

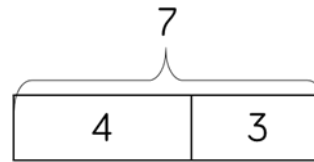
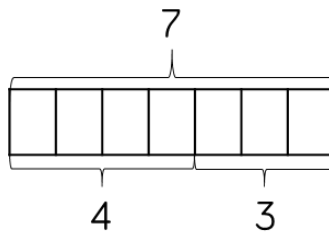
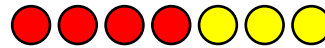
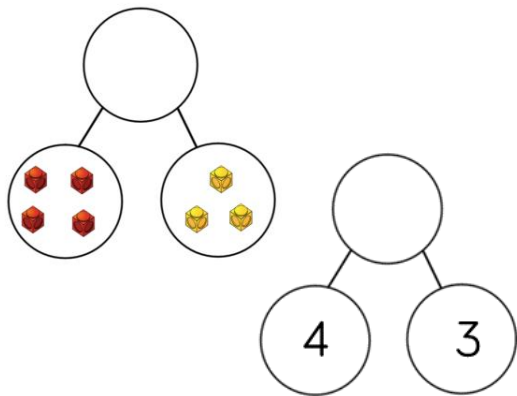
**Addition**

Skill	Year	Representations and models	
Add two 1-digit numbers to 10	1	Part-whole model Bar model Number shapes	Ten frames (within 10) Bead strings (10) Number tracks
Add 1 and 2-digit numbers to 20	1	Part-whole model Bar model Number shapes Ten frames (within 20)	Bead strings (20) Number tracks Number lines (labelled) Straws
Add three 1-digit numbers	2	Part-whole model Bar model	Ten frames (within 20) Number shapes
Add 1 and 2-digit numbers to 100	2	Part-whole model Bar model Number lines (labelled)	Number lines (blank) Straws Hundred square

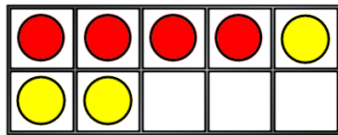
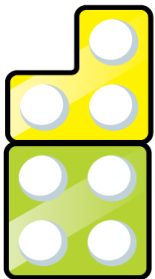
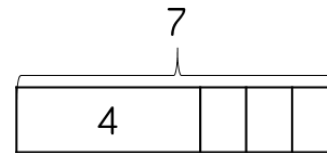
Skill	Year	Representations and models
Add two 2-digit numbers	2	Part-whole model Bar model Number lines (blank) Straws Base 10 Place value counters
Add with up to 3-digits	3	Part-whole model Bar model Base 10 Place value counters Column addition
Add with up to 4-digits	4	Part-whole model Bar model Base 10 Place value counters Column addition
Add with more than 4 digits	5	Part-whole model Bar model Place value counters Column addition
Add with up to 3 decimal places	5	Part-whole model Bar model Place value counters Column addition

## Skill: Add 1-digit numbers within 10

Year: 1



$$4 + 3 = 7$$



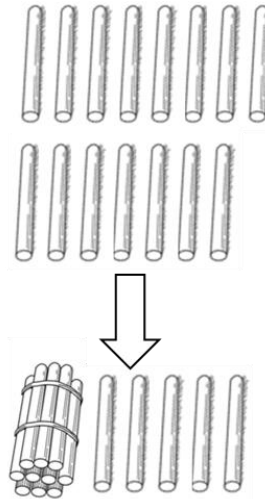
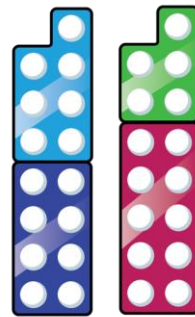
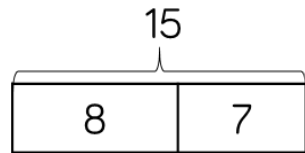
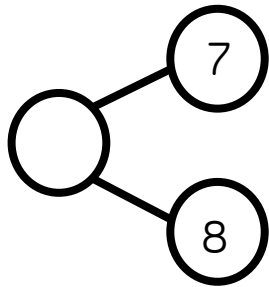
When adding numbers to 10, children can explore both aggregation and augmentation.

The part-whole model, discrete and continuous bar model, number shapes and ten frame support aggregation.

The combination bar model, ten frame, bead string and number track all support augmentation.

