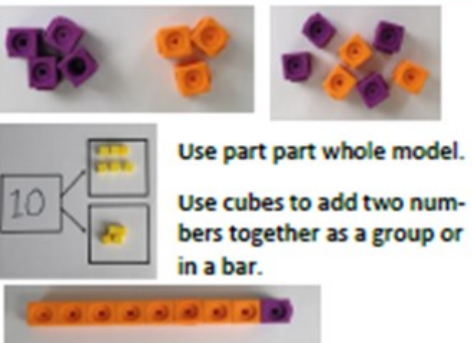
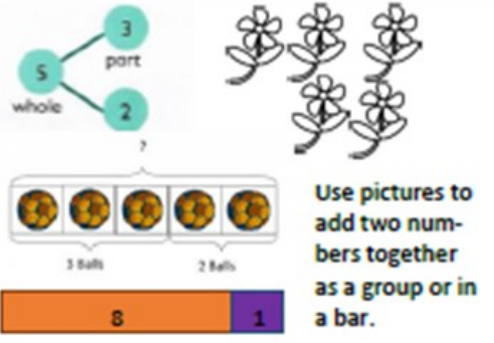

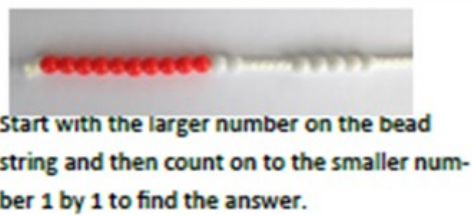
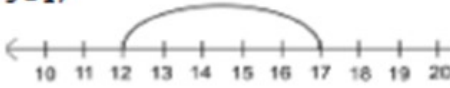
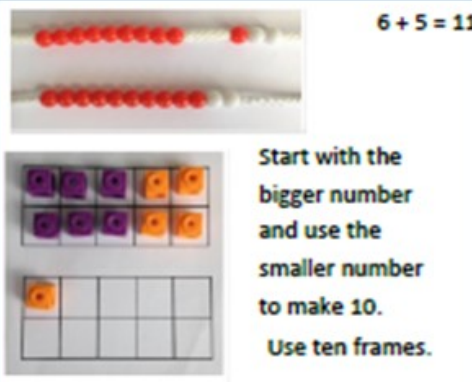
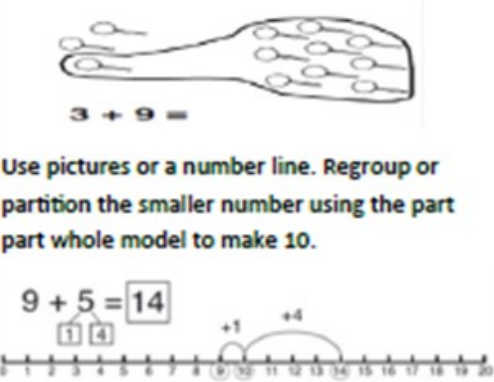
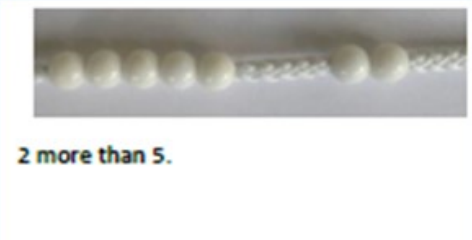
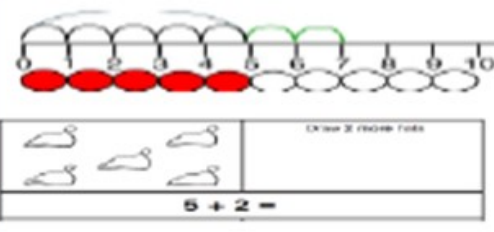





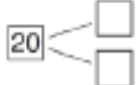
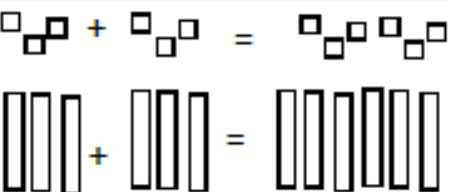
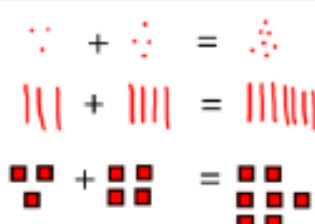


