Subtraction

minuend - subtrahend = difference

Mental strategies

Children first learn how to solve subtraction calculations in their head. There are many strategies for this and children are encouraged to explore all of them and begin to make decisions about which ones would be useful for different questions.

Crossing out

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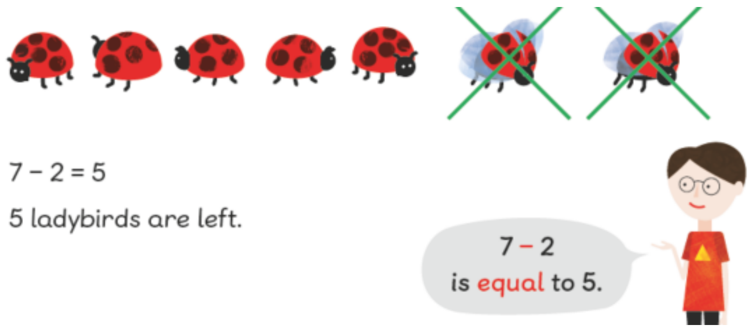
<u>Year 1</u>
Children start with the total amount of items and then cross out the ones that are being removed to see how many are left.

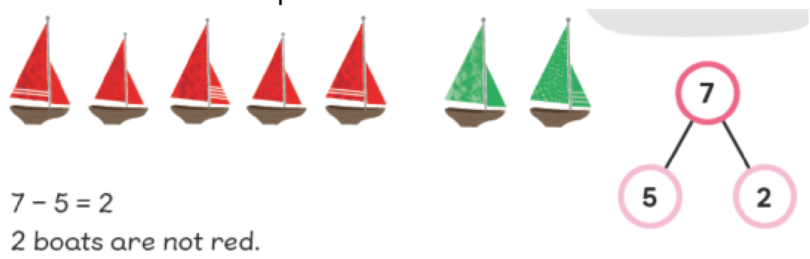


</td>
<td>Although this strategy is not explicitly taught further up the school, it is often useful or referred back to.</td>
</tr>
</table>

Number bonds

<table>
<tr>
<td>

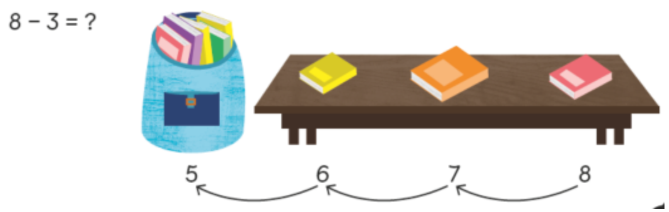
<u>Year 1</u>
In reception, children learnt that numbers can be split into parts. In Year 1, this is then looked at in terms of subtraction. The children know that 7 is made up of 5 and 2 so this becomes 7 - 5 = 2.



</td>
<td>Although this strategy is not explicitly taught further up the school, it is often useful or referred back to.</td>
</tr>
</table>

Counting back

Year 1
Children learn to start with the initial amount and then count back in ones the required amount.



Year 2
Children count back in ones from any 2-digit number:

Method 1 Count back from 28.

21	22	23	24	25	26	27	28	29	30

28 − 3 = 25

Children also learn to count back in tens from any 2-digit number:

Count back in tens from 36.

36, 26, 16

36 − 20 = 16

Year 3
From year 2, children count back in ones and tens from any 3-digit number.

They also learn to count back in hundreds from any 3-digit number:

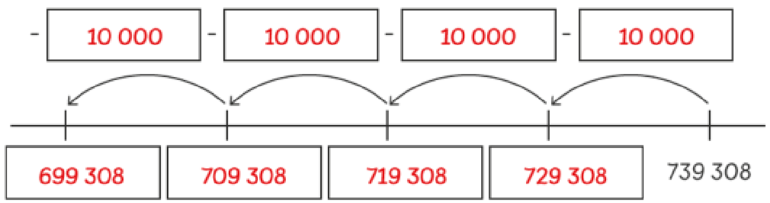
Count back in hundreds from 658.

