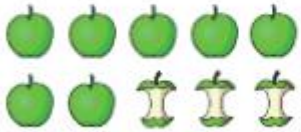
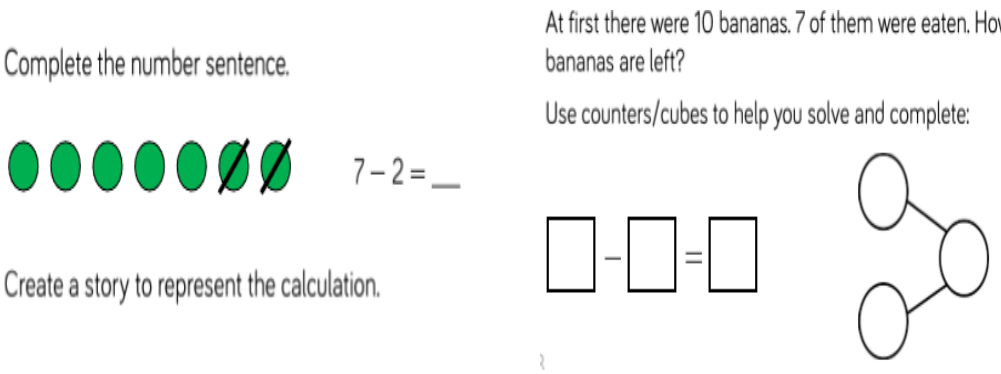
West Jesmond Calculation Policy Yr 1-Yr 6: Subtraction

Progression In Written Subtraction Methods

Year 1	Models & Examples
How Many Left? (1) Children are introduced to the language of subtraction rather than the subtraction symbol rather than the subtraction symbol being explored straight away' 'Taking away' is used in a range of real life contexts such as flying away and eating. The unit of zero is important so children know that when nothing is taken away the whole remains the same. First, then, now … story representations can help the children understand the concept of 'how many left.	There were 7 birds in a tree and 3 flew away. Complete the sentences.  At first there were ___ birds. Then ___ flew away. Now there are ___ birds in the tree. Complete the sentences to create a story and draw a part-whole model.  At first there were ___ apples. Then ___ were eaten. Now there are ___ apples.

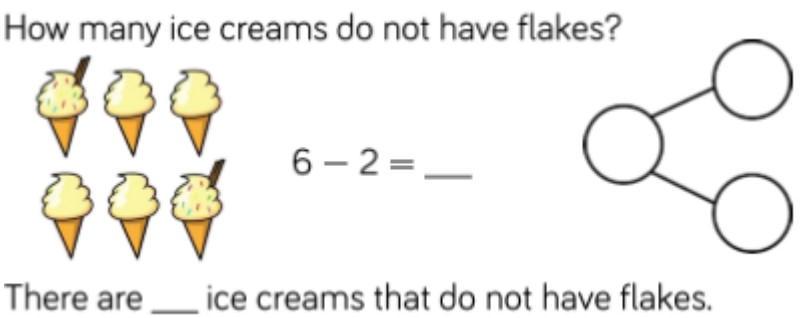
How Many Left? (2)

Once children understand the concept of taking away, the subtraction symbol can be introduced. It is still important for children to create stories about the calculation and use concrete and pictorial representations so they can deepen their understanding of subtraction.



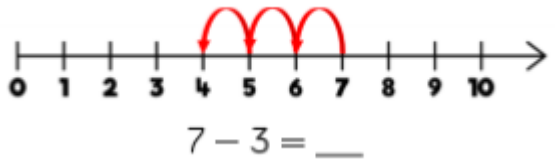
Subtraction – Breaking Apart

Children continue using the subtraction symbol. Building on their understanding of finding a part, they are introduced to subtraction by partitioning.



