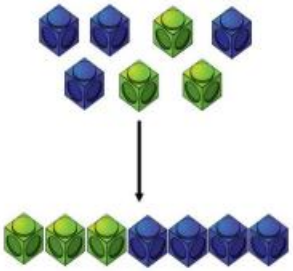
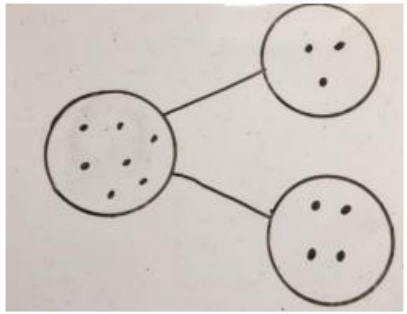
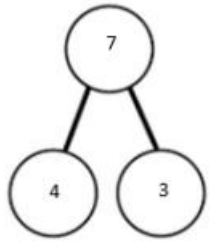
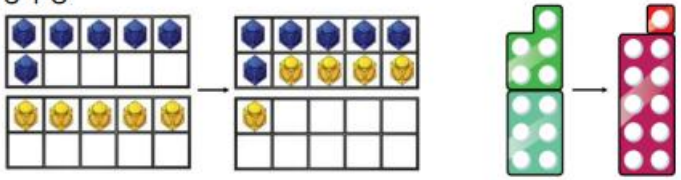
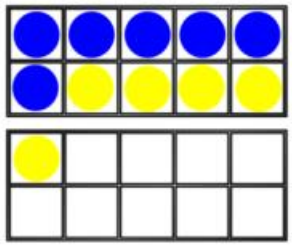
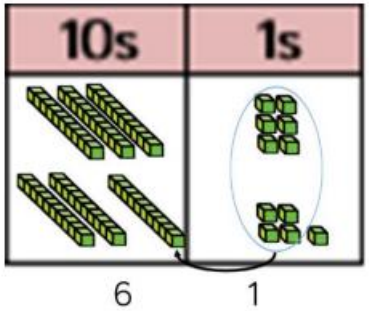
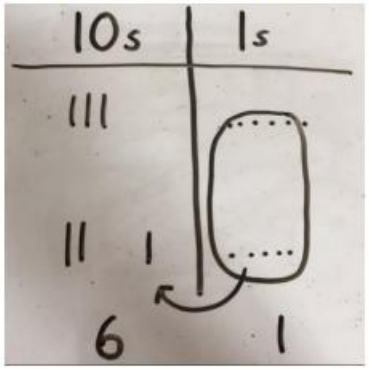
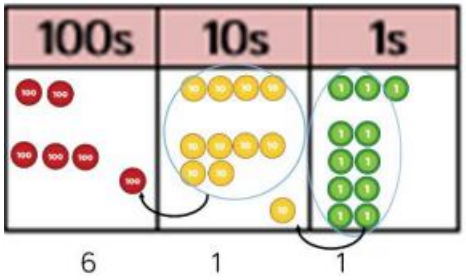
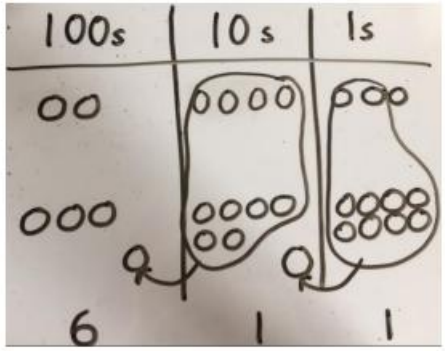
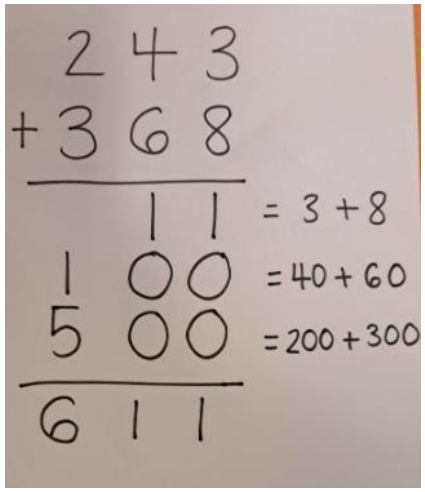
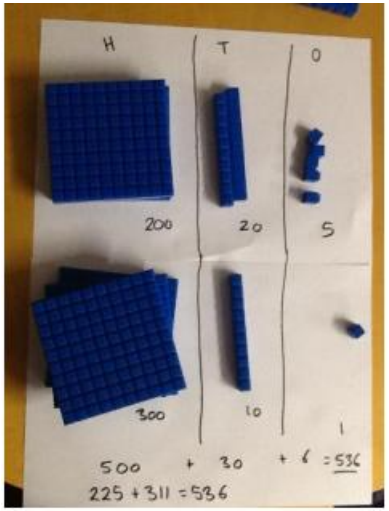
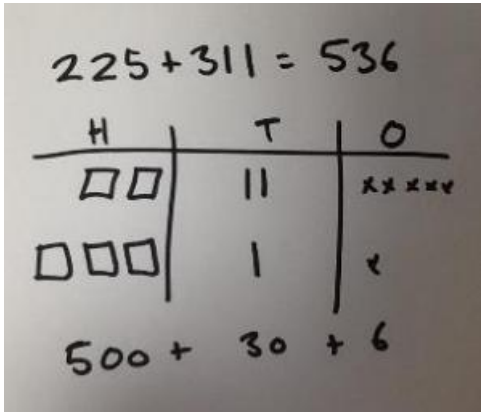
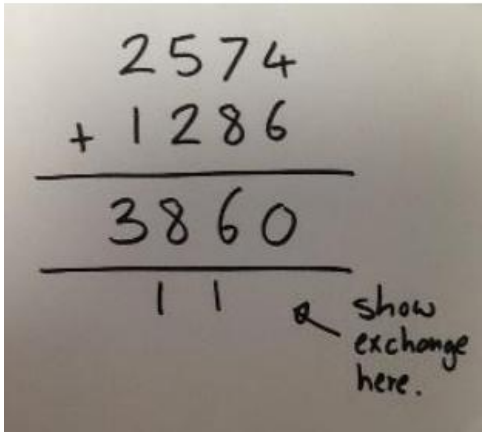
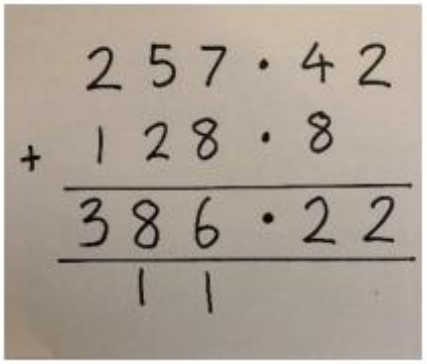
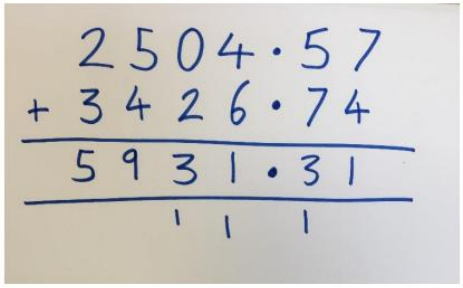
Calculation policy: Addition

