

Maths Workshop

Guide for Parents/Carers

Yrs 4, 5 & 6

Maths curriculum statement (summary)

At Herrick Primary School, we are currently adopting a **Mastery Approach** to mathematics.

The emphasis is on developing pupils' mathematic skills and master them alongside ensuring they are **fluent in their knowledge of times tables** and the **four mathematical operations**: addition, subtraction, multiplication and division. Various methods and strategies are introduced as they progress throughout the school and a greater emphasis is placed on children's **reasoning skills** once the basics are embedded.

Working Together



Aims of this presentation

To explain concrete, pictorial and abstract approaches in maths

What is A Mastery Approach?

To discuss the written calculations policy (focus on + and -)

Information on the Herrick Primary School website

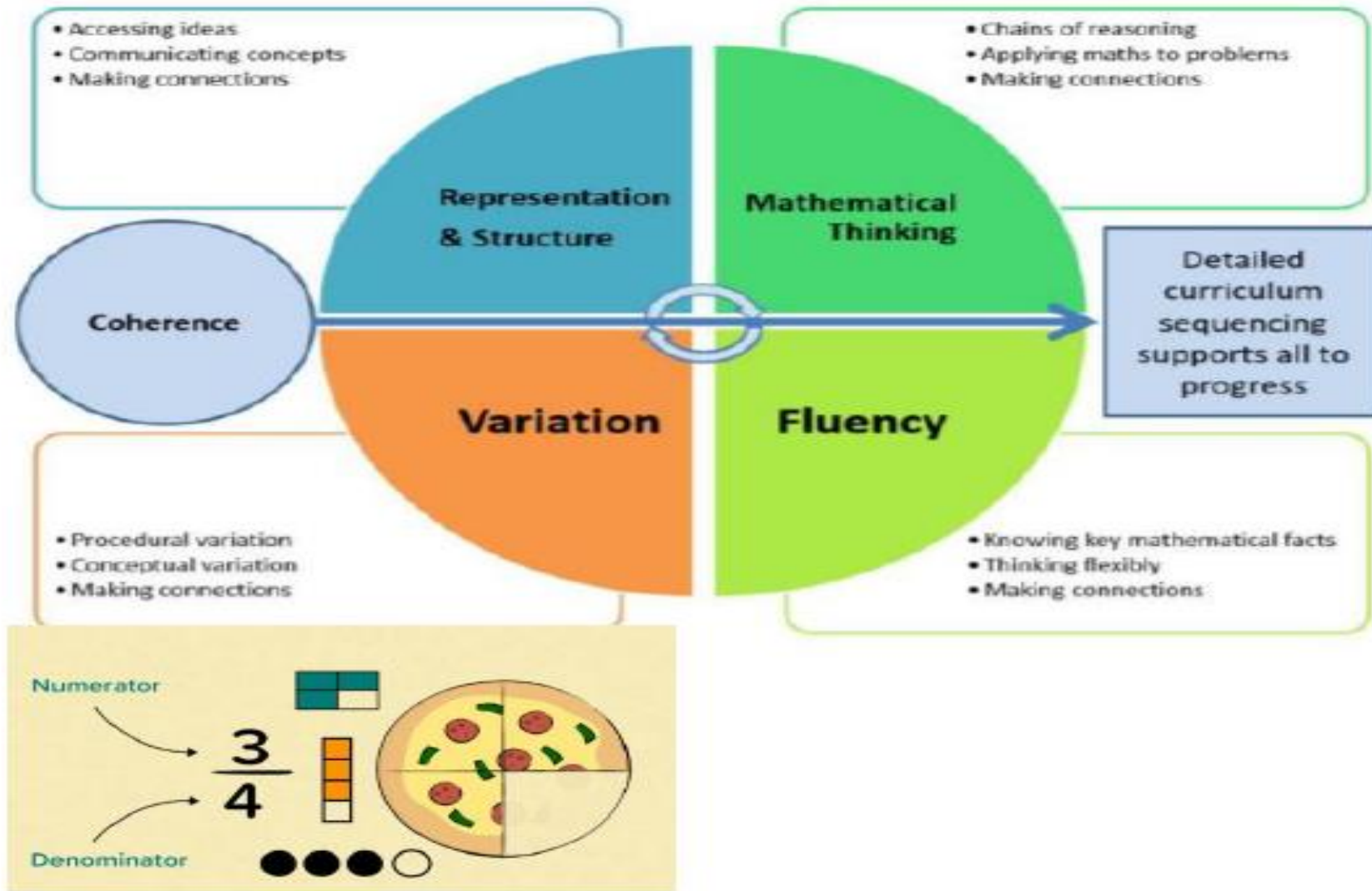
To try out some of the methods yourself!!