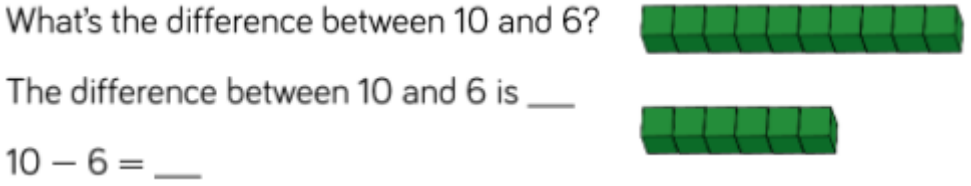
Count Back

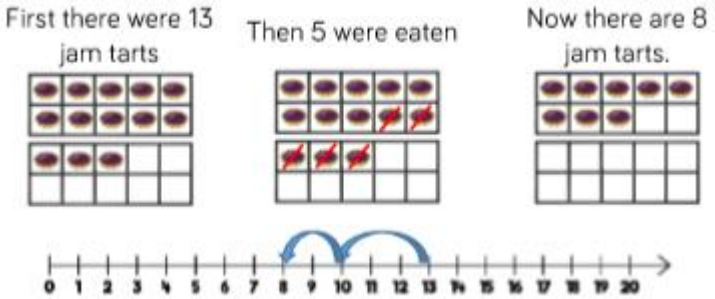
Children count backwards to subtract. It is an important step to help children work in the abstract. It is vital to model how to count backwards by 'putting the start number in our head and counting backwards.'

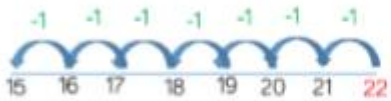
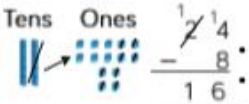
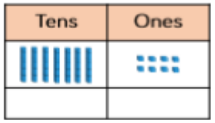


Find the Difference

Children explore finding the difference as a form of subtraction.



Subtraction – Not Crossing 10 Children build on the language of subtraction, recognising and using the subtraction symbol within 20.	There are 16 biscuits on a plate. Mo eats 5 of them. Complete the sentences. First there were ___ biscuits. Then ___ were eaten. Now there are ___ biscuits. 16 – 5 = ___  First there were 9 sheep. Then they all ran away. How many sheep are left? Use ten frames and counters to represent the sheep. 
Subtraction – Crossing 10 (1) For the first time, children will be introduced to subtraction where they have to cross ten. This small step focuses on the strategy of partitioning to make ten. Children should represent this using concrete manipulatives or pictorially to begin with. Ten frames and number lines are particularly useful to model the structure of this strategy. Children will move towards using this as a mental strategy.	
Subtraction – Crossing 10 (2) Children subtract numbers, within 20, crossing the 10. Children begin to understand the different structures of subtraction (taking away, partitioning, difference.)	Complete the number sentences to describe what happens to the sweets.  First there were ___ sweets. Then ___ sweets were eaten. Now there are ___ sweets. 

Year 2	Models & Examples
Subtract 10s Children should make use of place value to subtract 10s from a given number within 100.	 5 6 − 3 0 _____
Subtract 1-digit from 2-digits	22 − 7 =  Can you put the larger number in your head and count back the smaller number? Start at 22 and count back 7
	Subtract 8 from 24  1 1 2 4 − 8 1 6 • Do we have enough ones to take 8 ones away? • Exchange one ten for ten ones. • Take away 8 ones. • Can you write this using the column method?
Subtract with 2-digits (1)	78 minus 34 = _____ 8 ones − 4 ones = _____ 7 tens − 3 tens = _____ We have _____ tens and _____ ones.  34 − 13 = _____ 34 30 4 −10 −3 20 1 • Partition the number 34. • Partition 13 and subtract the ones and the tens. • Place the partitioned number back together. Subtract 13 from 28  2 8 − 1 3 1 5

Subtract with 2-digits (2)

Children use their knowledge that one ten is the same as ten ones to exchange when crossing a ten in subtraction.

Use the number line to subtract 12 from 51

51

Can you subtract the ones first and then the tens?
Can you partition the ones to count back to the next ten and then subtract the tens?

42 – 15 =

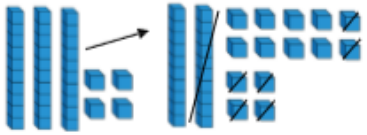
42 → 40, 2 → −10, −5

We can't subtract the ones. Can we partition differently?

42 → 30, 12 → −10, −5 → 20, 7

Now we can subtract the ones and then subtract the tens.
42 – 15 = 27

Take 16 away from 34



$$\begin{array}{r} {}^{2}\not{3}\,{}^{1}4 \\ -\,1\;6 \\ \hline 1\;8 \end{array}$$

Year 3

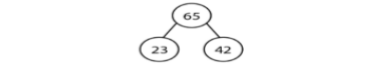
Models & Examples

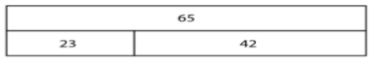
Subtract Multiples of 100

Children will apply their prior knowledge of subtracting ones and tens to subtracting multiples of 100. Using concrete manipulatives and pictorial representations throughout is important so the children can see the value of the digits.