658 − 500 = 158

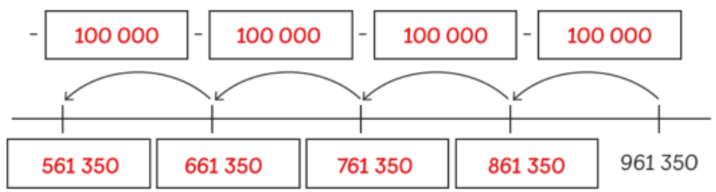
658, 558, 458, 358, 258, 158

Year 5
Children count back in multiples of 10, 100, 1000 and 10 000 from any 6-digit number.

(b) 739 308 − 40 000 = 699 308



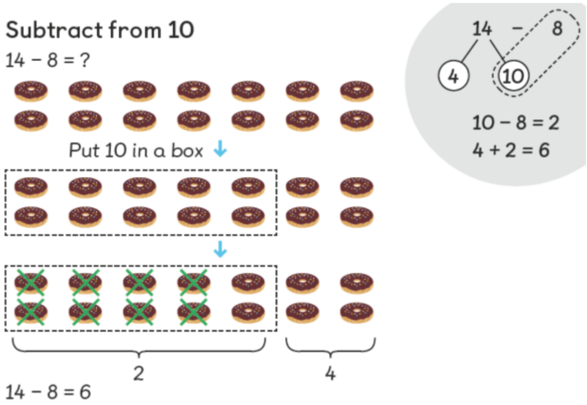
(c) 961 350 − 400 000 = 561 350

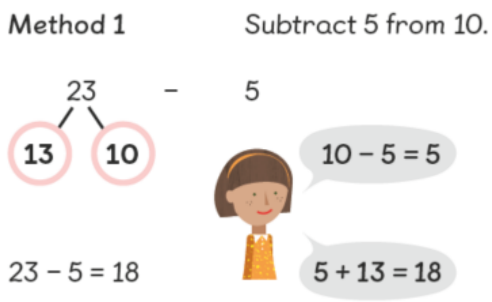


Subtracting from ten

Year 1
Children partition the number into ten and one. They subtract from the ten and then add the ones back on.

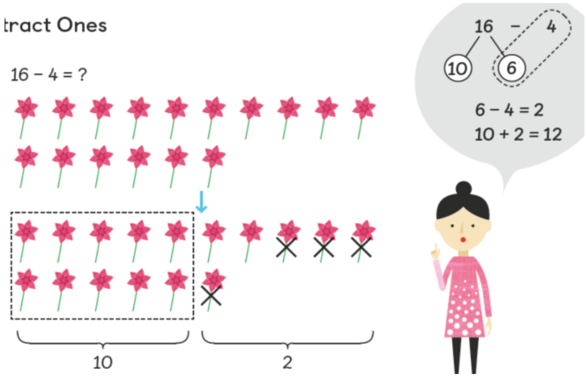
Year 2
As with year 1, children partition the number into ten and another part. They subtract from the ten and then add the other part back on again.



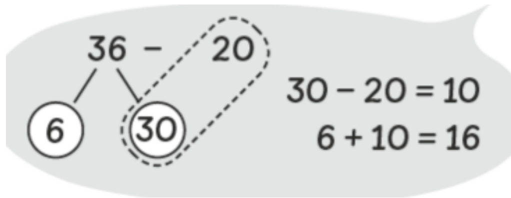


Subtracting from one value (ones, tens, hundreds etc.)

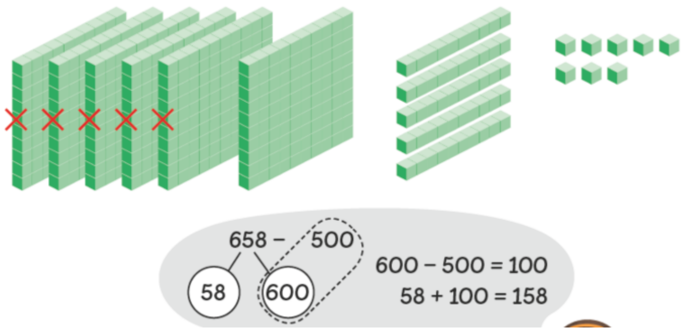
Year 1
Children start by partitioning a number into tens and ones. They subtract the ones from the ones and then finally add the tens back on.



