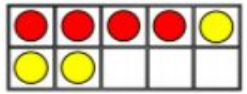
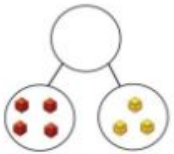
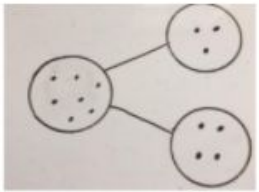
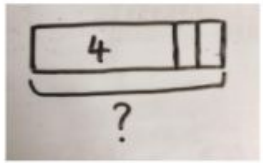
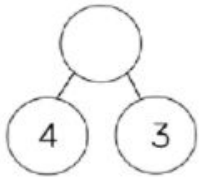
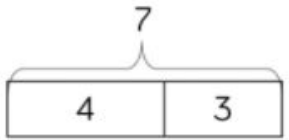
Ysgol Maes y Mynydd
Calculation Policy

Addition and Subtraction

Calculation policy: Addition

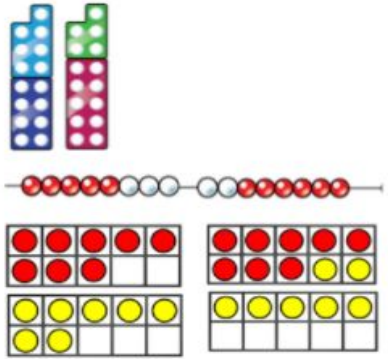
Key vocabulary: Sum, total, parts and whole, plus, add, altogether, more, ‘is equal to’, ‘is the same as’.

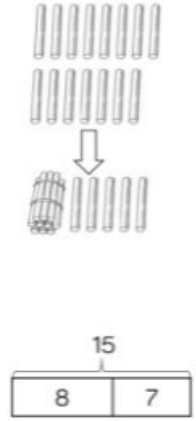
Skill	Concrete	Pictorial	Abstract
Add 1 digit numbers within 10. When adding numbers to 10, children can explore both aggregation and augmentation. The part-whole model, discrete and continuous bar model, numicon and tens frame support aggregation. The combination bar model, ten frame, bead string and number line all support augmentation.	   	   	$4 + 3 = 7$  

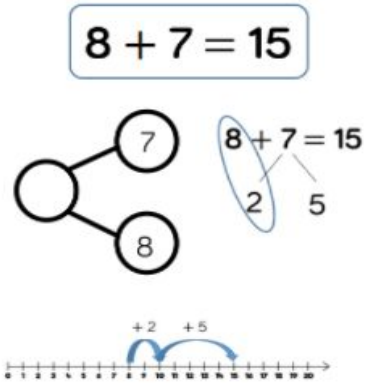
Add 1 and 2 digit numbers to 20.

When adding one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.

Different manipulatives can be used to represent this exchange. Use concrete resources alongside number lines to support children in understanding how to partition their jumps.





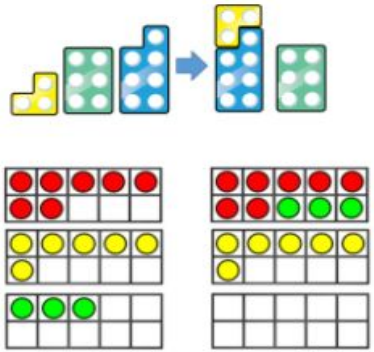


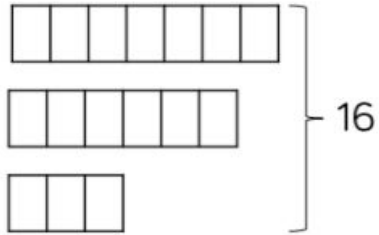
Add three 1-digit numbers.

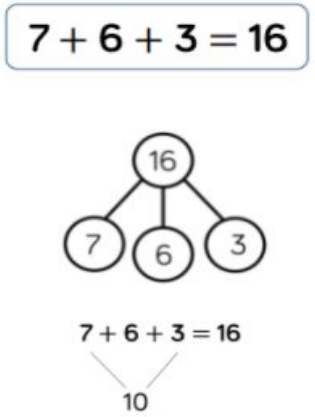
When adding three 1-digit numbers, children should be encouraged to look for number bonds to 10 or doubles to add the numbers more efficiently.

This supports children in their understanding of commutativity.

Manipulatives that highlight number bonds to are effective when adding three 1-digit numbers.