Objective & Strategy	Concrete	Pictorial	Abstract
Combining two parts to make a whole: part- whole model	 <p>Use part part whole model.</p> <p>Use cubes to add two numbers together as a group or in a bar.</p>	 <p>Use pictures to add two numbers together as a group or in a bar.</p>	$4 + 3 = 7$  <p>Use the part-part whole diagram as shown above to move into the abstract.</p> $10 = 6 + 4$
Starting at the bigger number and counting on	 <p>Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.</p>	$12 + 5 = 17$  <p>Start at the larger number on the number line and count on in ones or in one jump to find the answer.</p>	$5 + 12 = 17$ <p>Place the larger number in your head and count on the smaller number to find your answer.</p>
Regrouping to make 10. <i>This is an essential skill for column addition later.</i>	 <p>Start with the bigger number and use the smaller number to make 10.</p> <p>Use ten frames.</p>	 <p>Use pictures or a number line. Regroup or partition the smaller number using the part part whole model to make 10.</p>	$7 + 4 = 11$ <p>If I am at seven, how many more do I need to make 10. How many more do I add on now?</p>
Represent & use number bonds and related subtraction facts within 20	 <p>2 more than 5.</p>	 <p>5 + 2 =</p>	<p>Emphasis should be on the language</p> <p>'1 more than 5 is equal to 6.'</p> <p>'2 more than 5 is 7.'</p> <p>'8 is 3 more than 5.'</p>

Begin to use a number line with less guidance and move towards partitioning.

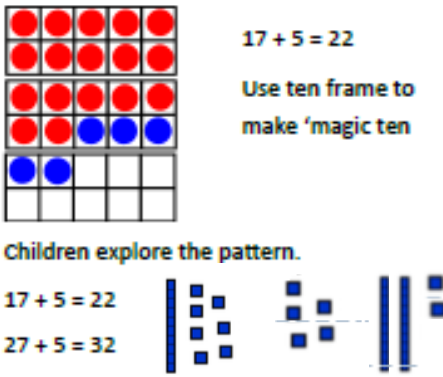
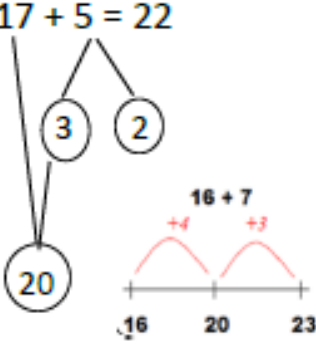
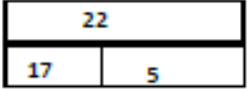

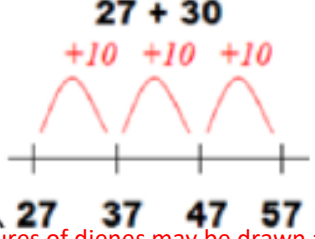

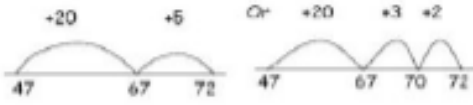

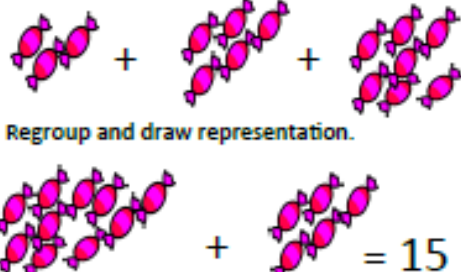
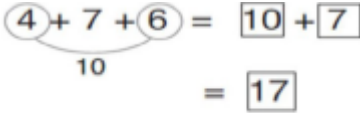
Y1

ADDITION +

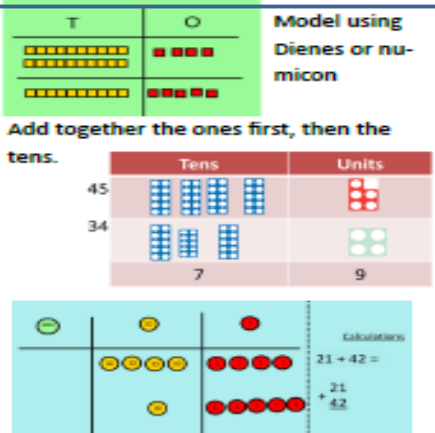

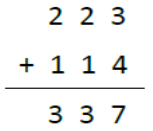
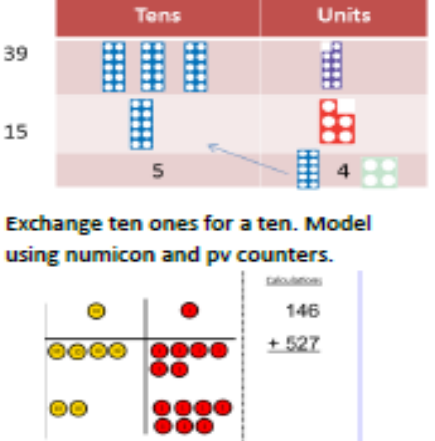
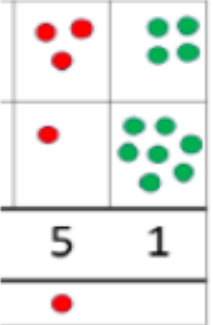
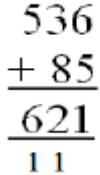
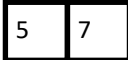
Y2 ADDITION +