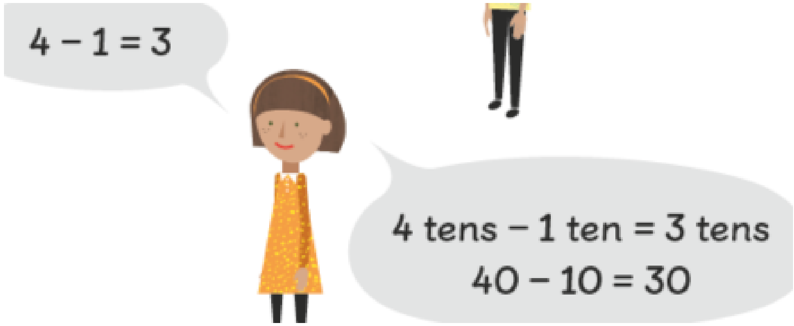
Year 2
Children continue their learning from Year 1 and subtract ones from 2-digit numbers. They also learn to subtract the tens from the tens. Children partition the number into tens and ones. They add the tens to the tens and then finally add on the ones.



Year 3
Children apply what they learnt in years 1 and 2 to three-digit numbers. They also partition numbers to subtract only hundreds.



Unitising

Year 2	**Key Stage 2**
Children learn to change the units of a calculation. In year 2, they apply this to subtracting tens. 	Although this strategy is not taught in Key Stage 2, it is used when solving written methods. Children subtract ones, tens, hundreds and thousands by changing the units. Subtract the ones. 7 ones − 6 ones = 1 one Subtract the tens. 3 tens − 1 ten = 2 tens Subtract the hundreds. 4 hundreds − 0 hundreds = 4 hundreds Subtract the thousands. 3 thousands − 2 thousands = 1 thousand In Key Stage 2, this strategy is also taught when subtracting fractions and decimals.

Compensating

Year 4

When subtracting from a number with a lot of zeros, children can change the number (in this example 5000 becomes 4999) as this makes the subtraction easier. They must then remember to compensate for this and add the given amount back on again.

3 5000 − 2179 = 2821

4999 − 2179 = 2820

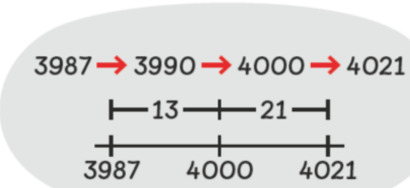
Can you use 4999 − 2179 = 2820 to work out 5000 − 2179 = 2821 ?

Counting on

Year 4

When subtracting numbers that are close together, children can count on from the smaller number to find the difference between them.

4021 − 3987 =

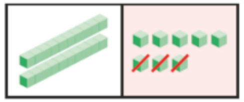


Written strategies

The main written strategy for solving subtraction problems is **column subtraction**. This should only be used when the calculation is too difficult to solve mentally.

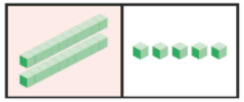
Year 2	Year 3	Year 4
Teaching begins with 2-digit numbers. Concrete resources (Dienes) are always used to support understanding. Children start by subtracting a 1-digit number from a 2-digit number where there is no renaming.	Teaching continues with 3-digit numbers. Children start with no renaming and Dienes are still used:	Teaching continues with 4-digit numbers. As with year 3, children start with no renaming but are now using place value counters to support them:

Step 1 Subtract the ones.
8 ones − 3 ones = 5 ones



	tens	ones
	2	8
−		3
		5

Step 2 Subtract the tens.

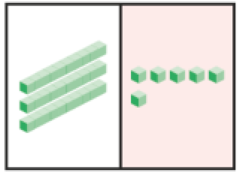


	tens	ones
	2	8
−		3
	2	5

28 − 3 = 25

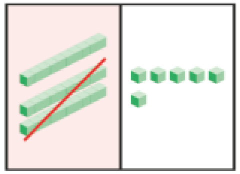
Next, they move onto a 2-digit number subtract a multiple of ten.

