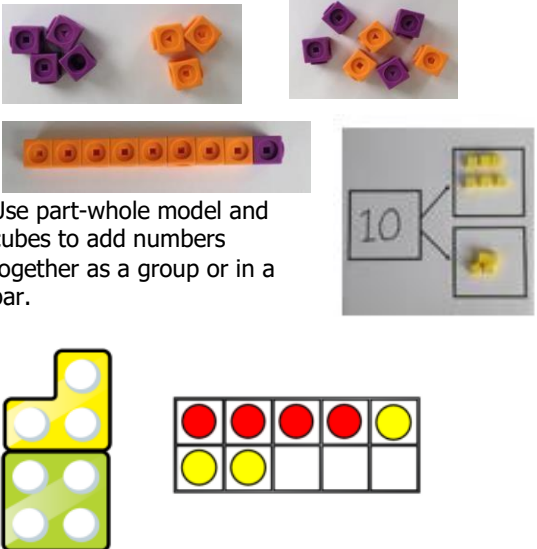
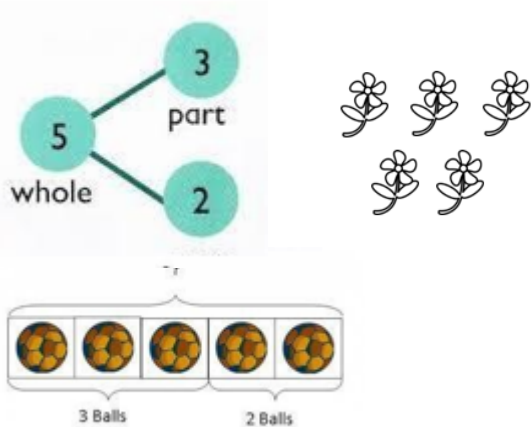
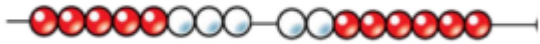


## Addition

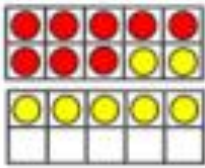
Key language: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to'/'is the same as', regrouping, exchange, increase, addend, commutative.

### Foundation Stage

Objective	Concrete	Pictorial	Abstract
<p>Begin to relate addition to finding one more than a given number.</p>	 <p>Use part-whole model and cubes to add numbers together as a group or in a bar.</p> <p>Use five frames and tens frame with double sided counters and Numicon to aid adding two numbers, especially number bonds. To also use counting bears, small people instead of double sided counters.</p> <p>Introduce dice to children when using then five or tens frame as an additional activity</p>	 <p>Use part-whole models with numbers or pictures to add two numbers together as a group.</p> <p>Use Numicon Number line up to 20.</p>	<p><math>4 + 3 = 7</math></p> <p>Ensure number sentences are used with addition and equals signs.</p>

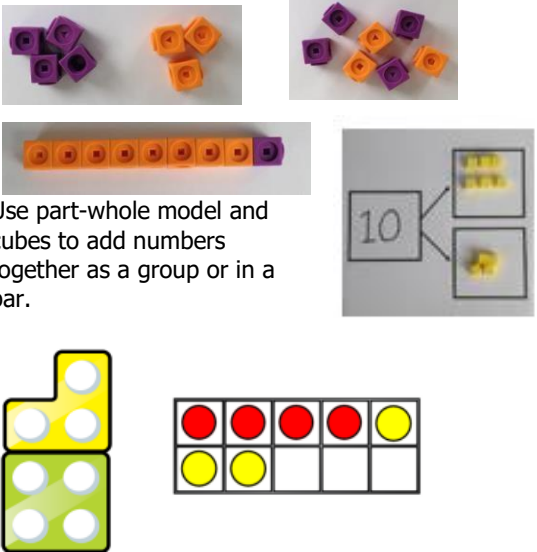
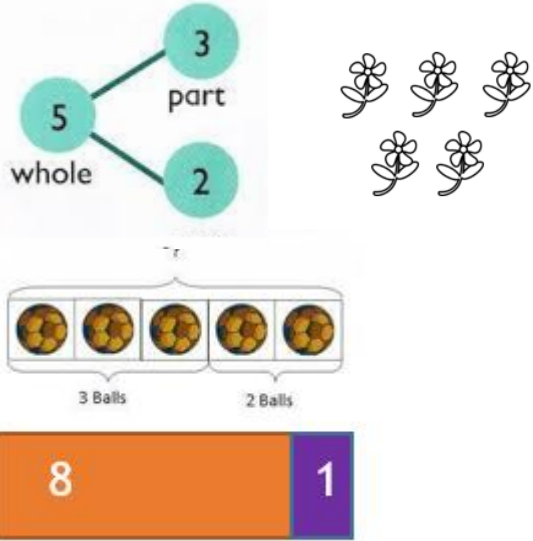

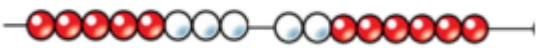


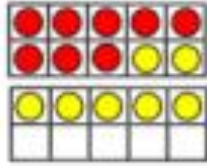
Start with the larger number on the bead string and then count on to the smaller number one by one to find the answer.



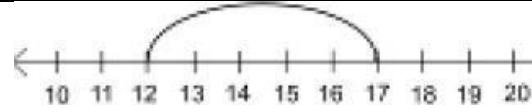
Use Tens frame with double sided counters to show crossing 10. Keep highlighting the importance of ten ones equalling one ten.

# Year 1

Objective	Concrete	Pictorial	Abstract
<p>Add two 1 digit numbers to 10 (including number bonds)</p>	 <p>Use part-whole model and cubes to add numbers together as a group or in a bar.</p> <p>Use Tens frame with double sided counters and Numicon to aid adding two numbers, especially number bonds.</p>	 <p>Use part-whole models with numbers or pictures to add two numbers together as a group or in a bar.</p>	$4 + 3 = 7$  <p>Use the part-whole diagram to move into the abstract addition calculation</p> $10 = 6 + 4$ <p>Ensure number sentences are used with equals sign in varied positions.</p>
<p>Add 1 and 2 digit numbers (including number bonds) to 20</p>	 <p>Start with the larger number on the bead string and then count on to the smaller number one by one to find the answer.</p>	$12 + 5 = 17$	$12 + 5 = 17$ <p>Place the larger number in your head then count on the smaller number to find your answer.</p>

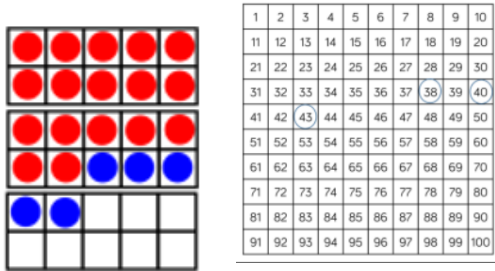
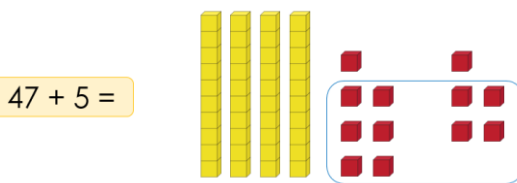
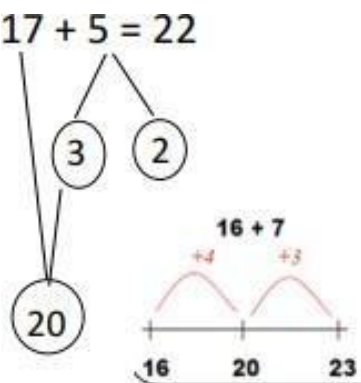
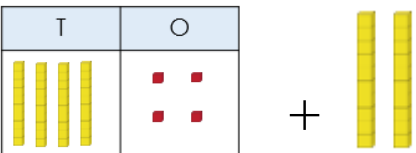
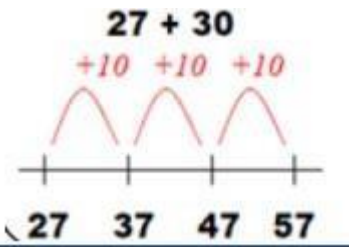


Use Tens frame with double sided counters to show crossing 10. Keep highlighting the importance of ten ones equalling one ten.



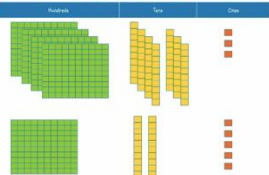
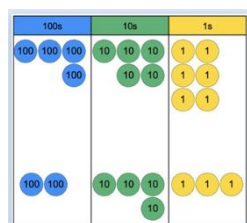
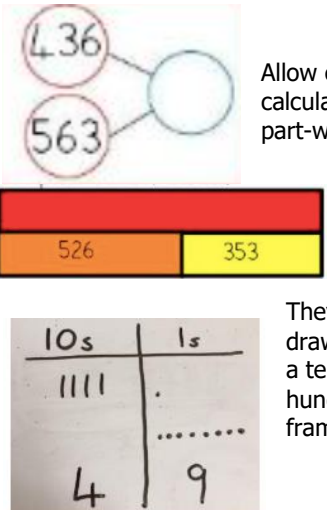
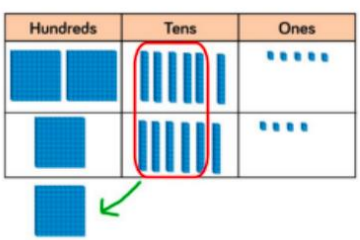
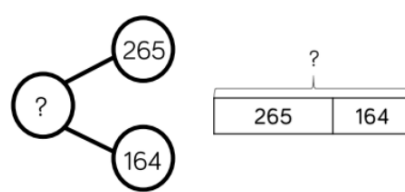
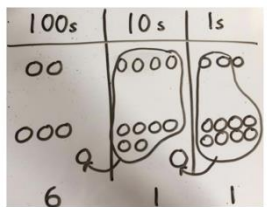
Start at the larger number on the number line and count on in ones or in one jump to find the answer.

