



Perton Primary Academy

Calculation Policy

2023 -2024

Reception to Year 4
Addition and Subtraction

Maths calculation Policy 2019-2020

This policy supports the White Rose maths scheme used throughout the school alongside Numicon, Nrich and NCTEM. Progression within each area of calculation is in line with the programme of study in the 2014 National Curriculum.

This calculation policy should be used to support children to develop a deep understanding of number and calculation. This policy has been designed to teach children through the use of concrete, pictorial and abstract representations.

Concrete representation— a pupil is first introduced to an idea or skill by acting it out with real objects. This is a 'hands on' component using real objects and is a foundation for conceptual understanding.

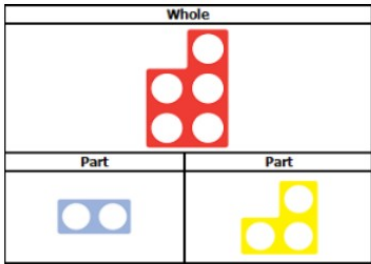
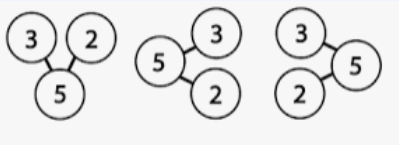
Pictorial representation - a pupil has sufficiently understood the 'hands on' experiences performed and can now relate them to representations , such as a diagram or picture of the problem.

Abstract representation—a pupil is now capable of representing problems by using mathematical notation, for example $12 \times 2 = 24$.

It is important that conceptual understanding , supported by the use of representation, is secure for all procedures. Reinforcement is achieved by going back and forth between these representations.

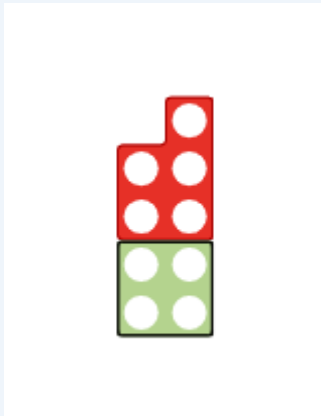
Addition (Reception)

Explore part part whole relationship— combining two parts to make a whole.

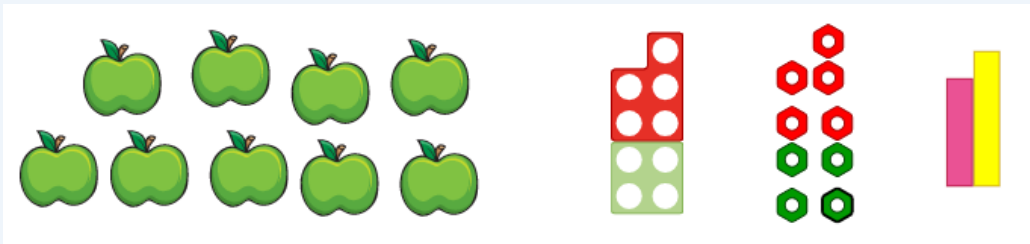


Using the ten frame and Numicon to support addition of single digits— counting all/ combining two groups.
Children combine Numicon to look for known shapes.

	$6 + 4 = 10$
	$4 + 4 = 8$
	$5 + 2 = 7$
	$2 + 4 = 6$



Solving problems using concrete, pictorial images.
Children use a range of concrete resources including counters, rods, numicon and

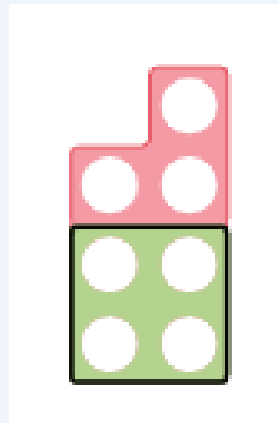


Subtraction (Reception)

Using concrete strategies for counting.

Subtraction by finding the difference.

Step 1—Cover larger Numicon with smaller Numicon to find the difference.

