Rivelin Primary School

Calculation Policy

Reviewed: July 2024

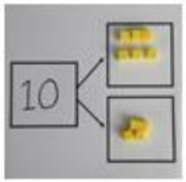
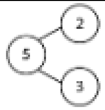
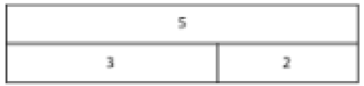
Next Review: December 2024

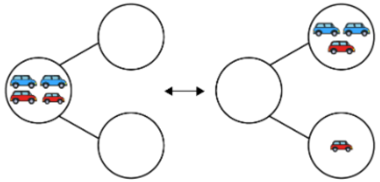
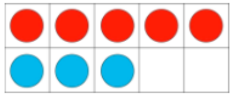
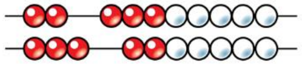
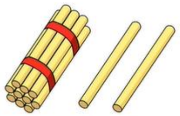
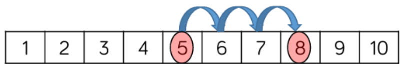
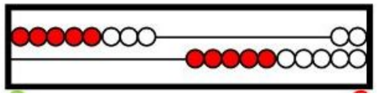
CALCULATION POLICY

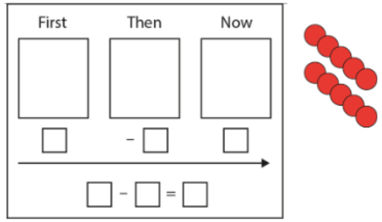
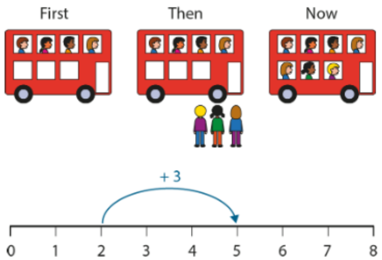
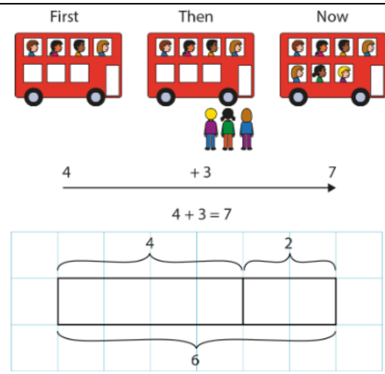
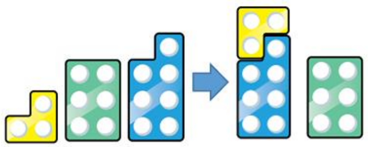
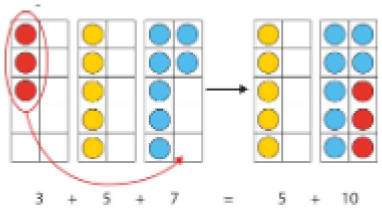
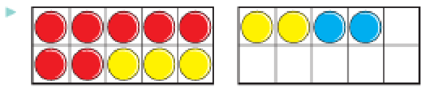
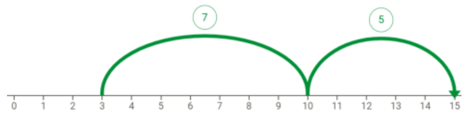
This policy lays out the expectations for both mental and written calculations for the four number operations and has been created to support the teaching of a mastery approach to mathematics. This is underpinned by the use of models and images that support conceptual understanding and this policy promotes a range of representations to be used across the primary years. Mathematical understanding is developed through use of representations that are first of all concrete (e.g. counters and multilink cubes), and then pictorial (e.g. part whole) to then facilitate abstract working (e.g. formal written methods). This policy is a guide through an appropriate progression of representations and if at any point a pupil is struggling with the abstract, they should revert to familiar pictorial and/or concrete materials/representations as appropriate. As children move through the different stages, representations should be modelled alongside each other to ensure a secure understanding is maintained. Children should only move onto the abstract method when they have a secure understanding of the two former methods.

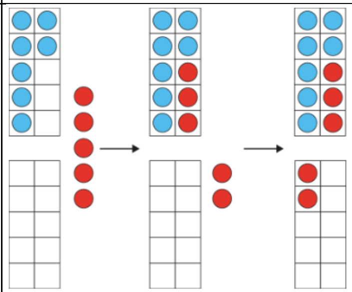
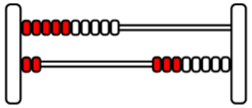
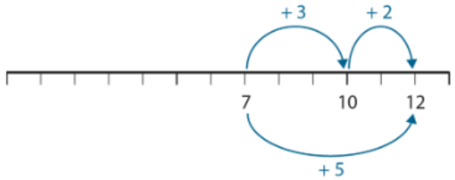
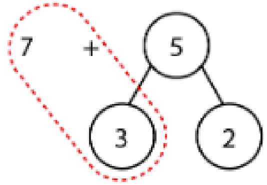
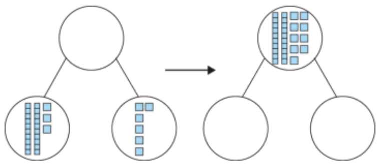
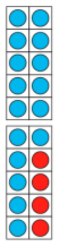
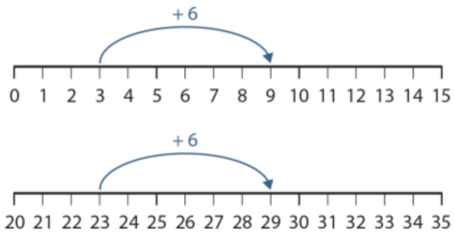
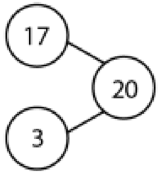
Although this policy sets out the main methods of mental and written calculations to be taught, it has been appended with a list of recommendations and effective practice teaching ideas aimed at informing and enhancing teaching across all the primary phases. Many of these models and images come from the White Rose materials. Some models are also supplemented by the NCETM's Spine materials and Mastering Number.

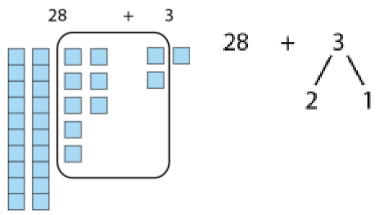
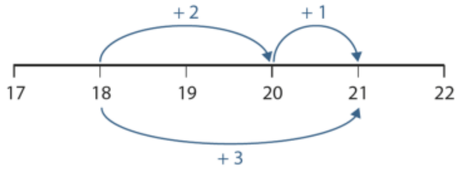
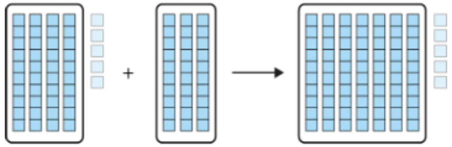
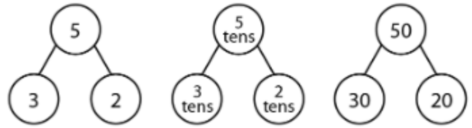
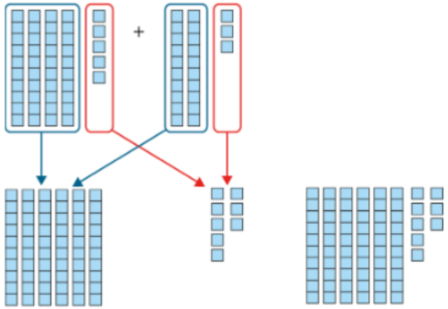
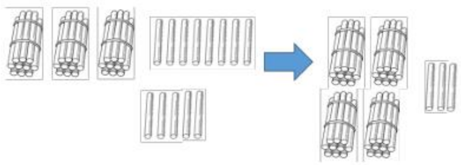
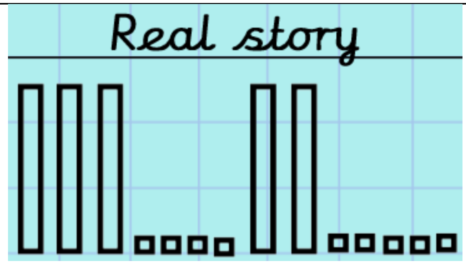
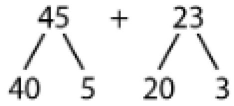
Addition

Stem sentences	Concrete (Can we make it?)	Pictorial (Can we draw it?)	Abstract (Can we write the equation?)
__ is the whole, __ is a part, __ is a part. __ = __ plus __ and __ plus __ = __ There are __ in total. ____ is a part. ____ + _____ = ________ ____ = ______ + _______ There are ___ red counters and ____ yellow counters. There are ______ counters altogether. This means that _____ and _____ are a bond to _____. OR There are _____ counters altogether. ____ + _____ = _______ One part is ___ and the other part is ___. The whole is _____. ____ plus _____ is equal to ______. _____ + ______ = ______ ______ = _____ + ________ **FS/Y1**	*****When adding numbers to 10, children can explore both aggregation and augmentation.* ***Aggregation** – Combining 2 or more parts to make a whole; the addition symbol, +, can be used to represent aggregation.* *The part-whole model, discrete and continuous bar model, number shapes and ten frame support aggregation.* ***Augmentation** – An addition context described by a 'first.., then…, now…' story is an example of this. We can link the story to a numerical representation – each number represents something in the story.* *The combination bar model, ten frame, bead string and number track all support augmentation.*    Use cubes to add two numbers together as a group or in a bar.	 3 + 2 = 5 2 + 3 = 5 5 = 3 + 2 5 = 2 + 3	 2 + 3 = 5 3 + 2 = 5 5 = 2 + 3 5 = 3 + 2 Bar model 

	  3 + 4 = 7 7 = 3 + 4 4 + 3 = 7 7 = 4 + 3  5 + 3 = 8 8 = 5 + 3 3 + 5 = 8 8 = 3 + 5   10, 11, 12 5 + 3 = 8  *Mastering Number Programme  5+3 = 8		

First… Then… Now… e.g. **First** there were 4 children on the bus, **then** 3 children got on. **Now** there are 7 children on the bus. First there were ______. Then ___ more were added. Now there are ____. ____ + ______ = _____ <u>Counting on</u> I need to start counting from ___. The number that comes after ___ is ___. I will say the number ___ because… I will not say the number ___ because… **FS/Y1**	Role play getting 'on the bus' or use a toy bus. 	 4 + 3 = 7 2 + 3 = 5	 4 + 2 = 6
If I have ___ counters, I need to add ___ more counters to make ___. I need to add ___ to ____ to make ___. We can look for pairs of addends which sum to 10. __ plus __ is equal to 10, then 10 plus __ is equal to __. __ ones + ___ ones = ___ ones So ___ ones + ___ ones + ___ ones = ___ ones ___ and ___ are a bond to _____ 10 + _____ = _____ So _____ + ______ = _____	   7 + 5 + 2 = _____		3 + 5 + 7 = 3 + 7 + 5 = 10 + 5 = 15

Year 2	*Manipulatives that highlight number bonds to 10 are effective when adding three 1-digit numbers.* *When adding one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.* *From Y2, use different manipulatives to represent this exchange alongside number lines to support children in understanding how to partition their jumps.*		
First, I partition the __: __ plus __ is equal to __. Then __ plus __ is equal to ten … and ten plus __ is equal to __. **Year 2** *When adding single digits to a two-digit number, children should be encouraged to count on from the larger number.*	 7 + 5 = 7 + 3 = 10 10 + 2 = 12 *Mastering Number Programme  10 + 2 = 12	 7 + 5 = 7 + 3 = 10 10 + 2 = 12	 7 + 3 = 10 10 + 2 = 12
I know that __ plus __ is equal to __. (single-digit fact) So __ plus __ is equal to __. (related two-digit plus single digit fact) I know that __ plus __ is equal to ten so __ plus __ is equal to __. There are ___ groups of 10 and ____ more. There are ____ in total. There are ___ tens and ___ ones. The number is ____.	  16 + 4 = 20 3 + 6 = 9 23 + 6 = 29	 3 + 6 = 9	 17 + 3 = 20

Year 2		 23 + 6 = 29	
I know that __ plus __ is equal to __. So __ tens plus __ tens is equal to __ tens. __ tens and __ ones, plus __ tens is equal to __ tens and __ ones. **Year 2**	 40 + 30 = 70 so 45 + 30 = 75	 45 + 30 = 75	 2 + 3 = 5 2 tens + 3 tens = 5 tens 20 + 30 = 50
First, I partition the __ into __ and __, and the __ into __ and __. __ plus __ is equal to __... (addition of the tens) __ plus __ is equal to __... (addition of the ones) and __ plus __ is equal to __. (addition of the tens and ones) So __ plus __ is equal to __. (summary of the overall calculation) **Year 2**	 45 + 23 = 60 + 8 = 68  30 + 13 => 40 + 3 = 43	 34 + 25 =	 40 + 20 = 60 5 + 3 = 8 60 + 8 = 68

<table>
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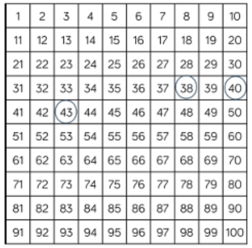
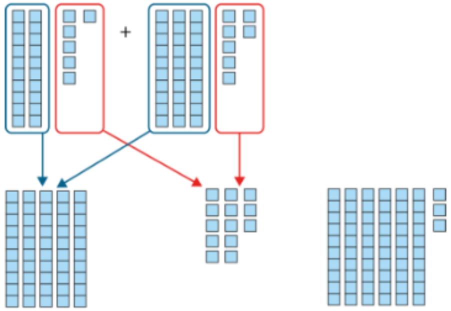
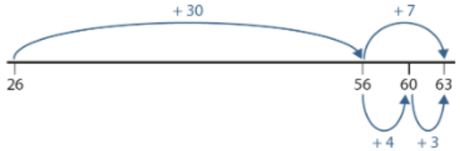
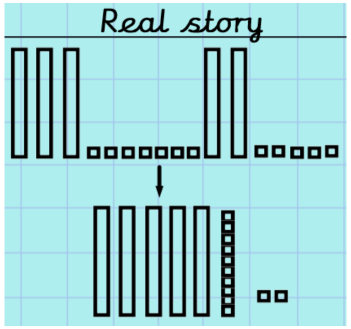
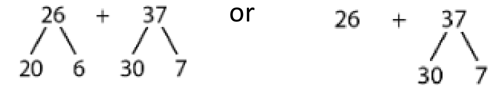
<td>
Hundred squares and straws can support children to find the number bond to 10.</td>
<td></td>
<td></td>
</tr>
<tr>
<td>First I partition the __ into __ and __, and the __ into __ and __.
__ plus __ is equal to __... (addition of the tens)
__ plus __ is equal to __... (addition of the ones)
and __ plus __ is equal to __. (addition of the tens and ones)
So __ plus __ is equal to __. (summary of the overall calculation)