## Skill: Add 1 and 2-digit numbers to 20

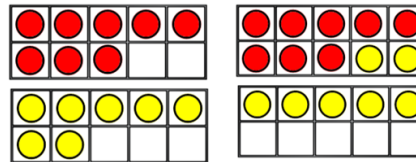
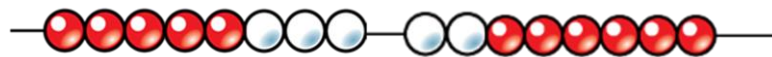
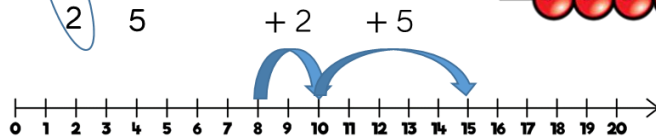
Year: 1/2



$$8 + 7 = 15$$

$$8 + 7 = 15$$

2 5



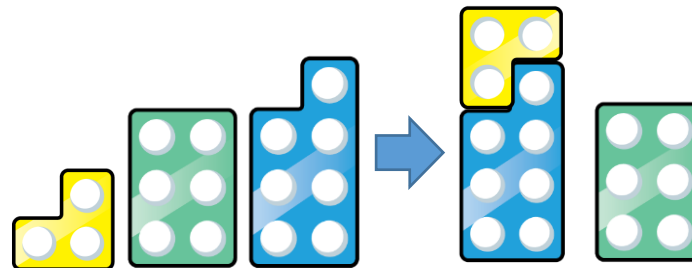
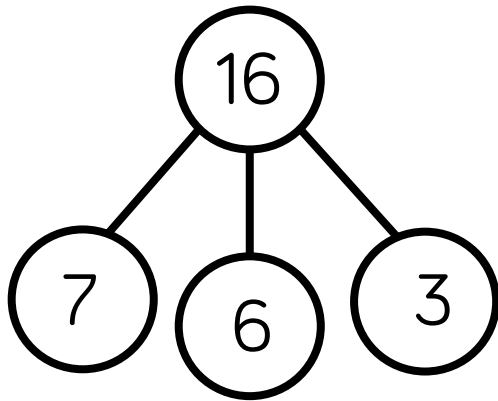
$$8 + 7 = 15$$

2 5

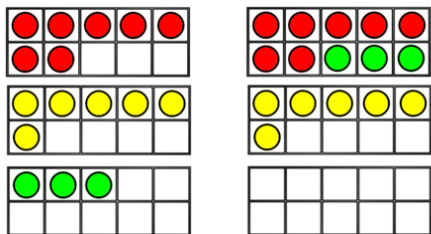
When adding one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten. In Year 1, this is only done just by counting on. From Year 2, use different manipulatives can be used to represent this exchange alongside number lines to support children in understanding how to partition their jumps.

## Skill: Add three 1-digit numbers

Year: 2

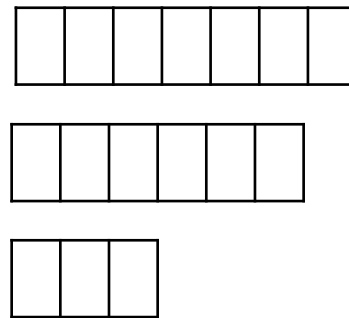


$$7 + 6 + 3 = 16$$



$$7 + 6 + 3 = 16$$

10



16

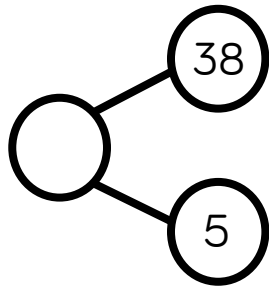
When adding three 1-digit numbers, children should be encouraged to look for number bonds to 10 or doubles to add the numbers more efficiently.

This supports children in their understanding of commutativity.

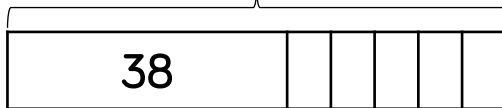
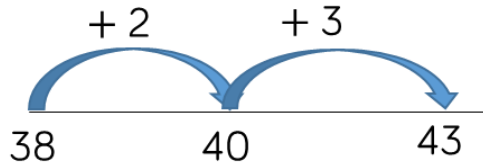
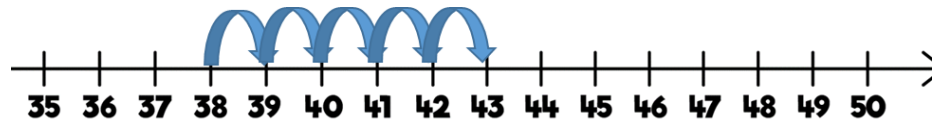
Manipulatives that highlight number bonds to 10 are effective when adding three 1-digit numbers.