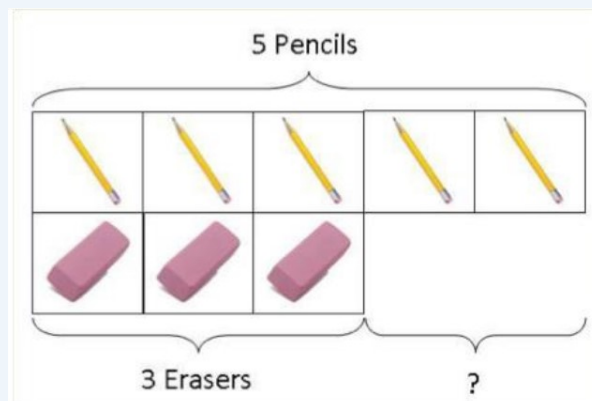


Step 2—cover the holes you are subtracting.

Step 3 -

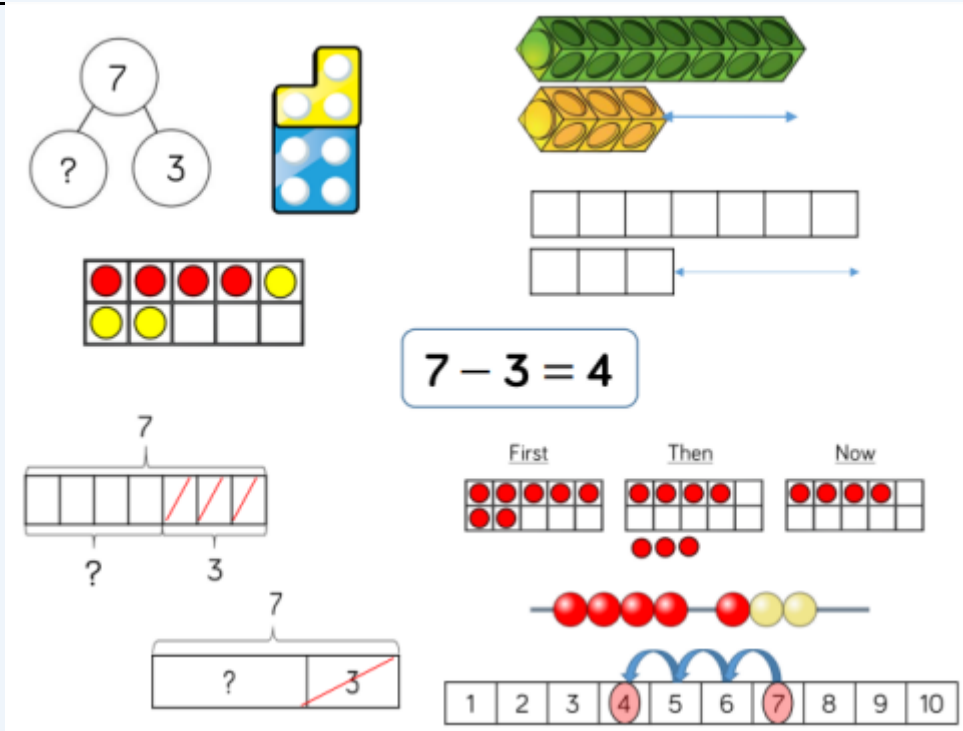
Look for the shape and calculate the answer

Using the ten frames to support subtraction by taking away



Subtraction (Year 1)

