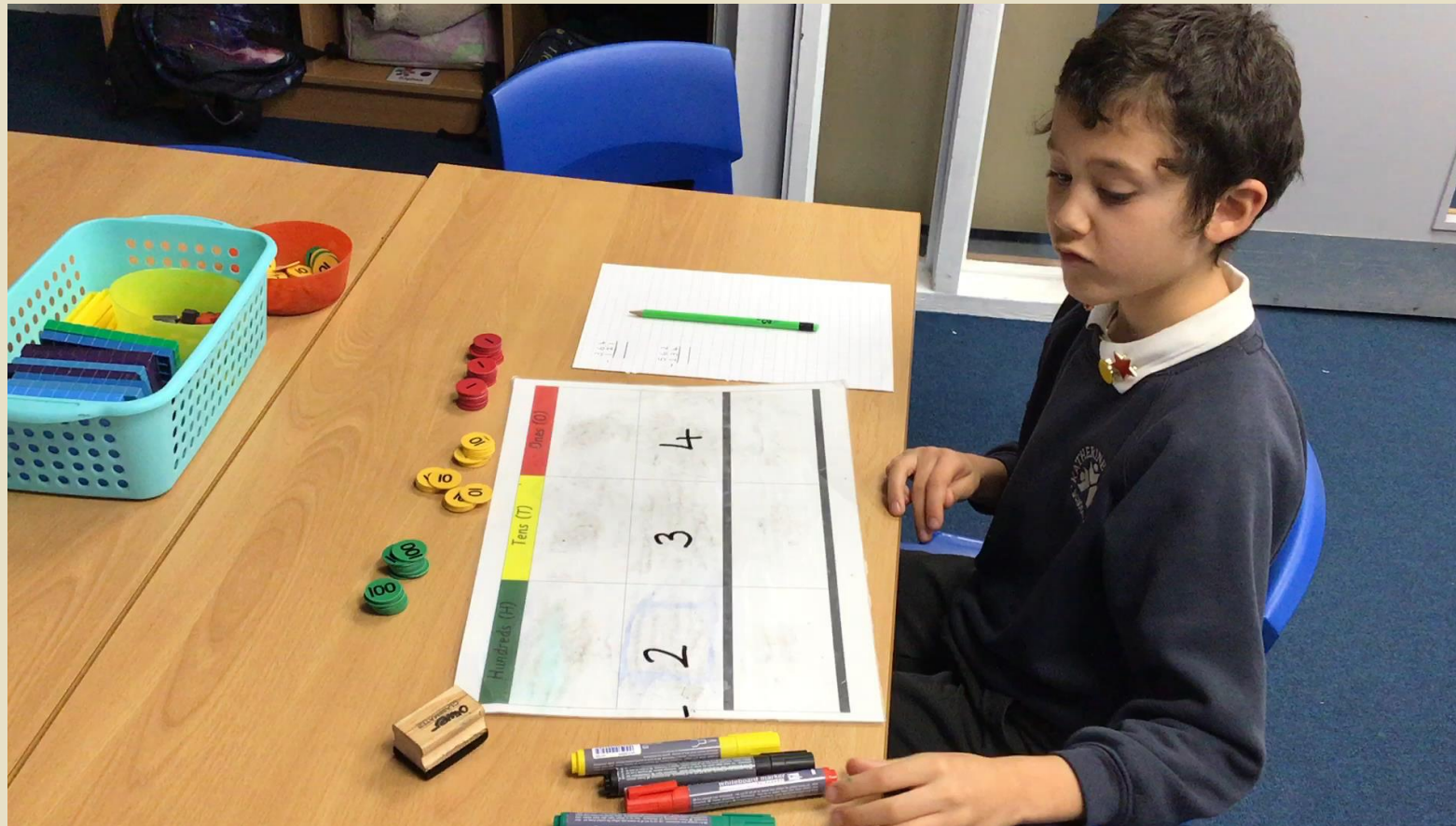
Concrete



Pictorial



Abstract



Formal Written Calculations and Strategies

$$364 - 234 = ?$$

Column subtraction

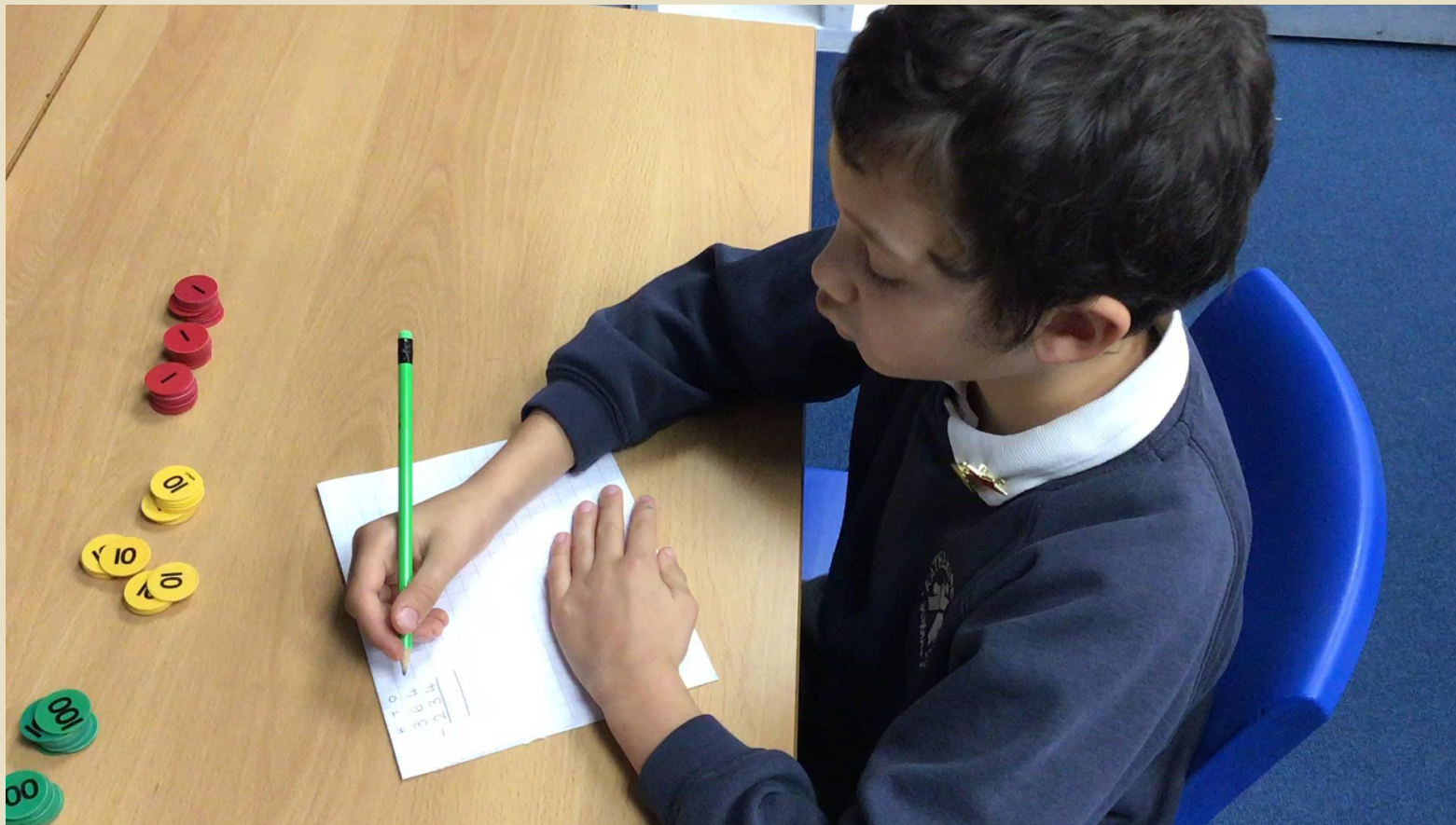
Concrete



Pictorial



Abstract



Formal Written Calculations and Strategies

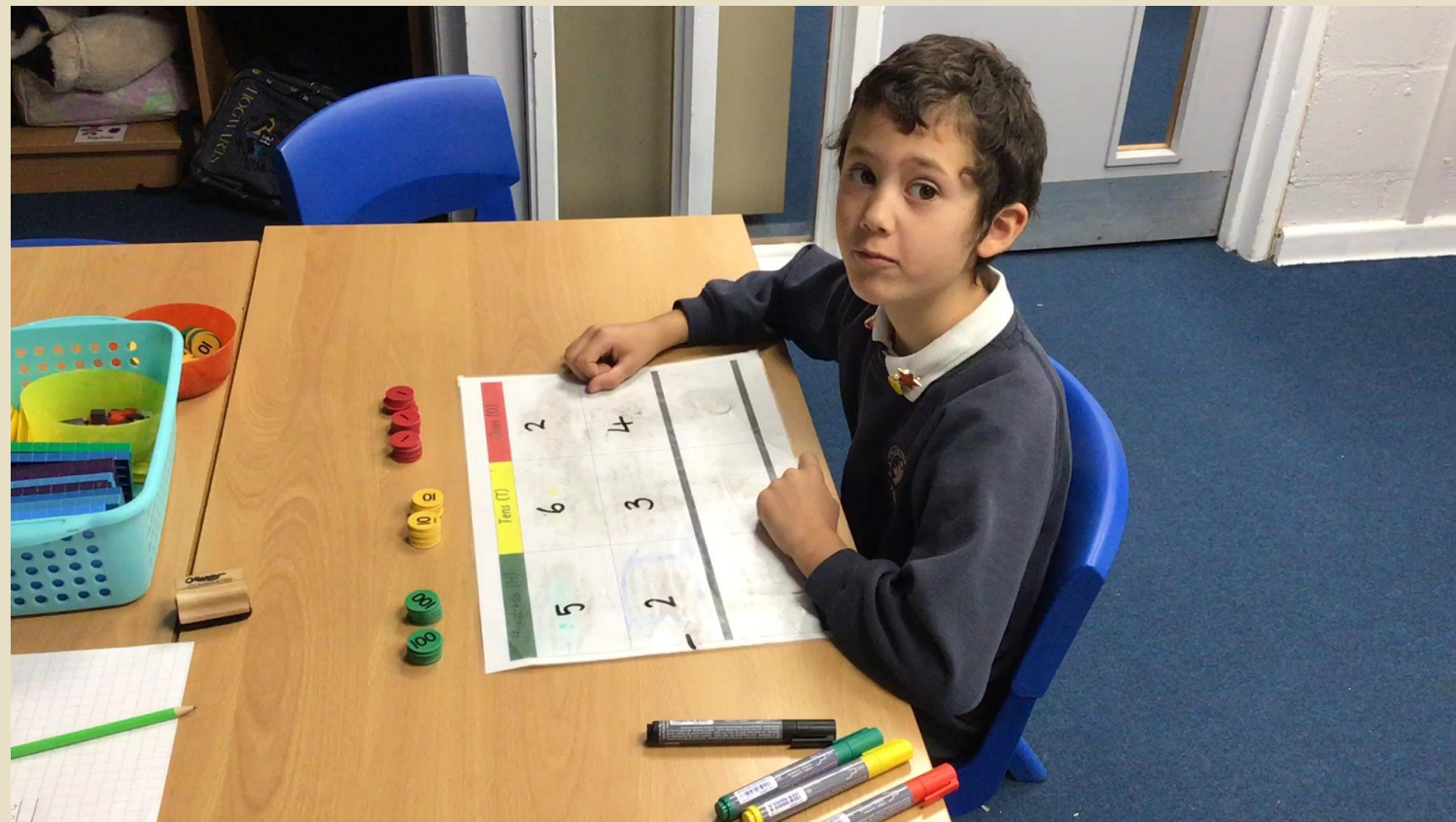
$$562 - 234 = ?$$

Column subtraction

Concrete



Abstract



Formal Written Calculations and Strategies

$$562 - 234 = ?$$

Column subtraction

Concrete



Abstract

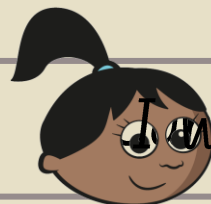


Have a think



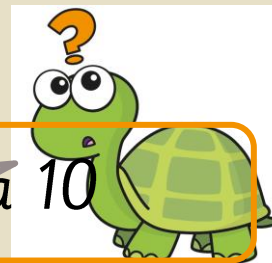
$$451 - 325 =$$

	H	T	O
	4	5	1
-	3	2	5


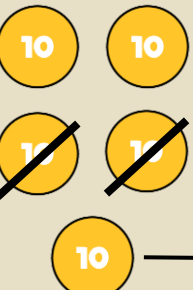
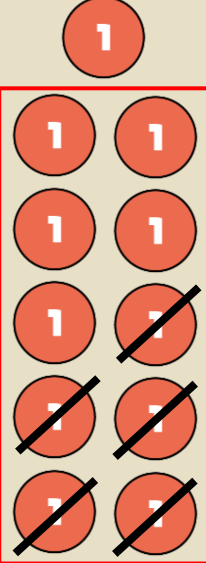


I will subtract 5 ones from 1 one.

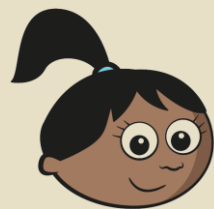
No, you need to exchange a 10



$$451 - 325 = 126$$

Hundreds	Tens	Ones
		
1	2	6

	H	T	O	
	4	⁴ 5	¹ 1	
—	3	2	5	