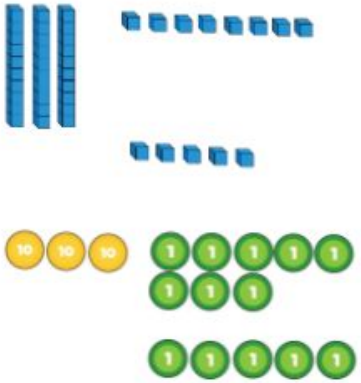


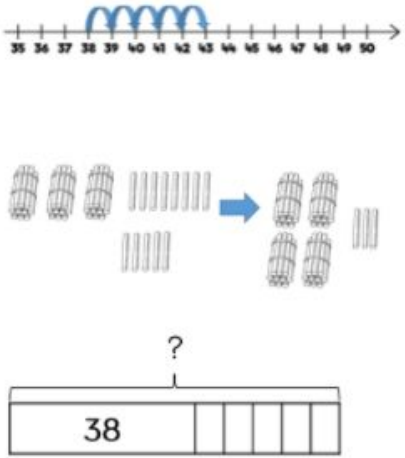
Add 1-digit and 2-digit numbers to 100.

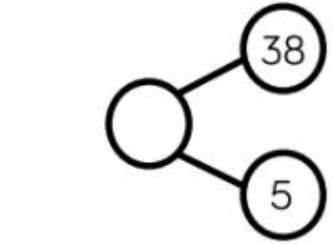
When adding single digits to a two-digit number, children should be encouraged to count on from the larger number.

They should also apply their knowledge of number bonds to add more efficiently e.g. 8 + 5 =13 so 38 + 5 = 43.

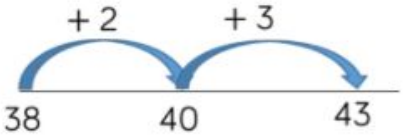
Hundred squares and straws can support children to find the number bond to 10.







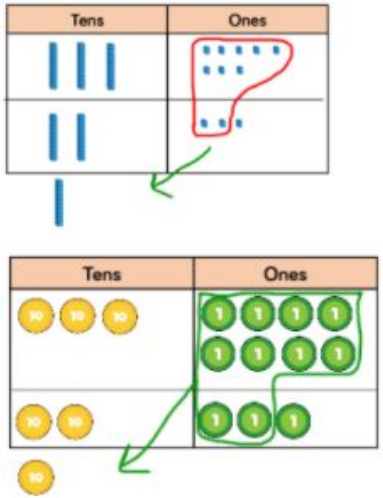
$$38 + 5 = 43$$

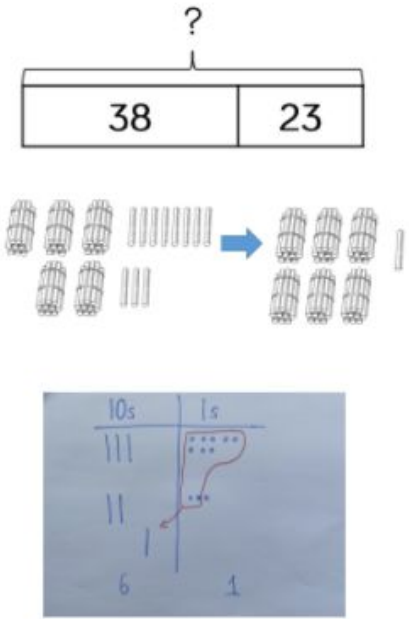


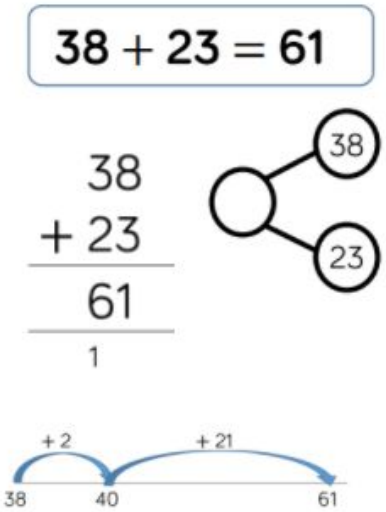
Add two 2-digit numbers to 100.

At this stage, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws will be less efficient.

Children can also use a blank number line to count on to find the total. Encourage them to jump to multiples of 10 to become more efficient.