## Skill: Add 1-digit and 2-digit numbers to 100

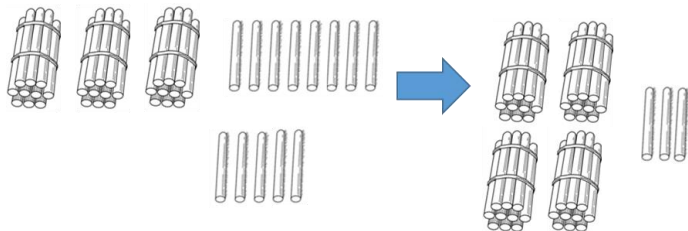
Year: 2/3



?



$$38 + 5 = 43$$



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

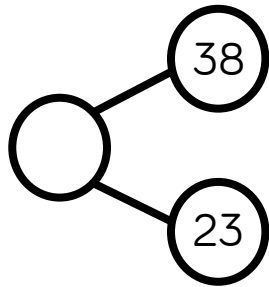
When adding single digits to a two-digit number, children should be encouraged to count on from the larger number.

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.

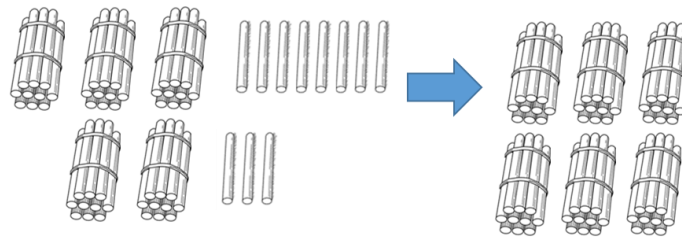
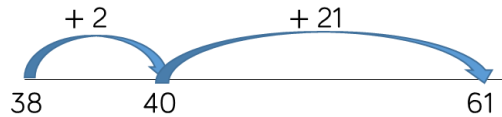
## Skill: Add two 2-digit numbers to 100

Year: 2/3



?

38	23
----	----



$$38 + 23 = 61$$

Tens	Ones

$$\begin{array}{r} 38 \\ + 23 \\ \hline 61 \\ 1 \end{array}$$

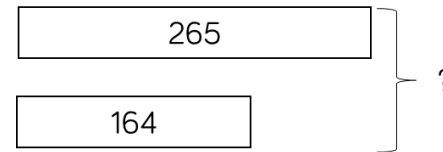
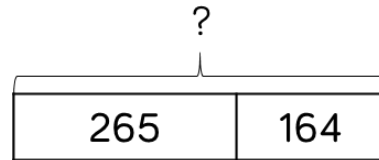
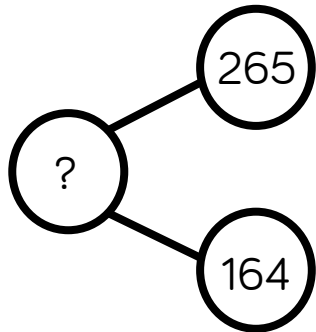
Tens	Ones

Children can use a blank number line and other representations to count on to find the total. Encourage them to jump to multiples of 10 to become more efficient. From Year 3, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.

