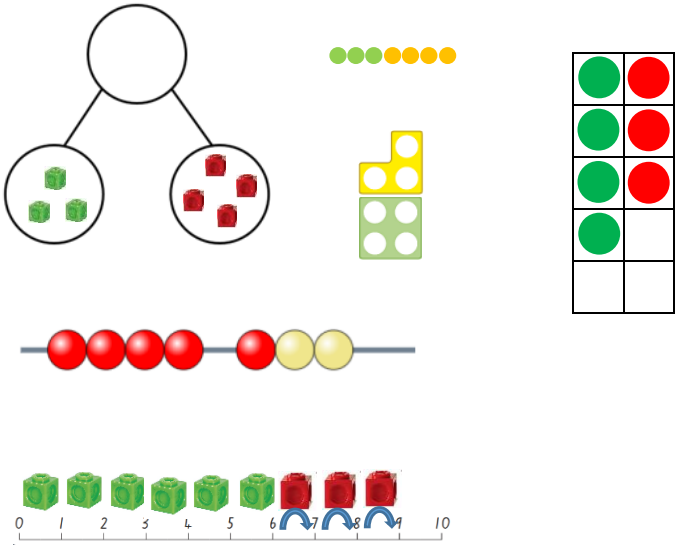
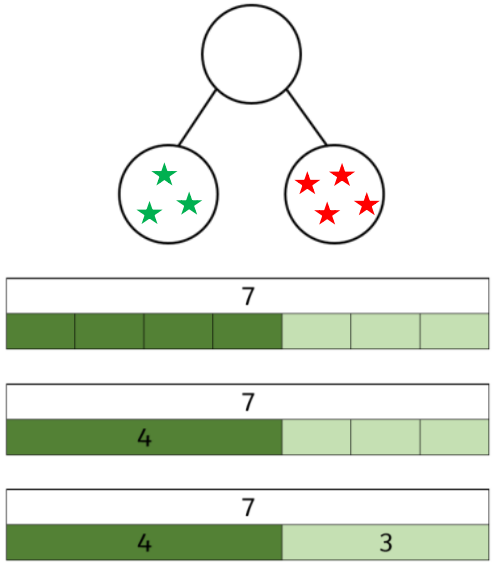
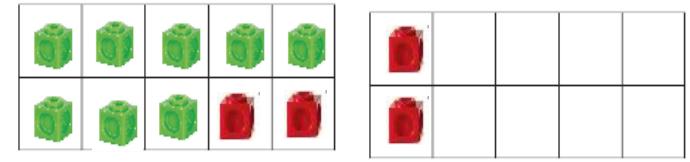
Bowsland Green – Addition and Subtraction Calculation Policy

Addition

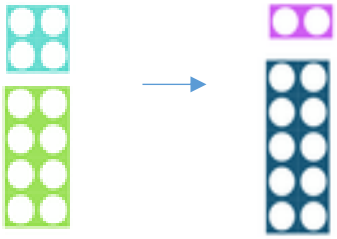
	Concrete	Pictorial	Abstract
Add 1-digit numbers to 10 Part whole model, Numicon, Bead string, Multilink, Number lines, Bar models			3 + 4 = 7 4 + 3 = 7 7 = 3 + 4 7 = 4 + 3 The emphasis should be on the language: 4 more than 3 is equal to 7. 7 is 4 more than 3. 3 more than 4 is 7.
To support pupils with **aggregation**, use a part-whole model, discrete and continuous bar model and tens frame. To support with **augmentation**, use bar model tens frame and a bead string.			

Add 1-digit numbers to 20
Regrouping to make 10
Resources from prior step can also be used.

8 + 4 =



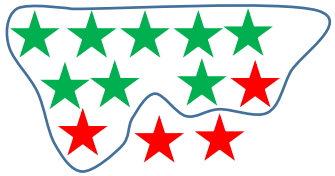
Four more than eight.

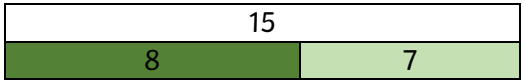


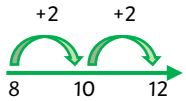
Start with the larger number and use the smaller number to make ten.

Use tens frames.

Variety of drawn representations where pupils need to identify groups of 10.