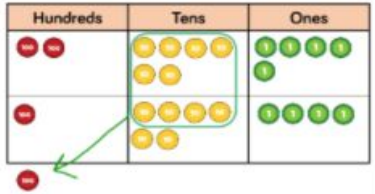


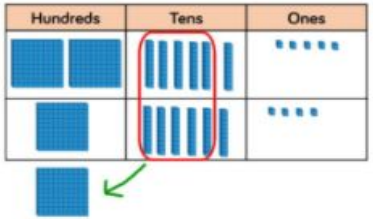
Add numbers with up to 3 digits.

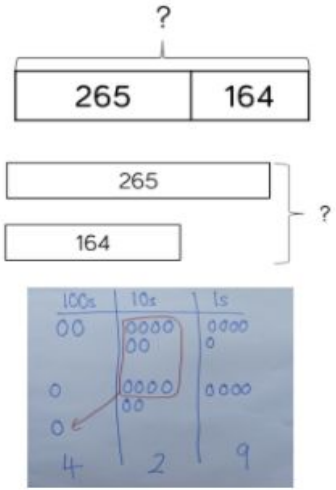
Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 3 digits.

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

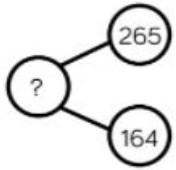
Plain counters on a place value grid can also be used to support learning.







265 + 164 = 429

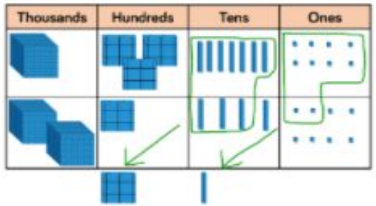


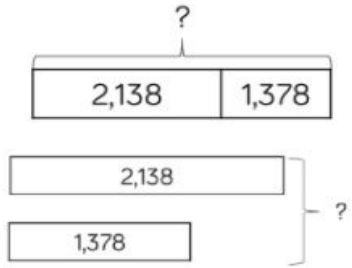
$$\begin{array}{r} 265 \\ +\ 164 \\ \hline 429 \\ {\scriptstyle 1\ \ \ } \end{array}$$

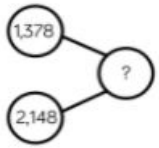
Add numbers with up to 4 digits.

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.



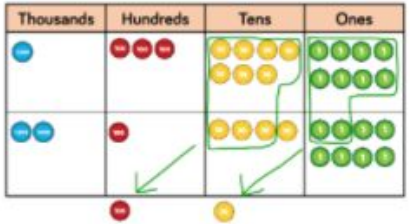


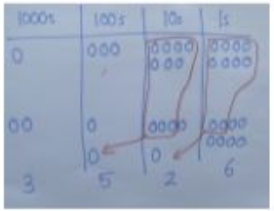


$$\begin{array}{r} 1378 \\ +\ 2148 \\ \hline 3526 \\ {\scriptstyle 1\ 1\ \ } \end{array}$$

1,378 + 2,148 = 3,526

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

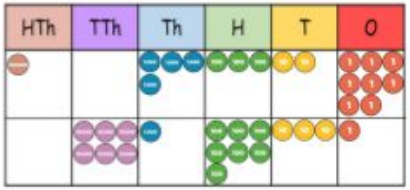


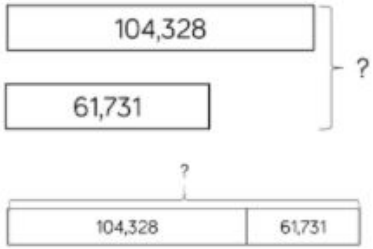


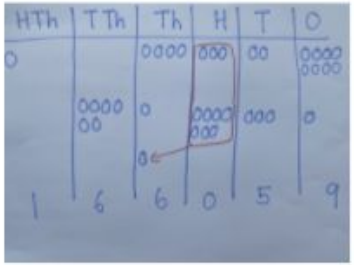
Add numbers with more than 4 digits.

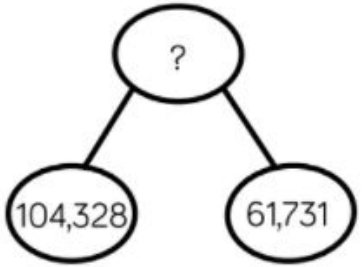
Place value counters or plain counters on a place value grid are the most effective concrete resources when adding numbers with more than 4 digits.