Year 2</td>
<td>
26 + 37 = 50 + 13 = 63</td>
<td>

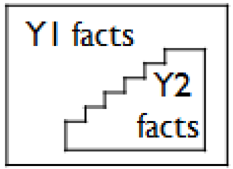
26 + 30 = 56
56 + 7 = 63


37 + 25 = 62</td>
<td>

20 + 30 = 50
6 + 7 = 13
50 + 13 = 63

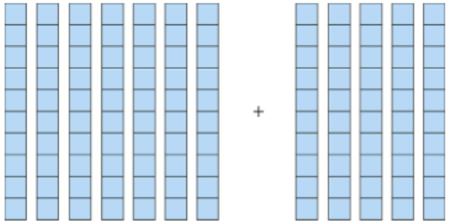
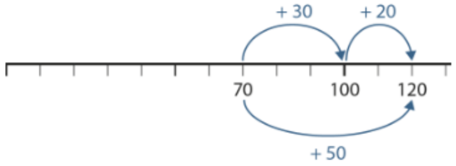
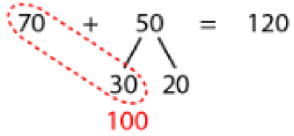
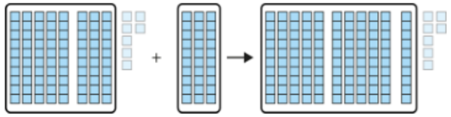
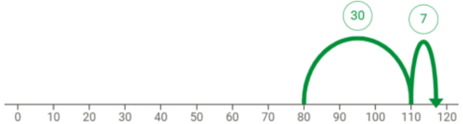
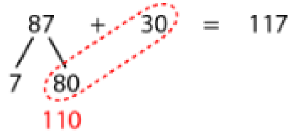
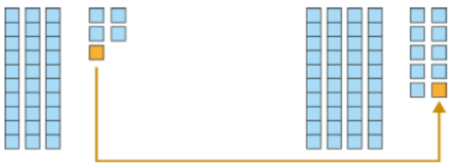
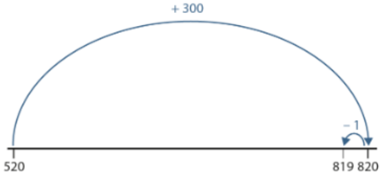
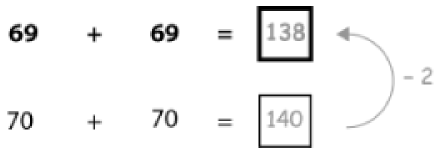
26 + 30 = 56
56 + 7 = 63</td>
</tr>
</table>

Addition Facts				
Adding 1	Bonds to 10	Adding 10	Bridging/compensating	
Adding 2	Adding 0	Doubles	Near doubles	



+	0	1	2	3	4	5	6	7	8	9	10
0	0 + 0	0 + 1	0 + 2	0 + 3	0 + 4	0 + 5	0 + 6	0 + 7	0 + 8	0 + 9	0 + 10
1	1 + 0	1 + 1	1 + 2	1 + 3	1 + 4	1 + 5	1 + 6	1 + 7	1 + 8	1 + 9	1 + 10
2	2 + 0	2 + 1	2 + 2	2 + 3	2 + 4	2 + 5	2 + 6	2 + 7	2 + 8	2 + 9	2 + 10
3	3 + 0	3 + 1	3 + 2	3 + 3	3 + 4	3 + 5	3 + 6	3 + 7	3 + 8	3 + 9	3 + 10
4	4 + 0	4 + 1	4 + 2	4 + 3	4 + 4	4 + 5	4 + 6	4 + 7	4 + 8	4 + 9	4 + 10
5	5 + 0	5 + 1	5 + 2	5 + 3	5 + 4	5 + 5	5 + 6	5 + 7	5 + 8	5 + 9	5 + 10
6	6 + 0	6 + 1	6 + 2	6 + 3	6 + 4	6 + 5	6 + 6	6 + 7	6 + 8	6 + 9	6 + 10
7	7 + 0	7 + 1	7 + 2	7 + 3	7 + 4	7 + 5	7 + 6	7 + 7	7 + 8	7 + 9	7 + 10
8	8 + 0	8 + 1	8 + 2	8 + 3	8 + 4	8 + 5	8 + 6	8 + 7	8 + 8	8 + 9	8 + 10
9	9 + 0	9 + 1	9 + 2	9 + 3	9 + 4	9 + 5	9 + 6	9 + 7	9 + 8	9 + 9	9 + 10
10	10 + 0	10 + 1	10 + 2	10 + 3	10 + 4	10 + 5	10 + 6	10 + 7	10 + 8	10 + 9	10 + 10

Stem sentences	Concrete (Can we make it?)	Pictorial (Can we draw it?)	Abstract (Can we write the equation?)

I know that __ plus __ is equal to __. (single-digit addends) So __ tens plus __ tens is equal to __ tens. (multiple-of-ten addends) __ plus __ is equal to one hundred and __. **Year 3**	 7 + 5 = 12 7 tens + 5 tens = 12 tens 70 + 50 = 120	 70 + 50 = 70 + 30 = 100 100 + 20 = 120	 70 + 50 = 70 + 30 + 20 = 100 + 20 = 120
I know that __ plus __ is equal to __. (single-digit addends) So __ tens plus __ tens is equal to __ tens. (multiple-of-ten addends) __ plus __ is equal to one hundred and __. *When adding single digits to a two-digit number, children should be encouraged to count on from the larger number.* *Children should also apply their knowledge of number bonds to add more efficiently e.g. 8 + 5 = 13 so 38 +5 = 43.* **Year 3**	 87 + 30 = 110 + 7 = 117	 87 + 30 = 80 + 30 + 7 = 110 + 7 = 117	 87 + 30 = 80 + 7 + 30 = 110 + 7 = 117
First, we add: __ plus __ is equal to __ ... ... then we adjust: __ minus __ is equal to __. ___ ones +___ ones = __ ones	35 + 49 = 34 + 50 = 84 	 520 + 299 = 520 + 300 = 820 820 – 1 = 819	

If I have ___ ones, I can exchange them for ____ ten and ____ ones. I have ___ hundreds, ___ tens and ___ ones, so altogether I have ___. **Year 3**			

We line up the ones; __ ones plus __ ones.
We line up the tens: __ tens plus __ tens.
The __ is in the ones column – it represents __ ones. The __ is in the ones column – it represents __ ones.
__ ones plus __ ones is equal to __ ones.
The __ is in the tens column – it represents __ tens. The __ is in the tens column – it represents __ tens.
__ tens plus __ tens is equal to __ tens.

In column addition we start at the right-hand side.

___ ones +___ ones = __ ones

If I have ___ ones, I can exchange them for _____ ten and _____ ones.

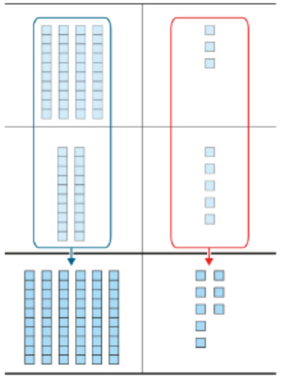
I have ___ hundreds, ___ tens and ___ ones, so altogether I have ___.

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.

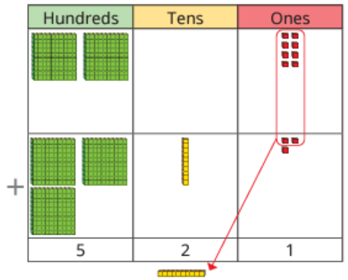
When teaching the column method, initially ask pupils to write column headings above their calculation (Th, H, T, O, etc.) and make a point of reminding them that there should be one digit in each square. This will help ensure that pupils line up their columns correctly.

After setting up the columns, pupils will always begin with the smallest place value and then move to the left

Start with two-digit numbers to exemplify lining up the columns.

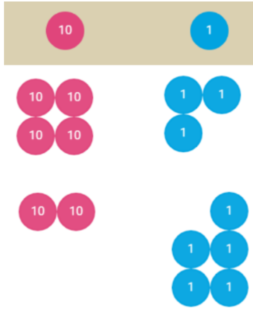


- Dexter uses base 10 to work out 208 + 313



	H	T	O
	2	0	8
+	3	1	3
	5	2	1
		1	

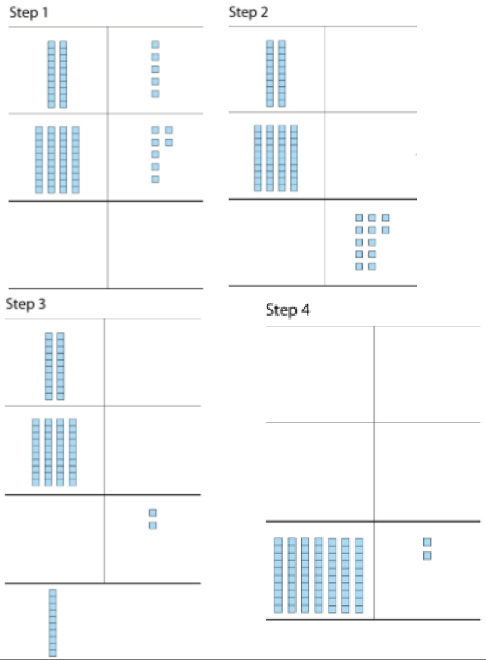
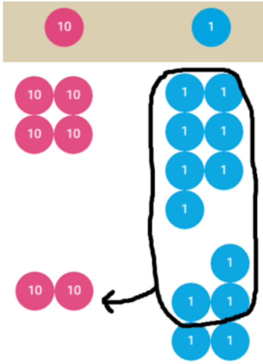
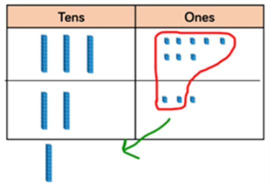
Children could draw place value counters.

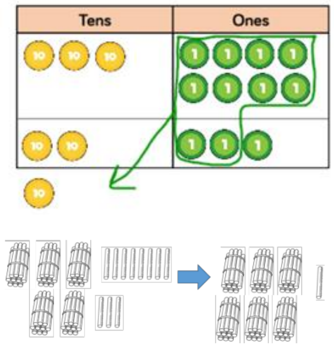


Start with two-digit numbers to exemplify lining up the columns.

	4	3
+	2	5

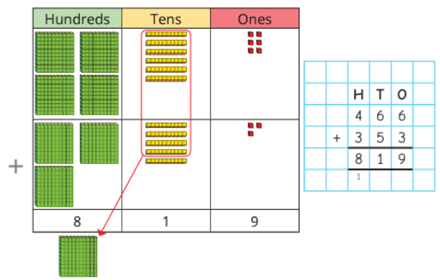
462
+ 205
___

Remind children that when using column method that the bigger number goes on the top. The operation symbol (+,-,x and ÷) need to go to the left of the equation. **Year 3**			
If the column sum is equal to ten or more, we must exchange. __ ones + ____ ones = ____ ones If I have ___ ones, I can exchange them for ___ ten and ___ ones. I have ___ hundreds, ___ tens and ____ ones, so altogether I have ____. ____ tens + ___ tens = ____ tens If I have ___ tens, I can exchange them for ___ hundred and ___ tens. I have ___ hundreds, ___ tens and ___ ones, so altogether I have ______.	**Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 3 digits. Plain counters on a PV grid can also be used to support learning. Plain counters on a place value grid can also be used to support learning.* Start with two-digit numbers to exemplify the exchanging.  	Children could draw place value counters.   38 + 23 61 1 *Ensure children write out their calculation alongside any concrete resources so they can see links to the written column method.*	Start with two-digit numbers to exemplify the exchanging. 2 5 + 4 7 2 1 2 5 + 4 7 7 2 1 567 +233 800 1 1



38 + 23 = 61

Nijah uses base 10 to work out 466 + 353



If the column sum is equal to ten or more, we must exchange.

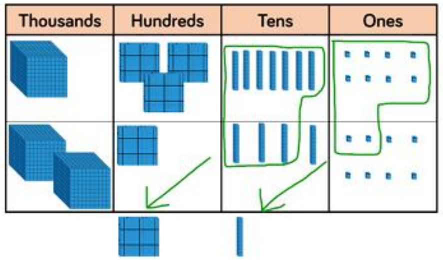
Year 4

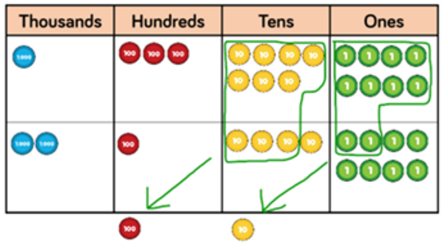
___ ones added to ___ ones is equal to ___ ones.
___ plus ___ plus the 1 that I exchanged from the last column is equal to ___.
I have ___ hundreds/tens/ones, so I do/do not need to make an exchange.

I can exchange 10 ___ for 1 ___.

**Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 4 digits. Plain counters on a PV grid can also be used to support learning.*

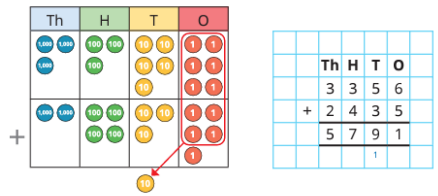
See Year 3 examples





See Year 3 examples

Kim uses counters to find the total of 3,356 and 2,435



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.

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

```
   6, 5  8  4
+  2, 7  3  9
   9, 3  2  3
   1  1  1
```

```
   £  2  4 . 5  5
+  £  1  7 . 8  2
   £  4  2 . 3  7
      1  1
```

If the column sum is equal to ten or more, we must exchange.

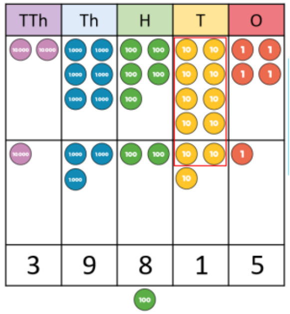
Years 5 and 6

**Base 10 and place value counters are the most effective manipulatives 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.

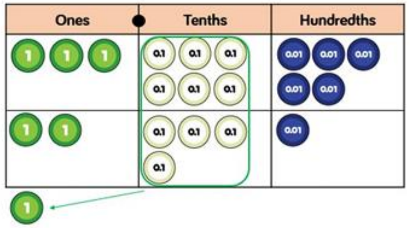
Place value counters and plain counters on a place value grid are the most effective manipulatives when adding decimals with 1,2 and then 3 decimal places.

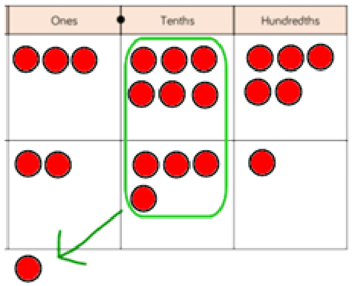
Ensure children have experience of adding decimals with a variety of decimal places. This includes putting this into context when adding money and other resources.