Key language: sum, total, parts and wholes, plus, add, altogether, more, 'Is equal to' 'is the same as'.

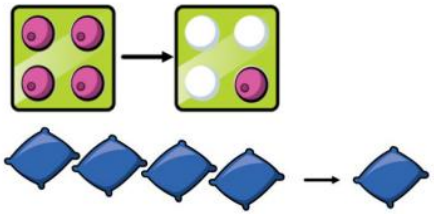
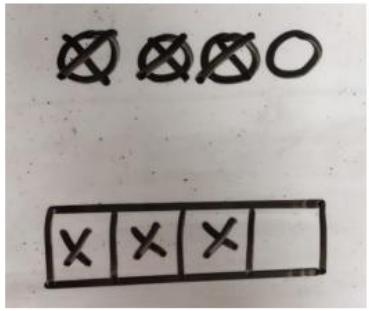
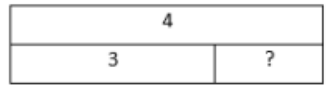
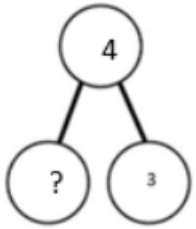
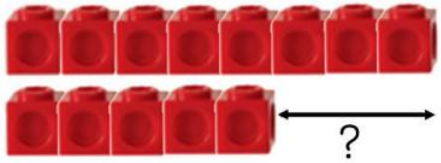
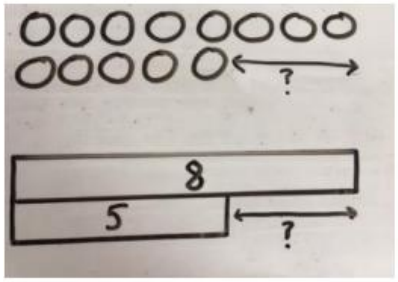
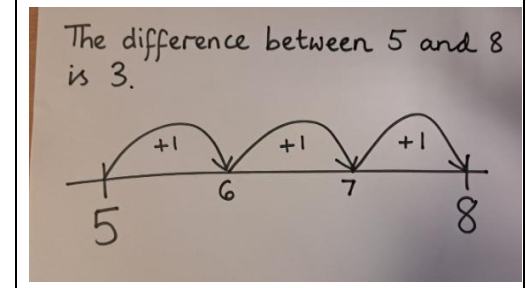
	Concrete	Pictorial	Abstract
Reception	**Combining two parts to make a whole** (use other resources too e.g. eggs, shells, teddy bears, cars). 	Children to represent the cubes using dots or crosses. They could put each part on a part whole model too. 	4 + 3 = 7 Four is a part, 3 is a part and the whole is seven. 
Year 1	**Regrouping to make 10;** using ten frames and counters/cubes or using Numicon. 6 + 5 	Children to draw the ten frame and counters/cubes. 	Children to develop an understanding of equality e.g. 6 + □ = 11 6 + 5 = 5 + □ 6 + 5 = □ + 4