What is CPA?

The Concrete Pictorial Abstract (CPA) approach is a system of learning that uses physical and visual aids to build a child's understanding of abstract topics.



Teaching Mastery



Glossary

Addend - A number to be added to another.

Aggregation - combining two or more quantities or measures to find a total.

Augmentation - increasing a quantity or measure by another quantity.

Commutative - numbers can be added in any order.

Complement - in addition, a number and its complement make a total e.g. 300 is the complement to 700 to make 1,000

Difference - the numerical difference between two numbers is found by comparing the quantity in each group.

Exchange - Change a number or expression for another of an equal value.

Minuend - A quantity or number from which another is subtracted.

Partitioning - Splitting a number into its component parts.

Reduction - Subtraction as take away.

Subitise - Instantly recognise the number of objects in a small group without needing to count.

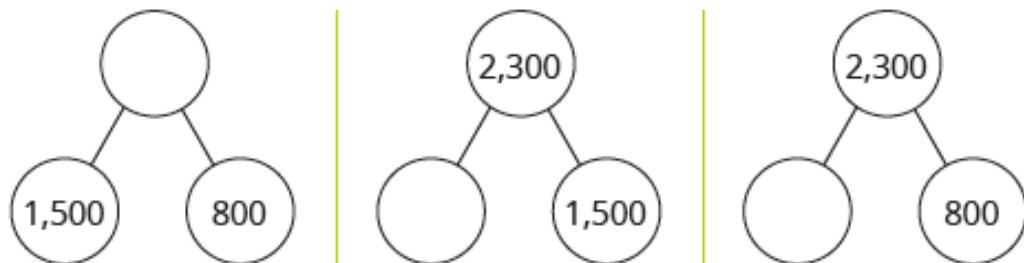
Subtrahend - A number to be subtracted from another.

Sum - The result of an addition.

Total - The aggregate or the sum found by addition.

Key learning

- Complete the part-whole models and number sentences.



$$1,500 + 800 = \underline{\quad\quad\quad} \quad 2,300 - 1,500 = \underline{\quad\quad\quad} \quad 2,300 - 800 = \underline{\quad\quad\quad}$$

How could you check your answers?

- Complete the bar model for $3,582 - 2,236 = 1,346$



Use the bar model to write the fact family.

- Which subtractions can be used to check the addition $1,574 + 3,432 = 5,006$?

$5,006 - 3,432$

$5,006 - 1,574$

$3,432 - 1,574$

$1,574 - 5,006$

- Which additions can be used to check the subtraction $3,265 - 823 = 2,442$?

$3,265 + 823$

$823 + 2,442$

$3,265 + 2,442$

$2,442 + 823$

- Use an inverse operation to check each calculation.

How many different inverse calculations can you do for each?

	Th	H	T	O
	4	5	1	9
+		7	2	3
	5	2	4	2
	1		1	

	Th	H	T	O
	3	4 6	1	4
-	1	4	8	4
	2	0	8	0

- Dani has answered a problem.

Mr Rose has £2,358 in his bank account.

He spends £1,209 on a family holiday.

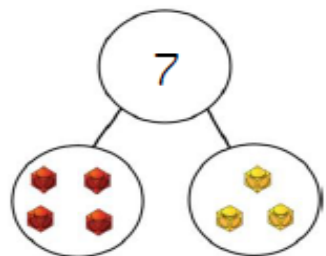
How much does he have left?