# Year 2

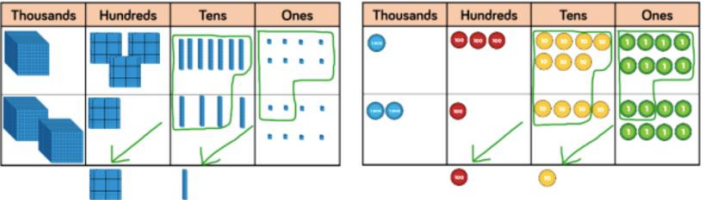
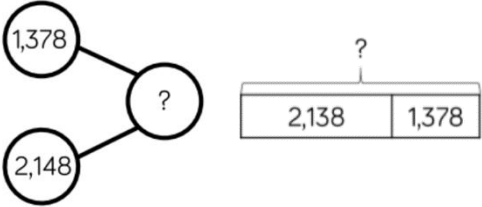

Objective	Concrete	Pictorial	Abstract
<p>Add a 2 digit numbers and ones</p>	 <p>Use Tens frame and 100 squares to make/start at bigger number and count on ones.</p>  <p>Use Base 10 and number bonds to regroup and cross 10.</p>	 <p>Use part-whole diagram and number line to model using number bonds to cross 10.</p>	$17 + 5 = 22$ $5 + 17 = 22$ $22 - 17 = 5$ $22 - 5 = 17$ <p>Explore related facts (fact families).</p>
<p>Add 2 digit numbers and tens</p>	 $44 + 20$ <p>Use Base 10 to make larger number and add on relevant tens. Explore that the ones digit does not change.</p>	 <p>Use number line to add on 10s.</p>	<p>Write as abstract number sentences. Keep adding tens to pattern spot.</p> $27 + 10 = 37$ $27 + 20 = 47$ $27 + \underline{\quad} = 57$



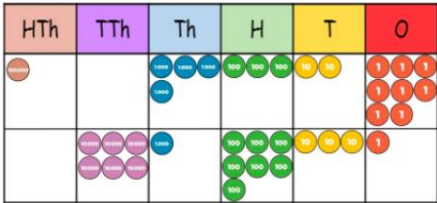
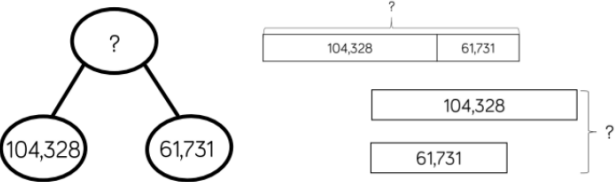
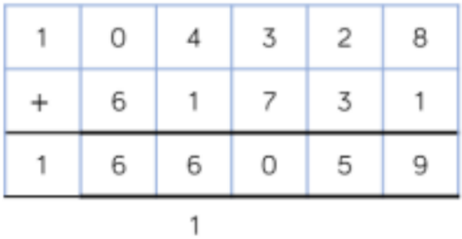
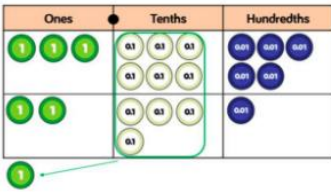
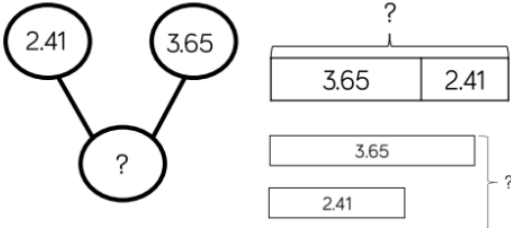
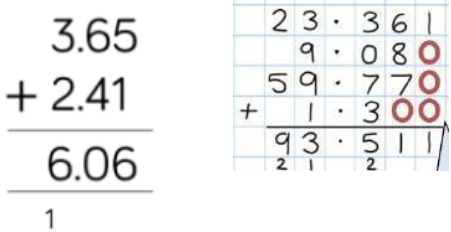
# Year 3

Objective	Concrete	Pictorial	Abstract
<p>Add numbers with up to 3 digits (no regrouping/exchange)</p>	<p>Use Base 10 to make the two numbers first before moving onto place value counters. Add together the ones first then add the tens, then hundreds.</p> <p>473 + 125</p>  <p>456 + 243</p> 	 <p>Allow children to see the calculations represented in part-whole and bar models.</p> <p>They can also move to drawing the counters using a tens and ones frame or hundreds tens and ones frame.</p>	$\begin{array}{r} 223 \\ + 114 \\ \hline 337 \end{array}$ <p>Written column method used, building on use of 2 digits in Year 2. Add the ones first, then the tens, then the hundreds.</p>
<p>Add numbers with up to 3 digits (with regrouping/exchange)</p>	<p>Use Base 10 to make the two numbers first before moving onto place value counters.</p>  <p>Model physically exchanging ten ones for a ten, or ten tens for one hundred.</p> <p>Make sure exchanged counters/Base 10 are put below the column to the left and added into calculation.</p>	 <p>Allow children to see the calculations represented in part-whole and bar models.</p> <p>Children can draw a pictorial representation of the columns and place value counters to further support their learning and understanding.</p> 	$\begin{array}{r} 265 \\ + 164 \\ \hline 429 \\ 1 \end{array}$ <p>Start by partitioning the numbers before formal column to show the exchange(s).</p>

## Year 4

Objective	Concrete	Pictorial	Abstract
Add numbers with up to 4 digits  (with regrouping/exchange)	<p><i>As Year 3 but with 4 digit numbers.</i></p> <p>Children continue to use Base 10 and place value counters to add, exchanging ten ones for a ten; ten tens for a hundred; and ten hundreds for a thousand.</p> 	 <p>Allow children to see the calculations represented in part-whole and bar models.</p>	

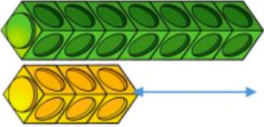

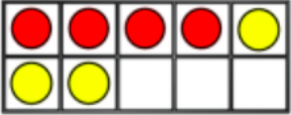


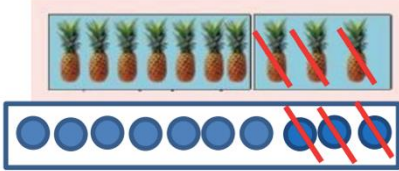

## Year 5/6

Objective	Concrete	Pictorial	Abstract
Add larger numbers with 4 or more digits	<p><i>As Year 4 but with numbers with more than 4 digits.</i></p>  <p>Use place value counters to model, drawing on abstract knowledge from previous years.</p>	 <p>Allow children to see the calculations represented in part-whole and bar models.</p>	
Add numbers with decimal places	 <p>Use decimal place value counters. Make sure decimals are lined up with decimal point. Put placeholder '0' in columns if different decimal places.</p>	 <p>Allow children to see the calculations represented in part-whole and bar models.</p>	 <p>Explain to put a placeholder '0' in columns if different decimal places and ensuring decimal points are lined up.</p>

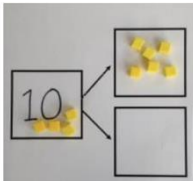
# Subtraction

Key language: subtract, take away, less than, difference, minus, fewer, decrease, exchange, regroup, minuend, subtrahend.

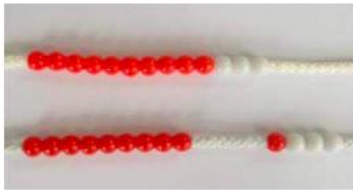
## Foundation Stage

Objective	Concrete	Pictorial	Abstract
<p>Begin to relate subtraction to finding one less than a given number</p>	<p><i>Link to addition.</i></p> <p>Use cubes to find the difference (how many more) Link to number bonds to 10.</p>   <p>Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones.</p>  <p>Use Tens frames with double sided counters. Make larger number and turn over the smaller number to show subtraction.</p> 	<p> 8 - 3 = 5</p> <p>Draw out the amount (larger number) and cross off the number to find the difference.</p>  <p>Use number line to subtract by starting at larger number and counting back.</p> 	<p style="text-align: center;"><math>7 - 3 = 4</math></p> <p>Use the part-whole diagram to move into the abstract subtraction calculation. Ensure number sentences are used with subtraction and equals sign.</p>

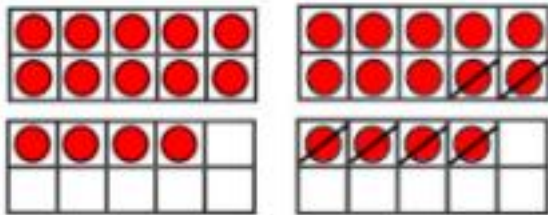
Make larger number in Numicon and take away smaller number.