See Year 3 examples

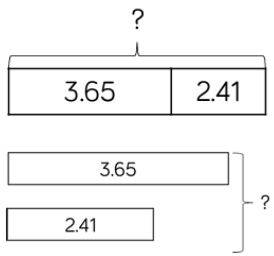


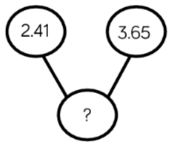
Adding with up to 3 decimal places





See Year 3 examples



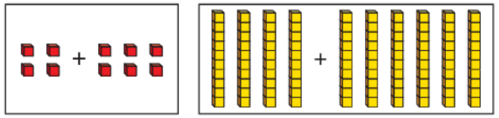
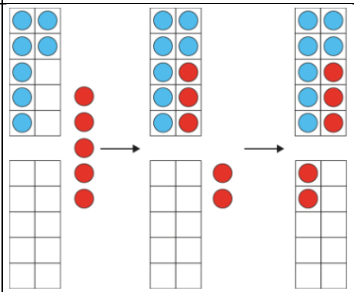
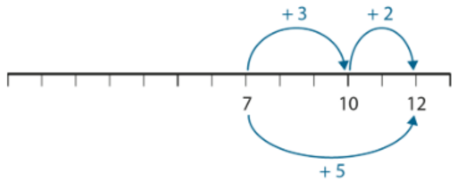
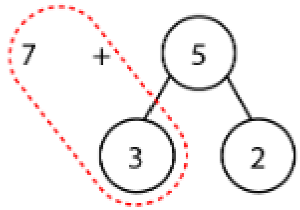
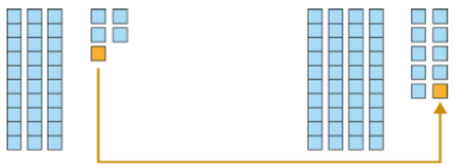
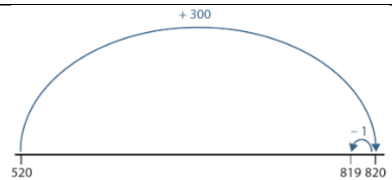
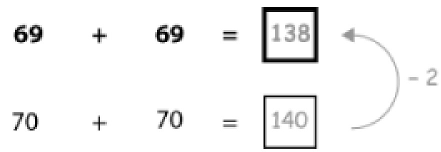


As in Year 4 but using numbers with more than 4 digits

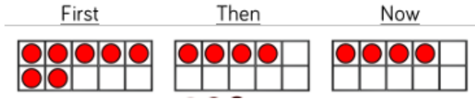
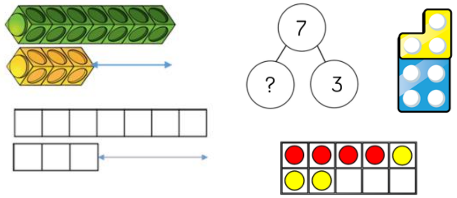
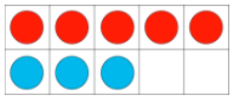
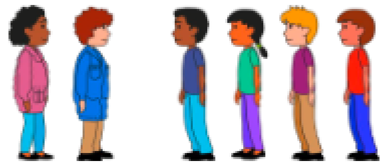
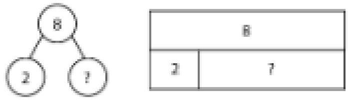
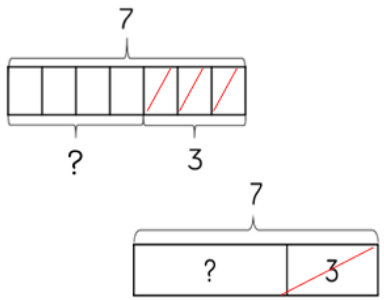
$$
\begin{array}{r}
26584 \\
+\ 13231 \\
\hline
39815 \\
\hline
{}^{1}\ \ \ \
\end{array}
$$

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

Addition – Key mental strategies for Key Stage 1 & 2

Strategy	Concrete (Can we make it?)	Pictorial (Can we draw it?)	Abstract (Can we write the equation?)
This is introduced in Year 2 but can be used up to Year 6. Bonds to 100 If ___ ones + ___ ones = 10, Then _____ tens + ___ tens = 100 If I have ___ tens, I need to add ___ more tens to make 100. I need to add _____ to ___ to make 100.	 How many ones are there? How many tens are there? Write the number sentence for each bond. What do you notice?		
Bridging through a multiple of 10, 100, etc **Years 3, 4, 5 and 6** If ___ ones + ___ ones = 10, Then _____ tens + ___ tens = 100 If I have ___ tens, I need to add ___ more tens to make 100. I need to add _____ to ___ to make 100.	 7 + 5 = 7 + 3 = 10 10 + 2 = 12	 7 + 5 = 7 + 3 = 10 10 + 2 = 12	 7 + 3 = 10 10 + 2 = 12
Compensating – rounding to the nearest multiple 10, 100, etc and adjusting **Years 3, 4, 5 and 6**	 35 + 49 = 34 + 50 = 84	 520 + 299 = 520 + 300 = 820 820 – 1 = 819	

Subtraction

Stem sentences	Concrete (Can we make it?)	Pictorial (Can we draw it?)	Abstract (Can we write the equation?)
__ is the whole, __ is a part, __ is a part. __ = __ minus __ and __ minus __ = __ If the whole is ___ and ____ is a part, then the other part is ____. ___ minus ____ is _____. _____ - ______ = _____ **FS/Y1**	**Part-whole models, bar models, ten frames and number shapes support partitioning.* *Ten frames, number tracks, single bar models and bead strings support reduction.* ***Reduction*** *– A subtraction context described by a 'first..., then..., now...' story is an example of this. We can link the story to a numerical representation – each number represents something in the story.*  *Cubes and bar models with two bars can support finding the difference.*  I have 8 counters. 5 counters are red. How many are blue?  *In Y1, subtracting one-digit numbers that cross 10, is done by counting back, using objects, number tracks and number lines.*	There are 6 children. 2 have their coat on. How many do not have their coat on? 	There are 8 flowers. 2 are red and the rest are yellow. How many are yellow?  8 – 2 = 6 

First... Then... Now...
e.g. **First** there were 4 children in the car, **then** 1 child got out. **Now** there are 3 children in the car.

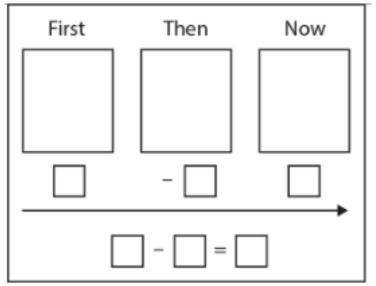
First there were _____
Then _____ where taken away.
Now there are ______.
____ - _______ = _________

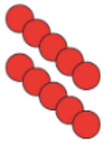
I need to start from _____.
I need to make ______ jumps backwards.
I land on _____.
This means that _____ - _______ = _____

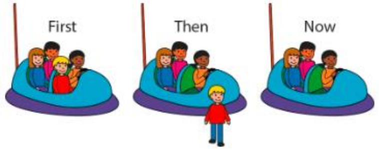
I need to start from ____.
I need to make ____ jumps backwards.
I land on _____.
This means that ____ - ____ = ____.

FS/Y1

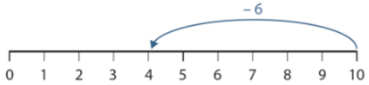
Role play 'getting out of a car'.



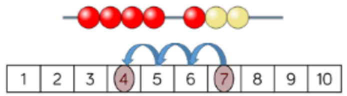




4 - 1 = 3
3 = 4 – 1

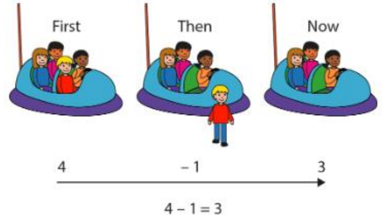


10 – 6 = 4



• Complete the number lines and the subtractions.

9 – 3 = _____



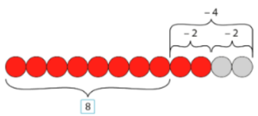
When subtracting, the answer will be ___ than the number I start with.

We partition the __ into __ and __.
First we subtract the __ from __ to get to 10.
Then we subtract the remaining __ from 10.
We know 10 minus __ is equal to __.

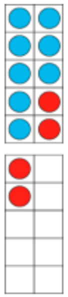
I need to subtract ___ to get to 10.
I can partition ___ into ___ and ____.
I need to subtract ____ more.
____ less than ____ is ______.

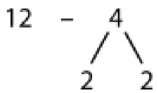
Year 2

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.

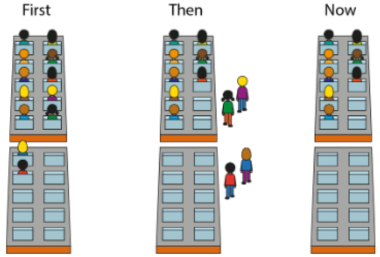


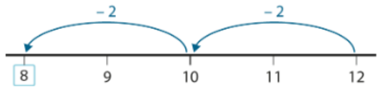
12 – 4 =
12 – 2 = 10
10 – 2 = 8



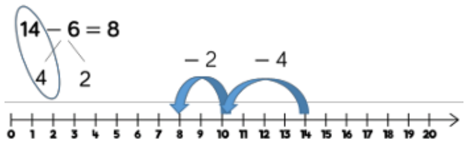


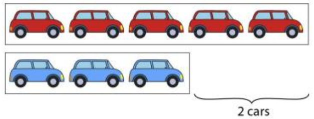
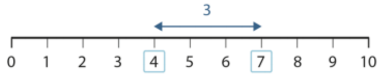
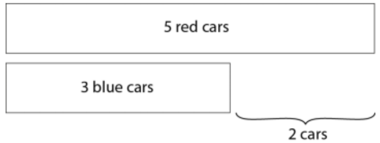
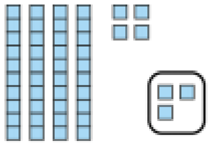
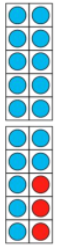
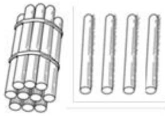
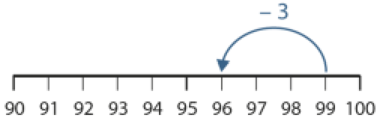
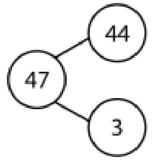
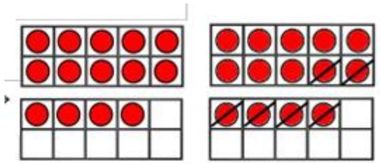
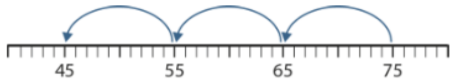
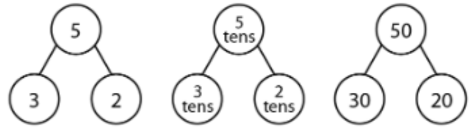
First there were 12 children on the ride. Then 4 got off. Now there are 8 children on the ride.

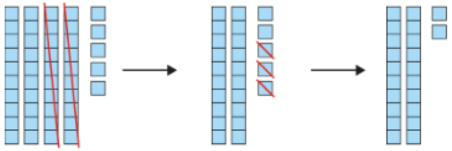
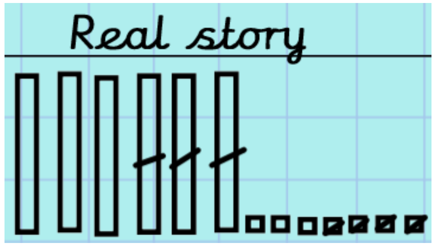
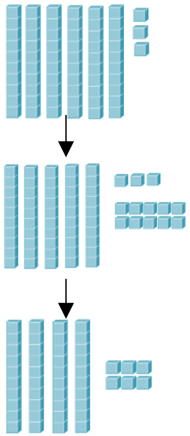
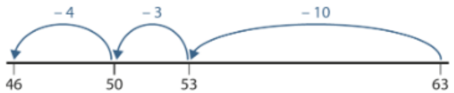
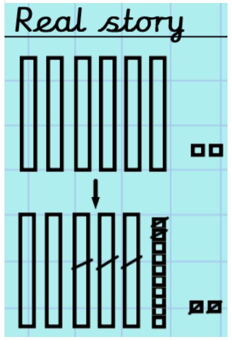
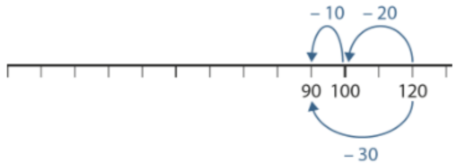
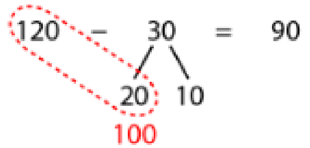


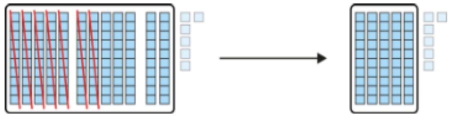
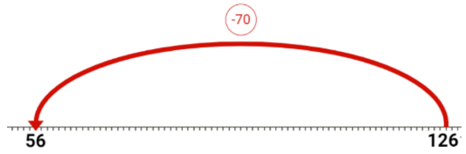
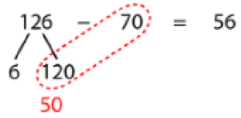
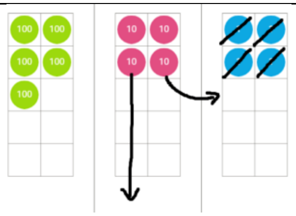
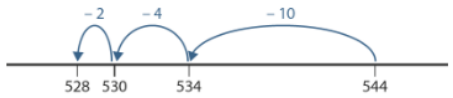
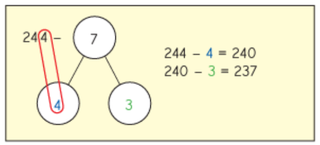
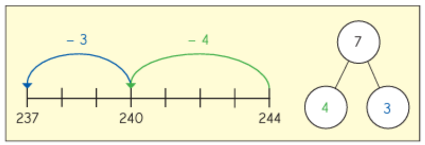
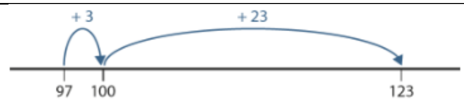


12 – 4 =
12 – 2 = 10
10 – 2 = 4



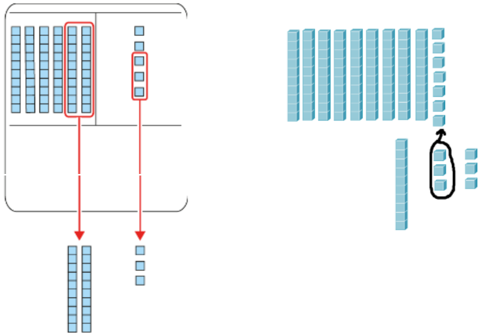
There are more __ than __. There are fewer __ than __. The difference between __ and __ is __. **Year 2**	 The difference between 2 and 5 is 3. The difference between 5 and 2 is 3.	 The difference between 4 and 7 is 3. The difference between 7 and 4 is 3. *Children can also use a blank number line to count back to find the difference.* *Encourage pupils to jump to multiples of 10 to become more efficient.*	 5 – 3 = 2
I know that __ minus __ is equal to __. (single-digit fact) So __ minus __ is equal to __. (related two-digit minus single digit fact) I know that ten minus __ is equal to __ so __ minus __ is equal to __. **Year 2**	 7 – 3 = 4 47 – 3 = 44  20 – 3 =17  	 9 – 3 = 6 99 – 3 = 96	 47 – 3 = 44
I know that __ minus __ is equal to __. So __ tens minus __ tens is equal to __ tens. **Year 2**	 70 – 30 = 40 so 75 – 30 = 45 	 75 – 30 = 45	 5 – 3 = 2 5 tens – 3 tens = 2 tens 50 – 30 = 20