Use a range of familiar representations of a given calculation alongside the column-subtraction layout so that children see the relationship between the numbers, including:
Part-part-wholes and Dienes

Part–part–wholes:



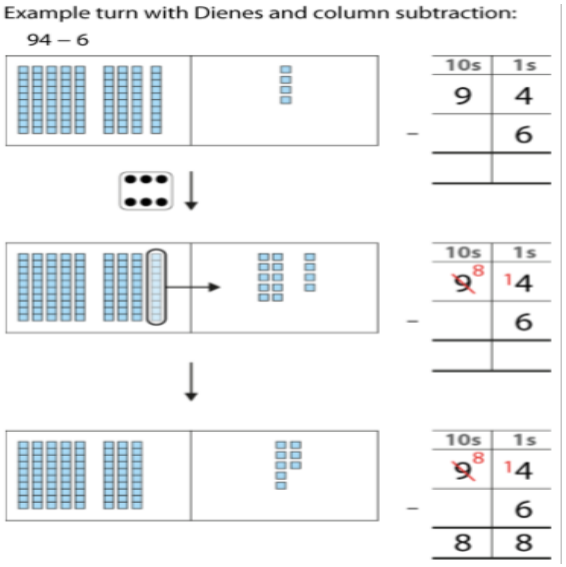


Column subtraction:

$$\begin{array}{r} 6\;5 \\ -\,2\;3 \\ \hline 4\;2 \end{array}$$

Example turn with Dienes and column subtraction:

94 – 6



3-digit & 1-digit Numbers

During this small step, children subtract ones from a 3-digit number without an exchange.

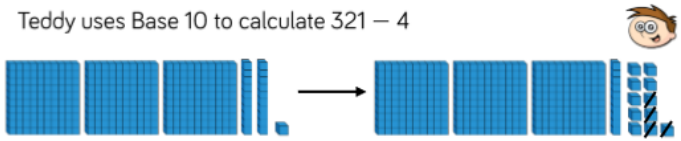
Use the place value grid to complete the calculations.

214 – 3 = ___ 214 + 3 = ___

Subtract 1-digit from 3-digits

Children subtract 1-digit from a 3-digit number using an exchange. Children need to be secure in the fact that 321 is 3 hundreds, 2 tens and 1 one but that it is also 3 hundreds, 1 ten and 11 ones.

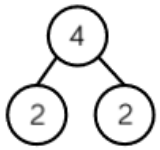
Teddy uses Base 10 to calculate 321 – 4

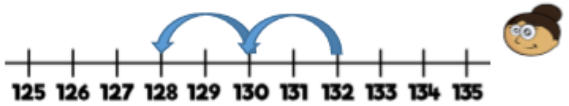


Use this method to calculate:

322 – 4 322 – 7 435 – 7

Dora uses the part-whole model and number line to solve 132 – 4

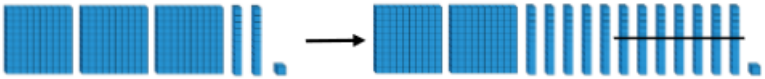




Subtract 2-digits from 3-digits

Children subtract multiples of 10 from a 3-digit number, with an exchange. The examples show different ways this concept could be taught using number lines and part-whole models. The column method could be used, however it is not the most efficient method. Counting backwards in tens or using 100 to help will support mental strategies.

Rosie uses Base 10 to subtract 70 from 321



321 – 70 = 251

Count back in tens to solve 240 – 70

Amir calculates 425 – 90 by subtracting 100 and then adding 10

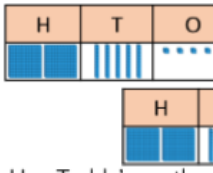
425 – 100 = 325

325 + 10 = 335

Subtract 2-digits from 3-digits

Children focus on the position of numbers and place value to subtract 2-digits from 3-digits using the column method. Children start by exchanging one ten for ten ones. Next they exchange one hundred for ten tens before subtracting numbers where there are exchanges in both columns. Encourage children to use Base 10 and place value counters so they can physically exchange and see the link between the concrete and the written column method.

Teddy uses Base 10 to subtract 28 from 255

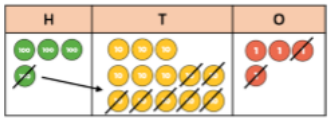


	2	$^{4}\cancel{5}$	$^{1}5$
−		2	8
	2	2	7

Use Teddy's method to calculate:

365 – 48 492 – 38 722 – 16

Alex uses place value counters to calculate 434 – 72

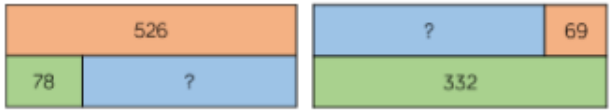


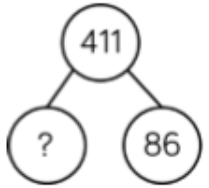
	$^{3}\cancel{4}$	$^{1}3$	4
−		7	2
	3	6	2

Use Alex's method to calculate:

248 – 67 247 – 67 354 – 92

Calculate the missing number in each model.