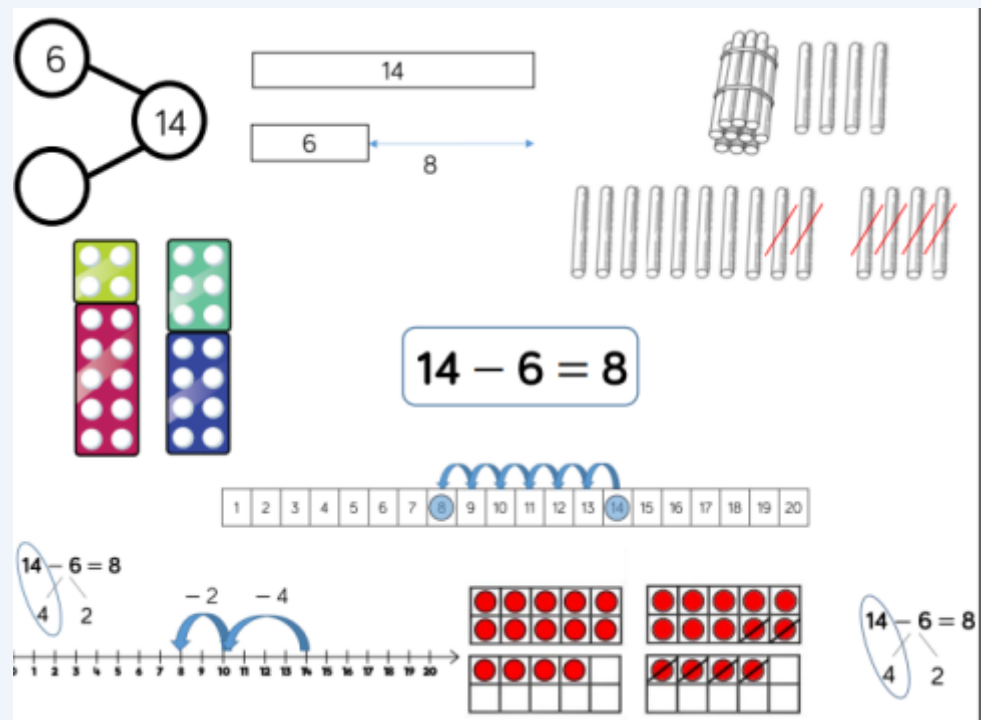
Subtracting a single digit number from a single digit number and a single digit from a two digit by crossing out pictures



Subtracting using the part part whole model (include problem solving with missing digits). $? - 5 = 2$

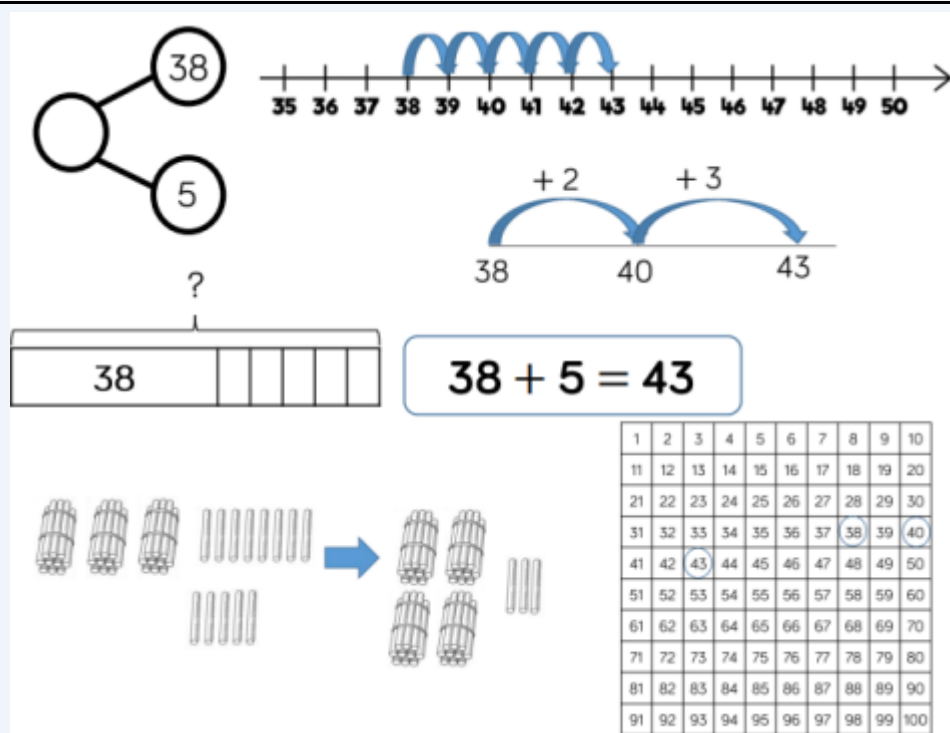
When subtracting using Dienes children should be taught to regroup (rename) a ten rod for 10 ones and then subtract from those ones. Subtracting Multiples of 10.