Use part-whole model with counters to model the inverse.



$13 - 4 = 9$   
Move the beads along the bead string as you count backwards.



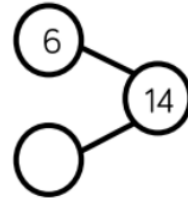
Use Tens frame to make number in counters and then take them away in ones. Emphasise what happens when you cross 10 and that ten ones equal 10.



Use Numicon to reinforce crossing 10 and number bonds.

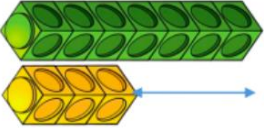

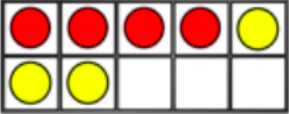

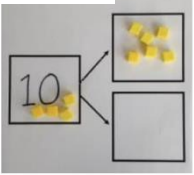

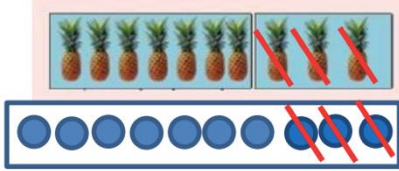

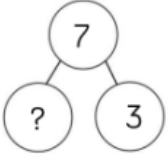


Use number line to subtract by starting at larger number and counting back.

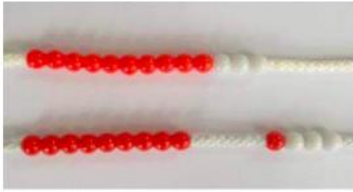


Show subtractions as part-whole models to emphasise difference.

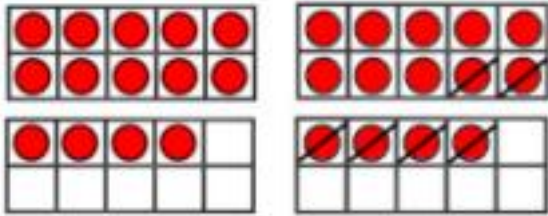
# Year 1

Objective	Concrete	Pictorial	Abstract
<p>Subtract 1 digit numbers within 10 (including number bonds)</p>	<p><i>Link to addition.</i></p> <p>Use cubes to find the difference (how many more) Link to number bonds to 10.</p>  <p></p> <p>Make the larger number in your subtraction. Move the beads along your bead string as you count backwards in ones.</p> <p></p> <p>Use Tens frames with double sided counters. Make larger number and turn over the smaller number to show subtraction.</p> <p></p> <p>Make larger number in Numicon and take away smaller number.</p> <p></p> <p>Use part-whole model with counters to model the inverse.</p>	<p> 8 - 3 = 5</p> <p>Draw out the amount (larger number) and cross off the number to find the difference.</p>  <p>Use number line to subtract by starting at larger number and counting back.</p> 	 <p><math>7 - 3 = 4</math></p> <p>Use the part-whole diagram to move into the abstract subtraction calculation. Ensure number sentences are used with subtraction and equals sign.</p>

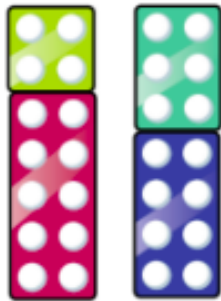
Subtract 1 and 2 digit numbers (including number bonds) to 20



$13 - 4 = 9$   
Move the beads along the bead string as you count backwards.



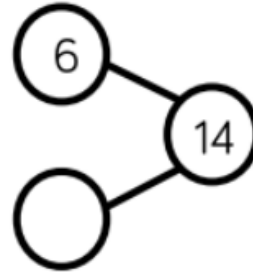
Use Tens frame to make number in counters and then take them away in ones. Emphasise what happens when you cross 10 and that ten ones equal 10.



Use Numicon to reinforce crossing 10 and number bonds.

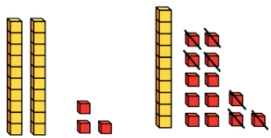
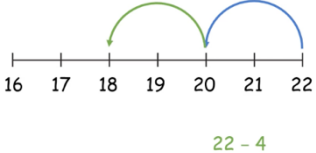

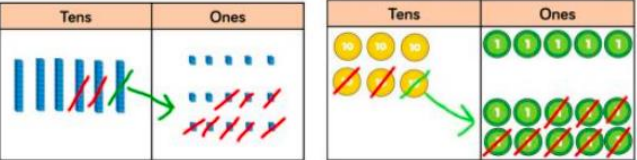
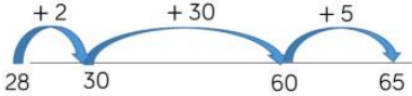
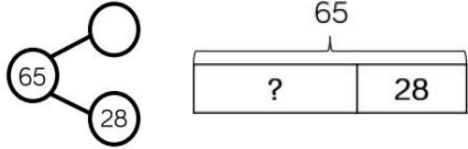
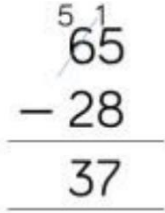


Use number line to subtract by starting at larger number and counting back.

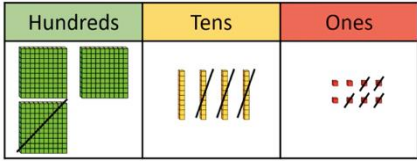
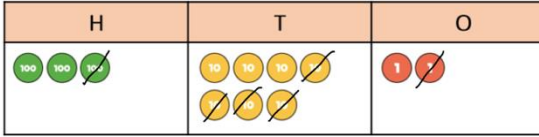
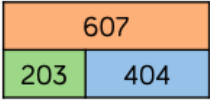
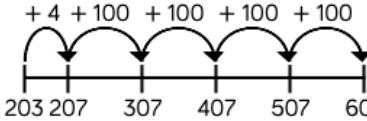

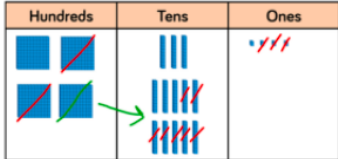
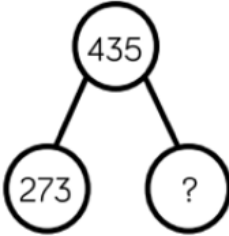
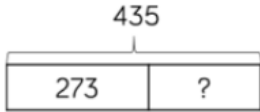
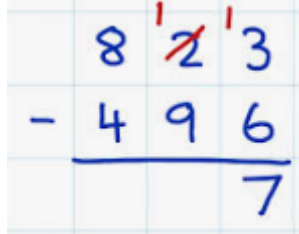


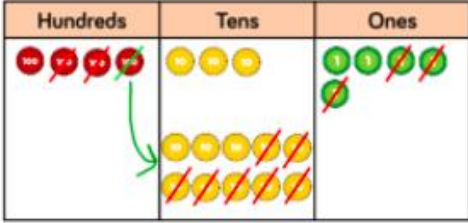
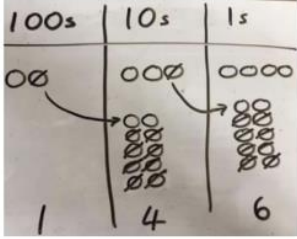
Show subtractions as part-whole models to emphasize difference.

# Year 2

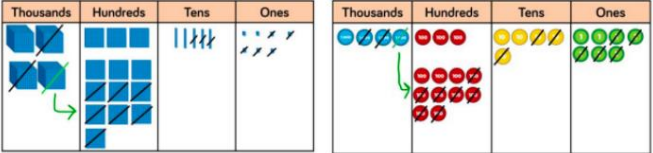
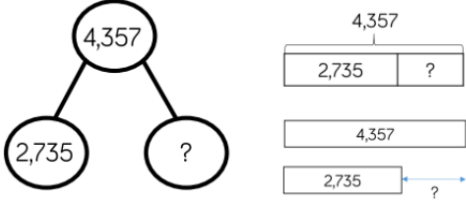
Objective	Concrete	Pictorial	Abstract
Subtract a 1 digit number from a 2 digit number  (including exchange)	<p><i>As Year 1 but with numbers to 100 rather than 20</i></p> <p><math>23 - 7</math></p>  <p>Use Base 10 and place value counters to make larger number. Model exchange one ten for ten ones and then subtracting.</p>	<p><i>As Year 1 but with numbers to 100 rather than 20</i></p>  <p>Use number line to emphasise number bonds and crossing 10.</p>	<p><math>23 - 7 = 16</math></p> <p>Use related facts to make fact families.</p> <p><math>23 - 16 = 7</math>  <math>16 + 7 = 23</math>  <math>7 + 16 = 23</math></p>
Subtract a 2 digit number from a 2 digit number to 100  (including exchange)	<p>Use Base 10 to subtract the smaller number from the bigger number (partition place value).</p>   <p>Model using Base 10 then move on to place value counters. Use place value grids when adding to support moving to formal column method.</p> <p>Emphasise only making larger number and subtracting ones first and explain exchange from tens to ones.</p>	 <p>Use number line to count on from smaller number (find difference).</p>  <p>Use part-whole and bar models if necessary.</p>	 <p>Once consolidated, introduce children to formal column method, continuing to model alongside counters.</p>