£ 1,049

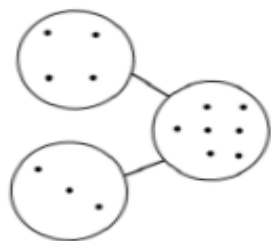
Estimate to check Dani's answer.

Now use an inverse calculation to check if Dani's answer is correct.

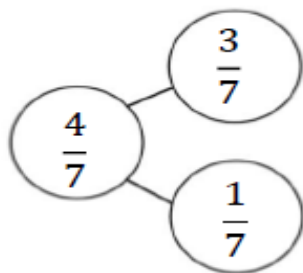
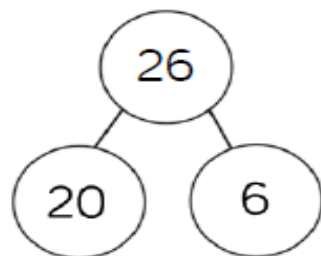
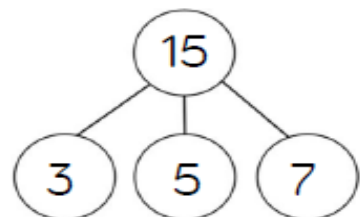
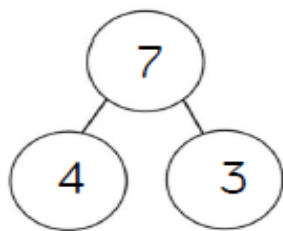
Part-Whole Model



$$7 = 4 + 3$$
$$7 = 3 + 4$$



$$7 - 3 = 4$$
$$7 - 4 = 3$$



Benefits

This part-whole model supports children in their understanding of aggregation and partitioning. Due to its shape, it can be referred to as a cherry part-whole model.

When the parts are complete and the whole is empty, children use aggregation to add the parts together to find the total.

When the whole is complete and at least one of the parts is empty, children use partitioning (a form of subtraction) to find the missing part.

Part-whole models can be used to partition a number into two or more parts, or to help children to partition a number into tens and ones or other place value columns.

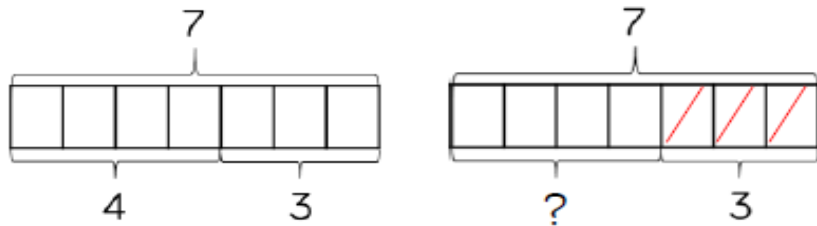
In KS2, children can apply their understanding of the part-whole model to add and subtract fractions, decimals and percentages.

Bar Model (single)

Concrete



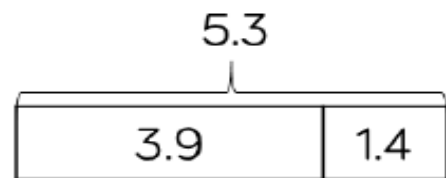
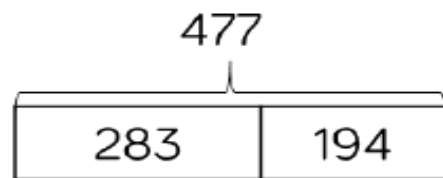
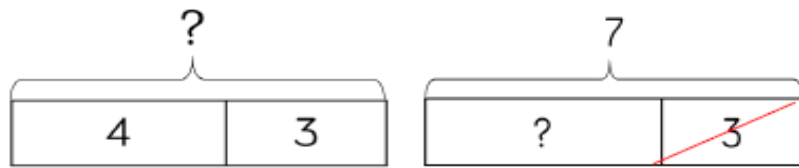
Discrete



Combination



Continuous



Benefits

The single bar model is another type of a part-whole model that can support children in representing calculations to help them unpick the structure.

Cubes and counters can be used in a line as a concrete representation of the bar model.

Discrete bar models are a good starting point with smaller numbers. Each box represents one whole.