First I subtract the tens, then I subtract the ones. ___ ones - _____ ones = _____ ones ___ tens - ______ tens = _____ tens The difference between _____ and ___ is ___ ___ minus ___ is equal to ______ **Year 2**	 45 – 23 = 45 – 20 = 25 25 – 3 = 22	67 – 34 = 33  *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.*	45 – 23 = 22
First I subtract the tens, then I subtract the ones. 1 ten is equal to ___ ones. I need to exchange ___ for ____. I know I need to make an exchange because… The difference between ___ and ___ is ___. I know this is a subtraction because… I know I need to make an exchange because… ___ subtract ___ is equal to ____. **Year 2**		  62 – 34 = 28	63 – 17 = 46
I know that __ minus __ is equal to __. (bridging ten) So __ tens minus __ tens is equal to __ tens. (bridging ten tens) One hundred and __ minus __ is equal to __. **Year 3**	See Year 2 (bridging)	 120 – 30 = 120 – 20 = 100 100 – 10 = 90	 120 – 30 = 120 – 20 = 100 100 – 10 = 90

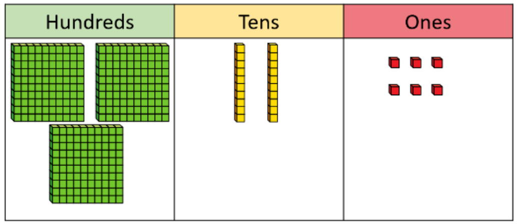
I know that __ minus __ is equal to __. (bridging ten) So __ tens minus __ tens is equal to __ tens. (bridging ten tens) One hundred and __ minus __ is equal to __. There are ___ hundreds, ___ tens and ___ ones. ___ tens minus ____ tens are equal to ____ tens. The tens column will decrease by _____. **Year 3**	 126 – 70 = 56		 126 – 70 = 120 – 70 + 6 = 50 + 6 = 56
We partition the __ into __ and __. First, we subtract the __ from __ to get to a multiple of 10. Then we subtract the remaining __ from the multiple of 10. We know 10 minus __ is equal to __ so __ minus __ is equal to __. The previous multiple of 10 before ___ is ___. ___ can be partitioned into ____ and ____. I need to subtract ___ to get to the previous multiple of 10, then subtract ___ more. **Year 3**		544 – 16 	Count back to multiples of 10/100 • Scott and Whitney are working out 244 – 7 **Scott's method**  **Whitney's method** 
We partition the __ into __ and __. First, we add the __ to __ to get to 100. Then we add the remaining __ to 100. We know 100 plus __ is equal to __. **Year 3**	*Base 10 and place value counters are the most effective manipulative when subtracting numbers with up to 3 digits.*	 123 – 97 = 26	Count on to multiples of 10/100

We line up the ones; __ ones plus __ ones.
We line up the tens: __ tens plus __ tens.
The __ is in the ones column – it represents __ ones.
__ ones minus __ ones is equal to __ ones.
The __ is in the tens column – it represents __ tens.
__ tens minus __ tens is equal to __ tens.
In column subtraction we start at the right-hand side.

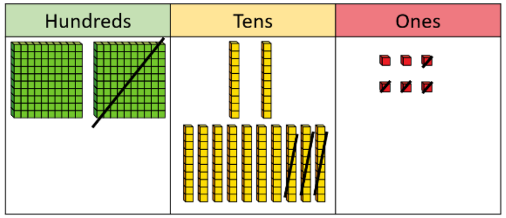
Year 3



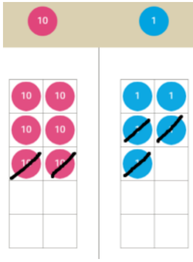
$326 - 134 =$



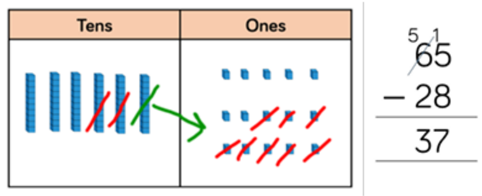
$326 - 134 =$ 192

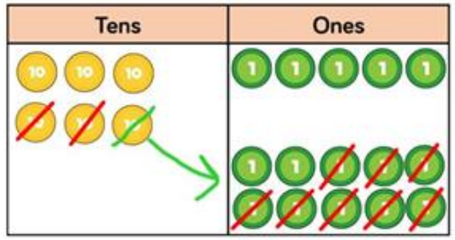


Children could draw place value counters.



From Y3, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters.



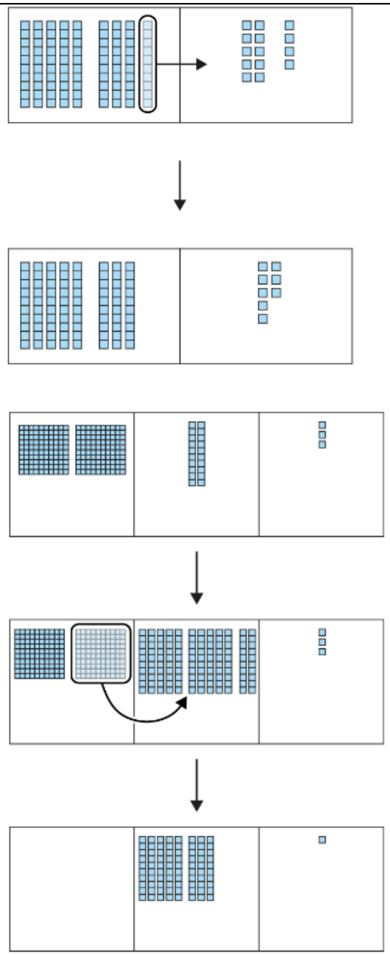


Ensure children write their calculation alongside any concrete resources so they can see the links to the written column method.
Plain counters on a place value grid can also be used to support learning.

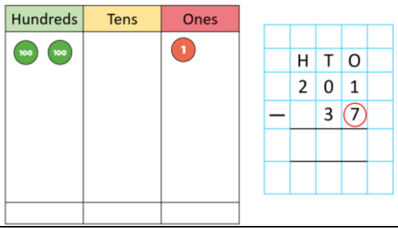
If there is an insufficient number to subtract from in a given column, we must exchange from the column to the left.

Year 3

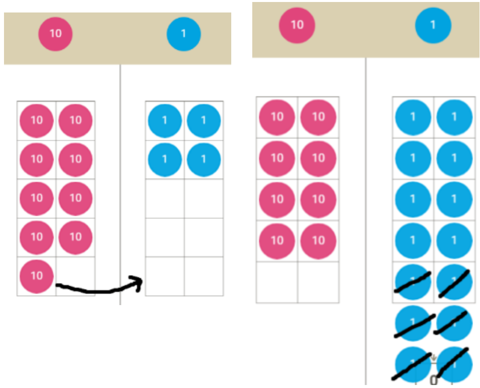
___ hundreds subtract ___ hundreds is equal to _____.
I will exchange 1 hundred for ___ tens, then 1 ten for ____ ones.



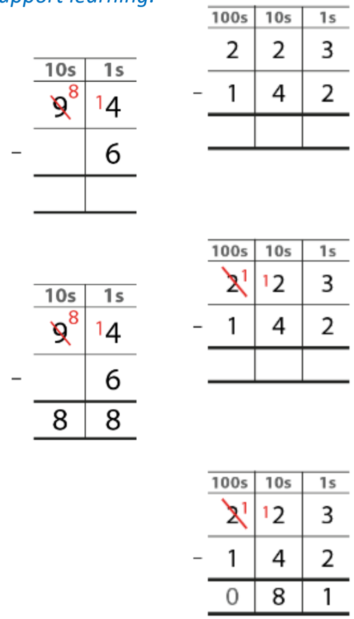
201 − 37 =

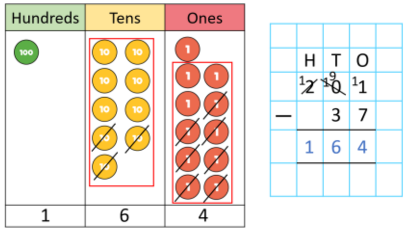
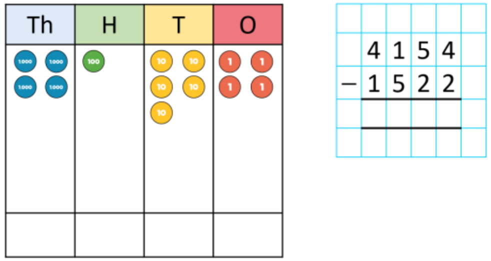
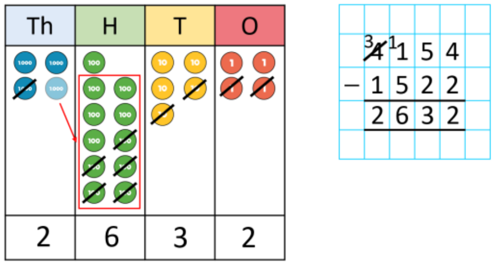
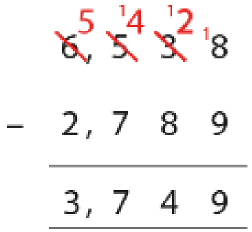
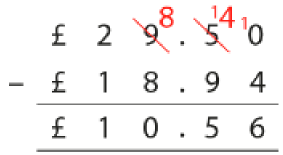


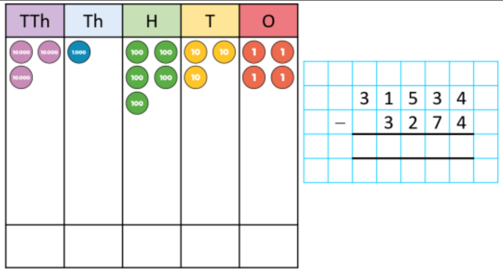
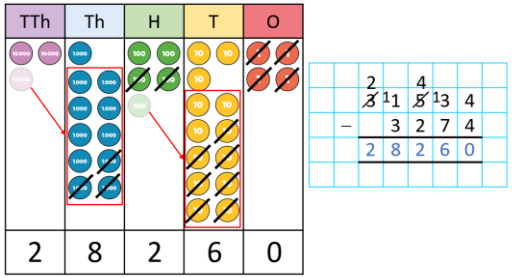
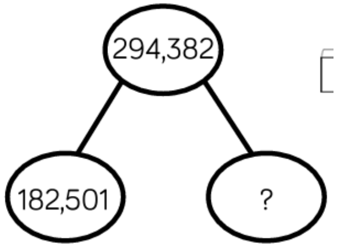
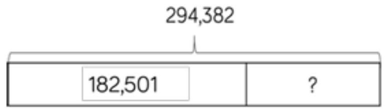
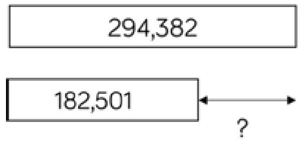
Children could draw place value counters.



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 links to the written column method.
Plain counters on a PV grid can also be used to support learning.

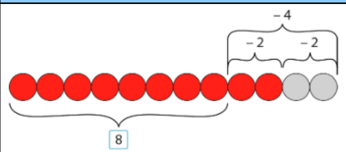
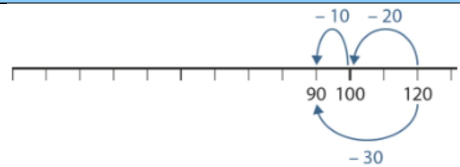
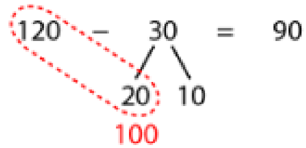


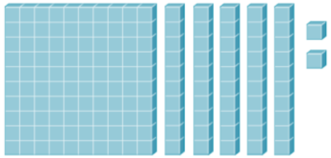
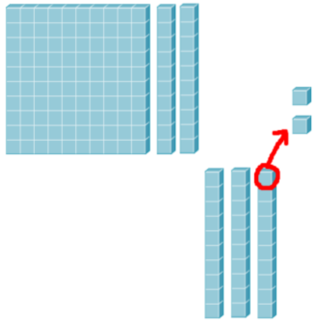
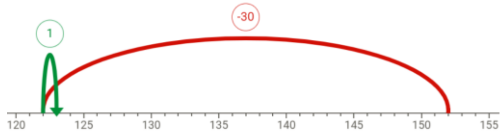
	201 − 37 = 		
If there is an insufficient number to subtract from in a given column, we must exchange from the column to the left. **Year 4**	See Year 3 examples 4,154 − 1,522 =  4,154 − 1,522 = 	See Year 3 examples	*Base 10 and place value counters are the most effective manipulative when subtracting numbers with up to 4 digits.* *Ensure children write out their calculation alongside any concrete resources so they can see links to the written column method.* *Plain counters on a PV grid can also be used to support learning.*  
If there is an insufficient number to subtract from in a given column, we must exchange from the column to the left. **Years 5 and 6**	See Year 3 examples	See Year 3 examples	As in Year 4 but using 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.* *Ensure children have experience of subtracting decimals with a variety of decimal places. This*

	  *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. Counters on a place value grid are also 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.*	   	*includes putting this into context when subtracting money and other measures.*

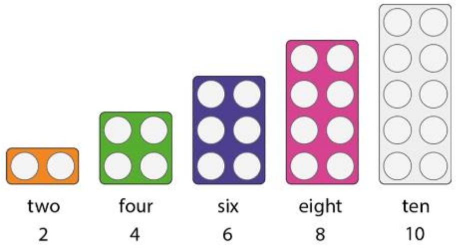
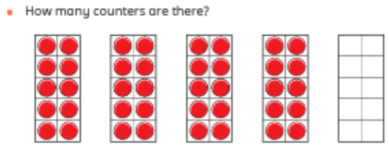
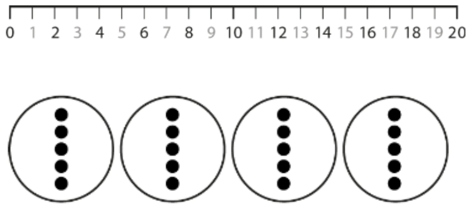
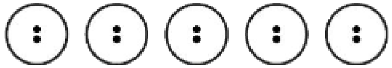
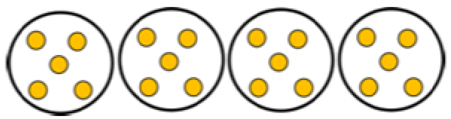
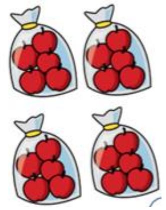
	2	9	³4̸	¹3	8	2
–	1	8	2	5	0	1
	1	1	1	8	8	1