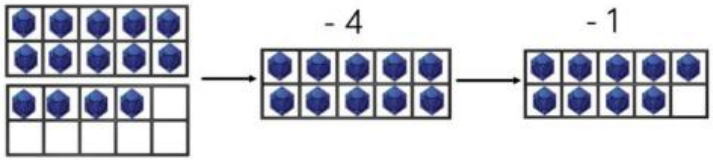
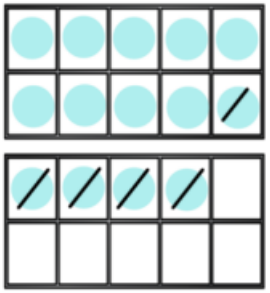
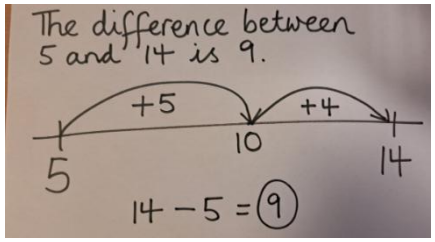
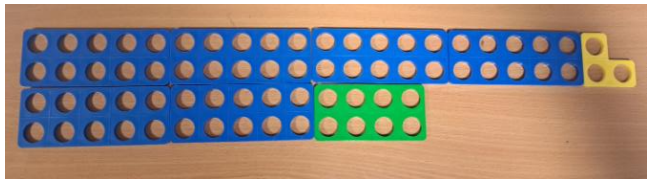
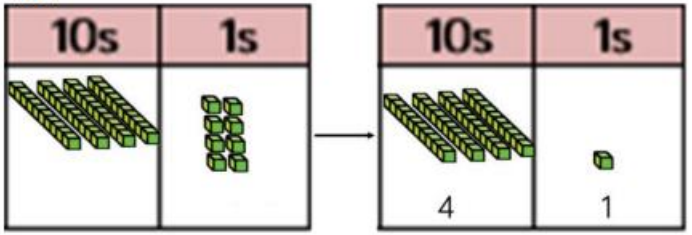
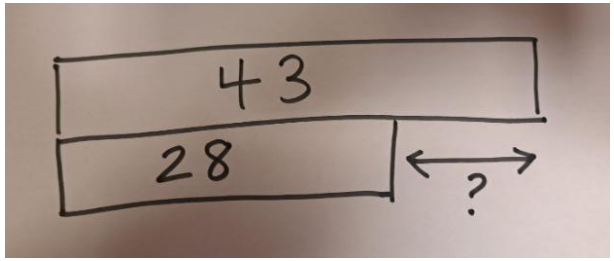
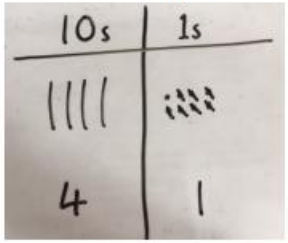
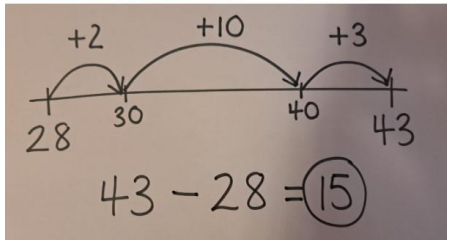
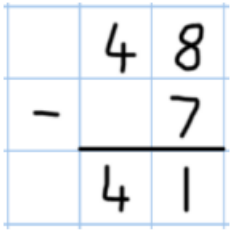
Year 2	**TO + TO using base 10.** Continue to develop understanding of partitioning and place value. 36 + 25 	Chidlren to represent the base 10 in a place value chart. 	Looking for ways to make 10. 30 + 20 = 50 5 + 5 = 10 50 + 10 + 1 = 61
Year 3	**Use of place value counters to add HTO + TO, HTO + HTO etc.** When there are 10 ones in the 1s column- we exchange for 1 ten, when there are 10 tens in the 10s column- we exchange for 1 hundred. 	Chidren to represent the counters in a place value chart, circling when they make an exchange. 	