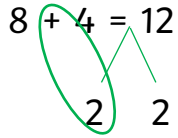






8 + 4 = 12
2 2

Use pictures or a number line. Regroup or partition the smaller number using a part whole model to make 10.



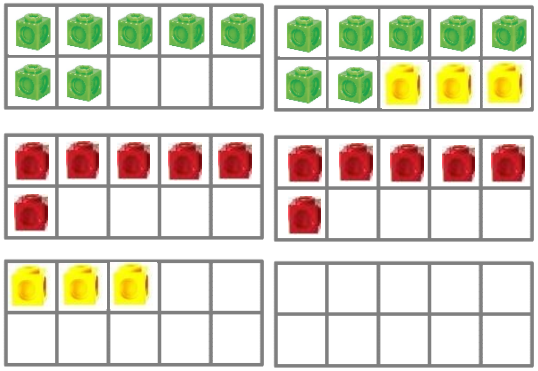
8 + 4 = ☐
8 + 4 = 4 + ☐
8 + 4 = ☐ + 8

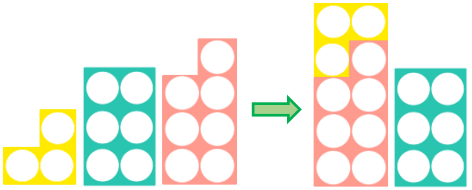
Place the larger number in your head. Partition the smaller number to make 10 and the remainder to find your answer.

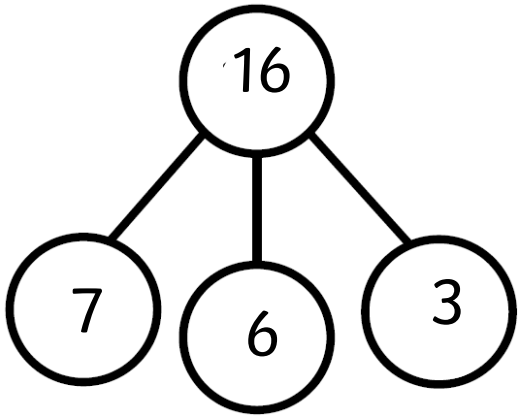
If I am at 8, how many more do I need to make 10? How many more do I add on now?

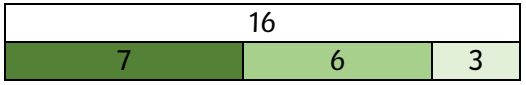
When completing this objective, it is important to highlight that ten ones equals one ten.
Manipulatives should be used alongside number lines to support pupils with how to partition their jumps.

Add three 1-digit numbers









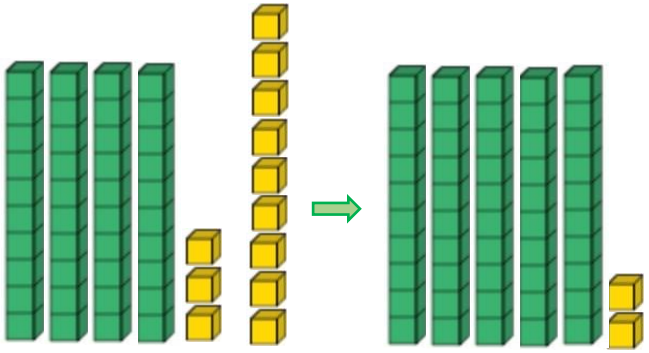
$7 + 6 + 3 = 16$

$16 = 7 + 6 + 3$

$7 + 6 + 3 = 16$

10

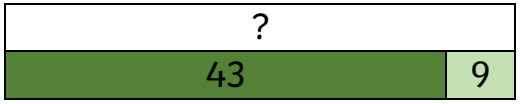
Add 1-digit and 2-digit numbers to 100



Tens	Ones
10 10 10 10	1 1 1
	1 1 1 1 1 1 1 1 1

Progression from dienes to drawing the number in a place value chart.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100



(or use single jumps)
Start on the larger number and count on in ones or "jumps" to find the answer.