# Year 3

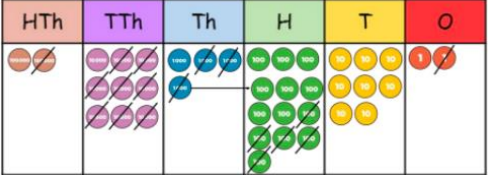

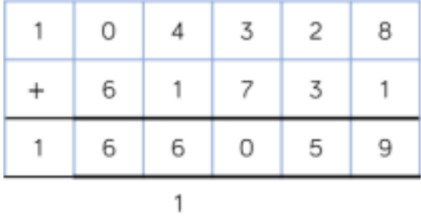
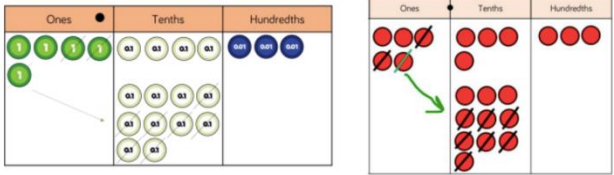
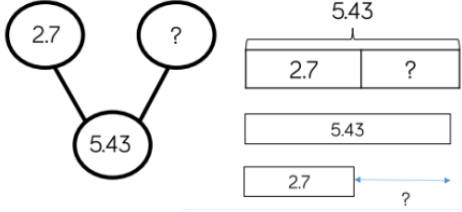
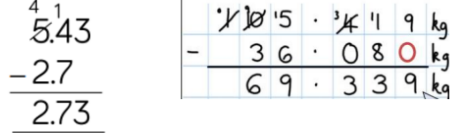
Objective	Concrete	Pictorial	Abstract
<p>Subtract numbers with up to 3 digits</p> <p>(no regrouping/exchange)</p>	<p>Use the Base 10 to make the larger number first before moving onto place value counters.</p>   <p>Subtract the ones first then add the tens, then hundreds.</p>	<p>Allow children to see the calculations represented in part-whole and bar models.</p>  	<p>Start by partitioning the numbers before formal column to show the exchange(s).</p> 
<p>Subtract numbers with up to 3 digits</p> <p>(with regrouping/exchange)</p>	<p>Use the Base 10 to make the calculation before moving onto place value counters.</p>  <p>Make larger number only. Model</p> <p>physically exchanging one ten for ten ones, or one hundred for ten tens.</p>	<p>Allow children to see the calculations represented in part-whole and bar models.</p>  	<p>Formal column method. Children must understand what has happened when they have crossed out digits.</p> 

	<p>Make sure exchanged counter/dienes are removed/crossed out.</p> 	<p>Represent the place value counters pictorially; remembering to show what has been exchanged.</p> 	
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## Year 4

Objective	Concrete	Pictorial	Abstract
<p>Subtract numbers with up to 4 digits  (with regrouping/exchange)</p>	<p><i>As Year 3 but with 4 digit numbers.</i></p> <p>Children continue to use Base 10 and place value counters to subtract, exchanging one thousand for ten hundreds; one hundred for ten tens; and one ten for ten ones.</p> 	 <p>Allow children to see the calculations represented in part-whole and bar models.</p>	$\begin{array}{r} 3 \ 1 \\ 4357 \\ - 2735 \\ \hline 1622 \end{array}$


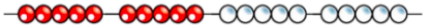
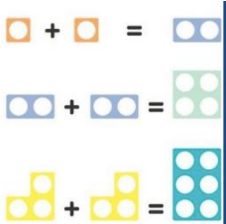
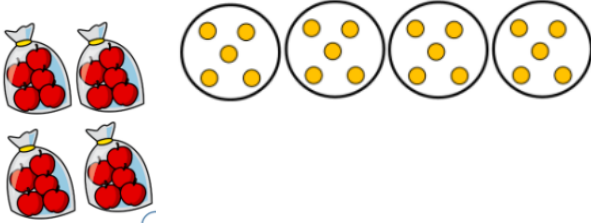
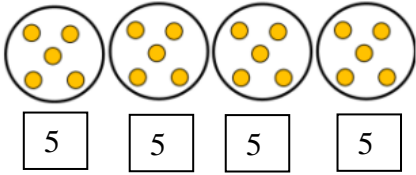
# Year 5/6

Objective	Concrete	Pictorial	Abstract
<p>Subtract larger numbers with 4 or more digits</p>	<p><i>As Year 4 but with numbers with more than 4 digits.</i></p>  <p>Use place value counters to model, drawing on abstract knowledge from previous years.</p>	<p>Allow children to see the calculations represented in part-whole and bar models.</p> 	
<p>Subtract numbers with decimal places</p>	<p>This needs to include money, measures and decimals with different numbers of decimal places.</p>  <p>Use decimal place value counters. Make sure decimals are lined up with decimal point. Put placeholder '0' in columns if different decimal places.</p>	<p>Allow children to see the calculations represented in part-whole and bar models.</p> 	 <p>Explain to put a placeholder '0' in columns if different decimal places and ensuring decimal points are lined up.</p>


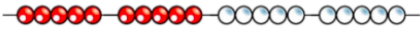
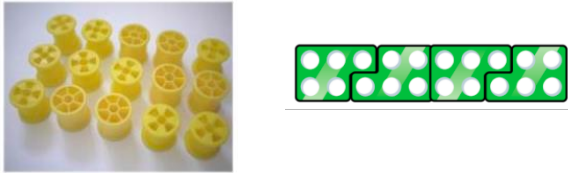
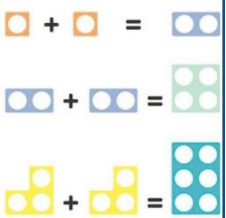
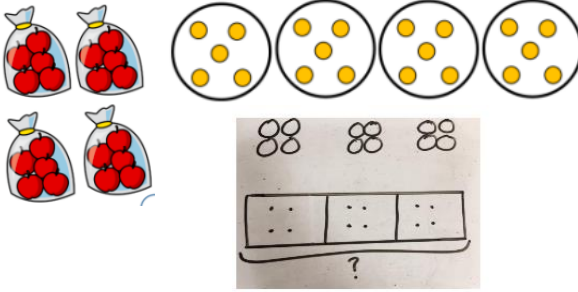
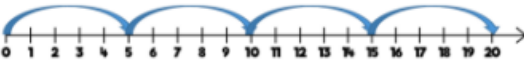
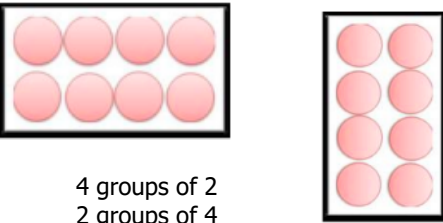

# Multiplication

Key language: multiply, double, times, multiplied by, groups of, lots of, equal groups, factor, multiple, multiplier, multiplicand, product, commutative, prime, composite, square, cube.






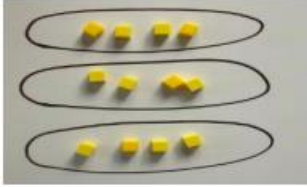


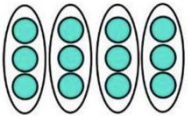
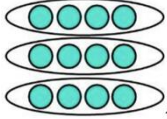
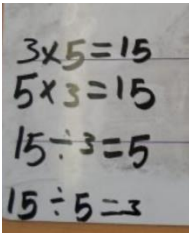
## Foundation Stage

Objective	Concrete	Pictorial	Abstract
<p>To understand multiplication as repeated addition, calculating the answer using concrete objects, pictorial representations and arrays.</p>	<p>Children should be taught to understand grouping as an array using the following steps:</p> <p>1. Using grouped objects or bead strings for repeated addition, without recombining.</p>   <p>2. Using Numicon to embed the concept of doubling (from Reception) and model number sentence.</p> 	<p>Children solve problems by drawing pictorial representations.</p> 	<p>Children solve problems by drawing pictorial representations and write the corresponding numeral under each group.</p> 