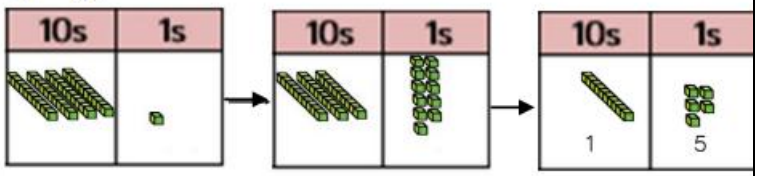
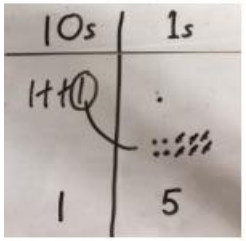
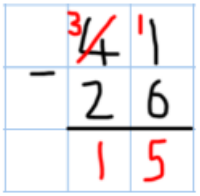
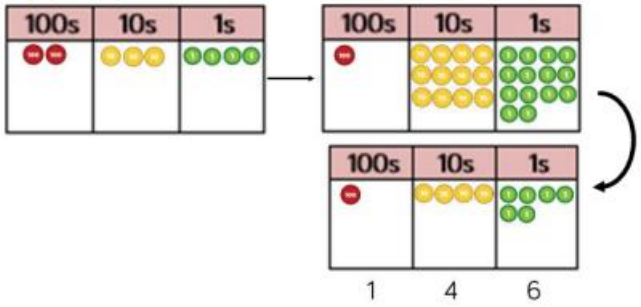
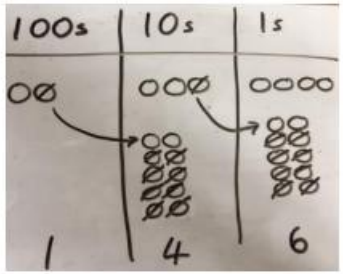
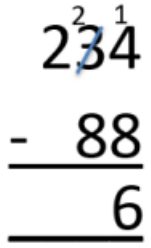
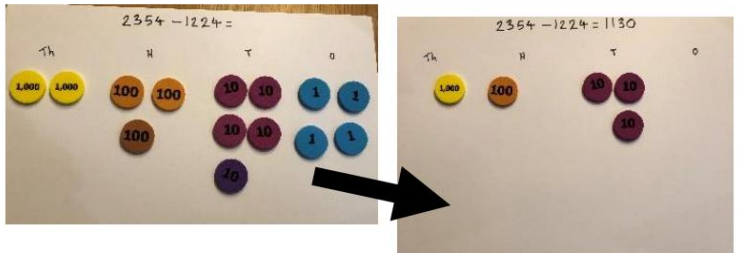
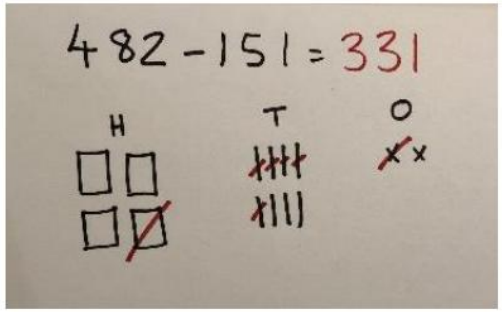
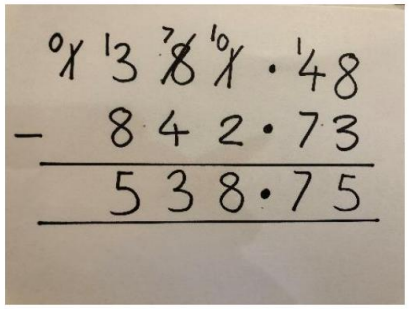
Year 4			
Year 5			
Year 6			

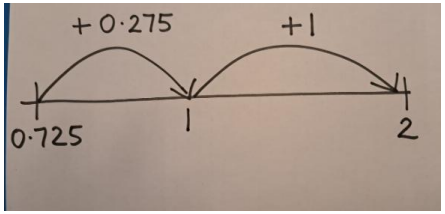
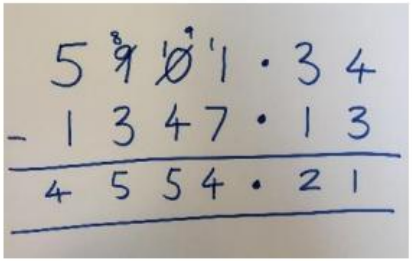
Calculation policy: Subtraction

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

	Concrete	Pictorial	Abstract
Reception	**Physically taking away and removing objects from a whole** (ten frames, Numicon, cubes and other items such as beanbags could be used). 4 – 3 = 1 	Children to draw the concrete resources they are using and cross out the correct amount. The bar model can also be used. 	4- 3 = ☐ = 4 – 3  
Year 1	**Finding the difference** (using cubes, Numicon or Cuisenaire rods, other objects can also be used). Calculate the difference between 8 and 5. 	Children to draw the cubes/other concrete objects which they have used or use the bar model to illustrate what they need to calculate. 	