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









104,328 + 61,731 = 166,059

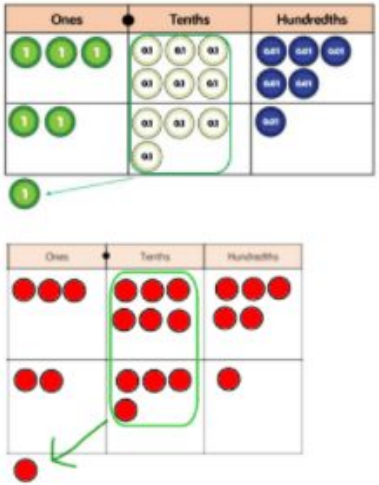
1	0	4	3	2	8
+	6	1	7	3	1
1	6	6	0	5	9

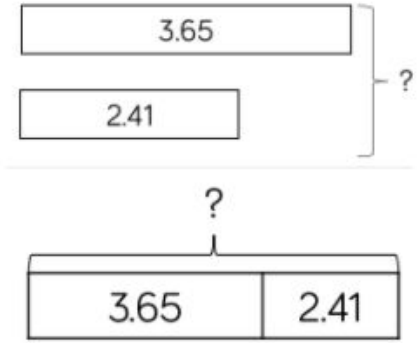
1

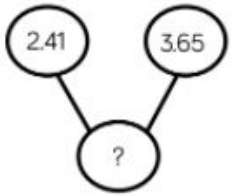
Add with up to 3 decimal places.

Place value counters and plain counters on a place value grid are the most effective manipulatives when adding decimals with 1, 2 and then 3 decimal places.

Ensure children have experience of adding decimals with a variety of decimal places.This includes putting this into context when adding money and other measures.





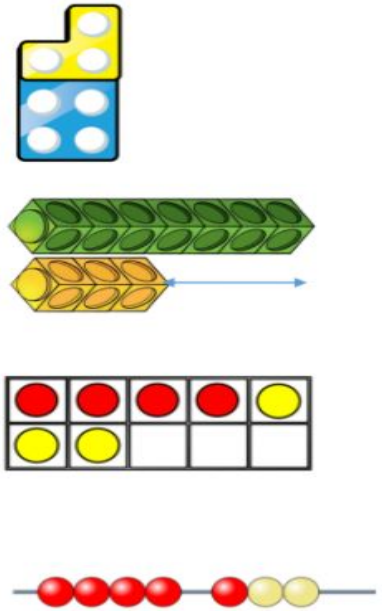
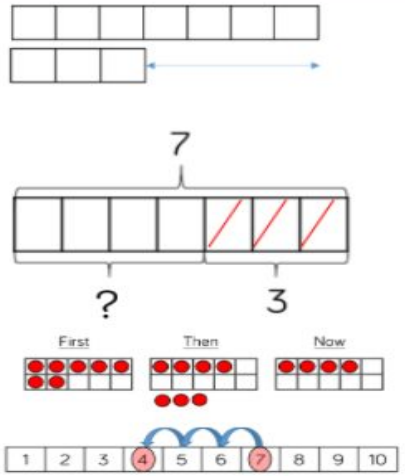
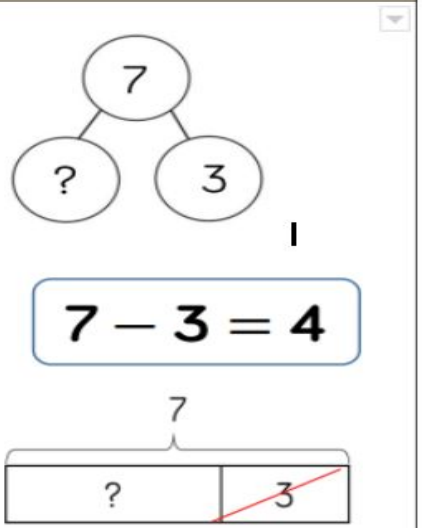


$$\begin{array}{r} 3.65 \\ +\ 2.41 \\ \hline 6.06 \\ {\scriptstyle 1} \end{array}$$

$$3.65 + 2.41 = 6.06$$

Calculation policy: Subtraction

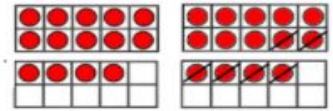
Key vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease.