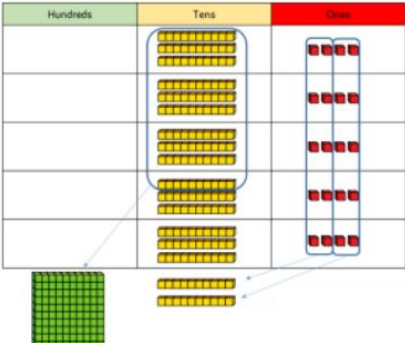

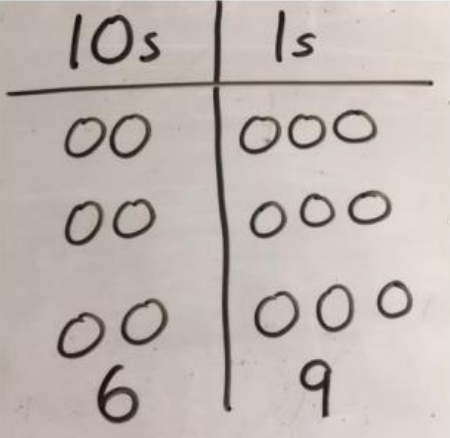
# Year 1

Objective	Concrete	Pictorial	Abstract
<p>Solve one-step problems involving multiplication, by calculating the answer using concrete objects, pictorial representations and arrays</p>	<p>Children should be taught to understand multiplication as an array using the following steps:</p> <ol style="list-style-type: none"> <li>Using grouped objects or bead strings for repeated addition, without recombining.</li> </ol>   <ol style="list-style-type: none"> <li>Arranging objects into rectangular arrays or using Numicon. Children will be counting in steps of 2, 5 and 10, and so it is useful if these numbers are used initially in any arrays created.</li> </ol>  <ol style="list-style-type: none"> <li>Using Numicon to embed the concept of doubling (from Reception) and model number sentence.</li> </ol> 	<p><b>Pictorial</b></p>  <p>Children solve problems by drawing pictorial representations or skip counting on a number line.</p>  <p>Children can then move onto drawing arrays by grouping into rows. Arrays should be rotated to start to demonstrate the commutativity of multiplication.</p>  <p>4 groups of 2 2 groups of 4</p>	<p><i>(Children not introduced to the multiplication symbol yet.)</i></p> $5 + 5 + 5 + 5 = 20$  $2 + 2 + 2 + 2 + 2 = 10$ <p>Children solve the problems and write the answers as repeated addition calculations.</p>

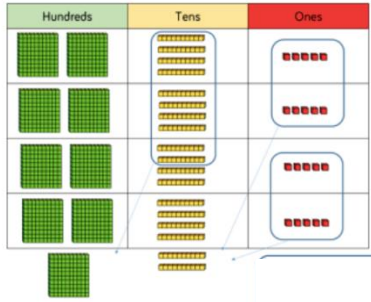
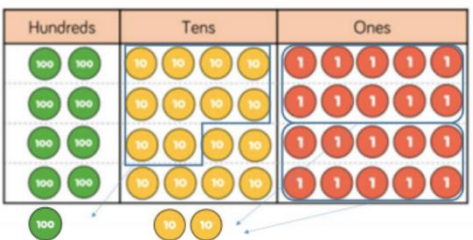
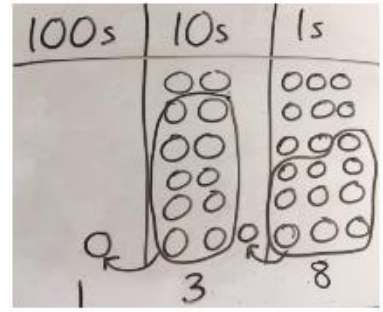
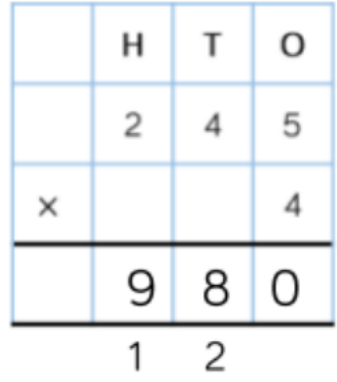
# Year 2

Objective	Concrete	Pictorial	Abstract
<p>Counting in multiples of 2, 5 and 10 from 0</p> <p><i>(show that multiplication of two numbers can be done in any order -commutative- and division of one number by another cannot)</i></p>	<p><i>Use repeated addition techniques used in Year 1 (bead strings, Numicon, arrays using concrete objects)</i></p>  <p><math>5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 40</math></p>    <p>Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer.</p>  	<p><b>Pictorial</b></p>   <p>Number lines, counting sticks and bar models should be used to show representation of counting in multiples.</p>  <p><math>12 \div 3</math></p>  <p><math>12 \div 4</math></p> <p>Use representations of arrays to show different calculations and explore commutativity.</p>	<p>Children recall their 2, 5 and 10 x table facts and use the X multiplication symbol (lots of, groups of, equal groups) to write in a number sentence.</p> <p><math>5 + 5 + 5 = 15</math></p> <p><math>3 + 3 + 3 + 3 + 3 = 15</math></p>  <p>Use commutative law to write related facts.</p>

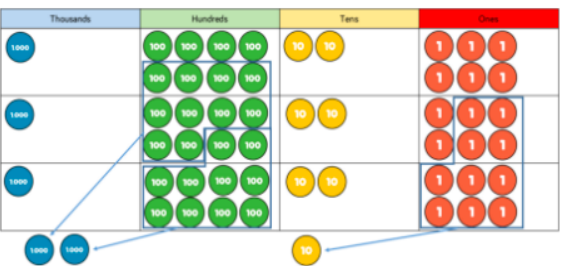
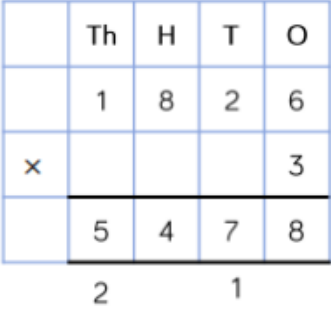
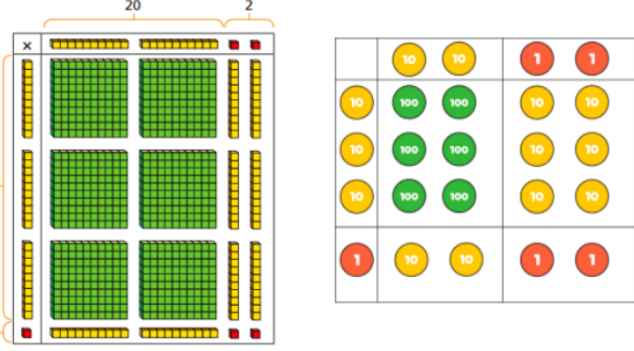
# Year 3

Objective	Concrete	Pictorial	Abstract
<p>Multiply 2 digit numbers by 1 digit</p> <p>(with regrouping/exchange)</p>	 <p>Use Base 10 and place value counters initially for all children to ensure full understanding before moving onto the written method.</p> <p><math>34 \times 5</math> Make 5 rows of 34. Add up each row starting in the ones. Explain any exchange and put the relevant counters beneath the column to the left.</p> 	 <p>Children can represent the work they have done with place value counters pictorially.</p>	<p>Children to be encouraged to show the steps they have taken before moving on to the formal written method.</p> $  \begin{array}{r}  3 \times 23 \\  \swarrow \quad \searrow \\  20 \quad 3  \end{array}  $ $  \begin{array}{r}  3 \times 20 = 60 \\  3 \times 3 = 9 \\  60 + 9 = 69  \end{array}  $ $  \begin{array}{r}  23 \\  \times 3 \\  \hline  69  \end{array}  $

# Year 4

Objective	Concrete	Pictorial	Abstract
<p>Multiply 3 digit numbers by 1 digit  (with regrouping/ exchange)</p>	<p>Use Base 10 and place value counters initially for all children to ensure full understanding before moving onto the written method.</p>  <p>254 X 4 Make 4 rows of 254. Add up each row starting in the ones. Explain any exchange and put the relevant counters beneath the column to the left.</p> 	<p>Children to represent the counters/base 10, pictorially e.g. the image below.</p> 	