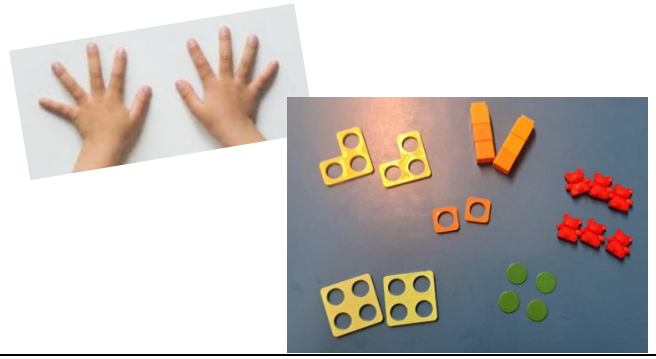
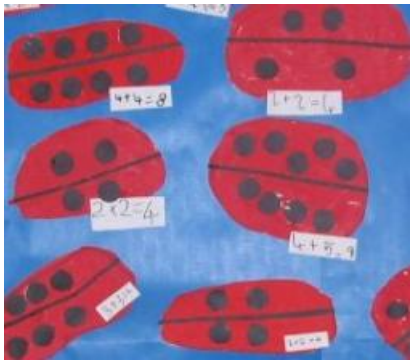
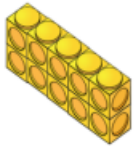
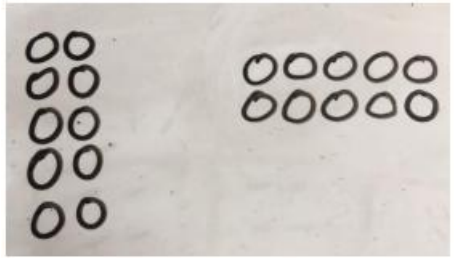
Year 2	**Making 10** using ten frames. 14 – 5 	Children to present the ten frame pictorially and discuss what they did to make 10. 	Children to count up along a numberline, jumping off the 10s to find  a difference.
Year 3	Using numicon and beadstrings to compare the two numbers and find the difference   **Column method** using base 10. 48-7 	 Children to represent the base 10 pictorially. 	Counting up along a number line, jumping off the 10s to find a difference.  

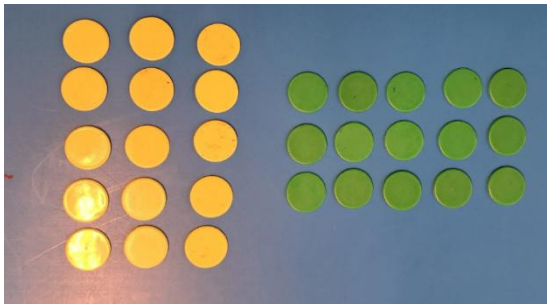
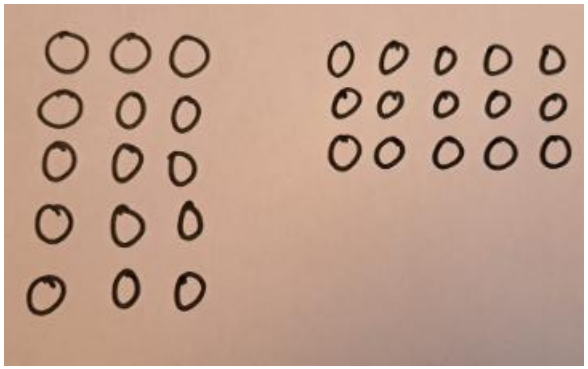
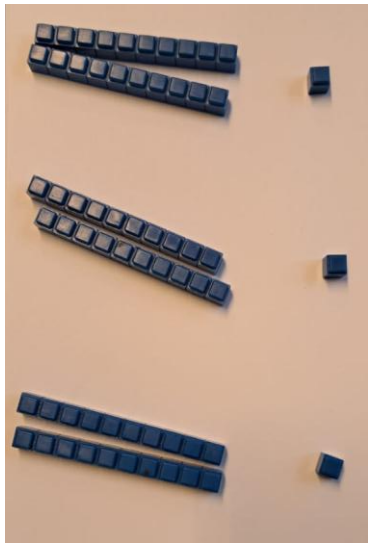
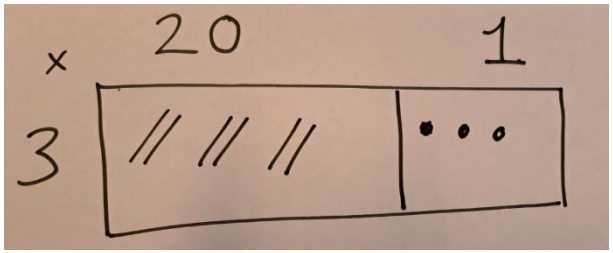
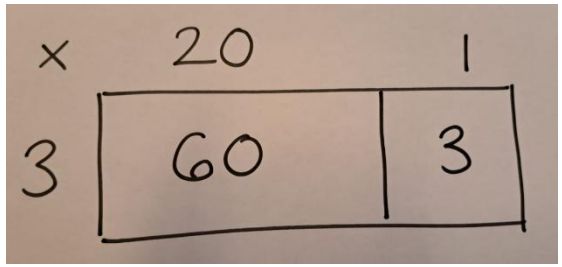
Year 4	**Column method** using base 10 and having to exchange. 41 – 26 	Represent the base 10 pictorially, remembering to show the exchange. 	Formal column method. Children must understand that when they have exchanged the 10 they still have 41 because 41 = 30 + 11. 
	Column method using place value counters. 234 – 88 	Represent the place value counters pictorially; remembering to show what has been exchanged. 	Formal colum method. Children must understand what has happened when they have crossed out digits. 
Year 5			