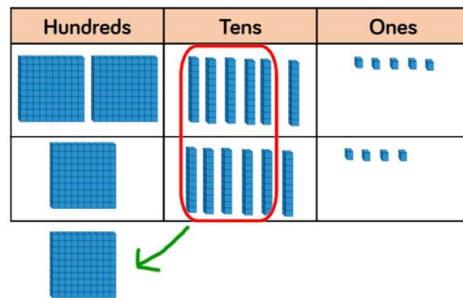


## Skill: Add numbers with up to 3 digits

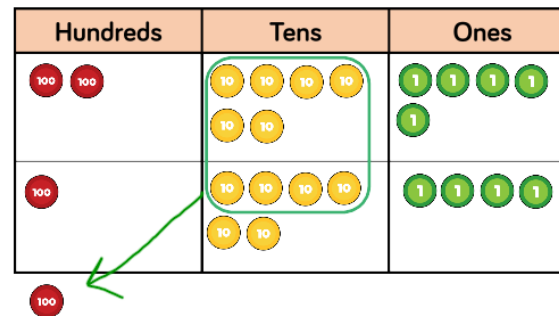
Year: 3



$$265 + 164 = 429$$



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



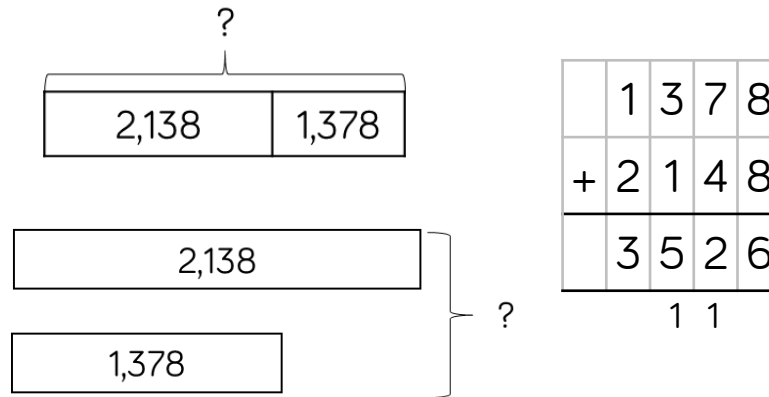
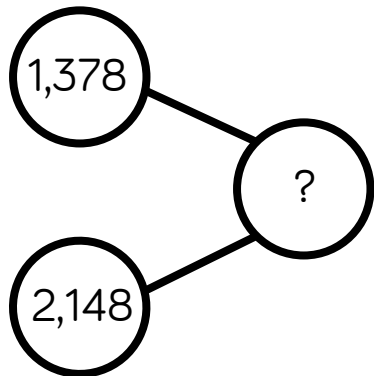
Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 3 digits.

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

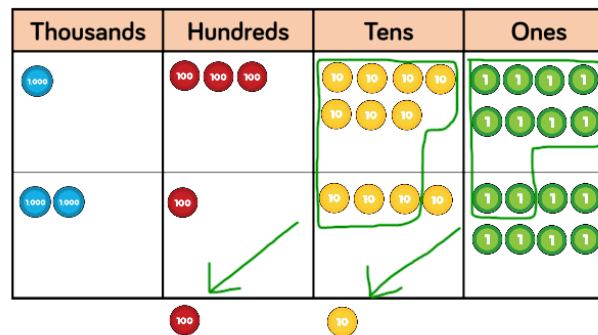
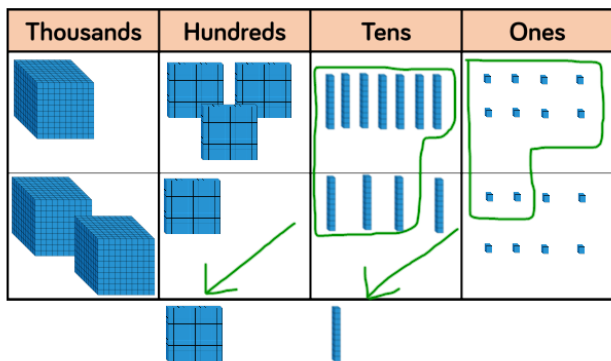
Plain counters on a place value grid can also be used to support learning.

## Skill: Add numbers with up to 4 digits

Year: 4



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



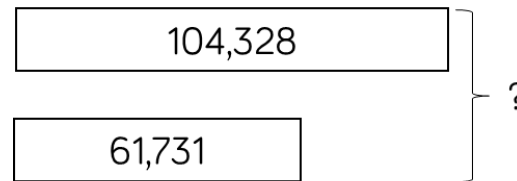
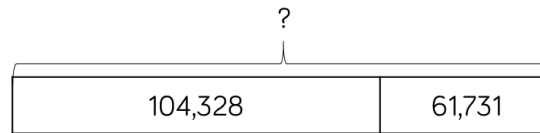
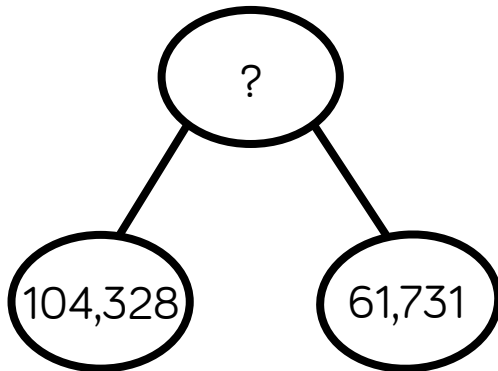
Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 4 digits.