# Year 5/6

Objective	Concrete	Pictorial	Abstract																																																																																																				
<p>Multiply 4 digit numbers by 1 digit (with regrouping/exchange)</p>	<p><i>As Year 4 but with numbers with 4 digits.</i></p>  <p>When multiplying 4 digits by 1 digit, place value counters are the best manipulative to support understanding of written method.</p>	<p><i>As Year 4 but with numbers with 4 digits.</i></p>																																																																																																					
<p>Multiply numbers up to 4 digits by 2 digits (with regrouping/exchange)</p>	 <p>Start by modelling 2 digit X 2 digit multiplication using Base 10 and place value counters. Ensure children have an opportunity to exchange using the concrete resources and model exchanging underneath the column to the left.</p> <p>Move on to 3 digits x 2 digits.</p>	<p>Continue to use bar modelling and grid method to consolidate understanding and support problem solving.</p> <table border="1" data-bbox="1120 837 1344 989"> <tr><td>×</td><td>20</td><td>2</td></tr> <tr><td>30</td><td>600</td><td>60</td></tr> <tr><td>1</td><td>20</td><td>2</td></tr> </table> <table border="1" data-bbox="1108 1053 1478 1204"> <tr><td>×</td><td>200</td><td>30</td><td>4</td></tr> <tr><td>30</td><td>6,000</td><td>900</td><td>120</td></tr> <tr><td>2</td><td>400</td><td>60</td><td>8</td></tr> </table>	×	20	2	30	600	60	1	20	2	×	200	30	4	30	6,000	900	120	2	400	60	8	<p>Long multiplication method introduced.</p> <p>Ensure secure understanding of using place holder to represent multiplying the tens.</p> <p>If children are still struggling with times tables, provide multiplication grids to support when they are focusing on the method.</p> <table border="1" data-bbox="1500 742 1668 981"> <tr><td></td><td>H</td><td>T</td><td>O</td></tr> <tr><td></td><td></td><td>2</td><td>2</td></tr> <tr><td>×</td><td></td><td>3</td><td>1</td></tr> <tr><td></td><td></td><td>2</td><td>2</td></tr> <tr><td></td><td>6</td><td>6</td><td>0</td></tr> <tr><td></td><td>6</td><td>8</td><td>2</td></tr> </table> <table border="1" data-bbox="1512 997 1702 1284"> <tr><td>Th</td><td>H</td><td>T</td><td>O</td></tr> <tr><td></td><td>2</td><td>3</td><td>4</td></tr> <tr><td>×</td><td></td><td>3</td><td>2</td></tr> <tr><td></td><td>4</td><td>6</td><td>8</td></tr> <tr><td>1</td><td>7</td><td>0</td><td>2</td><td>0</td></tr> <tr><td>7</td><td>4</td><td>8</td><td>8</td></tr> </table> <table border="1" data-bbox="1848 965 2083 1284"> <tr><td>TTh</td><td>Th</td><td>H</td><td>T</td><td>O</td></tr> <tr><td></td><td>2</td><td>7</td><td>3</td><td>9</td></tr> <tr><td>×</td><td></td><td></td><td>2</td><td>8</td></tr> <tr><td>2</td><td>1</td><td>9</td><td>1</td><td>2</td></tr> <tr><td>5</td><td>4</td><td>7</td><td>8</td><td>0</td></tr> <tr><td>7</td><td>6</td><td>6</td><td>9</td><td>2</td></tr> </table> <p>Consider where exchanged digits are placed and make sure it is consistent.</p>		H	T	O			2	2	×		3	1			2	2		6	6	0		6	8	2	Th	H	T	O		2	3	4	×		3	2		4	6	8	1	7	0	2	0	7	4	8	8	TTh	Th	H	T	O		2	7	3	9	×			2	8	2	1	9	1	2	5	4	7	8	0	7	6	6	9	2
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## **Years 2 - 6 Times Table Expectations**

The requirements for each year group as set out in the National Curriculum are as follows:

**Year 1** – counting in 2s, 5s and 10s

**Year 2** - recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers

**Year 3** – recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables

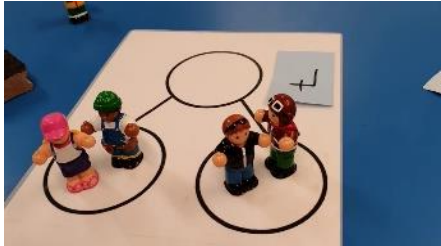
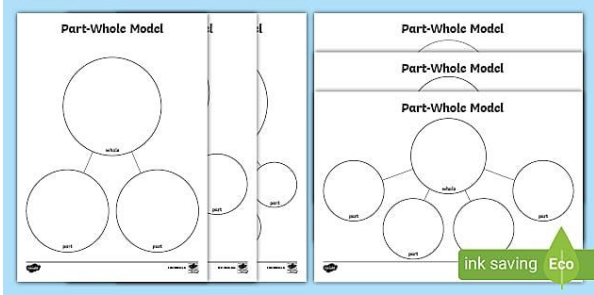
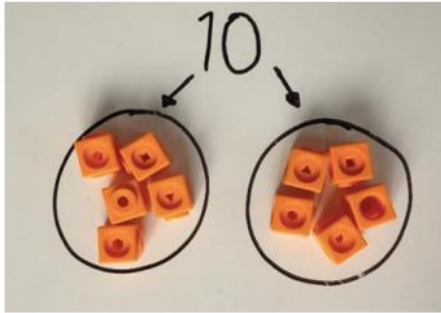
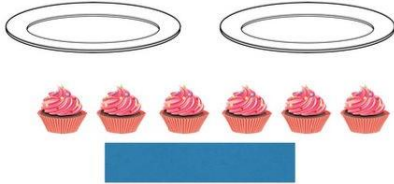
**Year 4** - recall multiplication and division facts for multiplication tables up to  $12 \times 12$  (Compulsory Multiplication Table Check at the end of the year)

**Years 5-6** - apply all the multiplication tables and related division facts frequently, commit them to memory and use them confidently to make larger calculations.

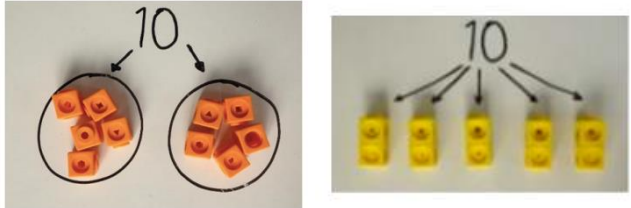


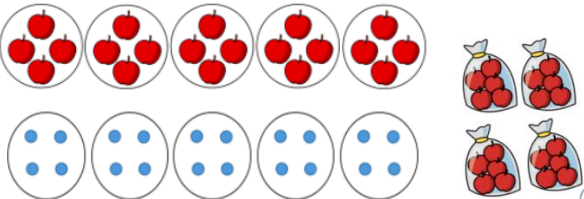
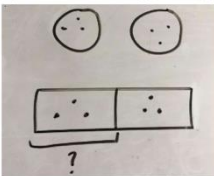

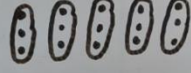
# Division

Key language: divide, share, group, equal groups, divided by, dividend, divisor, quotient, factor, multiple, remainder.

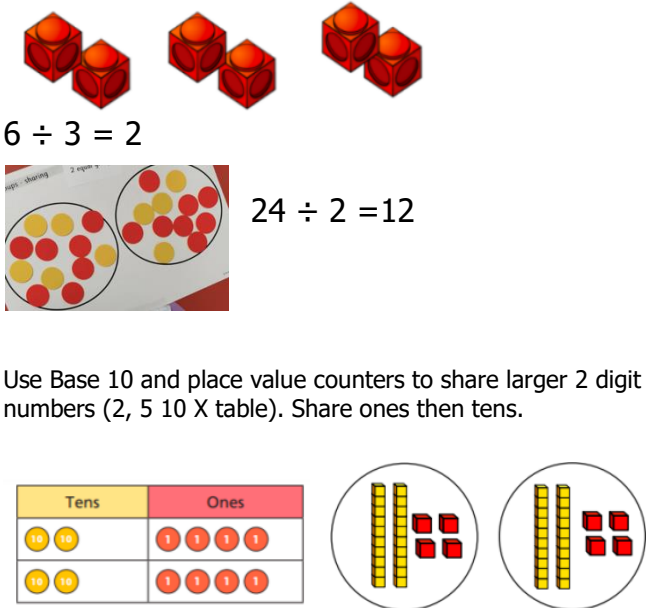
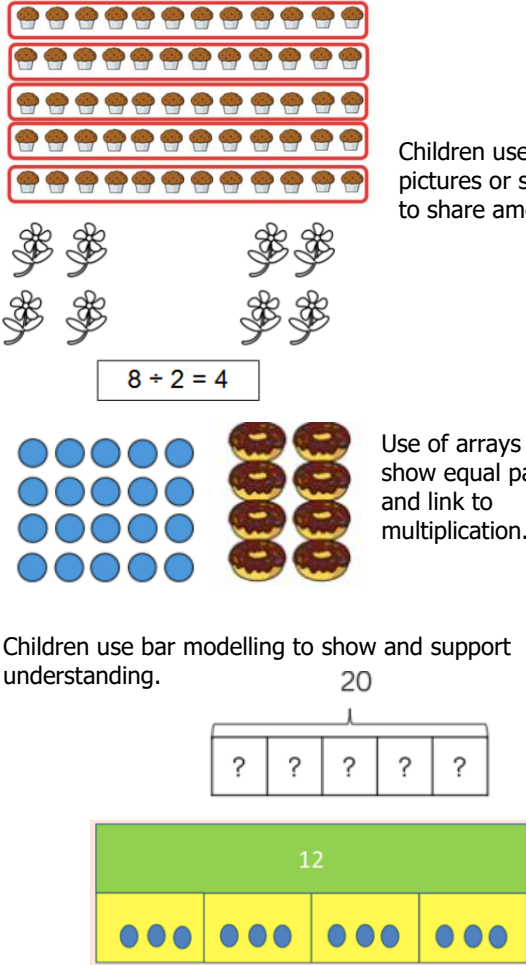
## Foundation Stage

Objective	Concrete	Pictorial	Abstract
<p>To understand division as quantities that can be distributed equally using concrete objects, pictorial representations and arrays.</p>	<p>Children understand division through <b>sharing</b> objects equally using part part whole or part part part part whole.</p>  	<p>Children solve sharing problems by drawing pictorial representations.</p> 	<p>6 Shared equally between 2 is 3</p> <p>There are 6 cakes. Can you share them? Try saying "one for me, one for you"</p> 