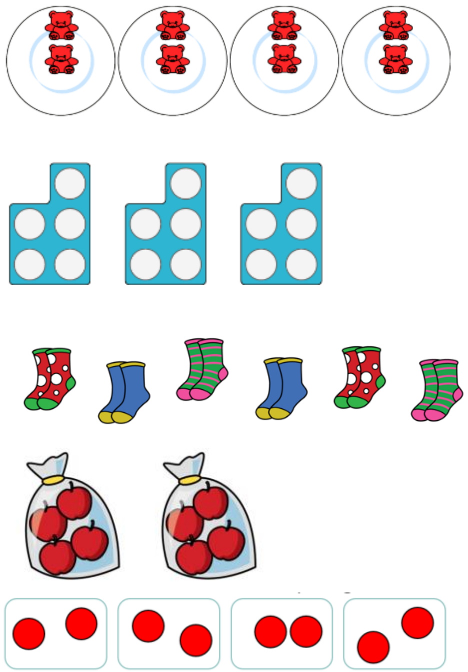
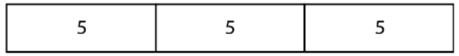
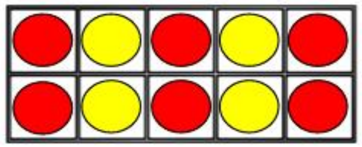
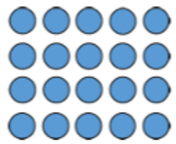
Subtraction – Key mental strategies for Key Stage 2

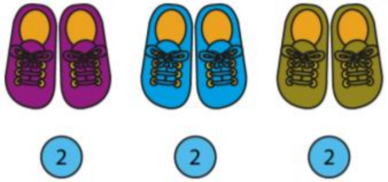
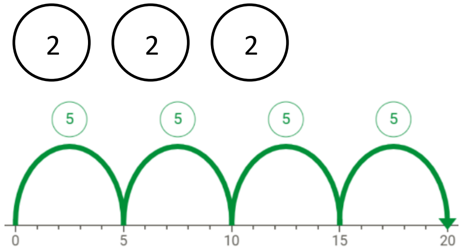
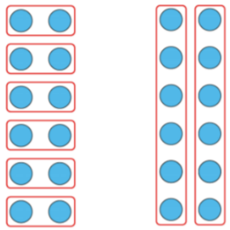
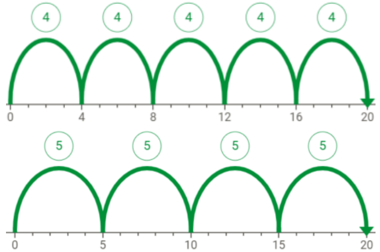
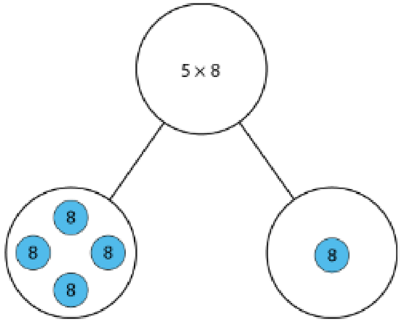
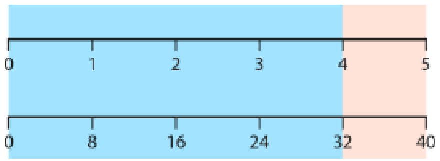
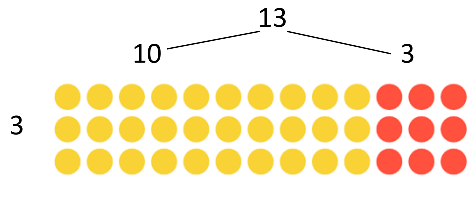
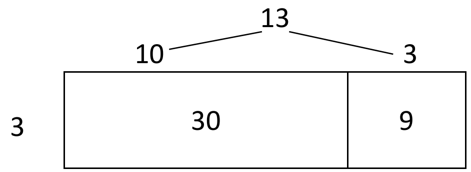
Strategy	Concrete (Can we make it?)	Pictorial (Can we draw it?)	Abstract (Can we write the equation?)
Bridging through a multiple of 10, 100, etc **Years 3, 4, 5 and 6**	 12 – 4 = 12 – 2 = 10 10 – 2 = 8	 120 – 30 =	 120 – 30 = 120 – 20 = 100

	12 – 4 2 2	120 – 20 = 100 100 – 10 = 90	100 – 10 = 90
Compensating – rounding to the nearest multiple 10, 100, etc and adjusting **Years 3, 4, 5 and 6**	 152 – 29 	 	152 – 30 = 122 122 + 1 = 123

Multiplication

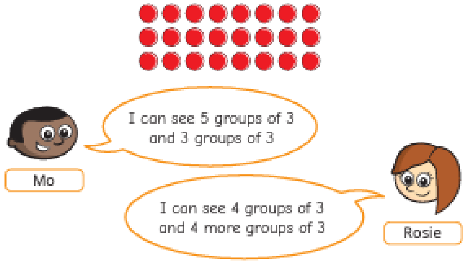
Stem sentences	Concrete (Can we make it?)	Pictorial (Can we draw it?)	Abstract (Can we write the equation?)
One group of two, two groups of two, three groups of 2, … Ten, twenty, thirty, … One five, two fives, three fives, … There are ___ groups of ten. There are ___ altogether. There are ___ full ten frames. There are ___ in total. **FS/Y1**	 		10, 20, 30, …
There are __ coins. Each coin has a value of __p. This is __p. There are ___ equal groups of ___. I know that the groups are equal/not equal because... To make the groups equal, I could… There are ___ equal groups of ___. I know that the groups are equal/not equal because… To make the groups equal, I could… There are ___ equal groups. There are ___ in each group. There are ____ altogether. There are ___ groups of ____ __ + ___ + ___ + ___ + ____ = ___ **Year 1**	 Representing each group by one object  *Children represent multiplication as repeated addition in many different ways.* *In Y1, children use concrete and pictorial representations to solve problems. They are not expected to record multiplication formally.*	  	Five 2p coins = 10p 5 + 5 + 5 + 5 = 20 5 + 5 + 5 + 5 = 20

There are __ in each group. There are __ groups. There are __ in a group and __ groups. **Year 2** There are ___ equal groups with ___ in each group. There are ___ groups of ___. There are ____ altogether. ____ lots of ____ = _____ ____ multiplied by _____ is equal to _____ ____ x _____ = _____ ___ x 2 is the same as ___ lots of 2. ____ multiplied by 2 is equal to ____. I know that ___ x 2 = _____, so I can add/subtract 2 to work out ____ x 2.	*In Year 2, children are introduced to the multiplication symbol.* *Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.* *Look for patterns in the two times table, using concrete manipulatives to support. Notice how all the numbers are even and there is a pattern in the ones.* 	    $5 + 5 + 5 + 5 = 20$ $4 \times 5 = 20$ $5 \times 4 = 20$	2 + 2 + 2 + 2 = 8 4 x 2 = 8 5 + 5 + 5 = 15 3 x 5 = 15 3 lots of 5 equal 15. 6 lots of 2 equal 12. *In Y2, children are introduced to the multiplication symbol. Children also make the link between multiplication and repeated addition. Children should already be secure in identifying equal groups and be able to represent this as an addition number sentence.* *When writing factor times factor, the first factor is the number of groups x the number within each group.* *3 x 4* *There are 3 groups/lots of 4.* *Children may find that using the language 'lots of' builds on previous learning, but they should also use other variations interchangeably, such as "times," "multiplied by" and so on.*

Factor times factor is equal to the product. The product is equal to factor times factor. There are 3 equal groups with ___ in each group. __ + __ + __ + __ = ___ __ x ___ = ___ **Year 2**	 Unitising equal groups – representing each group by one object		3 x 2 = 6 6 = 3 x 2
__ times __ can represent __ in a group and __ groups. It can also represent __ groups of __. Multiplication is commutative. **Year 2**			2 x 5 = 5 x 2
__ is equal to __ plus __, so __ times __ is equal to __ times __ plus __ times __. __ is equal to __ minus __, so __ times __ is equal to __ times __ minus __ times __. Multiplication is distributive. (NCETM Year 4 unit 2.10) **Year 3**			5 = 4 + 1 5 x 8 = 4 x 8 + 1 x 8 = 32 + 8 = 40 4 = 5 – 1 4 x 8 = 5 x 8 – 1 x 8 = 40 – 8 = 32
__ is equal to __ plus __, so __ times __ is equal to __ times __ plus __ times __. __ is equal to __ minus __, so __ times __ is equal to __ times __ minus __ times __.			3 x 13 = 3 x 10 + 3 x 3 = 30 + 9 = 39

<table>
<tr>
<td>Multiplication is distributive.

There are ____ groups.
There are ___ in each group.
There are ____ altogether.
__ x 3 = ___ x 3 + ____ x 3

(NCETM Year 4 unit 2.10)
Year 3</td>
<td>
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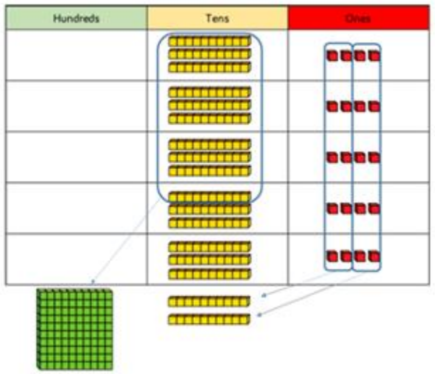
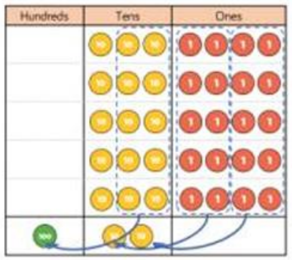
<tr>
<td>Informal methods and the expanded method are used in Year 3 before moving on to the short multiplication method in Year 4. Children apply their understanding of partitioning to represent and solve calculations using the expanded method. This involves partitioning the 2-digit number into tens and ones, multiplying separately, then adding the partial products together.

__ tens and ___ ones multiplied by __ is equal to ___ tens multiplied by ___ and ___ ones multiplied by ___.
__ ones is ___ tens and ____ ones.
__ x ___ = ___ tens x __ + ___ x ____

Year 3</td>
<td>


</td>
<td></td>
<td>
<table>
<tr><td></td><td>H</td><td>T</td><td>O</td><td></td><td></td></tr>
<tr><td></td><td></td><td>3</td><td>4</td><td></td><td></td></tr>
<tr><td>×</td><td></td><td></td><td>5</td><td></td><td></td></tr>
<tr><td></td><td></td><td>2</td><td>0</td><td>(5 × 4)</td><td></td></tr>
<tr><td>+</td><td>1</td><td>5</td><td>0</td><td>(5 × 30)</td><td></td></tr>
<tr><td></td><td>1</td><td>7</td><td>0</td><td></td><td></td></tr>
</table>
</td>
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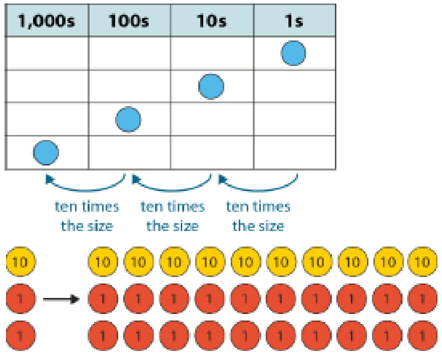
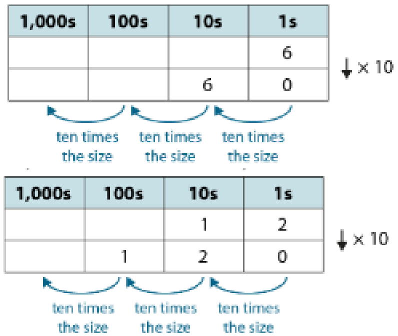
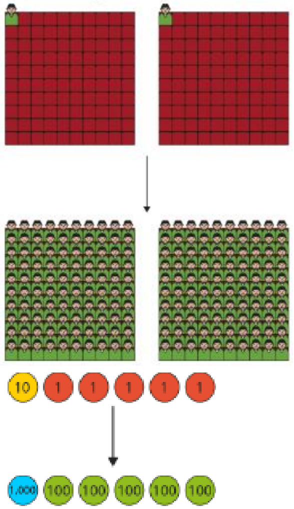
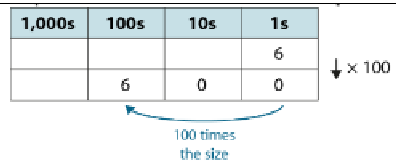
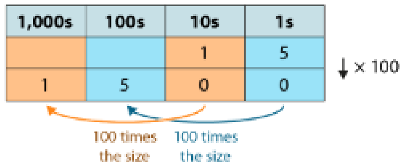
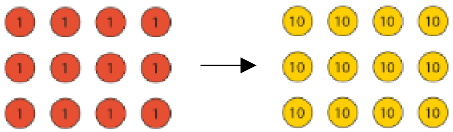
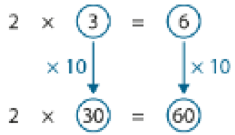
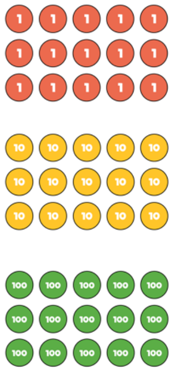
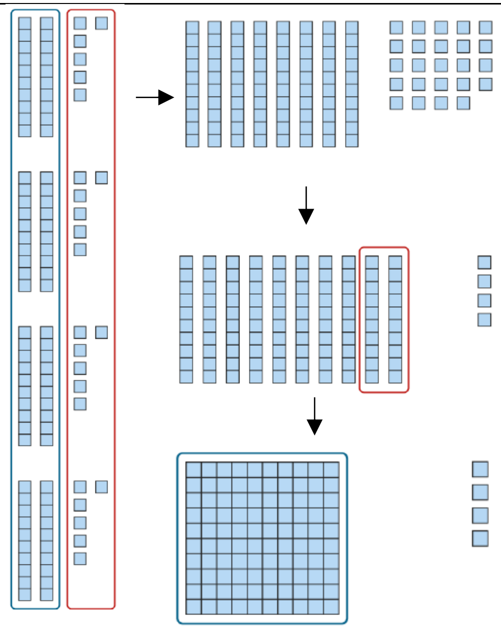
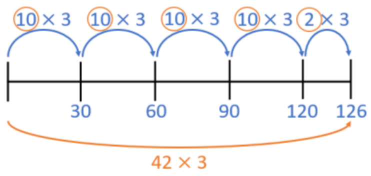
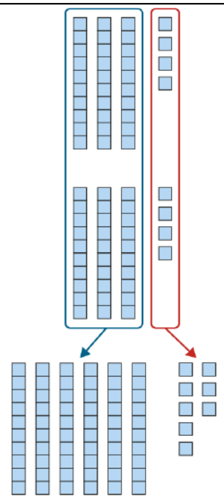
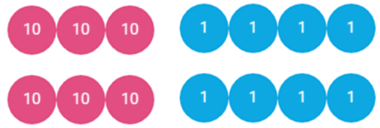
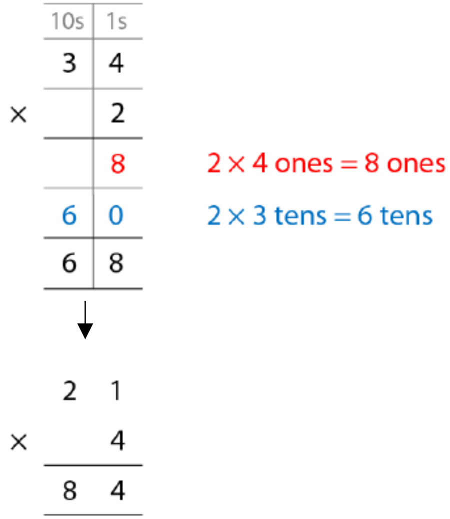
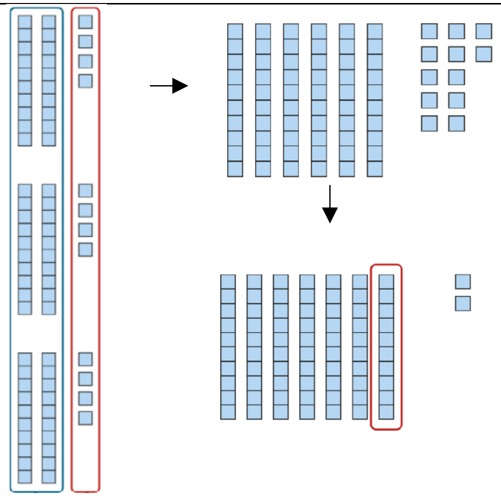
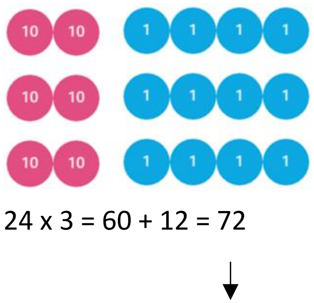
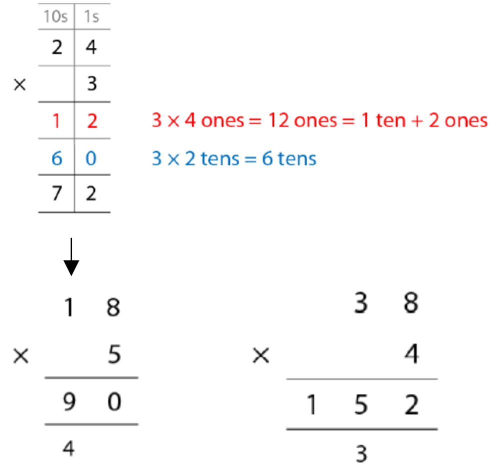
</table>