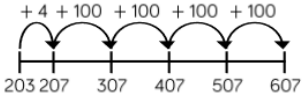
Subtract 3-digits from 3-digits (1)

It is important for the children to understand that there are different methods of subtraction. They need to explore efficient strategies for subtraction, including:

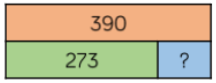
- Counting on (number lines)
- Near subtraction
- Number bonds

They then move on to setting out formal column subtraction supported by practical equipment.

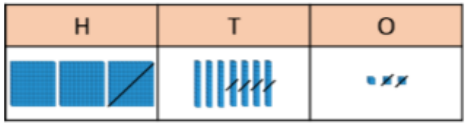
We can count on using a number line to find the missing value on the bar model. E.g.



Use this method to find the missing values.



Mo uses Base 10 to subtract 142 from 373



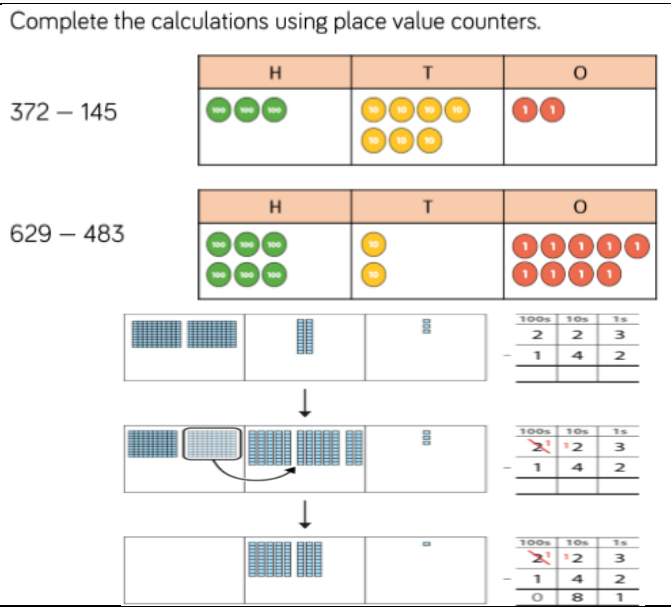
	3	7	3
−	1	4	2

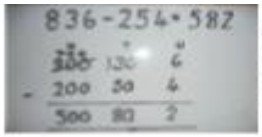
Use Mo's method to calculate:

565 – 154 565 – 145 565 – 165

Subtract 3-digits from 3-digits (2)

Children explore column subtraction using concrete manipulatives. It is important to show the column method alongside so that children make the connection to the abstract method and so understand what is happening.
Children progress from an exchange in one column, to an exchange in two columns. Reinforce the importance of recording any exchanges clearly in the written method.





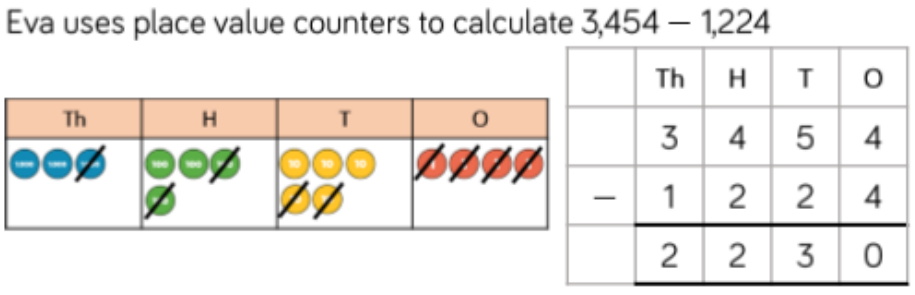
Year 4

Models & Examples

Subtract Two 4-digit Numbers (1)

Building on their experiences in Year 3, children use their knowledge of subtracting using the formal column method to subtract two 4-digit numbers.