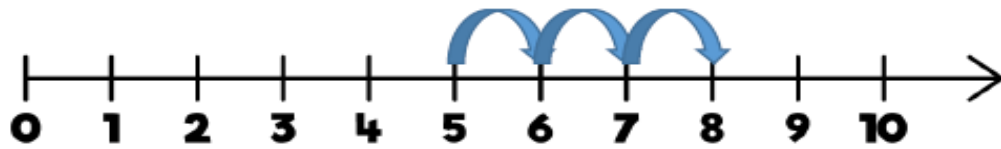
The combination bar model can support children to calculate by counting on from the larger number. It is a good stepping stone towards the continuous bar model.

Continuous bar models are useful for a range of values. Each rectangle represents a number. The question mark indicates the value to be found.

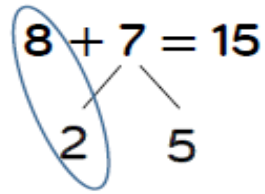
In KS2, children can use bar models to represent larger numbers, decimals and fractions.

Number Lines (labelled)

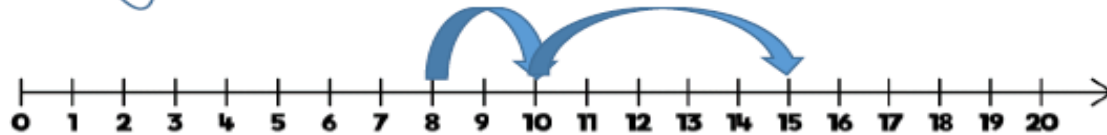
$$5 + 3 = 8$$



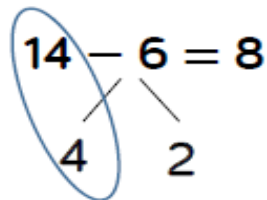
$$8 + 7 = 15$$



$$+ 2 \quad + 5$$



$$14 - 6 = 8$$



$$- 2 \quad - 4$$



Benefits

Labelled number lines support children in their understanding of addition and subtraction as augmentation and reduction.

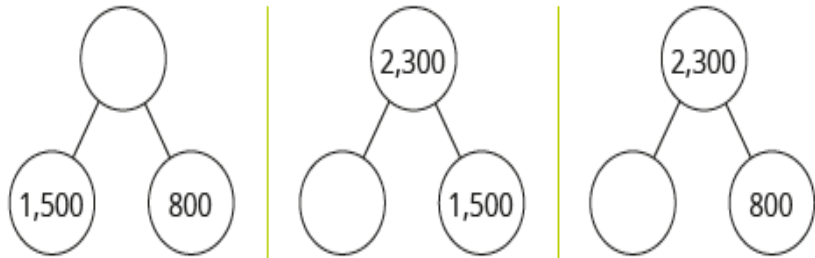
Children can start by counting on or back in ones, up or down the number line. This skill links directly to the use of the number track.

Progressing further, children can add numbers by jumping to the nearest 10 and then jumping to the total. This links to the making 10 method which can also be supported by ten frames. The smaller number is partitioned to support children to make a number bond to 10 and to then add on the remaining part.

Children can subtract numbers by firstly jumping to the nearest 10. Again, this can be supported by ten frames so children can see how they partition the smaller number into the two separate jumps.

Key learning

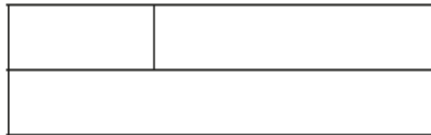
- Complete the part-whole models and number sentences.



$$1,500 + 800 = \underline{\quad\quad} \quad 2,300 - 1,500 = \underline{\quad\quad} \quad 2,300 - 800 = \underline{\quad\quad}$$

How could you check your answers?

- Complete the bar model for $3,582 - 2,236 = 1,346$



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- Which subtractions can be used to check the addition $1,574 + 3,432 = 5,006$?

$$5,006 - 3,432 \quad 5,006 - 1,574 \quad 3,432 - 1,574 \quad 1,574 - 5,006$$

- Which additions can be used to check the subtraction $3,265 - 823 = 2,442$?

$$3,265 + 823$$

$$823 + 2,442$$

$$3,265 + 2,442$$

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- Use an inverse operation to check each calculation.