	1	2	6	



I will exchange 1 ten for 10 ones.

When your child arrives - Tasks to complete



Have a go at completing some of the examples below using the concrete materials.

$$459 - 322 =$$

$$768 - 552 =$$

$$508 - 234 =$$

$$623 - 551 =$$



Have a go at completing some of the examples below using pictorial representations

$$567 - 347 =$$

$$748 - 605 =$$

$$783 - 239 =$$

$$492 - 124 =$$



Have a go at completing some of the examples below using the abstract formal written method.

$$795 - 273 =$$

$$467 - 247 =$$

$$662 - 308 =$$

$$530 - 94 =$$

When working with your child

01

Keep the mood light
and positive

02

Give your child time to
process their thoughts
(don't jump in too early
to help)

03

If they're not
performing to your
expectation, remember
that they may be
feeling under pressure

04

Never admit your own
failing with Maths!

05

Have a giggle



Any Questions?

When your child arrives - Tasks to complete



Have a go at completing some of the examples below using the concrete materials.

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Have a go at completing some of the examples below using pictorial representations

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Have a go at completing some of the examples below using the abstract formal written method.

$$795 - 273 =$$

$$467 - 247 =$$

$$662 - 308 =$$

$$530 - 94 =$$

How to help at home

- *Fluency facts are essential and often what hold children back when using the formal written method*
- *Doubling, halving, number bonds, number pairs, number facts*
- *If working through the formal written method with your children, follow the process we have looked at today/the calculation policy which can be found on our school website*
- *Time tables*



Any Questions?



<https://www.surveymonkey.co.uk/r/SHT3GRN>