Step 1 Subtract the ones.



	tens	ones
	3	6
−	2	0
		6

Step 2 Subtract the tens.
3 tens − 2 tens = 1 ten

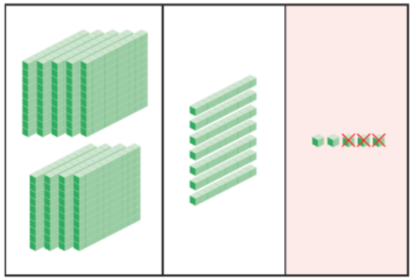


	tens	ones
	3	6
−	2	0
	1	6

36 − 20 = 16

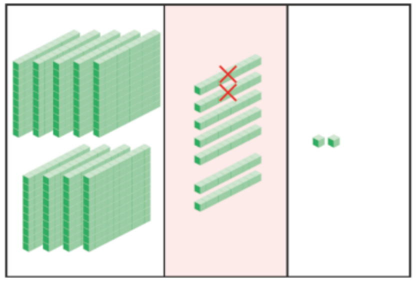
Next, they subtract two 2-digit numbers with no renaming.

Step 1 Subtract the ones.
5 ones − 3 ones = 2 ones



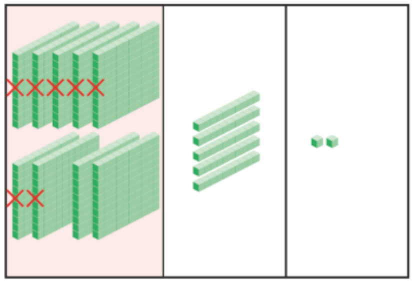
	h	t	o
	9	7	5
−	7	2	3
			2

Step 2 Subtract the tens.
7 tens − 2 tens = 5 tens



	h	t	o
	9	7	5
−	7	2	3
		5	2

Step 3 Subtract the hundreds.
9 hundreds − 7 hundreds = 2 hundreds

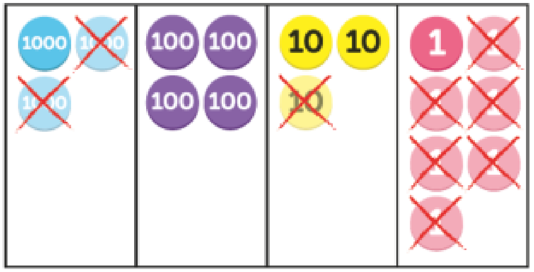


	h	t	o
	9	7	5
−	7	2	3
	2	5	2

975 − 723 = 252

Across a number of lessons, the children start to use more and more renaming. Starting in one place and then moving onto renaming in all the places:

subtract 2016



	3	4	3	7
−	2	0	1	6
	1	4	2	1

Step 1 Subtract the ones.
7 ones − 6 ones = 1 one

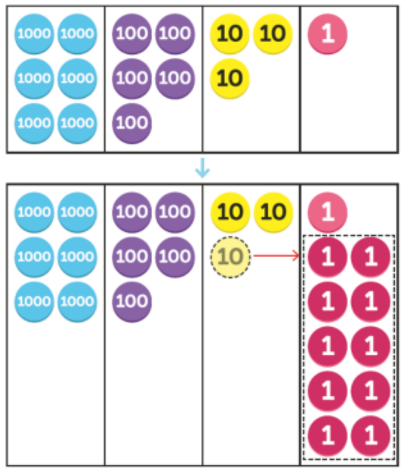
Step 2 Subtract the tens.
3 tens − 1 ten = 2 tens

Step 3 Subtract the hundreds.
4 hundreds − 0 hundreds = 4 hundreds

Step 4 Subtract the thousands.
3 thousands − 2 thousands = 1 thousand

Across a number of lessons, children are taught to use renaming in all of the different places:

Subtract 2385 from 6531.



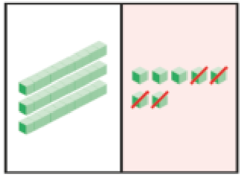
6 5 3 1

There aren't enough ones.

6 5 $\overset{2}{\cancel{3}}$ $\overset{11}{\cancel{1}}$

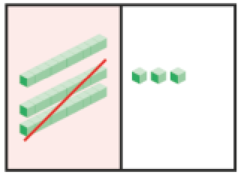
There aren't enough tens.