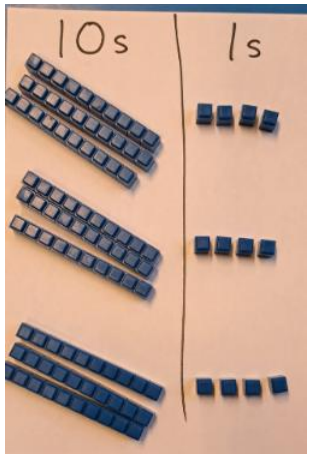
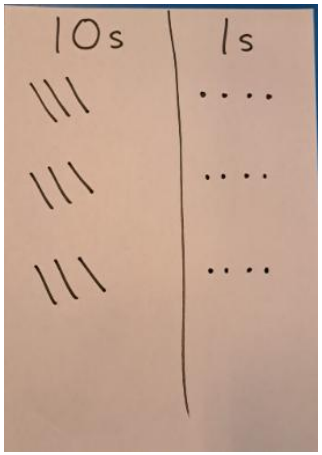
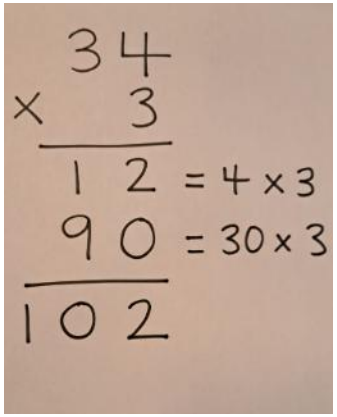
Year 6			Counting up along a number line to find a difference between an integer and a decimal number to avoid unnecessary exchanging. 2 – 0.725 =  Formal column method 

Calculation policy: Multiplication

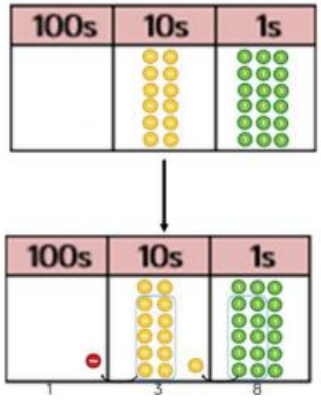
Key language: double, times, multiply by, the product of, groups of, l

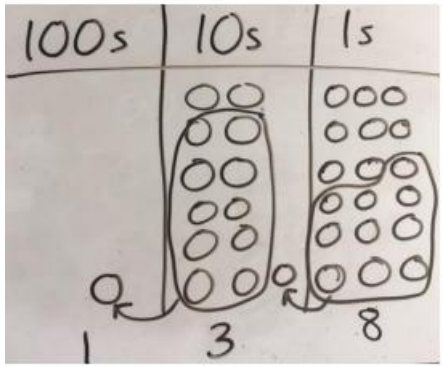
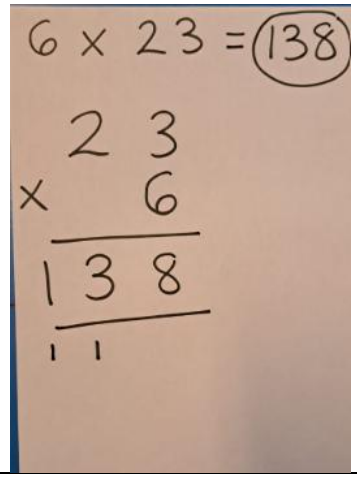
	Concrete	Pictorial	Abstract
Reception	Using fingers, counters, numicon, models and uni-fix to find doubles. 		2 + 2 = 4 3 + 3 = 6
Year 1	**Use arrays to illustrate commutativity** counters and other objects can also be used. 2 × 5 = 5 × 2  2 lots of 5  5 lots of 2	Children to represent the arrays pictorially. 	Children to be able to use an array to write a range of calculations e.g. 10 = 2 × 5 5 × 2 = 10 2 + 2 + 2 + 2 + 2 = 10 10 = 5 + 5