How many different inverse calculations can you do for each?

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	4	5	1	9
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	1		1	

	Th	H	T	O
	3	4 ¹ 6		4
-	1	4	8	4
	2	0	8	0

- Dani has answered a problem.

Mr Rose has £2,358 in his bank account.

He spends £1,209 on a family holiday.

How much does he have left?

£ 1,049

Estimate to check Dani's answer.

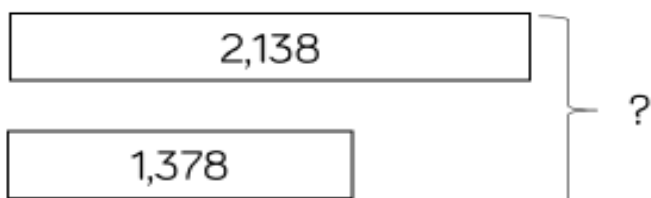
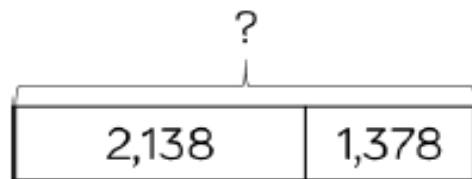
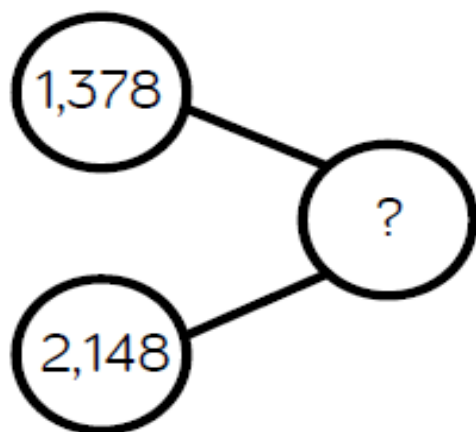
Now use an inverse calculation to check if Dani's answer is correct.

How
would you
do this
now?

The next set of slides provide information of the objectives for each year group: 4, 5 & 6 for addition.

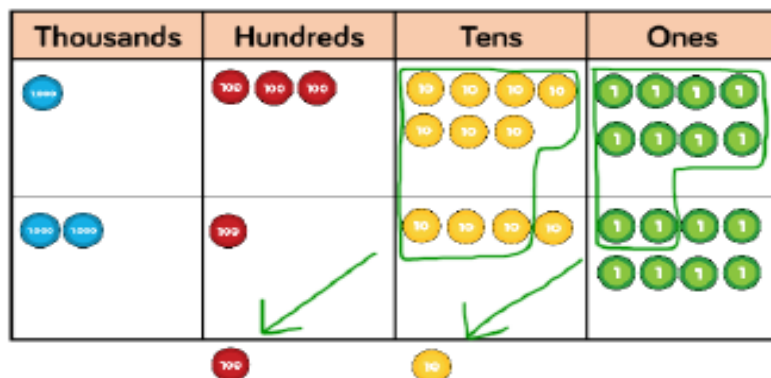
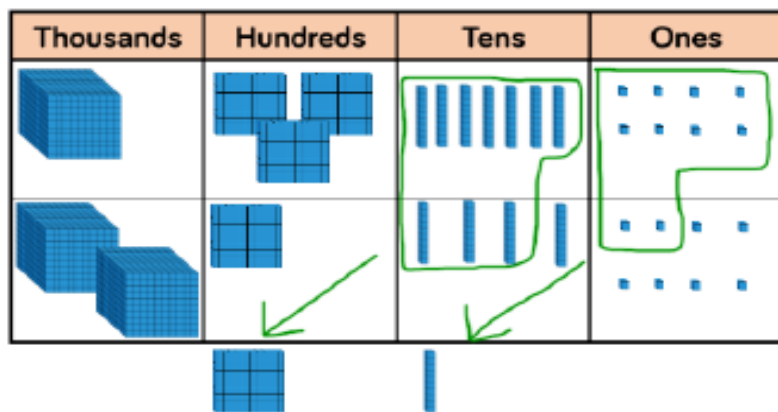
Skill: Add numbers with up to 4 digits