Step 1 Subtract the ones.
7 ones − 4 ones = 3 ones



	tens	ones
	3	7
−	2	4
		3

Step 2 Subtract the tens.
3 tens − 2 tens = 1 ten

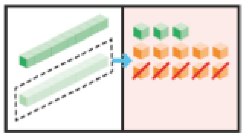


	tens	ones
	3	7
−	2	4
	1	3

37 − 24 = 13

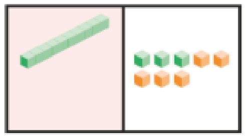
Finally, they subtract two 2-digit numbers with renaming. Dienes are used to support the understanding of **renaming** 23 (in this example) into 1 ten (10) and 13 ones.

Step 1 Regroup 1 ten into 10 ones.
Subtract the ones.
13 ones − 5 ones = 8 ones



	tens	ones
	$\overset{1}{\cancel{2}}$	$\overset{13}{\cancel{3}}$
−		5
		8

Step 2 Subtract the tens.

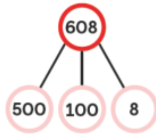


	tens	ones
	$\overset{1}{\cancel{2}}$	$\overset{13}{\cancel{3}}$
−		5
	1	8

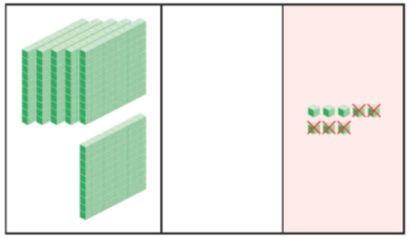
23 − 5 = 18

Let's Learn

Subtract 135 from 608.

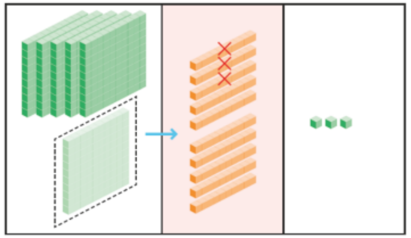


Step 1 Subtract the ones.
8 ones − 5 ones = 3 ones



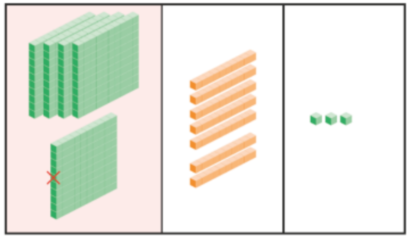
	h	t	o
	6	0	8
−	1	3	5
			3

Step 2 Regroup 1 hundred into 10 tens.
Subtract the tens.
10 tens − 3 tens = 7 tens



	h	t	o
	$\overset{5}{\cancel{6}}$	$\overset{10}{\cancel{0}}$	8
−	1	3	5
		7	3

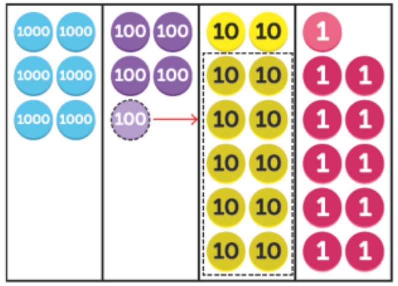
Step 3 Subtract the hundreds.
5 hundreds − 1 hundred = 4 hundreds



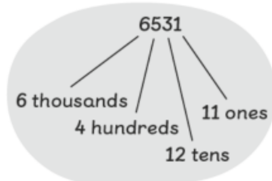
	h	t	o
	$\overset{5}{\cancel{6}}$	$\overset{10}{\cancel{0}}$	8
−	1	3	5
	4	7	3

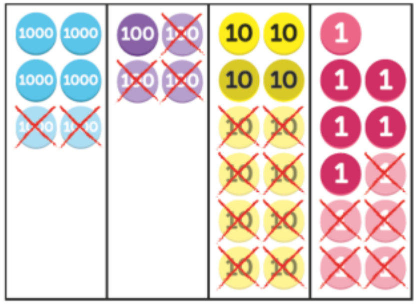
608 − 135 = 473

The children also have to look at what to do when there aren't enough to rename in one of the places.