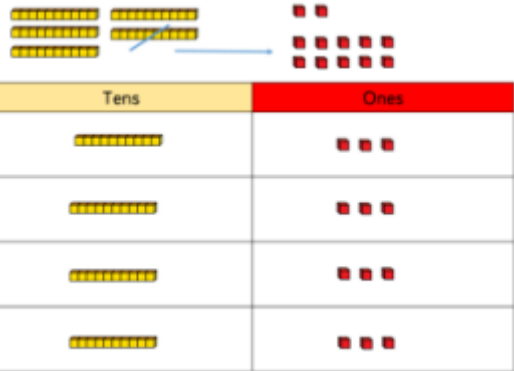

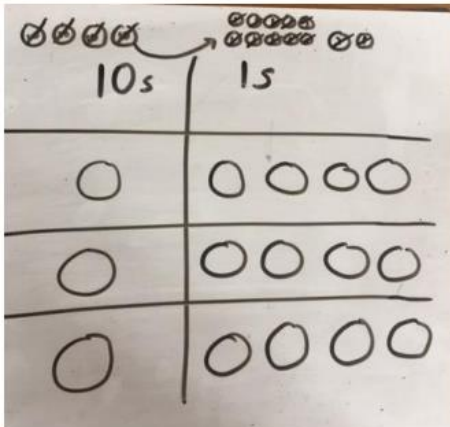
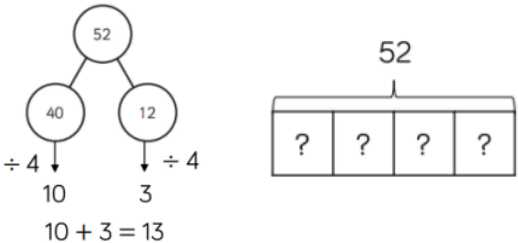
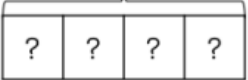
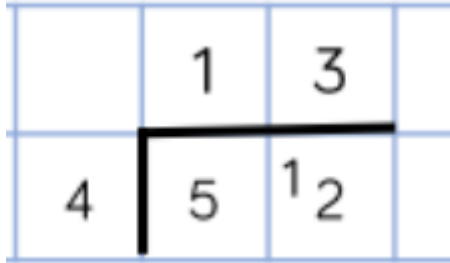
# Year 1

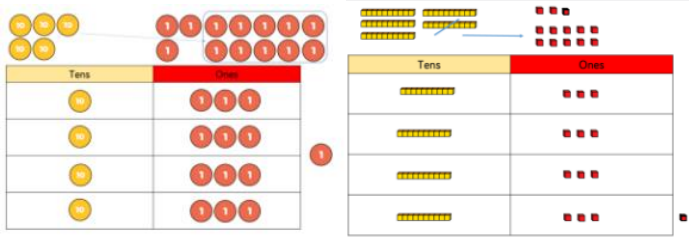
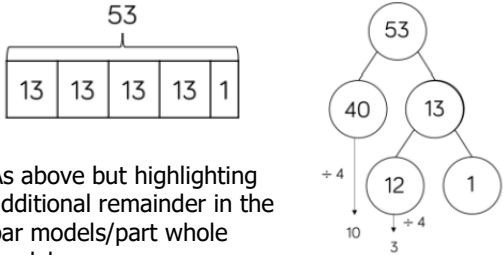
Objective	Concrete	Pictorial	Abstract
<p>Solve one-step problems involving division, by calculating the answer using concrete objects, pictorial representations and arrays</p>	<p>Children understand division through <b>grouping</b> and <b>sharing</b>.</p>  <p><u>Sharing</u> (I have 10 cubes, can you share them equally in 2 groups?)</p> <p><u>Grouping</u> (I have 10 cubes, can you put them into groups of 2?)</p>   <p>Bead strings or Numicon can be used to show grouping methods. I have 20 sweets, I need to put them in equal groups of 5. How many groups do I have?</p>	<p>Children solve sharing or grouping problems by seeing or drawing pictorial representations.</p>   <p><u>Sharing</u></p>  <p>Each person gets 5.</p> <p><u>Grouping</u></p>  <p>We can make 5 groups of 3.</p>	<p>(Children not introduced to the division symbol yet.)</p> <p>12 shared equally between 3 is 4.</p> <p>12 can be divided into 3 equal groups. In each group is 4.</p>

# Year 2

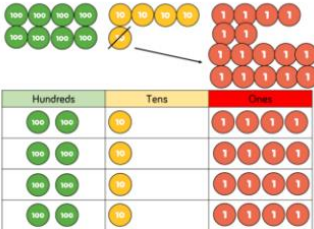
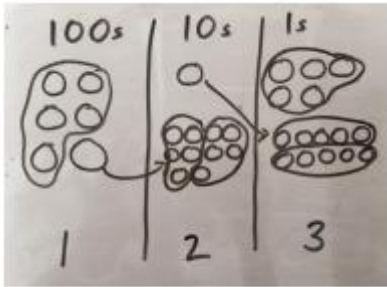
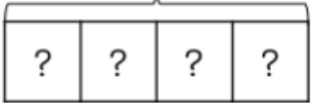
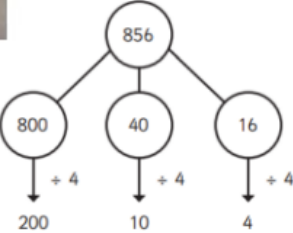
Objective	Concrete	Pictorial	Abstract
<p>Recall division facts of 2, 5 and 10 multiplication tables.</p>	<p>Use grouping and sharing techniques used in Year 1 (bead strings, Numicon, arrays using concrete objects)</p>  <p><math>6 \div 3 = 2</math></p> <p><math>24 \div 2 = 12</math></p> <p>Use Base 10 and place value counters to share larger 2 digit numbers (2, 5 10 X table). Share ones then tens.</p>	 <p>Children use pictures or shapes to share amounts.</p> <p><math>8 \div 2 = 4</math></p> <p>Use of arrays to show equal parts and link to multiplication.</p> <p>Children use bar modelling to show and support understanding.</p> <p><math>20</math></p> <p><math>12</math></p> <p><math>12 \div 4 = 3</math></p>	<p>Children recall their 2, 5 and 10 division facts and use the <math>\div</math> division symbol to write in a number sentence once understanding of sharing and grouping is consolidated.</p> <p><math>20 \div 5 = 4</math></p>

# Year 3

Objective	Concrete	Pictorial	Abstract
<p>Divide 2 digit numbers by 1 digit</p> <p>(with regrouping/exchange)</p>	<p><i>Continue Year 2 work on sharing evenly with multiples (e.g. <math>66 \div 3</math>) before moving on to calculations with exchange.</i></p> <p>Ensure children have opportunity to use Base 10 and place value counters.</p>  <p><math>52 \div 4</math></p> <p>Start with the biggest place value. We are sharing 50 (5 tens) into four groups. We can put 1 ten in each group and we have 1 ten left over. We exchange this ten for 10 ones and then share the 12 ones equally among the four groups. We look at how many are in each group- one ten and 3 ones. So <math>52 \div 4 = 13</math></p> 	 <p>Children can represent the work they have done with place value counters pictorially.</p>  <p>Children should be able to represent their division in bar models and part whole models to show relationship to multiplication.</p> 	<p>When deemed appropriate, children should start to complete short division calculations using the formal written layout, without the support of the place value counters.</p>  <p>Children should still be encouraged to verbalise their understanding as they did when working practically.</p> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; display: inline-block;"> <p><math>52 \div 4 = 13</math></p> </div>

<p>Divide 2 digit numbers by 1 digit (with remainders)</p>	<p>As above but any remainders made with the equipment are left outside the place value grid to highlight they cannot be divided equally.</p> 	 <p>As above but highlighting additional remainder in the bar models/part whole models.</p>	$\begin{array}{r} 13r1 \\ 4 \overline{) 53} \end{array}$ <div style="border: 1px solid black; padding: 5px; display: inline-block; margin-top: 10px;"> <math>53 \div 4 = 13 r1</math> </div>
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## Year 4

Objective	Concrete	Pictorial	Abstract															
<p>Divide 3 digit numbers by 1 digit (with regrouping/exchange)</p>	<p><i>As Year 3 but with 3 digits.</i></p> <p>Children should continue to use place value counters to strengthen their conceptual understanding of exchange when dividing. Note: calculations need to be chosen carefully to ensure they can use place value counters in an efficient way.</p> <div style="display: flex; align-items: center;"> <table border="1" style="margin-right: 20px;"> <thead> <tr><th>H</th><th>T</th><th>O</th></tr> </thead> <tbody> <tr><td>100 100</td><td>10</td><td>1</td></tr> <tr><td>100 100</td><td>10</td><td>1</td></tr> <tr><td>100 100</td><td>10</td><td>1</td></tr> <tr><td>100 100</td><td>10</td><td>1</td></tr> </tbody> </table> <div style="margin-right: 20px;"> <math>844 \div 4 = 211</math> </div> </div> <div style="display: flex; align-items: center; margin-top: 10px;">  <div style="margin-left: 20px;"> <math>856 \div 4 = 214</math> </div> </div>	H	T	O	100 100	10	1	100 100	10	1	100 100	10	1	100 100	10	1	<p><b>Pictorial</b></p>  <p>Children can represent the work they have done with place value counters pictorially.</p> <div style="display: flex; align-items: center; margin-top: 20px;"> <div style="margin-right: 20px;"> <math>844</math>   </div> <div>  </div> </div> <p>Children should be able to represent their division in bar models and part whole models to show relationship to multiplication.</p>	<p><b>Abstract</b></p> $\begin{array}{r} 214 \\ 4 \overline{) 856} \end{array}$ <p>Children should still be encouraged to verbalise their understanding as they did when working practically.</p>
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# Year 5