Year 2	Continue to use arrays to illustrate commutativity. 	Children draw arrays 	Children can write a range of multiplication sentences e.g. 15 = 5 x 3 5 x 3 = 15 3 x 5 =15 3 + 3 + 3 + 3 + 3 = 15
Year 3	Use Base 10 to create arrays to illustrate multiplication of 2digit by 1 digit 	Children draw these arrays. 	Children draw 'empty arrays' to calculate 2 digit by 1 digit multiplications 

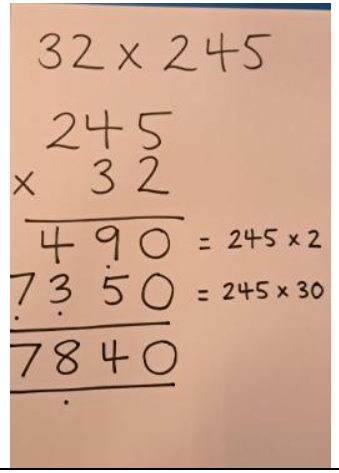
Year 4	Expanded column method using p.v counters or Base 10 equipment. 	Children to represent the numbers pictorially. 	Children to record what they are doing using expanded column method to show understanding 

<table>
<tr>
<td>Year 5</td>
<td>Formal column method using counters.

6 x 23
 
</td>
<td>Formal column method represented pictorially.

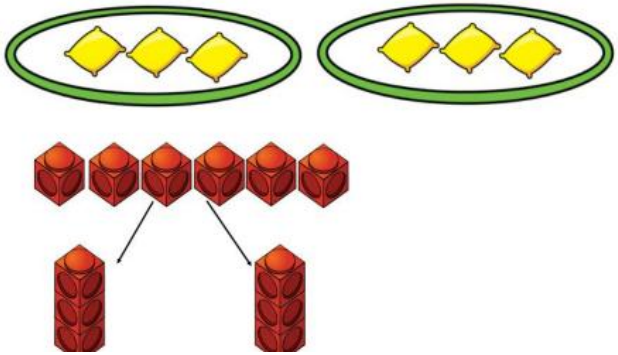
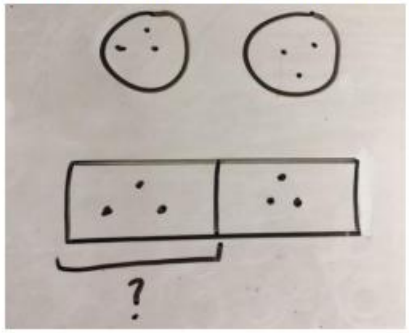
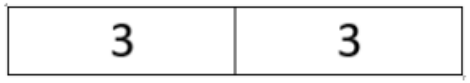
 
</td>
<td>Children to record what they are doing using a column method to show understanding.
 
</td>
</tr>
<tr>
<td>Year 6</td>
<td>When children start to multiply 3d × 3d and 4d × 2d etc., they should be confident with the abstract:

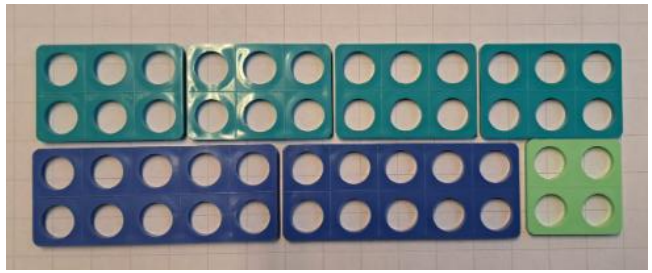
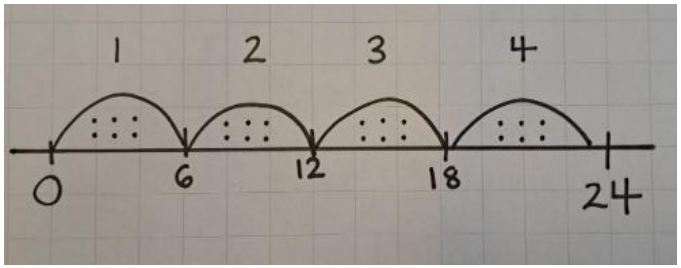
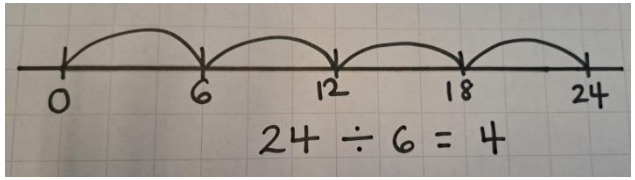
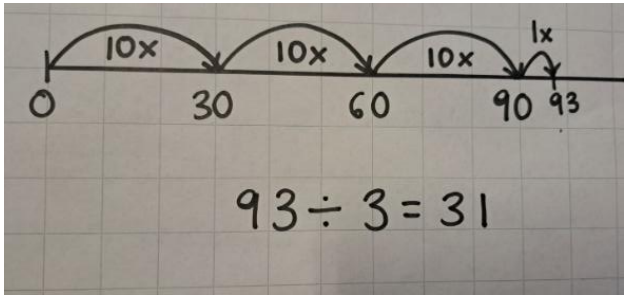
To get 744 children have solved 6 × 124.
To get 2480 they have solved 20 × 124.</td>
<td></td>
<td>Children to record what they are doing using a column method to show understanding.