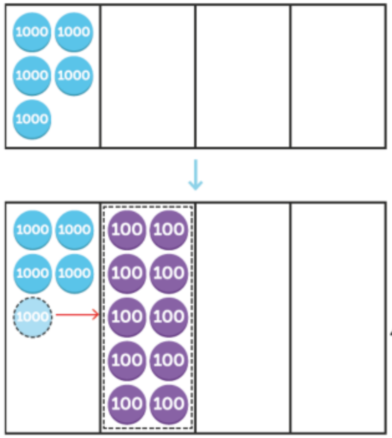
$6\ \overset{4}{\cancel{5}}\ \overset{12}{\cancel{3}}\ \overset{11}{\cancel{1}}$



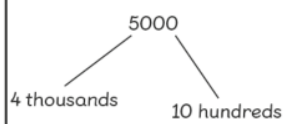


	6	$\overset{4}{\cancel{5}}$	$\overset{12}{\cancel{3}}$	$\overset{11}{\cancel{1}}$
−	2	3	8	5
	4	1	4	6

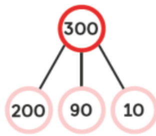
The children also have to look at what to do when there aren't enough to rename in one of the places.



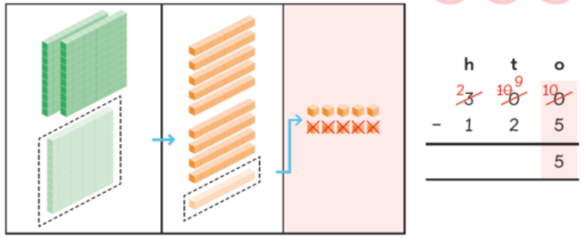
5000



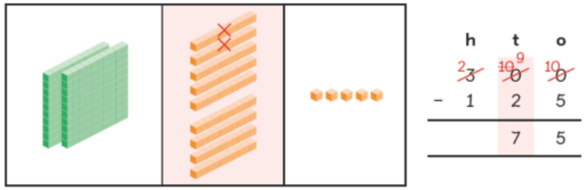
Subtract 125 from 300.



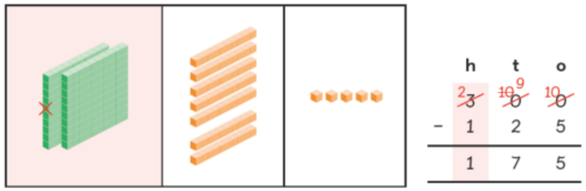
Step 1 Regroup 1 hundred into 10 tens.
Regroup 1 ten into 10 ones.
Subtract the ones.
10 ones − 5 ones = 5 ones



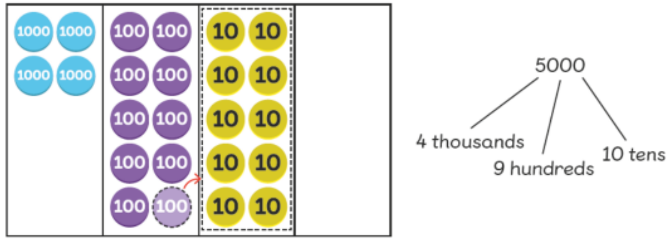
Step 2 Subtract the tens.
9 tens − 2 tens = 7 tens

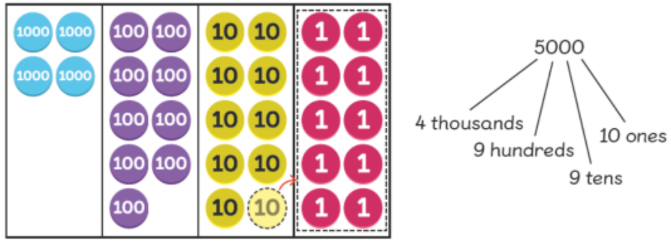


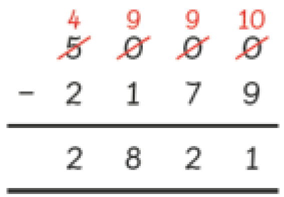
Step 3 Subtract the hundreds.
2 hundreds − 1 hundred = 1 hundred



300 − 125 = 175







The strategy is used in Years 5 and 6 to solve calculations with 5 and 6-digit numbers and decimals, but there is no explicit teaching as children should be confident by this point.