43 + 9 = 52

43 + 9 = 52

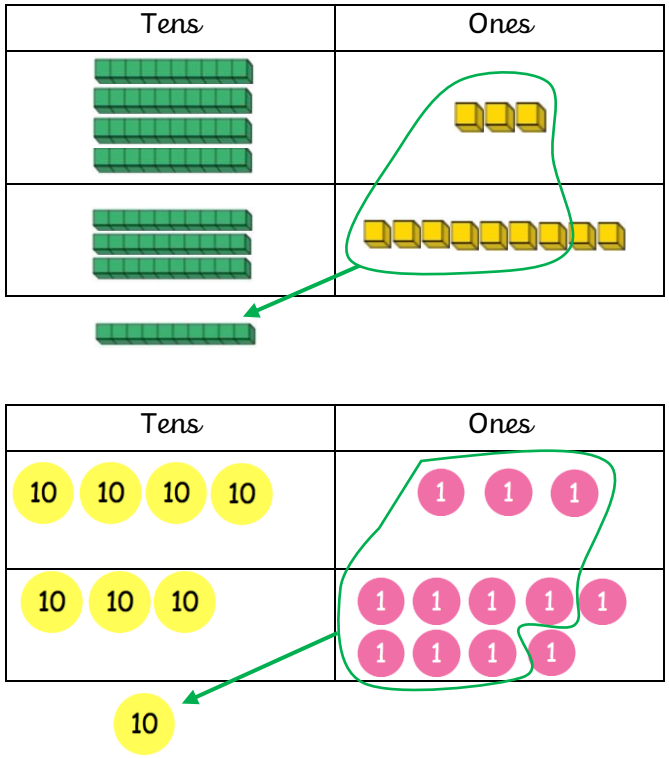
7 2

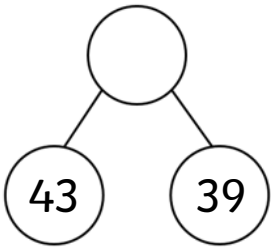
Children explore the pattern.
43 + 9 = 52
53 + 9 = 62

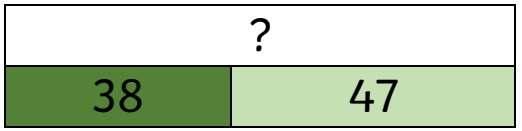
Explore related facts:
43 + 9 = 52
9 + 43 = 52
52 – 9 = 43

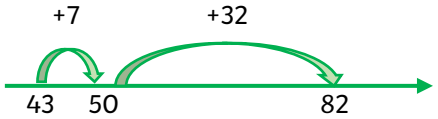
Pupils should use their number bonds to add more efficiently.
A hundreds square will support them with this.

Add two 2-digit numbers to 100









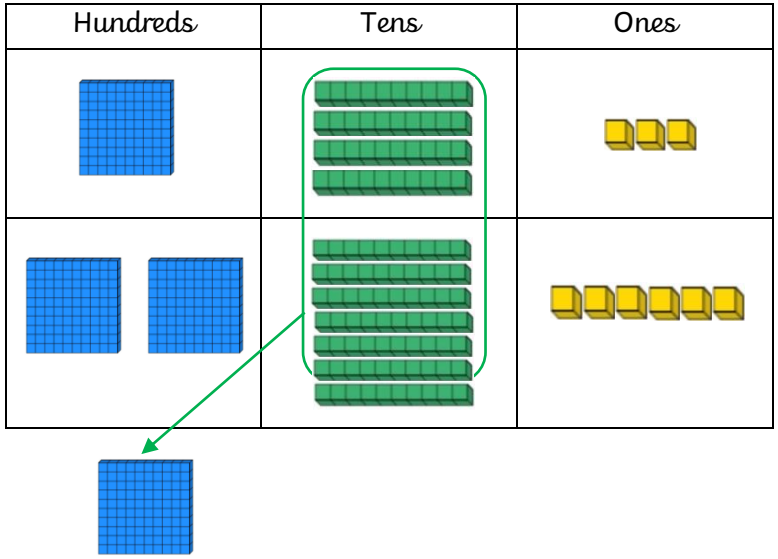
$$43 + 39 = 82$$

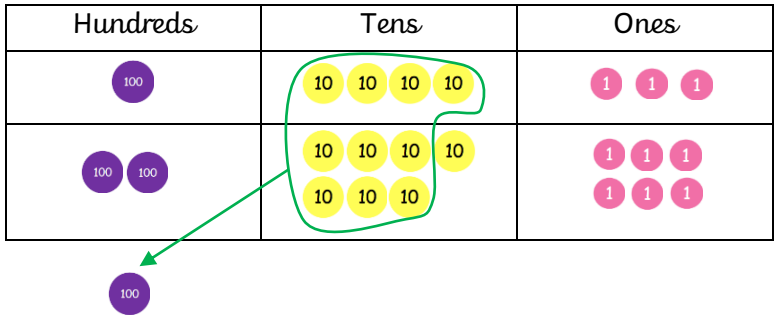
$$\begin{array}{r} 43 \\ +\ 39 \\ \hline 82 \\ 1 \end{array}$$