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
100000		1000 1000 1000 1000	100 100 100	10 10	1 1 1 1 1 1 1 1
	10000 10000 10000 10000 10000 10000	1000	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

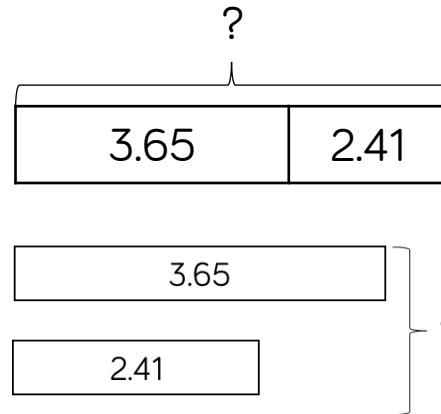
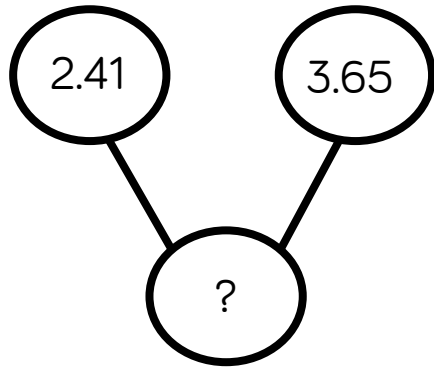
1

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.

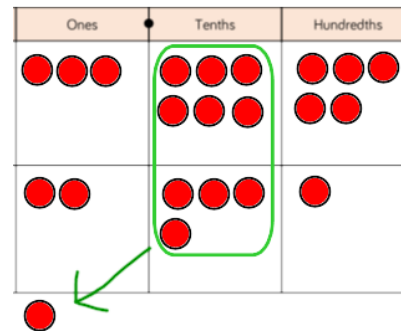
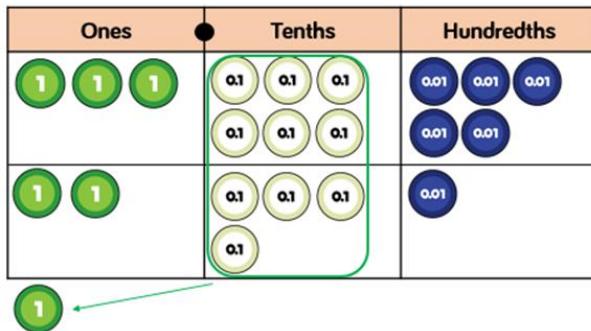
## Skill: Add with up to 3 decimal places

Year: 5



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

$$3.65 + 2.41 = 6.06$$



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.

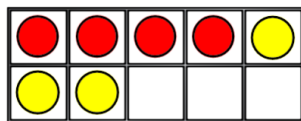
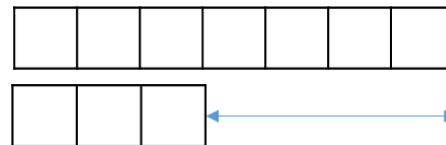
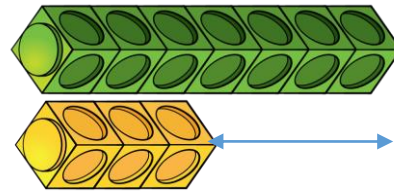
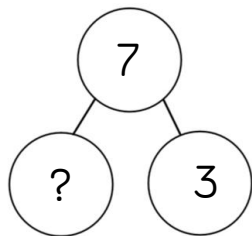
# Subtraction

Skill	Year	Representations and models	
Subtract two 1-digit numbers to 10	1	Part-whole model Bar model Number shapes	Ten frames (within 10) Bead strings (10) Number tracks
Subtract 1 and 2-digit numbers to 20	1	Part-whole model Bar model Number shapes Ten frames (within 20)	Bead string (20) Number tracks Number lines (labelled) Straws
Subtract 1 and 2-digit numbers to 100	2	Part-whole model Bar model Number lines (labelled)	Number lines (blank) Straws Hundred square
Subtract two 2-digit numbers	2	Part-whole model Bar model Number lines (blank) Straws	Base 10 Place value counters

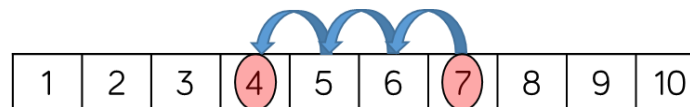
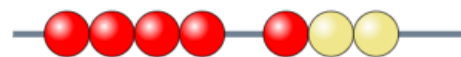
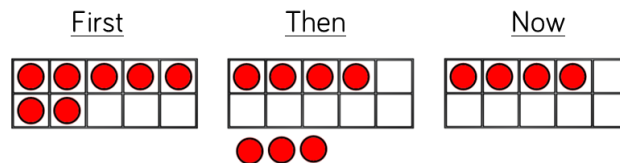
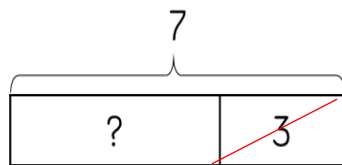
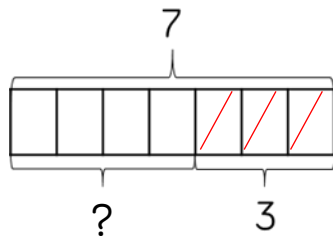
Skill	Year	Representations and models	
Subtract with up to 3-digits	3	Part-whole model Bar model	Base 10 Place value counters Column subtraction
Subtract with up to 4-digits	4	Part-whole model Bar model	Base 10 Place value counters Column subtraction
Subtract with more than 4 digits	5	Part-whole model Bar model	Place value counters Column subtraction
Subtract with up to 3 decimal places	5	Part-whole model Bar model	Place value counters Column subtraction