To multiply a whole number by 10, place a zero after the final digit of that number. **Year 4** ___ x 10 = ______ 10 x _____ = ______ _____ is 10 times the size of ______			6 x 10 = 60 12 x 10 = 120
All multiples of 100 have both a tens and ones digit of 0. When a number is multiplied by 100, the product is a multiple of 100. **Year 4** _____ x 100 = ____ x 10 x 10 = ______ x 10 = ____ _____ x 100 = _____, so 100 x ____ = ______ _____ is 100 times the size of ______.			2 x 100 = 200 There are 100 times as many people as before. 15 x 100 = 1500
If one factor is made ten times the size, the product will be ten times the size. **Year 4** ___ x 10 = ______ 10 x _____ = ______ _____ is 10 times the size of ______			4 x 3 = 12 so 4 x 30 = 120

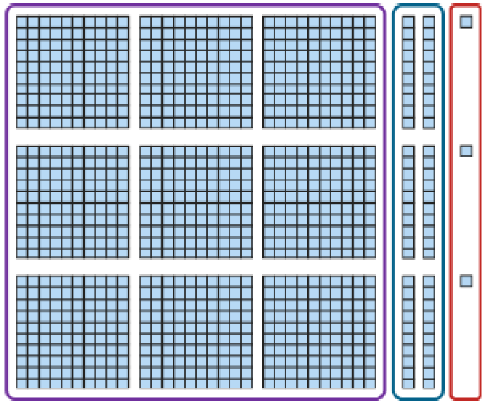
	 3×5 ones = 15 ones = 15 3×5 tens = 15 tens = 150 3×5 hundreds = 15 hundreds = 1,500		
If there are ten or more ones, we must exchange the ones into tens and ones. If there are ten or more tens, we must exchange the tens into hundreds and tens. Multiplication is distributive. **Year 4** __ x ___ = ___ x ___ + ___ x ___ __ x ___ = ___ x _____ - _____ x _____ __ x ____ = ___ x ___ x 2 ___ x ___ = ___ x _____ ÷ 2 In this step, children consolidate their knowledge and understanding of multiplication and begin to make decisions regarding the most efficient or appropriate methods to use a in a range of contexts.		84 × 6 = 504 80 4 $80 \times 6 = 480$ $4 \times 6 = 24$ $480 + 24 = 504$ $42 \times 3 =$ 	84 x 6 = 80 x 6 + 4 x 6 = 480 + 24 = 504 24 x 4 = 20 x 4 + 4 x 4 = 80 + 16 = 96 *Informal methods and the expanded method are used in Y3 before moving on to the short multiplication method in Y4.* *Place value counters should be used to support the understanding of the method rather than supporting the multiplication, as children should use times table knowledge.*

We work from the least significant digit, on the right, to the most significant digit, on the left. Multiplication is distributive. **Year 4**		 34 x 2 = 60 + 8 = 68	
If there are ten or more ones, we must exchange the ones into tens and ones. If there are ten or more tens, we must exchange the tens into hundreds and tens. Multiplication is distributive. **Year 4**		 24 x 3 = 60 + 12 = 72	

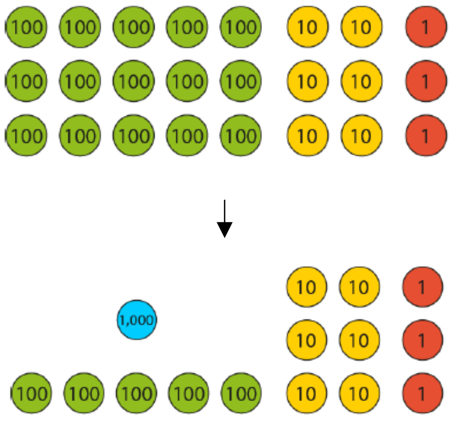
If there are ten or more ones, we must exchange the ones into tens and ones.
If there are ten or more tens, we must exchange the tens into hundreds and tens.
If there are ten or more hundreds, we must exchange the hundreds into thousands and hundred.

Multiplication is distributive.

Year 4

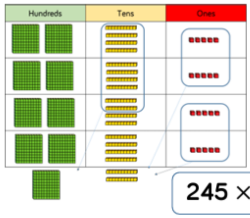


321 x 3 = 963



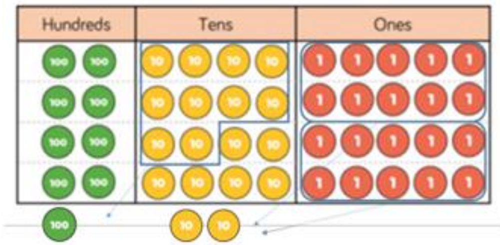
521
x 3 =

1000 + 500 + 60 + 3 = 1563



	H	T	O
	2	4	5
×			4
	9	8	0
	1	2	

245 × 4 = 980



	100s	10s	1s
	3	2	1
×			3
			3
		6	0
	9	0	0
	9	6	3

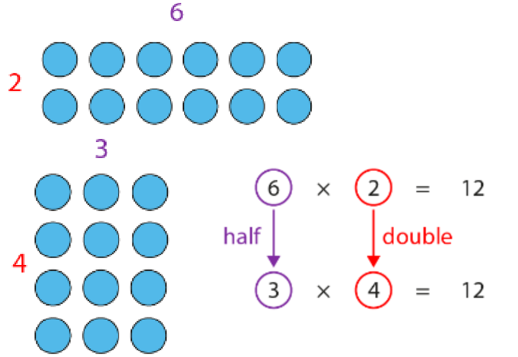
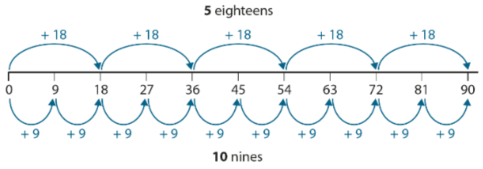
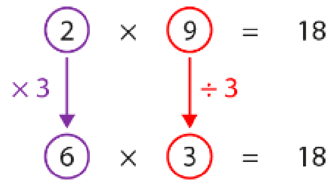
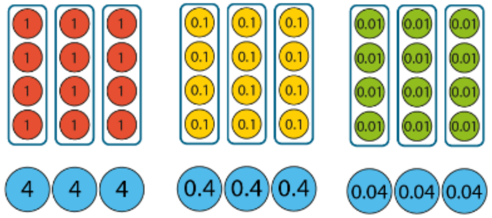
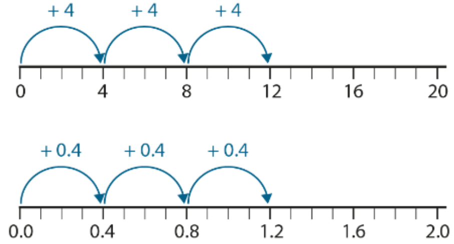
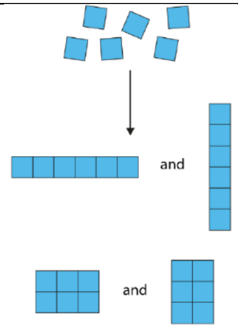
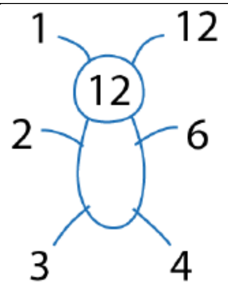
3 × 1 ones = 3 ones
3 × 2 tens = 6 tens
3 × 3 hundreds = 9 hundreds

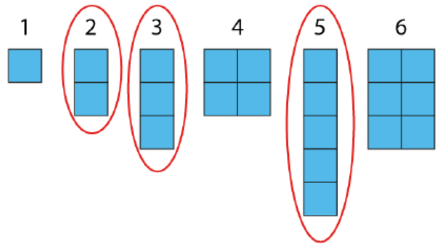
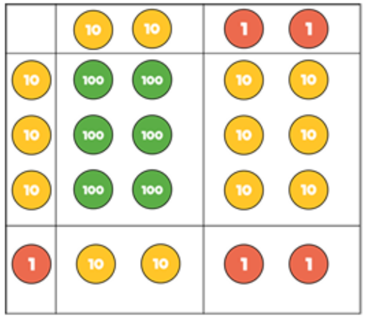
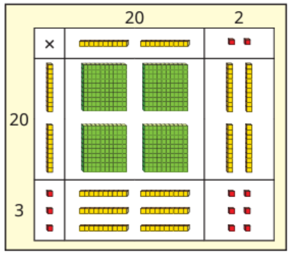
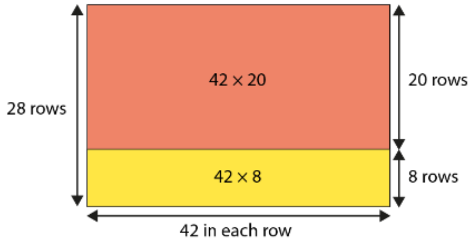
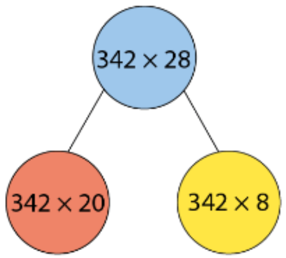
	3	2	1
×			3
	9	6	3

	1,000s	100s	10s	1s
		5	2	1
×				3
				3
			6	0
	1	5	0	0
	1	5	6	3

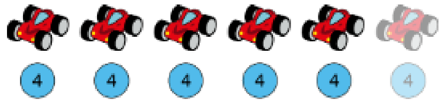
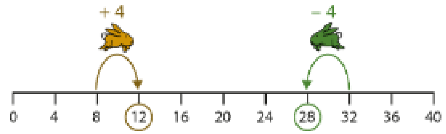
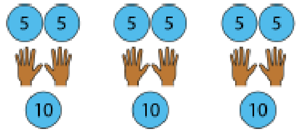
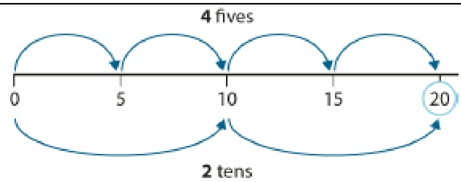
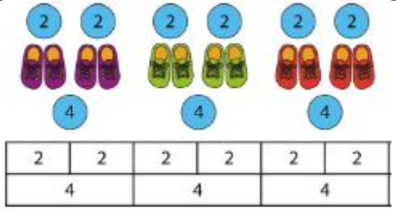
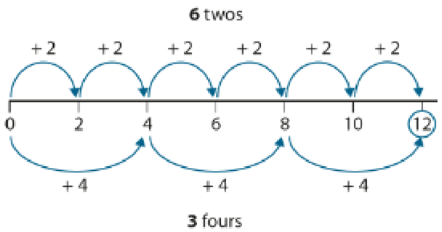
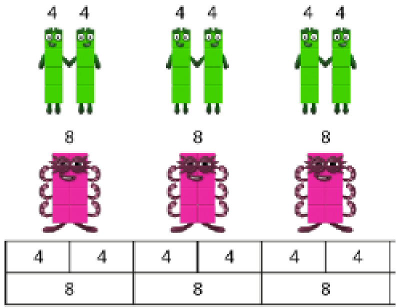
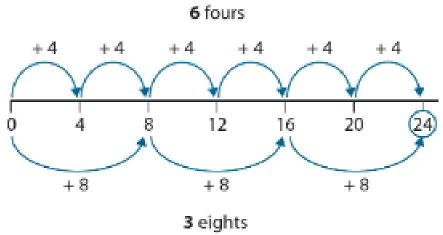
		3	6	7
×				4
	1	4	6	8
		2	2	

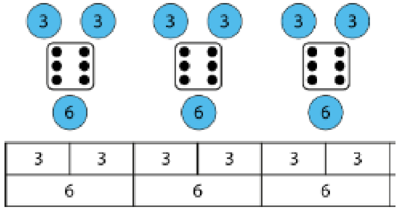
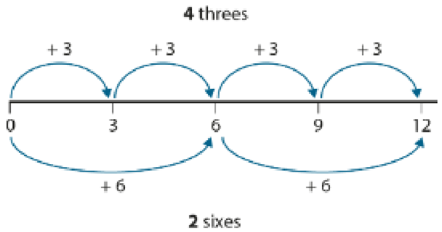
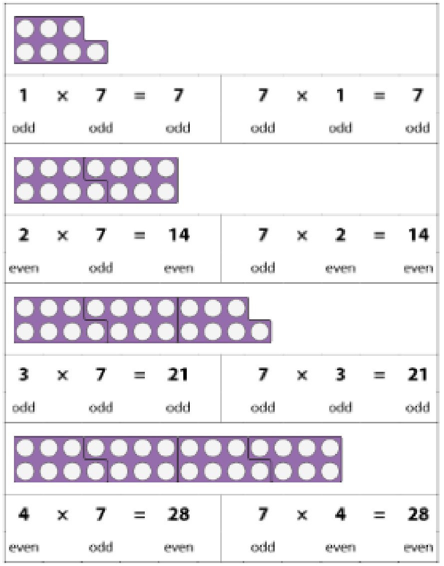
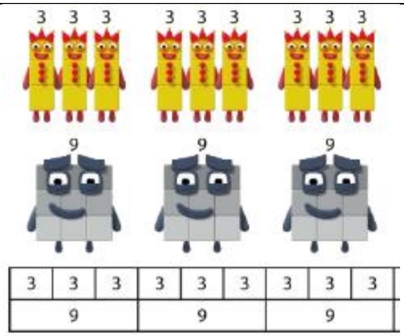
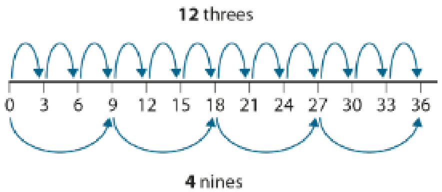
When moving to 3-digit by 1-digit multiplication, encourage children to move towards the short, formal written method.
Base 10 and place value counters continue to support the understanding of the written method.
Limit the number of exchanges needed in the questions and move children away from resources when multiplying larger numbers.