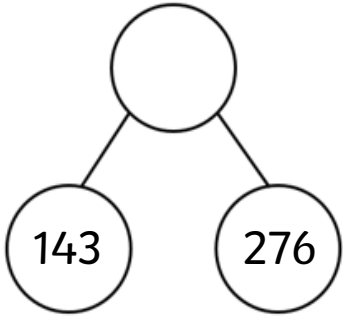
Pupils should be encouraged to use the written column method alongside manipulatives.
If partitioning a number into manageable chunks when using a number line, encourage pupils to count on in multiples of 10 before becoming more efficient.

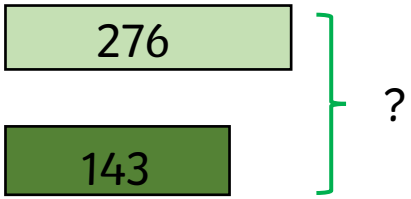
Add numbers with up to 3-digits

Repeat process for numbers with up to and more than 4-digits.









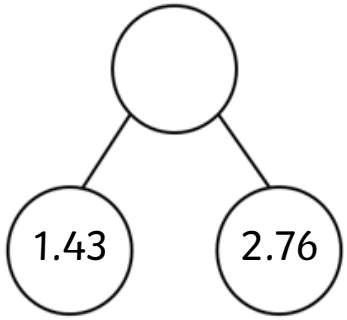
$$143 + 276 = 419$$

$$\begin{array}{r} 143 \\ +\ 276 \\ \hline 419 \\ 1 \end{array}$$

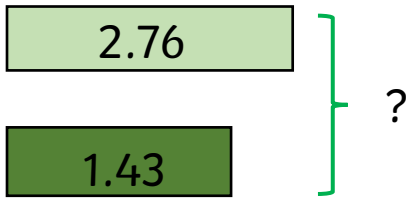
Writing down the calculation alongside manipulatives will enable pupils to notice the links between them.

Add numbers with up to three decimal places

Ones	Tenths	Hundredths
●	● ● ● ●	● ● ●
● ●	● ● ● ● ● ●	● ● ● ● ● ●



?	
1.43	2.76



$$1.43 + 2.76 = 4.19$$

$$\begin{array}{r} 1.43 \\ +\ 2.76 \\ \hline 4.19 \\ 1 \end{array}$$

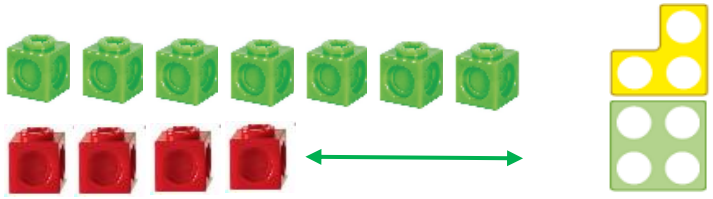
Ensure pupils experience adding decimals with varying decimal places.

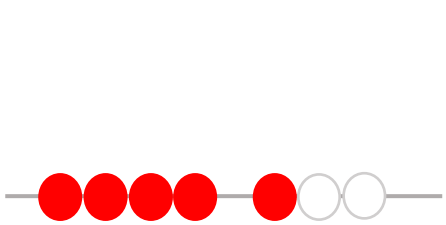
Use the contexts of money and measure to support this.