Using the vocabulary of 1 ten, two tens, etc, alongside 10, 20, 30 is important

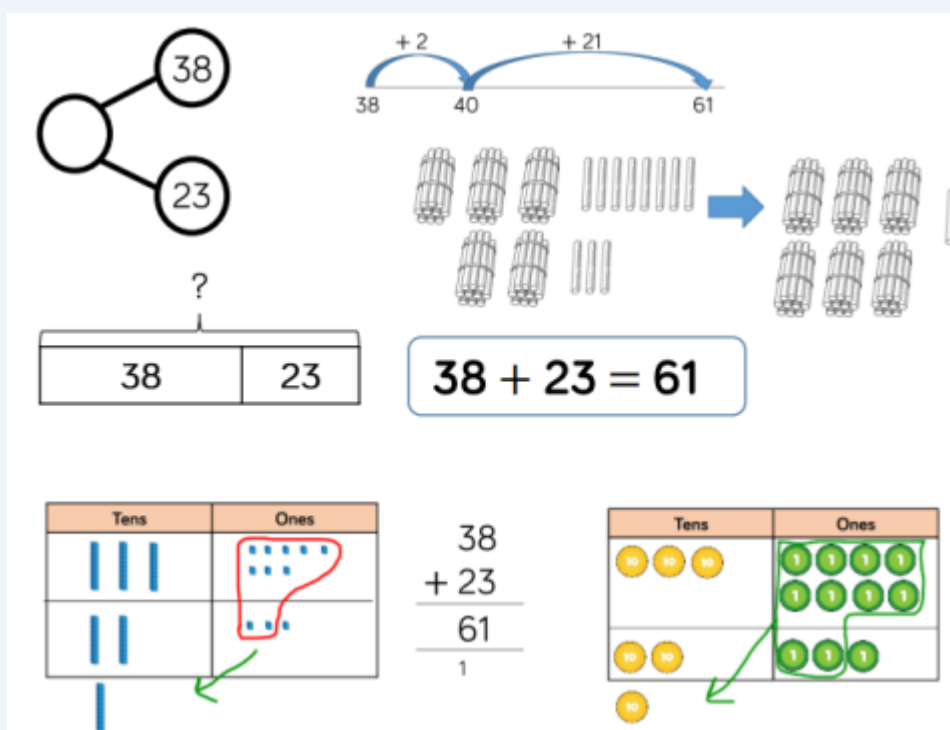


Addition (Year 2)

Using concrete and pictorial representations to add a 2 digit number to a 1 digit number and a 2 digit number to a tens number.



Using concrete and pictorial representations to add two 2 digit numbers.