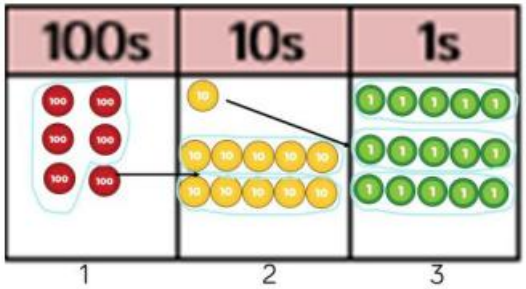
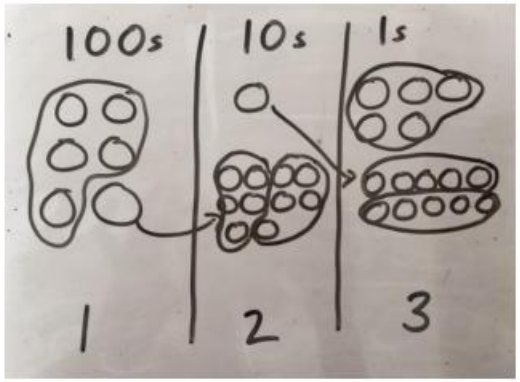
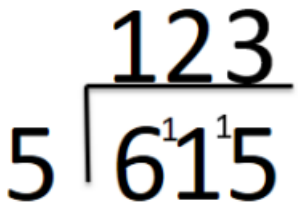
 
</td>
</tr>
</table>

Calculation policy: Division

Key language: share, group, divide, divided by, half

	Concrete	Pictorial	Abstract
Year 1 and 2	**Sharing** using a range of objects. 6 ÷ 2 	Represent the sharing pictorially. 	6 ÷ 2 = 3  Children should also be encouraged to use their 2 times tables facts.

Year 3	Grouping using numicon 	Drawing number lines to show the groupings 	Using number lines and their knowledge of multiplication facts to find an answer. 
Year 4			Using number lines and their knowledge of multiplication facts to find an answer. Chunking the 10s. 

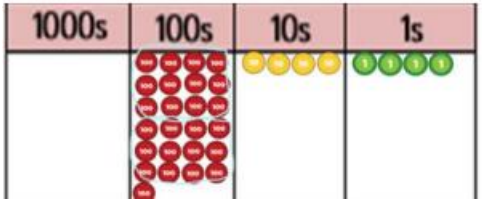
Year 5	**Short division** using place value counters to group. 615 ÷ 5  1. Make 615 with place value counters. 2. How many groups of 5 hundreds can you make with 6 hundred counters? 3. Exchange 1 hundred for 10 tens. 4. How many groups of 5 tens can you make with 11 ten counters? 5. Exchange 1 ten for 10 ones. 6. How many groups of 5 ones can you make with 15 ones?	Represent the place value counters pictorially.  	Children to complete the calculation using the short division scaffold. 

Year 6

Long division using place value counters

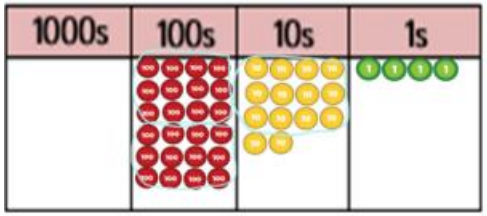
2544 ÷ 12

We can't group 2 thousands into groups of 12 so will exchange them.



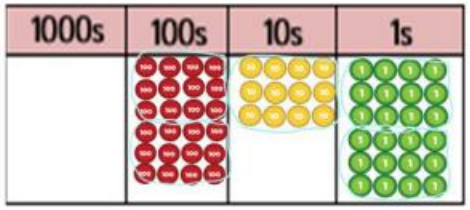
We can group 24 hundreds into groups of 12 which leaves with 1 hundred.

$$\begin{array}{r} 02 \\ 12\overline{)2544} \\ 24 \\ \hline 1 \end{array}$$



After exchanging the hundred, we have 14 tens. We can group 12 tens into a group of 12, which leaves 2 tens.

$$\begin{array}{r} 021 \\ 12\overline{)2544} \\ 24 \\ \hline 14 \\ 12 \\ \hline 2 \end{array}$$



After exchanging the 2 tens, we have 24 ones. We can group 24 ones into 2 group of 12, which leaves no remainder.

$$\begin{array}{r} 0212 \\ 12\overline{)2544} \\ 24 \\ \hline 14 \\ 12 \\ \hline 24 \\ 24 \\ \hline 0 \end{array}$$