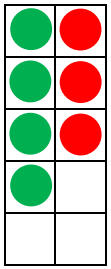
Subtraction

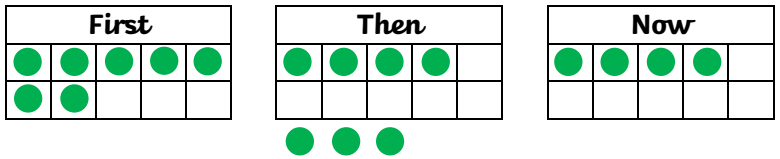
Subtract two 1-digit numbers to 10

Concrete

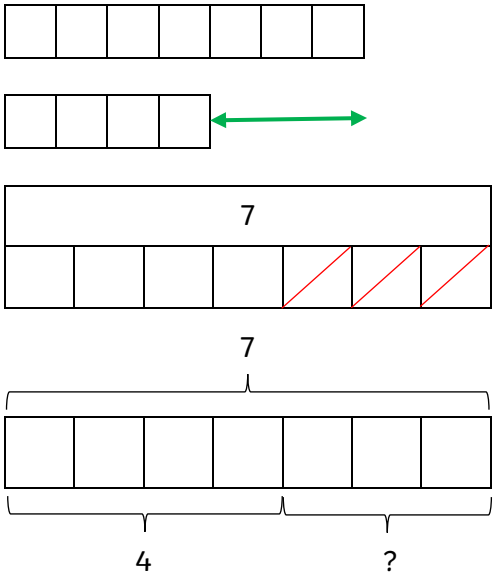


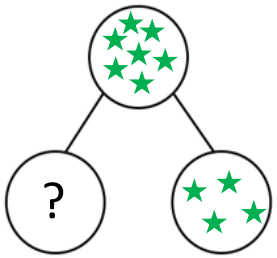






Pictorial





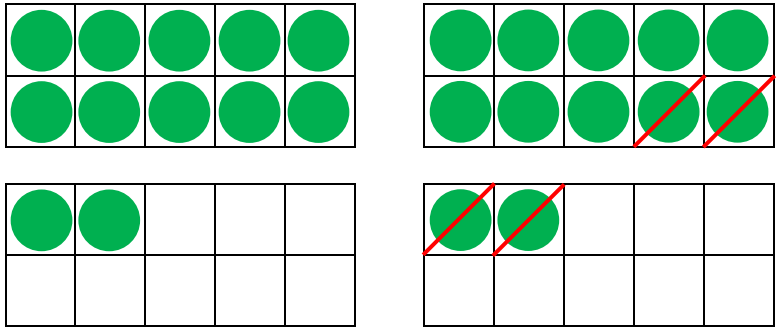
Abstract

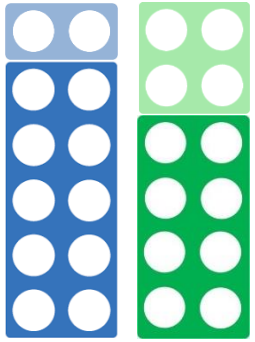
$7 - 4 = 3$

$7 - 3 = 4$

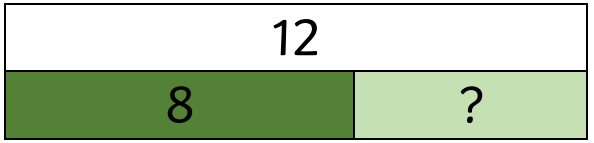
Use part-whole models, bar models and Numicon to support **partitioning**.
Use tens frames, single bar models and bead strings to support **reduction**.
Cubes and bar models can support finding the **difference**.

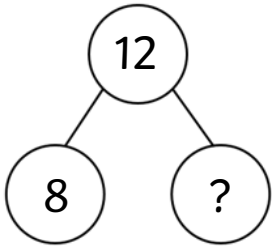
Subtract 1 and 2-digit numbers to 20

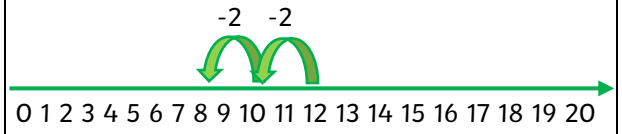


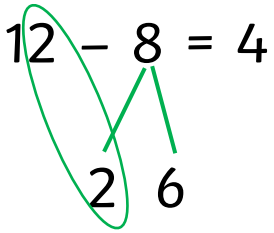


Straws and multilink can also be used here.