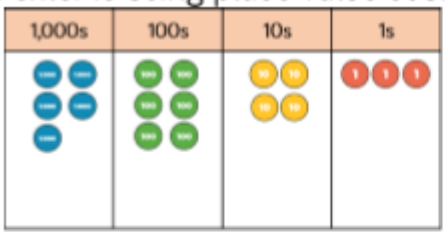
Children will focus on calculations with no exchanges, concentrating on the value of each digit.

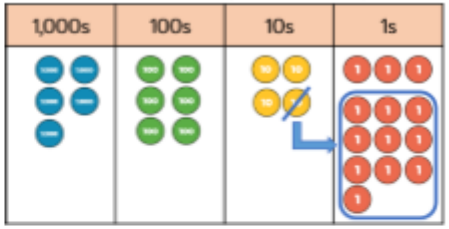


Subtract Two 4-digit Numbers (2)

Children next explore subtractions where there is one exchange. They use place value counters to model the exchange and match this with the written column method.

Dexter is using place value counters to calculate 5,643 – 4,316





	Th	H	T	O
	5	6	3 4	1 3
–	4	3	1	6
	1	3	2	7

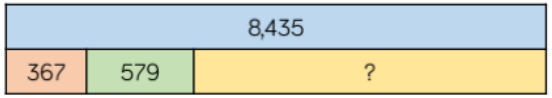
Subtract Two 4-digit Numbers (3)

Children explore what happens when a subtraction has more than one exchange. They can continue to use manipulatives to support their understanding.

Encourage children to continue to explain their working to ensure they have a secure understanding of exchange within 4-digits numbers.

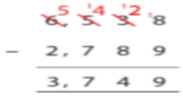
A shop has 8,435 magazines.
367 are sold in the morning and 579 are sold in the afternoon.

How many magazines are left?



There are ____ magazines left.

Column subtractions:



Find the missing 4-digit number.

	Th	H	T	O
	?	?	?	?
+	4	6	7	8
	7	4	3	1

Efficient Subtraction

Children use their understanding of column subtraction and mental methods to find the most efficient methods of subtraction. They compare the different methods of subtraction and discuss whether they would partition, take away or find the difference.

Ron, Rosie and Dexter are calculating 7,000 – 3,582

Here are their methods:

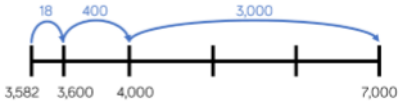
Ron

	Th	H	T	O
	6 ~~7~~	9 ~~0~~	9 ~~0~~	10
–	3	5	8	2
	3	4	1	8

Rosie

	Th	H	T	O
	6	9	9	9
–	3	5	8	1
	3	4	1	8

Dexter



3,000 + 400 + 18 = 3,418

Whose method is most efficient?

Use the different methods to calculate 4,000 – 2,831

Same difference:

Year 5

Models & Examples

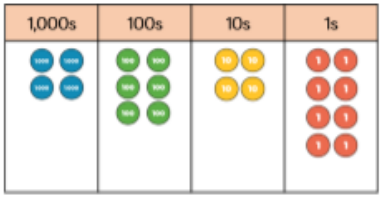
Subtract More than 4-digits

Building on Year 4 experience, children use their knowledge of subtracting using the formal column method to subtract numbers with more than four digits. Children will be focusing on exchange and will be concentrating on the correct place value.

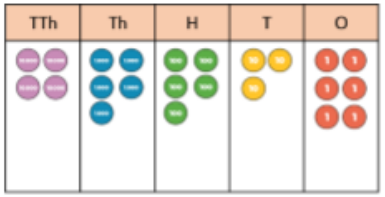
It is important that children know when an exchange is and isn't needed. Children need to experience 0 as a placeholder.

Calculate:

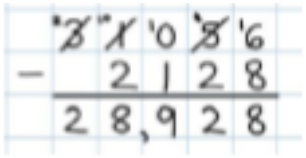
4,648 – 2,347



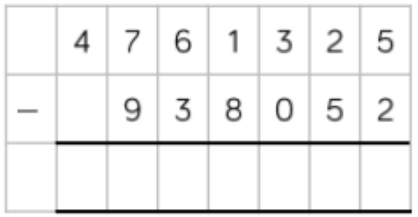
45,536 – 8,426



Children will be confident with the formal method of decomposition, which can be modelled with place value counters to enhance their understanding.



Use zeros for place-holders.

Year 6	Models & Examples
Subtract Integers Children consolidate their knowledge of column subtraction, reinforcing the language of 'exchange. 'Children will consider whether the column method is always appropriate. They use these skills to solve multi-step problems in a range of contexts.	 834,501 – 299,999
Subtract with increasingly large and more complex numbers and decimal values.