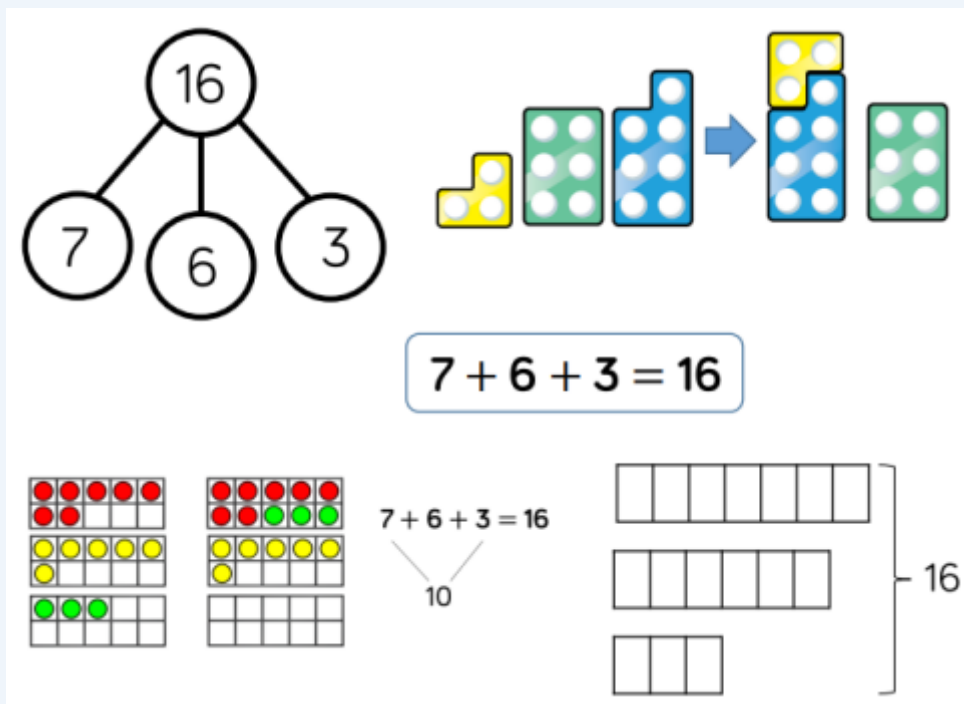


Addition (Year 2)

Using concrete and pictorial representations to add 3 single digit numbers.

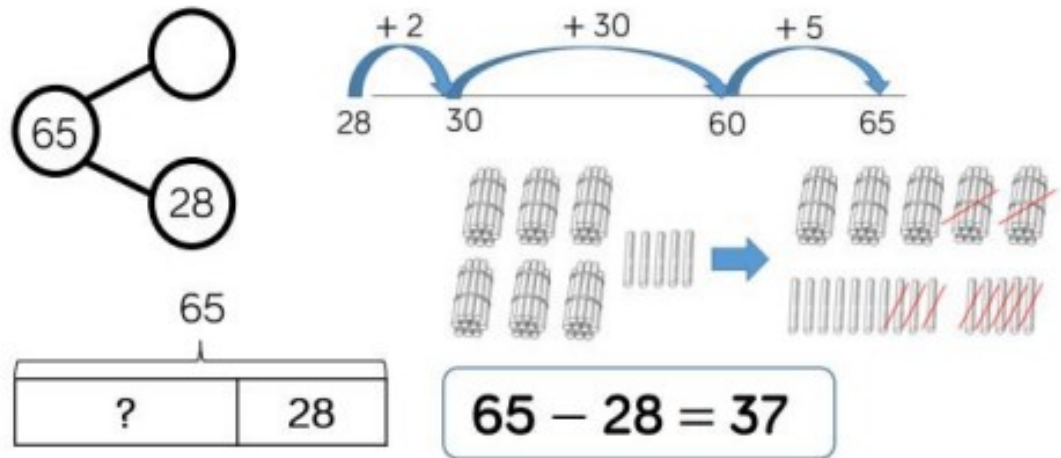
Using the bar model to find missing digits:

It is important for the children to use the bar model in this way to encourage the use of it to aid problem solving.

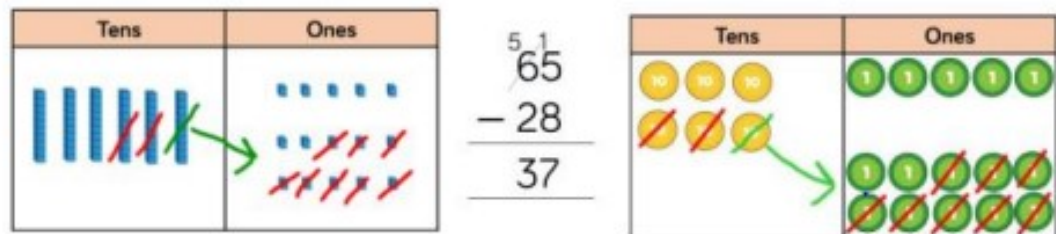


Subtraction (Year 2)

Using concrete and pictorial representations to subtract a 1 digit number from a 2 digit number



Using concrete and pictorial representations to subtract a 2 digit number from a tens number



Using concrete and pictorial representations to subtract a 2 digit number from a 2 digit number

Recognise and use the inverse relationship between addition and subtraction.