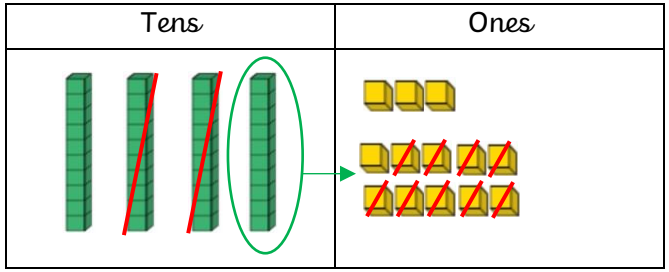


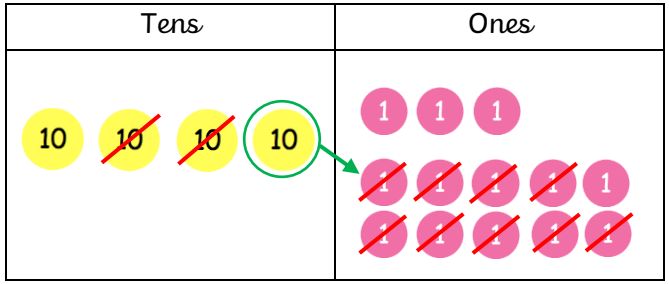




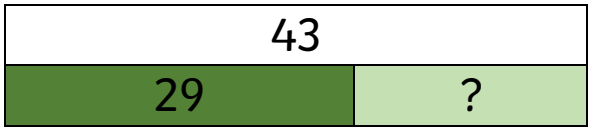
When subtracting 1-digit numbers that cross 10, pupils should be encouraged to partition to find the number bond to 10. Tens frames, Numicon and number lines are particularly helpful for this.

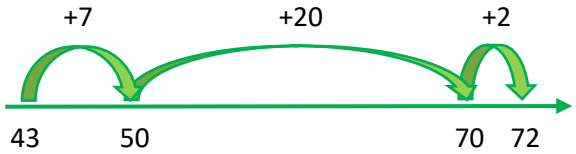
Subtract 1 and 2-digit numbers to 100

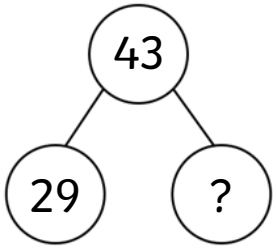




Straws and multilink may also be used to support pupils.







43 – 29 = 14

3 1
~~4~~3
- 29
14

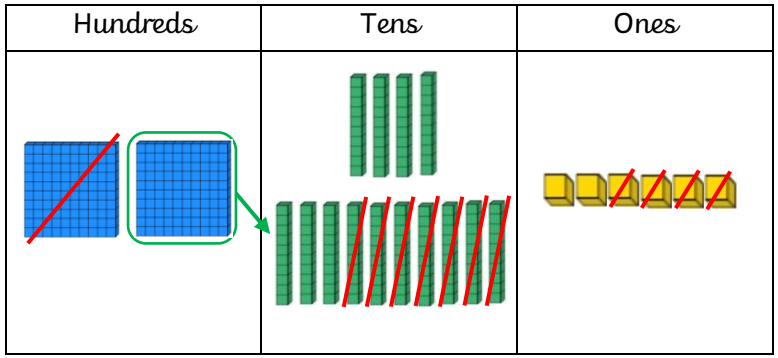
Encourage pupils to write the formal written method alongside any manipulatives used to allow them to make links between them. As numbers get larger, straws and multilink will become less effective.

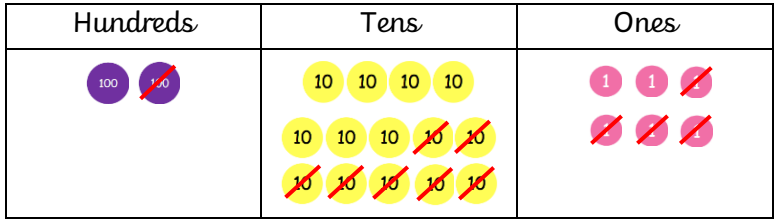
When using number lines to calculate the **difference**, encourage partitions that allow pupils to jump in multiples of 10.

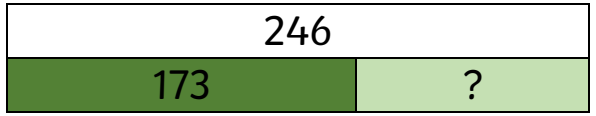
Pupils should have the opportunity to explore borrowing across zero.