## Skill: Subtract 1-digit numbers within 10

Year: 1



$$7 - 3 = 4$$



Part-whole models, bar models, ten frames and number shapes support partitioning.

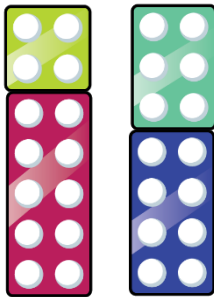
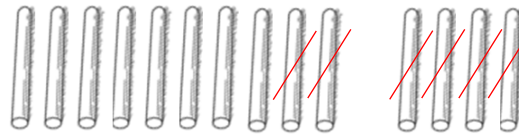
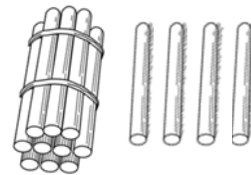
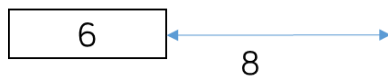
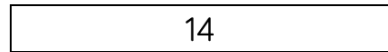
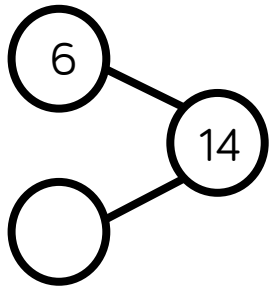
Ten frames, number tracks, single bar models and bead strings support reduction.

Cubes and bar models with two bars can support finding the difference.

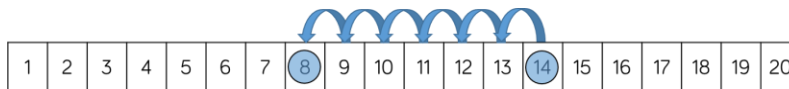


## Skill: Subtract 1 and 2-digit numbers to 20

Year: 1/2

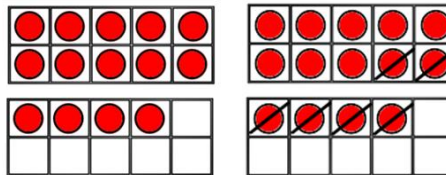
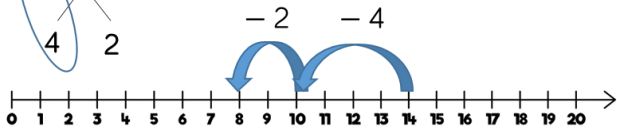


$$14 - 6 = 8$$



$$14 - 6 = 8$$

A number bond diagram for 14 - 6 = 8. The number 14 is circled. A line from 14 goes to 4, and another line goes to 2.



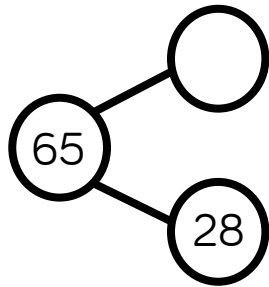
$$14 - 6 = 8$$

A number bond diagram for 14 - 6 = 8. The number 14 is circled. A line from 14 goes to 4, and another line goes to 2.

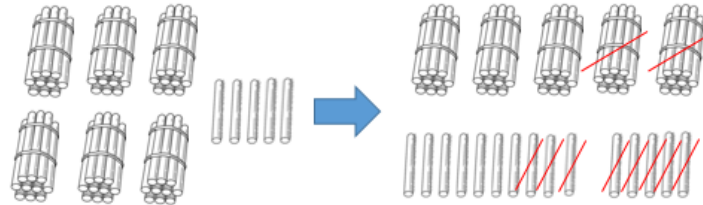
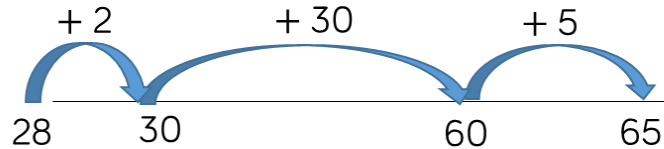
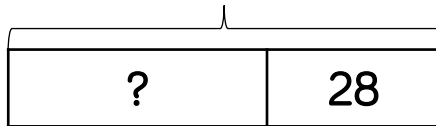
In Year 1, subtracting one-digit numbers that cross 10, is done by counting back, using objects, number tracks and number lines. From Year 2, children should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, number shapes and number lines are particularly useful for this.