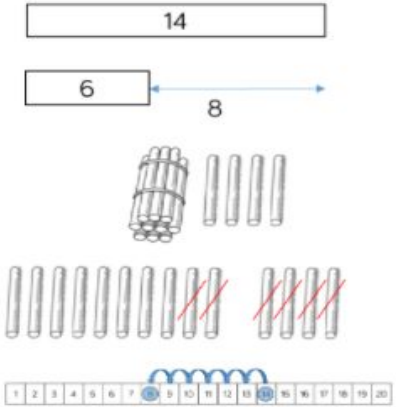
Skill	Concrete	Pictorial	Abstract
Subtract two 1 - digit numbers to 10 Part-whole models, bar models, ten frames and number shapes support partitioning. Ten frames, number tracks, single bar models and bead strings support reduction. Cubes and bar models with two bars can support finding the difference.			

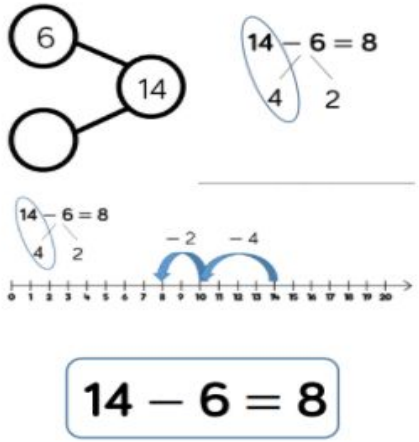
Subtract 1 and 2-digit numbers to 20

When subtracting one-digit numbers that cross 10, it is important to highlight the importance of ten ones equaling one ten.

Children should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, numicon and number lines are particularly useful for this.



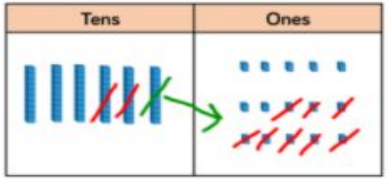


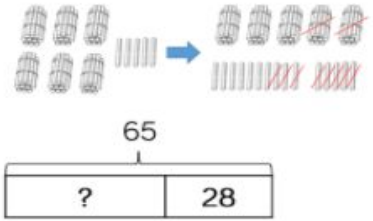


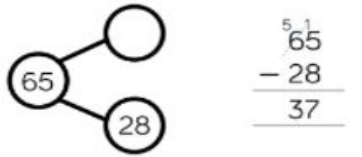
14 − 6 = 8

Subtract 1 and 2-digit numbers to 100

At this stage, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws will become less efficient.







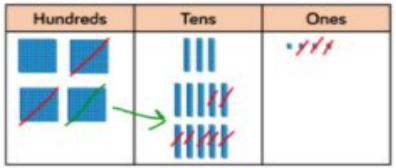
65 − 28 = 37

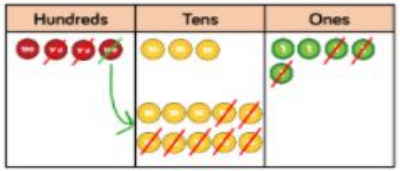
Subtract numbers with up to 3 digits

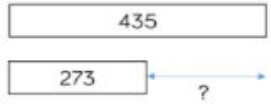
Base 10 and place value counters are the most effective manipulative when subtracting numbers with up to 3 digits.

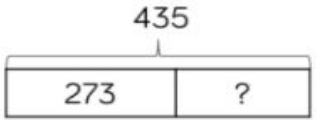
Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

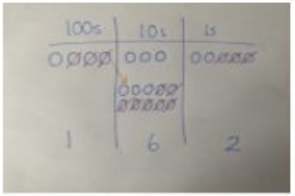
Plain value counters on a place value grid can also be used to support learning.

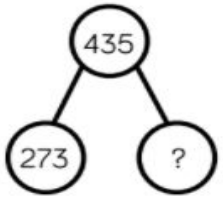












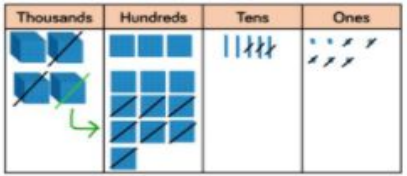
435 - 273 = 162

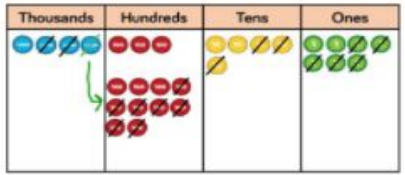
Subtract numbers with up t 4 digits

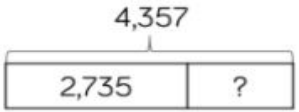
Base 10 and place value counters are the most effective manipulative when subtracting numbers with up to 4 digits.