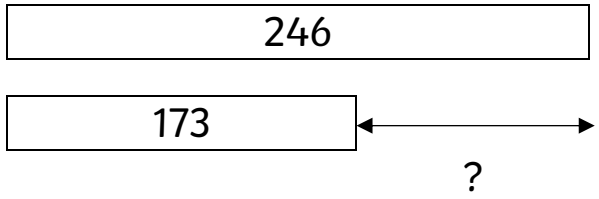
Subtract up to 3-digit numbers

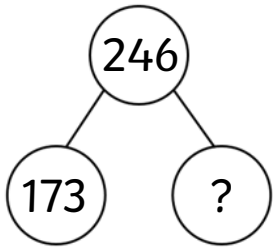
Repeat process for numbers with up to and more than 4-digits.









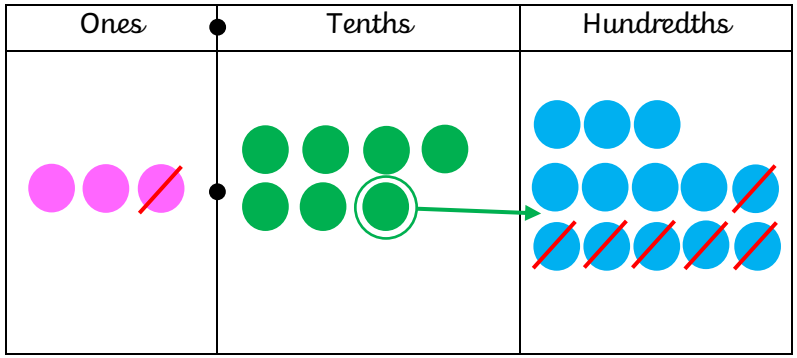


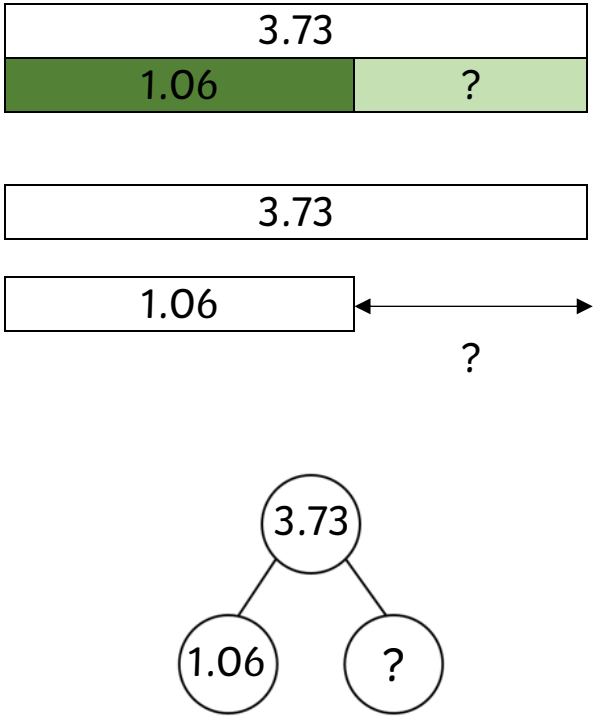
1 1
2 ~~4~~ 6
- 1 7 3
7 2

246 – 173 = 72

Place value counters (these can also be plain counters) and dienes are the most effective concrete manipulatives to use for this objective.
All concrete manipulatives should be used alongside the formal written method so pupils can see the links between them.
Ensure pupils have the opportunity to explore borrowing across zero.

Subtract with up to 3 decimal places





$$\begin{array}{r} {}^{6}\cancel{3}\,{}^{1}73 \\ -\ 1.06 \\ \hline 2.67 \end{array}$$

246 – 173 = 72

Ensure pupils have the opportunity to subtract decimals with varying decimal places.
This should also be explored in the context of money and measure.

Mathematical vocabulary that all pupils should be exposed to:

Addend – A number that is added to another.

Aggregation – Combining two or more quantities or measures to find a total.

Augmentation – To increase a quantity by another quantity.

Commutative – Numbers can be added in any order.

Complement – in addition, we combine the complement with another amount to make a total e.g. 8 is the complement to 2 to make 10.

Difference – To find the numerical difference between two numbers compare the quantity in each group.

Exchange - To substitute a number for another on an equal value.

Minuend – A number from which another is subtracted.

Partitioning – Splitting a number into its component parts.

Reduction – Subtraction as take away.

Subitise – To instantly recognise the number of objects in a group without the need to count them.

Subtrahend – A number that will be subtracted from another.

Sum – The outcome of an addition.

Total – The aggregate or sum of an addition calculation.