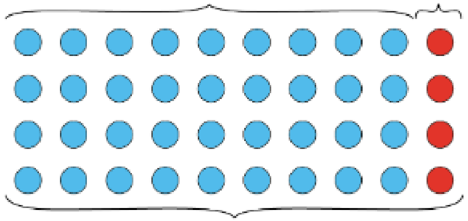
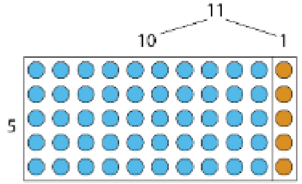
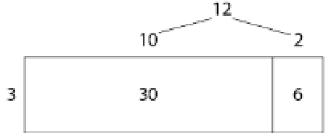
If there is a multiplicative increase in one factor and a multiplicative decrease in the other, the product remains the same. If I multiply one factor by __, I must divide the other factor by __ for the product to remain the same. **Year 5 and 6**			
If one factor is made one tenth of the size, the product will be one tenth of the size. If one factor is made one hundredth of the size, the product will be one hundredth of the size. I move the digits of the number I am multiplying __ places to the left until I get a whole number; then I multiply; then I move the digits of the product __ places to the right. **Year 5**	 4 x 3 = 12 0.4 x 3 = 1.2 0.04 x 3 = 0.12		4 5 6 × 4 1 8 2 4 2 2 4 . 5 6 × 4 1 8 . 2 4 2 2
Numbers that have more than two factors are composite numbers. **Year 5** The only factors of ___ are ___ and ___, so __ is prime. ___ is prime and a factor of ___, so ___ is a prime factor of ___.	 Factors of 6 are 1, 2, 3 and 6.	 Factor bugs	Factors of 6 are 1, 2, 3 and 6.

Numbers that have only two factors are prime numbers. **Year 5**			17 is a prime number because its only factors are 1 and 17.
Year 5 *When multiplying a multi-digit number by 2-digits, use the area model to help children understand the size of the numbers they are using.* *This links to finding the area of a rectangle by finding the space covered by the Base 10.* *The grid method matches the area model as an initial written method before moving on to the formal written multiplication method.* __ ones x ___ = ___ ones, so ___ tens x ___ = __ tens The products in my area model are __ , ___, ___ and __, so the total product is __ + __ + ___ + ___ = __		 23 × 22 = 400 + 60 + 40 + 6 = 506	× | 20 | 2 30 | 600 | 60 1 | 20 | 2
To multiply two two-digit numbers, first multiply by the ones, then multiply by the tens, then add them together. To multiply a three-digit number by a two-digit number, first multiply by the ones, then multiply by the tens, then add them together. **Year 6**			100s | 10s | 1s 2 7 × 2 3 8 1 27 × 3 5 4 0 27 × 20 6 2 1 1 3 1 2 × 2 8 2 4 9 6 6 2 4 0 8 7 3 6 1

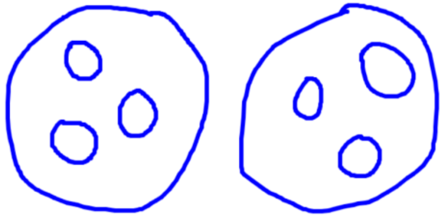
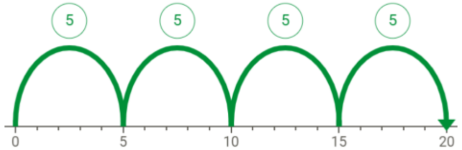
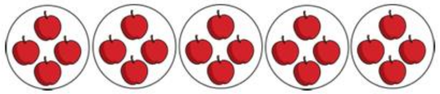
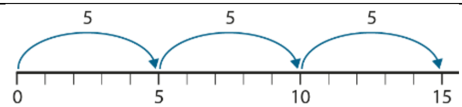
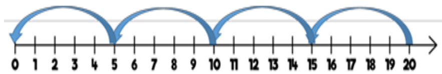
Multiplication – Key mental strategies for Key Stage 2

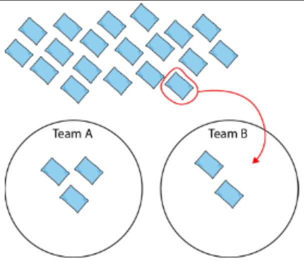
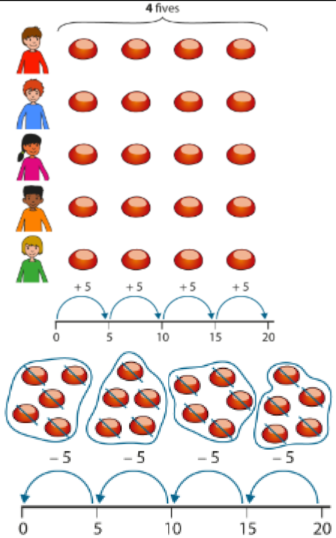
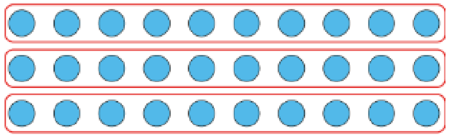
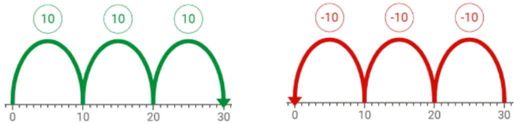
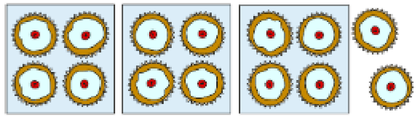
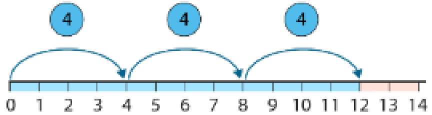
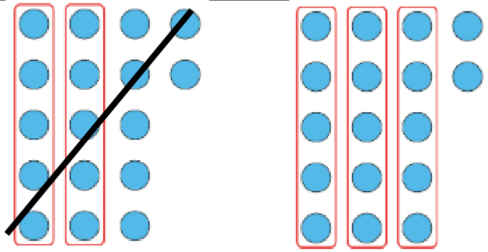
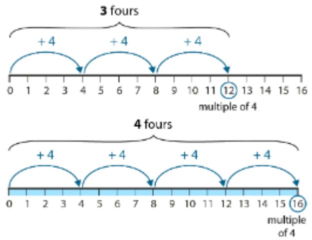
Strategy	Concrete (Can we make it?)	Pictorial (Can we draw it?)	Abstract (Can we write the equation?)
Adjacent multiples of __ have a difference of __. **Year 3 onwards**			4 x 6 = 4 x 5 + 4 4 x 9 = 4 x 10 - 4
Products in the 10 times table are double the products in the 5 times table. Products in the 5 times table are half of the products in the 10 times table. (NCETM Year 2 unit 2.5) **Year 3 onwards**			5 x 4 = 10 x 2
Products in the 4 times table are double the products in the 2 times table. Products in the 2 times table are half of the products in the 4 times table. **Year 3 onwards**			2 x 6 = 4 x 3
Products in the 8 times table are double the products in the 4 times table. Products in the 4 times table are half of the products in the 8 times table. **Year 3 onwards**			4 x 6 = 8 x 3

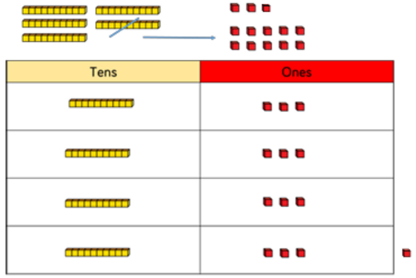
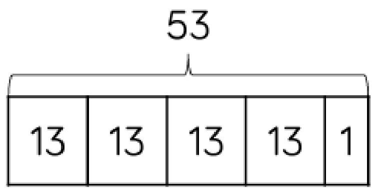
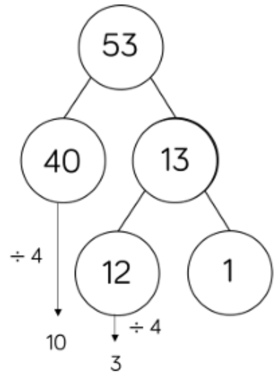
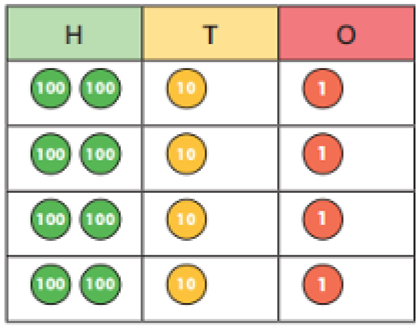
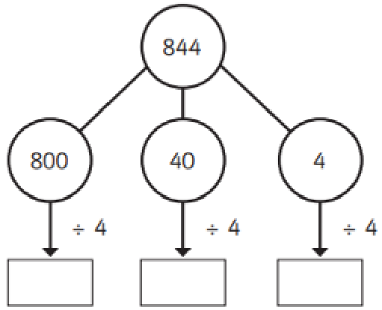
Products in the 6 times table are double the products in the 3 times table. Products in the 3 times table are half of the products in the 6 times table. **Year 3 onwards**			3 x 4 = 6 x 2
When both factors are odd, the product is odd. When one factor is odd and the other factor is even, the product is even. (NCETM Year 3 unit 2.9) **Year 3 onwards**			odd x odd = odd odd x even = even even x odd = even even x even = even
Products in the 9 times table are triple the products in the 3 times table.	 9 x 4 1 x 4		3 x 12 = 9 x 4

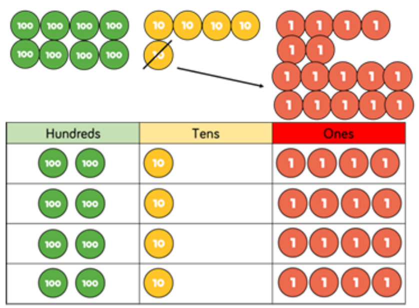
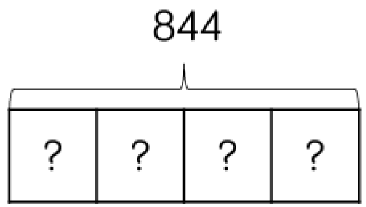
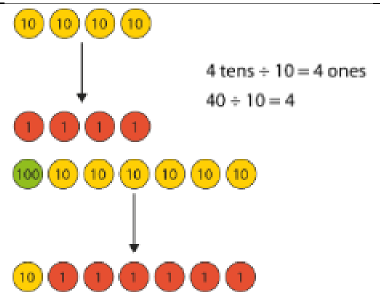
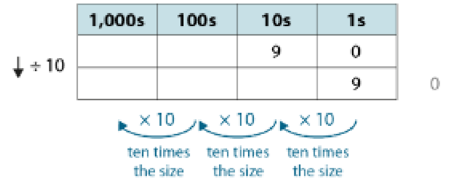
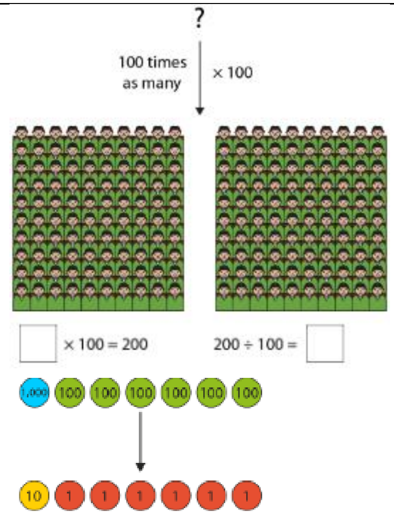
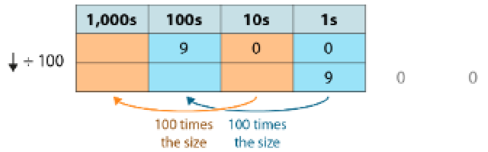
Products in the 10 times table can be used to find products in the 9 times table. (NCETM Year 3 unit 2.8) **Year 4 onwards**	 10 x 4		9 x 4 = 10 x 4 – 1 x 4
Products in the 10 times table can be used to find products in the 11 times table and 12 times table. **Year 4 onwards**			12 x 3 = 10 x 3 + 2 x 3 = 30 + 6 = 36

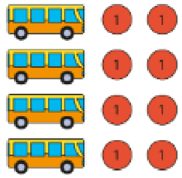
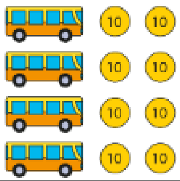
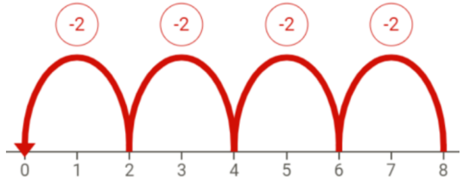
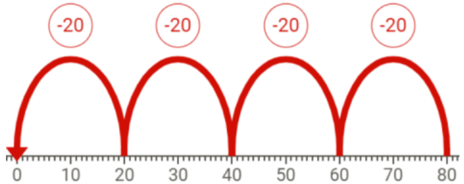
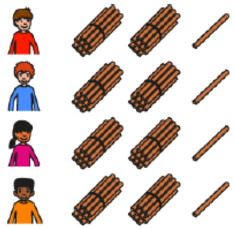
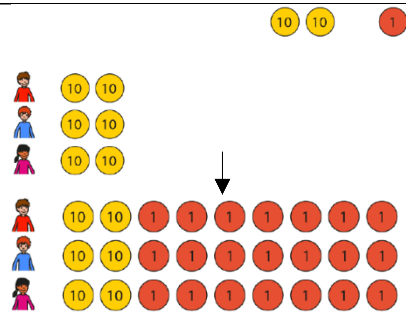
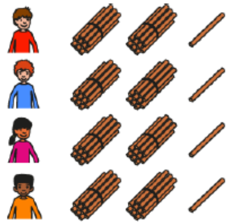
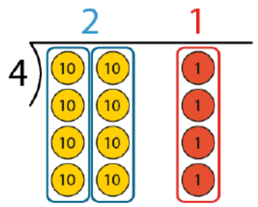
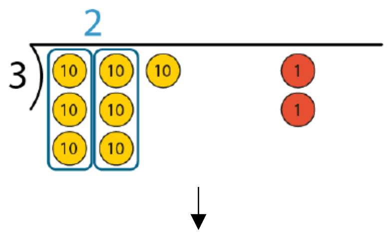
Division