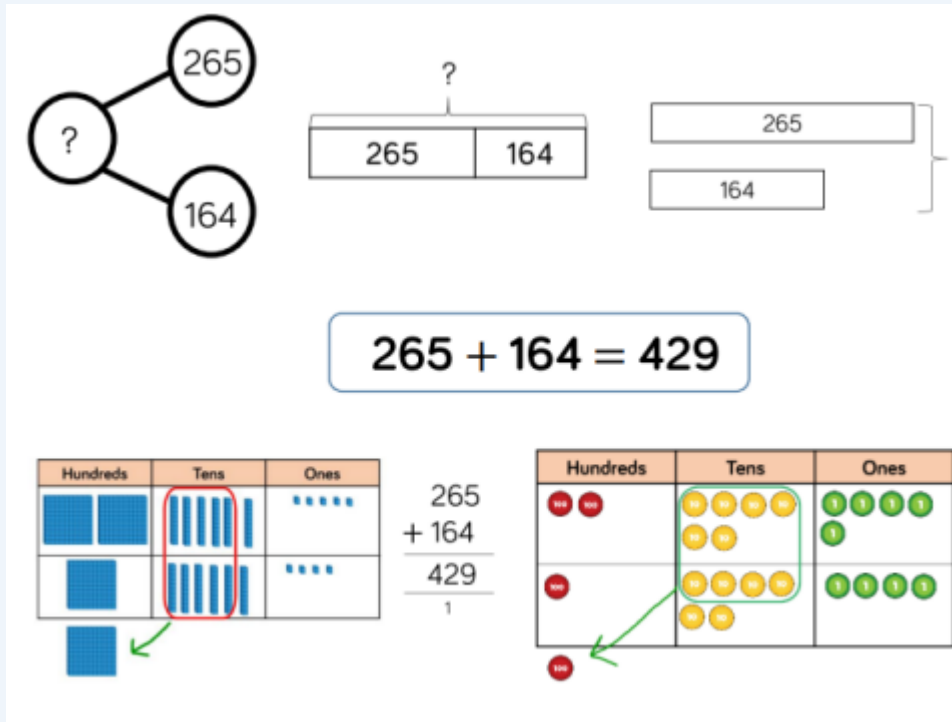
Addition (Year 3)

Add two three digit numbers.

Children need to first use equipment to support understanding of place value.

Start without renaming then gradually move onto renaming. Bar Modelling

It is important for the children to use the bar model in this way to encourage the use of it to aid problem solving.



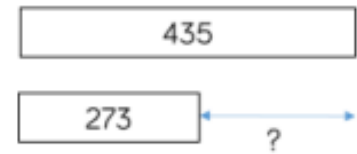
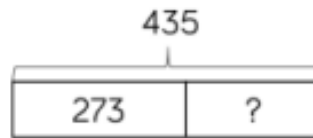
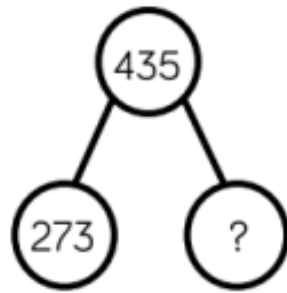
Subtraction (Year 3)

Use counters to practically calculate the answer.

Subtract up to 3 digits from 3 digits.

Children need to first use equipment to support understanding of place value.