## Skill: Subtract 1 and 2-digit numbers to 100

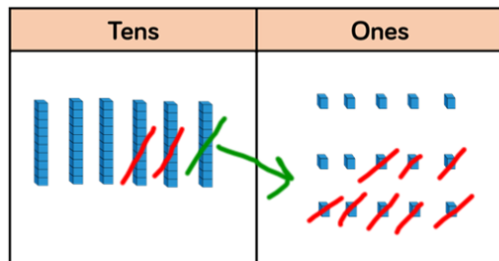
Year: 2/3



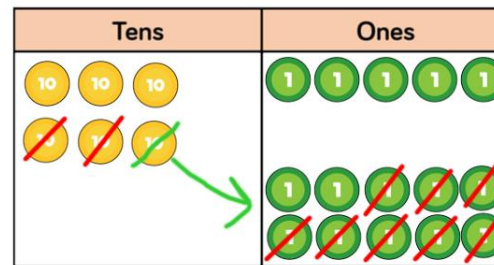
65



$$65 - 28 = 37$$



$$\begin{array}{r} 5 \ 1 \\ 65 \\ - 28 \\ \hline 37 \end{array}$$



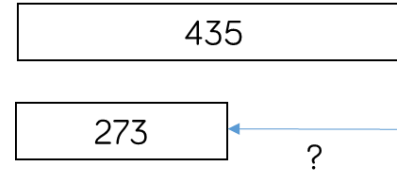
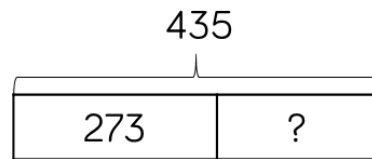
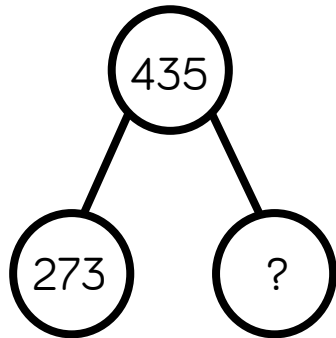
Children can also use a blank number line to count back to find the difference.

Encourage them to jump to multiples of 10 to become more efficient.

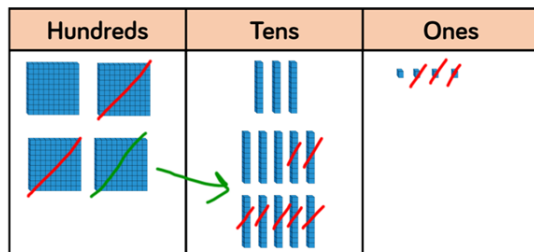
From Year 3, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.

## Skill: Subtract numbers with up to 3 digits

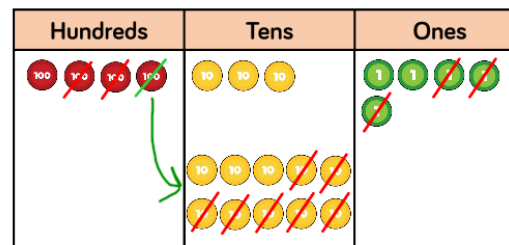
Year: 3



$$435 - 273 = 162$$



$$\begin{array}{r} 3 \quad 1 \\ 435 \\ - 273 \\ \hline 162 \end{array}$$



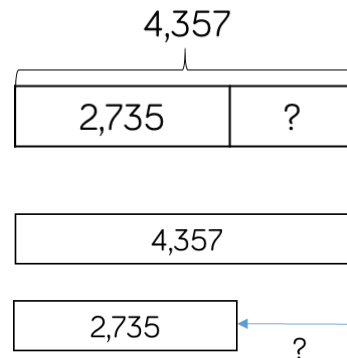
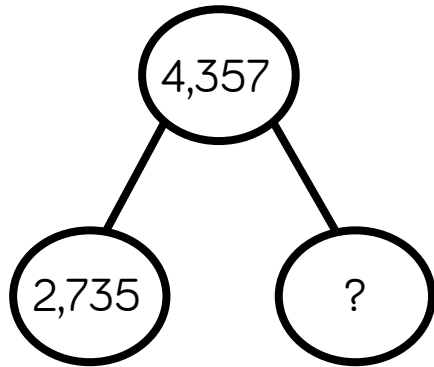
Base 10 and place value counters are the most effective manipulative when subtracting numbers with up to 3 digits.