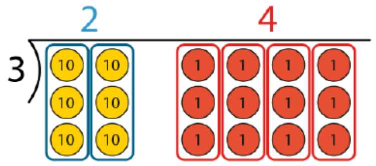
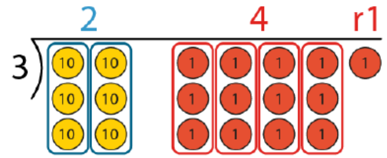
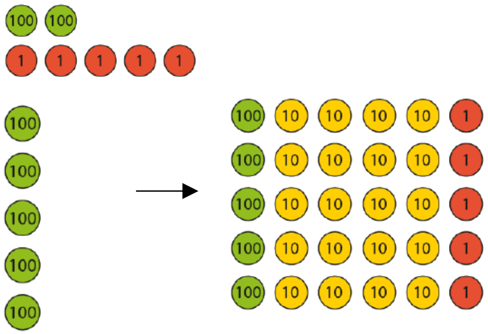
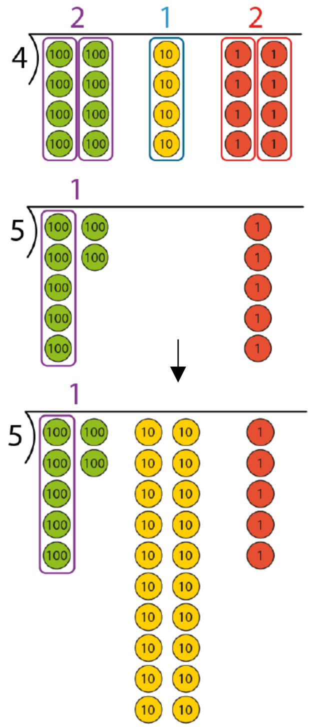
Stem sentences	Concrete (Can we make it?)	Pictorial (Can we draw it?)	Abstract (Can we write the equation?)
One group of two, two groups of two, three groups of 2, … Ten, twenty, thirty, … One five, two fives, three fives, … **FS/Y1**			6 biscuits shared between 2 children gives 3 biscuits each.
The _____ costs __p. Each coin has a value of __p. So I need __ coins. **Year 1**			Five 2p coins = 10p
__ is divided into groups of __. There are __ groups. We can skip count using the divisor to find the quotient. *Children use concrete and pictorial representations to solve problems. They are not expected to record division formally.* *Children solve problems by grouping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line.* **Year 2**	 	 	5 + 5 + 5 = 15 15 ÷ 5 = 3 *In Year 2, the children are introduced to the division symbol.*

__ divided between __ is equal to __ each. We can skip count using the divisor to find the quotient. *Children solve problems by sharing amounts into equal groups.* **Year 2**			One 5 is 1 each. That's 5. Two 5s is 2 each. That's 10. 10 ÷ 5 = 2
Ten times __ is equal to __ so __ divided into groups of ten is __. If the divisor is __, we can use the __ times table to find the quotient. **Year 2**	 30 represents the total number of counters. 10 represents the number in each group. 3 represents the number of groups.		10 x 3 = 30 3 x 10 = 30 30 ÷ 10 = 3
__ is divided into groups of __. There are __ groups and a remainder of __. (NCETM Year 4 unit 2.12) **Year 3**			14 = 4 x 3 + 2 14 ÷ 4 = 3 r 2
__ is a multiple of __ so when it is divided into groups of __, there is no remainder. The remainder is always less than the divisor.			17 ÷ 5 = 2 r 7 is incorrect because 7 is greater than 5. 17 ÷ 5 = 3 r 2

When dividing numbers with remainders, children can use Base 10 and place value counters to exchange one ten for ten ones. *Starting with equipment outside the place value grid will highlight remainders, as they will be left outside the grid once the equal groups have been made.* *Flexible partitioning in a part-whole model supports this method.* There are __ groups of ___ There are ___ remaining. So _____ ÷ ___ = ___ r ___ (NCETM Year 4 unit 2.12) **Year 3 or 4?**	 	 	53 ÷ 13 = 4 r 1
Divide 3-digits by 1-digit (sharing) *Children can continue to use place value counters to share 3-digit numbers into equal groups.* *Children should start with the equipment outside the place value grid before sharing the hundreds, tens and ones equally between rows.* *This method might help highlight remainders.* *Flexible partitioning in a part-whole model supports this method.* ___ hundreds divided by ___ = ___ hundreds ___ tens divided by ___ = ____ tens ___ ones divided by ___ = ___ ones There is ____ left over, so I need to exchange it for ___ **Year 4**			646 ÷ 2 = 300 + 20 + 3 = 323 844 ÷ 4 = 200 + 10 + 1 = 211

			
To divide a multiple of ten by 10, remove the zero from the ones place. ___ ÷ 10 = ___ ___ = ___ ÷ 10 ___ is one-tenth the size of _____ **Year 4**			90 ÷ 10 = 9 150 ÷ 10 = 15
To divide a multiple of 100 by 100, remove two zeros (from the tens and ones places). __ ÷ 100 = ____ ÷ 10 ÷ 10 = ____ ÷ 10 = __ __ ÷ 100 = ____, so ____ = ____ ÷ 100 __ is one-hundredth the size of ___ **Year 4**			900 ÷ 100 = 9 1500 ÷ 100 = 15

If the dividend is made ten times the size, the quotient will be ten times the size. **Year 4**	8 ÷ 4 = 2  80 ÷ 4 = 20 	 	12 ÷ 3 = 4 × 10 ↓ ↓ × 10 120 ÷ 3 = 40
If dividing the tens gives a remainder of one or more tens, we must exchange the remaining tens for ones. **Year 4**	 84 ÷ 4 = 21		8 tens ÷ 4 = 2 tens 4 ones ÷ 4 = 1 one 84 ÷ 4 = 21 6 tens ÷ 3 = 2 tens 21 ones ÷ 3 = 7 ones 81 ÷ 3 = 27
If dividing the tens gives a remainder of one or more tens, we must exchange the remaining tens for ones. **Year 4**		 72 ÷ 3 = 24 	10s 1s 2 1 4) 8 4 8 tens ÷ 4 = 2 tens 4 ones ÷ 4 = 1 one 2 1 4) 8 4 2 4 3) 7 [1]2

		 73 ÷ 3 = 24 r 1 	2 4 r 1 3) 7 ^{1}3
If dividing the hundreds gives a remainder of one or more hundreds, we must exchange the remaining hundreds for tens. **Year 4**			2 1 2 4) 8 4 8 1 4 1 5) 7 ^{2}0 5

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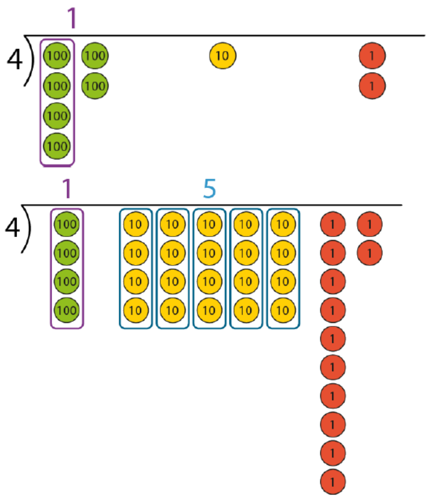
<td>612 ÷ 4 = 153

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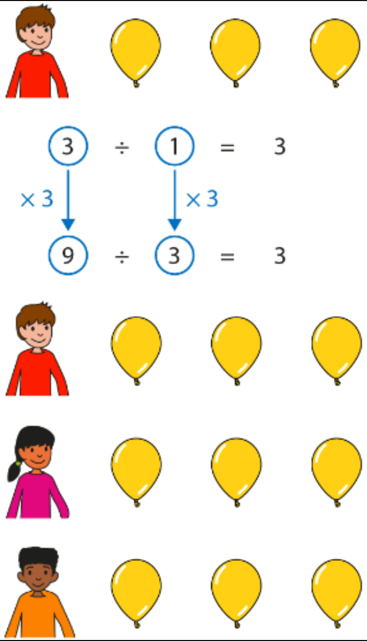
<tr>
<td>If there is a multiplicative change to the dividend factor and a corresponding change to the divisor, the quotient remains the same.

If I multiply the dividend by __, I must multiply the divisor by __ for the quotient to remain the same.

Year 5 and 6</td>
<td>
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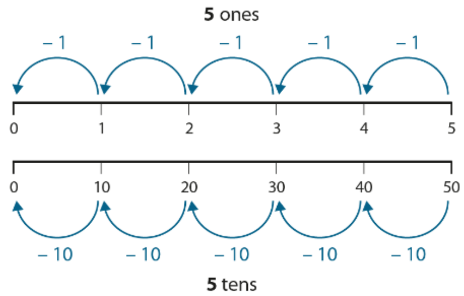
<td>
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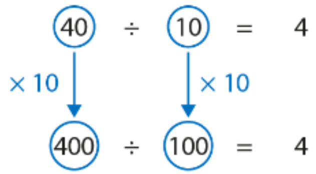
<td>
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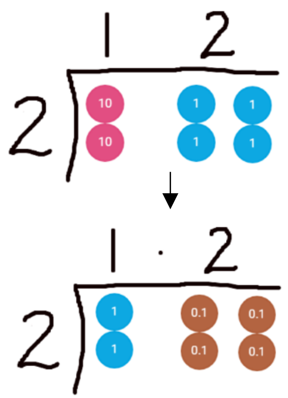
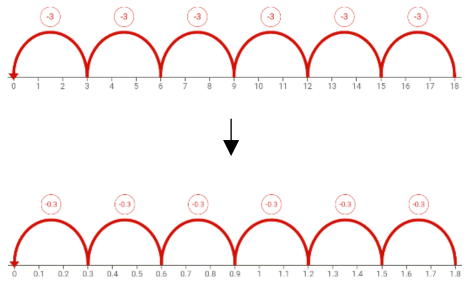
If the dividend is made one tenth of the size, the quotient will be one tenth of the size.

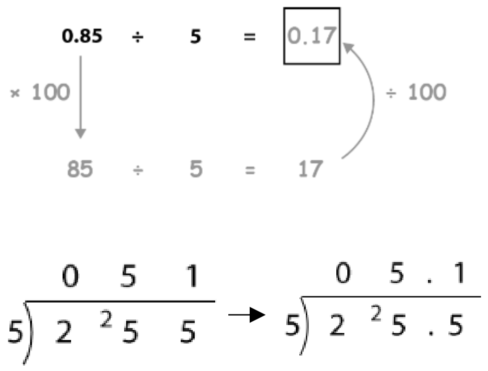
If the dividend is made one hundredth of the size, the quotient will be one hundredth of the size.

I move the digits of the dividend __ places to the left until I get a whole number; then I divide; then I move the digits of the quotient __ places to the right.

Year 5 onwards





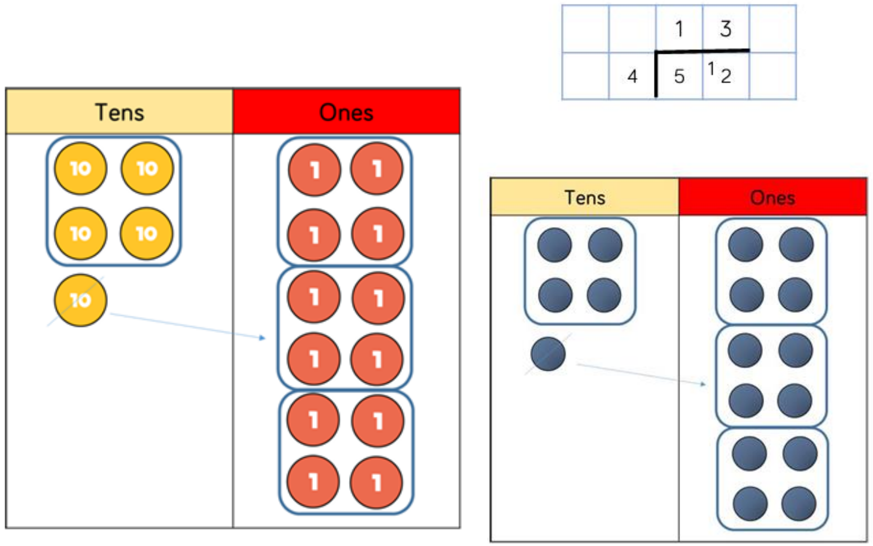


Divide 2-digits by 1-digit (grouping)

When using the short division method, children use grouping. Start with the largest place value, they group by the divisor.
Language is important here. Children should consider 'How many groups of 4 tens can we make?' and 'How many groups of 4 ones can we make?'

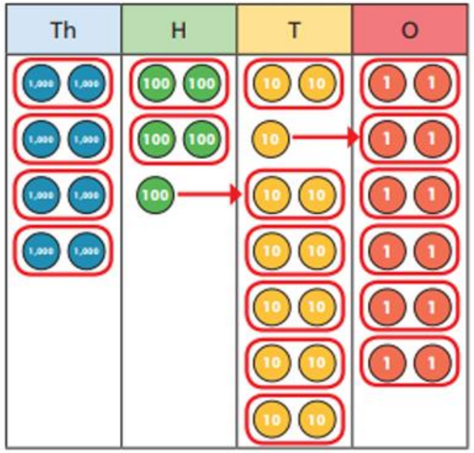
Remainders can also be seen as they are left ungrouped.

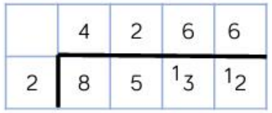
Year 5



Divide 4-digits by 1-digit (grouping)

Place value counters or plain counters can be used on a place value grid to support children to divide 4-digits by 1-digit. Children can also draw their own counters and group them through a more pictorial method. Children should be encouraged to move away from the pictorial and concrete when dividing numbers with multiple exchanges.

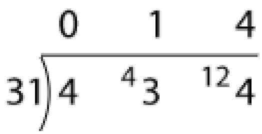




Any two-, three- or four-digit dividend can be divided by a two-digit divisor using skip-counting in multiples of the divisor, or by short division or long division.

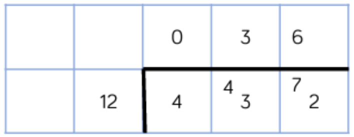
Where there is a remainder, the result can be expressed as a whole-number quotient with a whole-number remainder, a whole-number quotient with a proper-fraction remainder, or as a decimal-fraction quotient.

Short division



Year 6

When children begin to divide up to 4-digits by 2-digits, written methods become the most accurate as concrete and pictorial representations become less effective. Children are encouraged to write out multiples to support their calcuations with larger remainders. Children will also solve problems with remainders



$432 \div 12 = 36$

where the quotient can be rounded as appropriate.

7,335 ÷ 15 = 489

	0	4	8	9
15	7	$^{7}3$	$^{13}3$	$^{13}5$

15	30	45	60	75	90	105	120	135	150