Only when children are secure with method should exchanging be introduced.



$$435 - 273 = 262$$

Hundreds	Tens	Ones

$$\begin{array}{r} 3 1 \\ 435 \\ - 273 \\ \hline 262 \end{array}$$

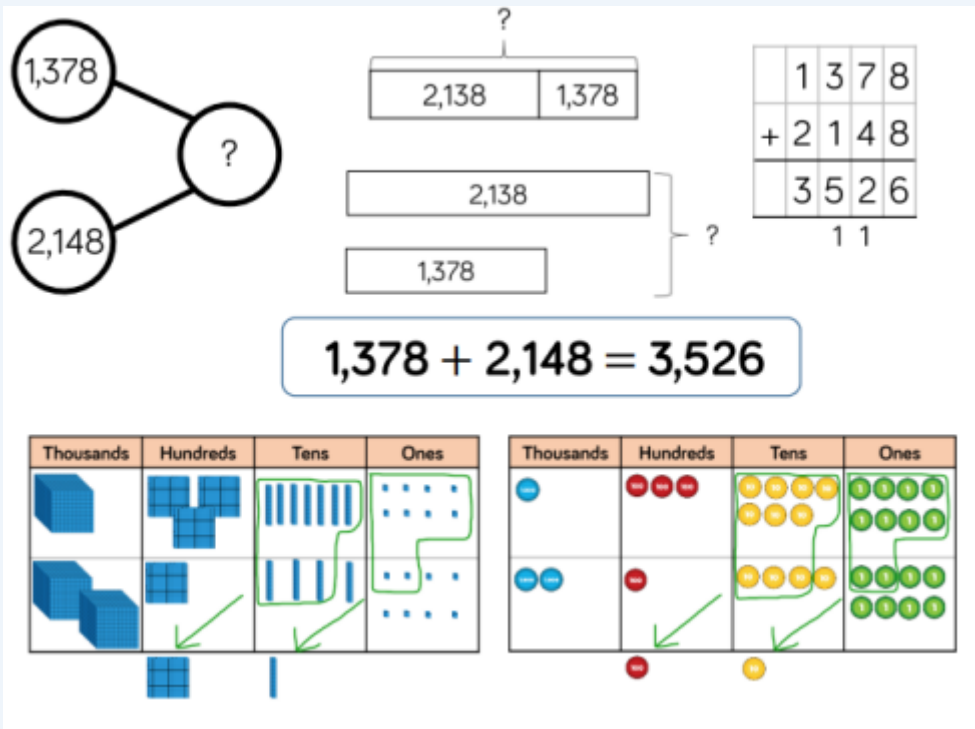
Hundreds	Tens	Ones

Addition (Year 4)

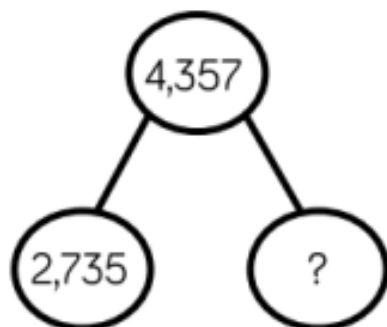
Adding numbers with up to 4 digits.

Again this should start with the children using equipment to support and lots of discussion about the values of digits.

Using the bar model to find missing digits.



Subtract with numbers up to four digits, including exchanging.



The diagram illustrates the subtraction of 2,735 from 4,357. At the top, a number line segment is shown with a bracket above it labeled 4,357. Below this, a box is divided into two sections: the left section is labeled 2,735 and the right section is labeled with a question mark. Below the box, the number 4,357 is written. At the bottom, a box is labeled 2,735. To the right of this box, a horizontal line with an arrow pointing left is labeled with a question mark, representing the difference to be found.

$$\begin{array}{r} \overset{3}{\cancel{4}}\overset{1}{3}57 \\ - 2735 \\ \hline 1622 \end{array}$$

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

Thousands	Hundreds	Tens	Ones

Thousands	Hundreds	Tens	Ones