Objective	Concrete	Pictorial	Abstract																																																					
<p>Divide numbers up to 4 digits by a 1 digit number.</p> <p>(including remainders)</p>	<div style="text-align: center;"> <table border="1" style="margin: 0 auto;"> <thead> <tr> <th style="width: 25%;">Hundreds</th> <th style="width: 25%;">Tens</th> <th style="width: 25%;">Ones</th> </tr> </thead> <tbody> <tr> <td>100 100</td> <td>10 10 10 10</td> <td>1 1 1 1 1</td> </tr> <tr> <td>100 100</td> <td>10 10 10 10</td> <td>1 1 1 1 1</td> </tr> <tr> <td>100 100</td> <td>10 10 10 10</td> <td>1 1 1 1 1</td> </tr> <tr> <td>100 100</td> <td>10 10 10 10</td> <td>1 1 1 1 1</td> </tr> </tbody> </table> <p style="text-align: right; margin-right: 20px;">1</p> <p><b><math>981 \div 4 = 245 \text{ r } 1</math> (sharing)</b></p> <table border="1" style="margin: 0 auto; width: 100%;"> <thead> <tr> <th style="width: 12.5%;">Thousands</th> <th style="width: 12.5%;">Hundreds</th> <th style="width: 12.5%;">Tens</th> <th style="width: 12.5%;">Ones</th> <th style="width: 12.5%;">Thousands</th> <th style="width: 12.5%;">Hundreds</th> <th style="width: 12.5%;">Tens</th> <th style="width: 12.5%;">Ones</th> </tr> </thead> <tbody> <tr> <td>1000 1000</td> <td>100 100 100 100</td> <td>10 10 10 10 10 10</td> <td>1 1</td> <td>1000 1000</td> <td>100 100 100 100</td> <td>10 10 10 10</td> <td>1 1 1 1 1 1</td> </tr> </tbody> </table> <p><b><math>4892 \div 4 = 1223</math> (grouping)</b></p> <p>Use place value counters to explore sharing and grouping methods with exchanges and remainders. Ensure children are confident using both methods before moving on to abstract methods.</p> </div>	Hundreds	Tens	Ones	100 100	10 10 10 10	1 1 1 1 1	100 100	10 10 10 10	1 1 1 1 1	100 100	10 10 10 10	1 1 1 1 1	100 100	10 10 10 10	1 1 1 1 1	Thousands	Hundreds	Tens	Ones	Thousands	Hundreds	Tens	Ones	1000 1000	100 100 100 100	10 10 10 10 10 10	1 1	1000 1000	100 100 100 100	10 10 10 10	1 1 1 1 1 1	<p><i>As Year 3/4 but with numbers with 4 digits.</i></p>	<table border="1" style="margin: 0 auto; text-align: center;"> <tr> <td></td> <td>4</td> <td>2</td> <td>6</td> <td>6</td> </tr> <tr> <td>2</td> <td>8</td> <td>5</td> <td>13</td> <td>12</td> </tr> </table> <table border="1" style="margin: 0 auto; text-align: center;"> <tr> <td></td> <td>1</td> <td>2</td> <td>2</td> <td>3</td> <td></td> </tr> <tr> <td>4</td> <td>4</td> <td>8</td> <td>9</td> <td>14</td> <td>r2</td> </tr> </table> <p>Ensure children are beginning their divisions in the largest columns and correctly showing exchange. They should use their known multiplication facts and understanding of sharing and grouping to solve problems.</p> <p>Children do <u>not</u> convert remainders to fractions or decimals at this stage.</p>		4	2	6	6	2	8	5	13	12		1	2	2	3		4	4	8	9	14	r2
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# Year 6

Objective	Concrete	Pictorial	Abstract																																																																																										
Divide numbers up to 4 digits by a 2 digit number	<i>Can use place value counters to model if needed but using abstract calculation is adequate with good previous understanding of short division as it can be time consuming.</i>	<i>Can use drawings in place of counters if needed but using abstract calculation is adequate with good previous understanding of short division as it can be time consuming.</i>	<p style="text-align: center;"><b>432 ÷ 12 = 36</b></p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <table border="1" style="border-collapse: collapse; width: 100px; height: 100px;"> <tr><td></td><td></td><td>0</td><td>3</td><td>6</td></tr> <tr><td>1</td><td>2</td><td>4</td><td>3</td><td>2</td></tr> <tr><td></td><td>-</td><td>3</td><td>6</td><td>0</td></tr> <tr><td></td><td></td><td></td><td>7</td><td>2</td></tr> <tr><td></td><td>-</td><td></td><td>7</td><td>2</td></tr> <tr><td></td><td></td><td></td><td></td><td>0</td></tr> </table> <p>(x30)</p> <p>(x6)</p> </div> <div style="text-align: left; font-size: small;"> <p>· 12 × 1 = 12            12 × 2 = 24            12 × 3 = 36            12 × 4 = 48            12 × 5 = 60            12 × 6 = 72            12 × 7 = 84            12 × 8 = 96            12 × 9 = 108            12 × 10 = 120</p> </div> <div style="text-align: center;"> <table border="1" style="border-collapse: collapse; width: 100px; height: 100px;"> <tr><td></td><td></td><td>0</td><td>3</td><td>6</td></tr> <tr><td>1</td><td>2</td><td>4</td><td>3</td><td>2</td></tr> <tr><td></td><td>-</td><td>3</td><td>6</td><td>↓</td></tr> <tr><td></td><td></td><td></td><td>7</td><td>2</td></tr> <tr><td></td><td>-</td><td></td><td>7</td><td>2</td></tr> <tr><td></td><td></td><td></td><td></td><td>0</td></tr> </table> </div> </div> <p style="text-align: center;"> <span style="margin-right: 100px;"><u>Example 1</u></span> <span><u>Example 2</u></span> </p> <p>Children use long division to solve these questions. They can write out multiples of the divisor using multiplication knowledge and doubling etc.</p> <p>Start with more expanded method with multiples shown (<b>example 1</b>) before progressing on to the more formal method of long division (<b>example 2</b>).</p> <div style="display: flex; justify-content: space-between; align-items: flex-start;"> <table border="1" style="border-collapse: collapse; width: 150px; height: 150px;"> <tr><td></td><td></td><td>0</td><td>3</td><td>7</td></tr> <tr><td>1</td><td>8</td><td>6</td><td>6</td><td>6</td></tr> <tr><td></td><td>-</td><td>5</td><td>4</td><td>↓</td></tr> <tr><td></td><td></td><td>1</td><td>2</td><td>6</td></tr> <tr><td></td><td>-</td><td>1</td><td>2</td><td>6</td></tr> <tr><td></td><td></td><td></td><td></td><td>0</td></tr> </table> <div style="font-size: small;"> <p><b>Steps</b></p> <p>Step 1: Children will put the calculation into the division bracket and list multiples of the divisor.</p> <p>Step 2: Start with the largest column. The divisor (18) doesn't divide into 6 so combine the 6 hundreds with the 6 tens to get 66 tens. Use the multiples of 18 to calculate the nearest multiple. 3 × 18 = 54. Record this product (54) underneath, put the 3 on the top of bracket as tens part of quotient.</p> <p>Step 3: Subtract 54 tens from 66 tens leaving 12 tens. Write this underneath in correct column. Bring down the 6 from the ones to make 126 ones.</p> <p>Step 4: Look at 126 and use the multiples of 18 to calculate nearest multiple. In this case, 7 × 18 = 126 so there will be no remainder. Write the 7 in the ones part of the quotient at the top and subtract the product (126). If no remainder, the total should be 0 once subtracted. The answer is 37.</p> </div> </div>			0	3	6	1	2	4	3	2		-	3	6	0				7	2		-		7	2					0			0	3	6	1	2	4	3	2		-	3	6	↓				7	2		-		7	2					0			0	3	7	1	8	6	6	6		-	5	4	↓			1	2	6		-	1	2	6					0
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<p>Divide numbers up to 4 digits by a 2 digit number</p> <p>(including remainders)</p>	<p><i>As above.</i></p>	<p><i>As above.</i></p>	<p><i>As above but with remainders.</i></p> <p><b><math>372 \div 15 = 24 \text{ r}12</math></b></p> <p>When a remainder is left at the end of the calculation, children can either leave it as a remainder or convert it to a fraction. This will depend on the context of the question. Children can also answer questions where the quotient needs to be rounded according to the context.</p> <p><b><math>372 \div 15 = 24 \frac{4}{5}</math></b></p>
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