Year: 4



	1	3	7	8
+	2	1	4	8
	3	5	2	6
		1	1	

$$1,378 + 2,148 = 3,526$$



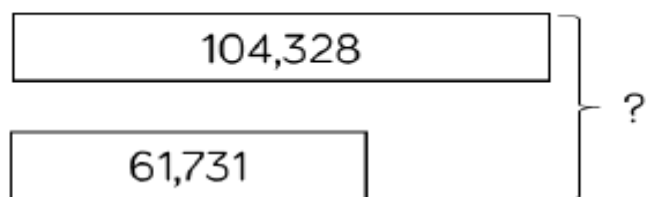
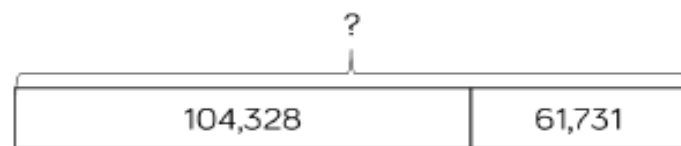
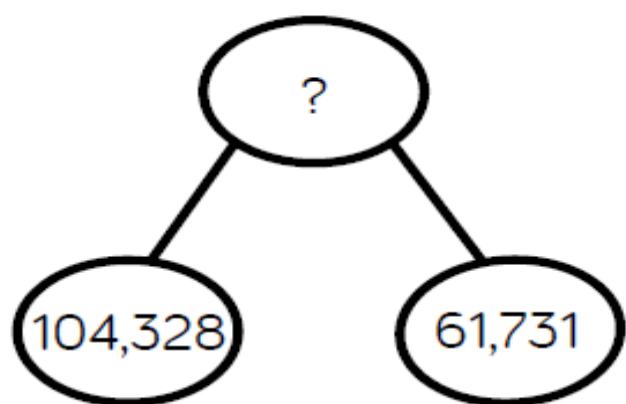
Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 4 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

Skill: Add numbers with more than 4 digits

Year: 5/6



$$104,328 + 61,731 = 166,059$$

HTh	TTh	Th	H	T	O
100,000		1,000 1,000 1,000 1,000	100 100 100	10 10	1 1 1 1 1 1 1 1
	10,000 10,000 10,000 10,000 10,000 10,000	1,000	100 100 100 100 100 100 100	10 10 10	1

1	0	4	3	2	8
+	6	1	7	3	1
1	6	6	0	5	9
					1

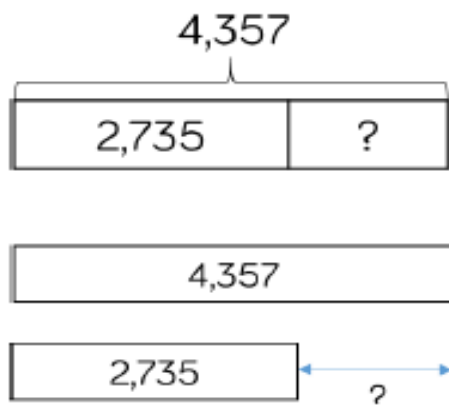
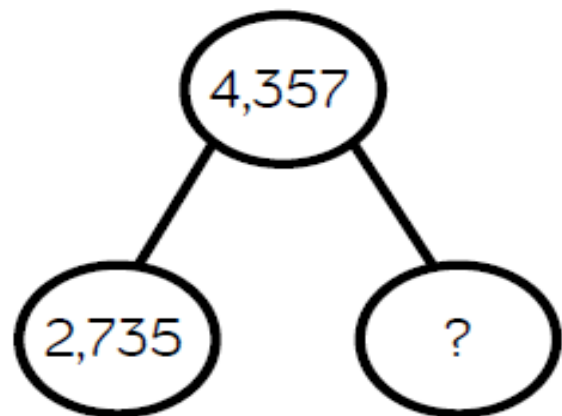
Place value counters or plain counters on a place value grid are the most effective concrete resources when adding numbers with more than 4 digits.