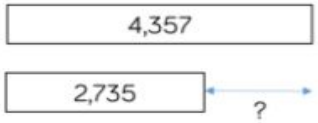
Ensure that children write out their calculation alongside any concrete resources so they can see the links to the written column method.

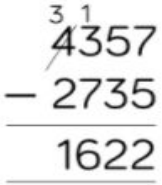
Plain place value counters on a

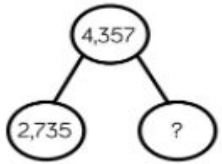


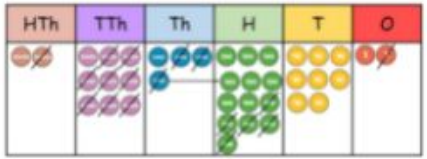
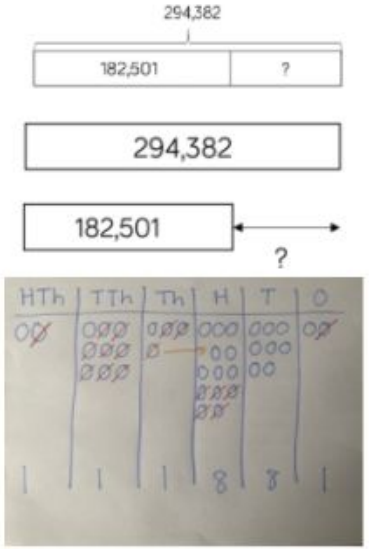
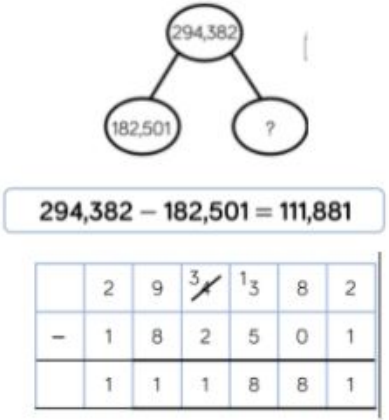








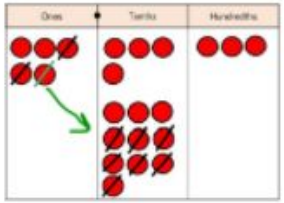


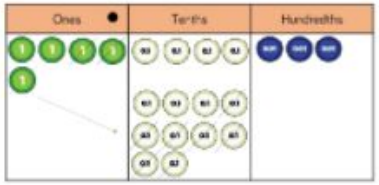
place value grid can also be used to support learning.			
Subtract numbers with more than 4 digits Place value counters or plain counters on a place value grid are the most effective concrete resource when subtracting numbers with more than 4 digits. At this stage children should be encouraged to work in the abstract, using column method to subtract larger numbers efficiently.			

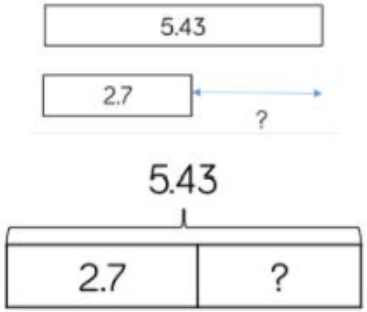
Subtract with up to 3 decimal places

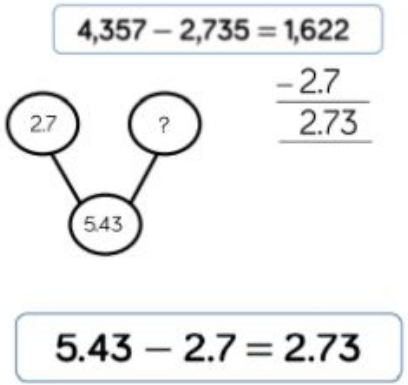
Place value counters and plain counters on a place value grid are the most effective manipulative when subtracting decimal places with 1, 2 and then 3 decimal places.

Ensure children have experience of subtracting decimals with a variety of decimal places. This includes putting this into context when subtracting money and other measures.









Calculation policy: 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	number s 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.
Reducation	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.