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

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

## Skill: Subtract numbers with up to 4 digits

Year: 4



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

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

Thousands	Hundreds	Tens	Ones

Thousands	Hundreds	Tens	Ones

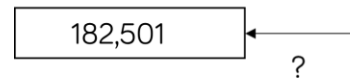
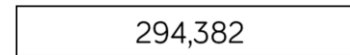
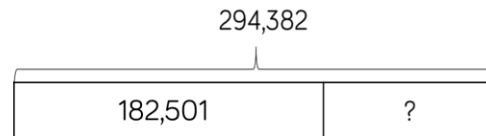
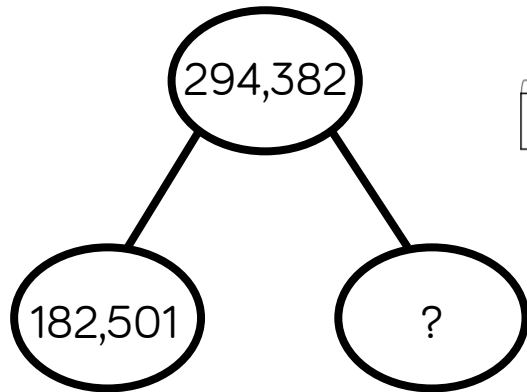
Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 4 digits.

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
100,000 (2) <del>100,000</del>	10,000 (9) <del>10,000</del>	1,000 (3) <del>1,000</del>	100 (3)	10 (3)	1 (1) <del>1</del>
	10,000 (3) <del>10,000</del>	1,000 (1)	100 (3)	10 (3)	
	10,000 (3) <del>10,000</del>		100 (3)	10 (2)	
			100 (1) <del>100</del>		
			100 (1) <del>100</del>		
			100 (1) <del>100</del>		
			100 (1) <del>100</del>		

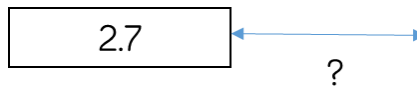
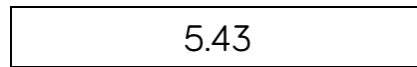
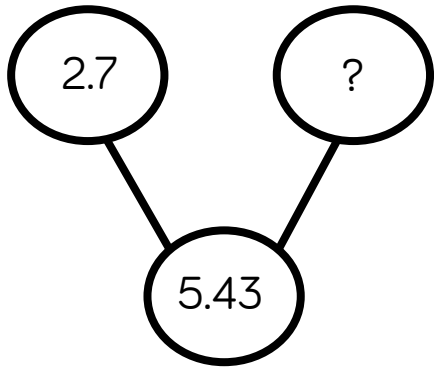
	2	9	<del>3</del>	1 <del>3</del>	8	2
-	1	8	2	5	0	1
	1	1	1	8	8	1

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.

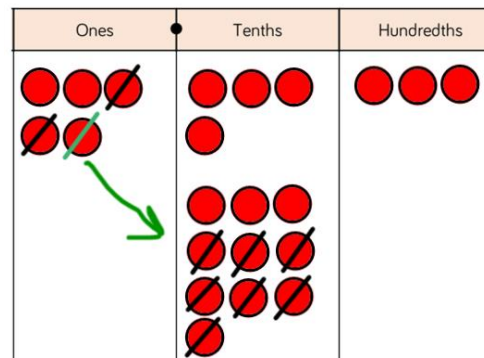
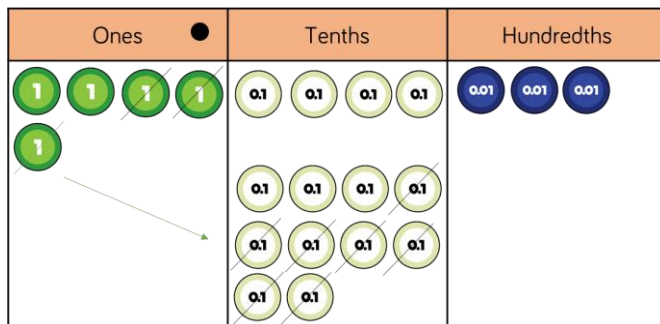
## Skill: Subtract with up to 3 decimal places

Year: 5/6



$$\begin{array}{r} 4 \quad 1 \\ \cancel{5}.43 \\ - 2.7 \\ \hline 2.73 \end{array}$$

$$5.43 - 2.7 = 2.73$$



Place value counters and plain counters on a place value grid are the most effective manipulative when subtracting decimals 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.

# 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.