At this stage, children should be encouraged to work in the abstract, using the column method to add larger numbers efficiently.

The next set of slides provide information of the objectives for each year group: 4, 5 & 6 for subtraction.

Skill: Subtract numbers with up to 4 digits

Year: 4



$$\begin{array}{r} ^3 ^1 \\ 4357 \\ - 2735 \\ \hline 1622 \end{array}$$

$$4,357 - 2,735 = 1,622$$

Thousands	Hundreds	Tens	Ones

Thousands	Hundreds	Tens	Ones

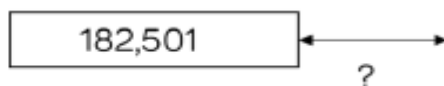
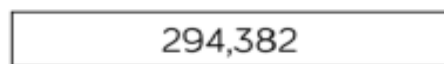
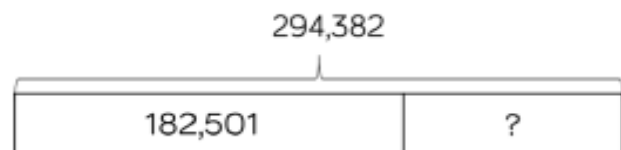
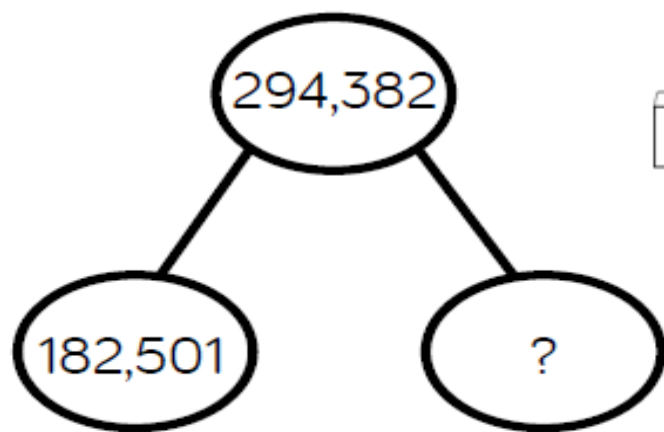
Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 4 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

Skill: Subtract numbers with more than 4 digits

Year: 5/6



$$294,382 - 182,501 = 111,881$$

HTh	TTh	Th	H	T	O
10,000 10,000	10,000 10,000 10,000 10,000 10,000 10,000	1,000 1,000 1,000 1,000	100 100 100 100 100 100 100 100 100 100	10 10 10 10 10 10 10 10	1 1

	2	9	3	13	8	2
-	1	8	2	5	0	1
	1	1	1	8	8	1

Place value counters or plain counters on a place value grid are the most effective concrete resource when subtracting numbers with more than 4 digits.

At this stage, children should be encouraged to work in the abstract, using column method to subtract larger numbers efficiently.

Please look at the school website for all the information on what children will be learning and how they will be taught. (Go to Curriculum – Maths)

Children from reception to Year 6 follow a scheme called 'White Rose Maths'.

Maths Curriculum Statement

At Herrick Primary School, we are currently adopting a Mastery Approach to mathematics.

The emphasis is on developing pupils' mathematic skills and master them alongside ensuring they are fluent in their knowledge of times tables and the four mathematical operations: addition, subtraction, multiplication and division. Various methods and strategies are introduced as they progress throughout the school and a greater emphasis is placed on children's reasoning skills once the basics are embedded.

This provides strategies

National Curriculum Progression

National curriculum and 'Ready to progress' mapping

Maths Curriculum Statement

Our vision for Maths at Herrick

Multiplication and division calculation policy.

Addition and subtraction calculation policy.

This tells you what the children will be learning

Reception

Autumn scheme of learning

Year 1

Autumn scheme of learning
Term overview

Year 2

Autumn scheme of learning
Term overview

Year 3

Autumn scheme of learning
Term overview

Year 4

Autumn scheme of learning
Term overview

Year 5

Autumn scheme of learning
Term overview

Year 6

Autumn scheme of learning
Term overview

This is a weekly breakdown



**To give each and
everyone a chance**

'learning never stops'