Objective & Strategy	Concrete	Pictorial	Abstract								
Adding multiples of ten	$50 = 30 + 20$  Model using dienes and bead strings	 $3 \text{ tens} + 5 \text{ tens} = \text{---} \text{ tens}$ $30 + 30 = \text{---}$ Use representations for base ten.	$20 + 30 = 50$ $70 = 50 + 20$ $40 + \square = 60$								
Use known number facts Part part whole	 Children explore ways of making numbers within 20	 $\square + \square = 20$ $20 - \square = \square$ $\square + \square = 20$ $20 - \square = \square$	$\square + 1 = 16$ $16 - 1 = \square$ $1 + \square = 16$ $16 - \square = 1$								
Using known facts	 $\square\square + \square\square = \square\square\square\square$	 Children draw representations of H, T and O	$3 + 4 = 7$ <i>leads to</i> $30 + 40 = 70$ <i>leads to</i> $300 + 400 = 700$								
Bar model Start to explore missing number models	 $3 + 4 = 7$ $3 + ? = 7$	 $7 + 3 = 10$ $7 + ? = 10$	<table border="1" data-bbox="1451 1114 1854 1233"> <tr> <td>23</td> <td>25</td> </tr> <tr> <td colspan="2">?</td> </tr> </table> $23 + 25 = 48$ <table border="1" data-bbox="1458 1326 1861 1437"> <tr> <td>23</td> <td>?</td> </tr> <tr> <td colspan="2">48</td> </tr> </table>	23	25	?		23	?	48	
23	25										
?											
23	?										
48											

Y2 ADDITION +

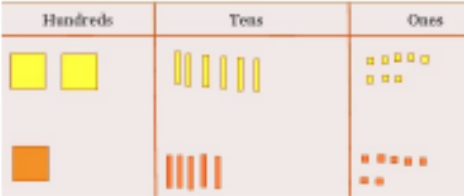
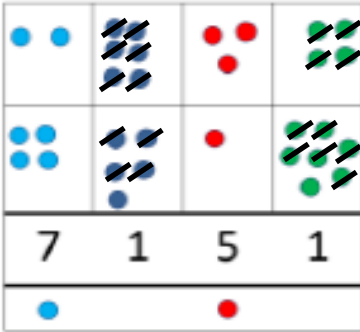
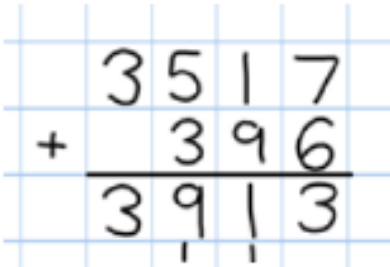

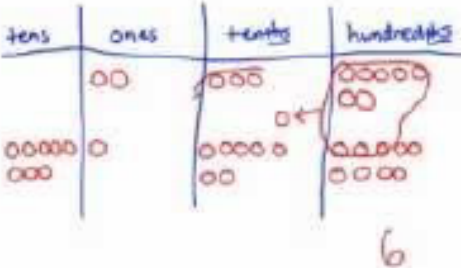
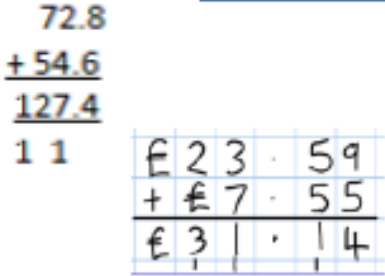
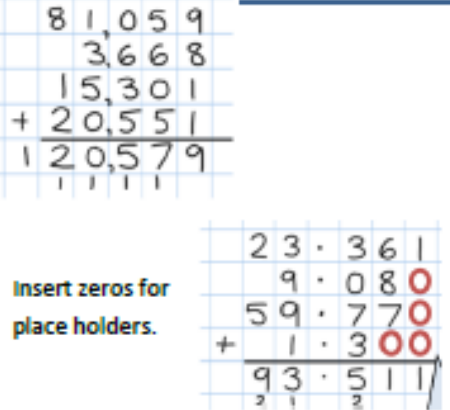
Objective & Strategy	Concrete	Pictorial	Abstract
<p>Add a two digit number and ones</p>	 <p>$17 + 5 = 22$</p> <p>Use ten frame to make 'magic ten'</p> <p>Children explore the pattern.</p> <p>$17 + 5 = 22$</p> <p>$27 + 5 = 32$</p>	<p>Use part part whole and number line to model.</p>  <p>$17 + 5 = 22$</p> <p>$16 + 7$</p> <p>$27 + 10 = 37$</p> <p>Pictures of dienes may be drawn as sticks and squares</p>	<p>$17 + 5 = 22$</p> <p>Explore related facts</p> <p>$17 + 5 = 22$</p> <p>$5 + 17 = 22$</p> <p>$22 - 17 = 5$</p> <p>$22 - 5 = 17$</p> 
<p>Add a 2 digit number and tens</p>	 <p>$25 + 10 = 35$</p> <p>Explore that the ones digit does not change</p>	 <p>$27 + 30$</p> <p>$+10 +10 +10$</p> <p>$27 \quad 37 \quad 47 \quad 57$</p> <p>Pictures of dienes may be drawn as sticks and squares</p>	<p>$27 + 10 = 37$</p> <p>$27 + 20 = 47$</p> <p>$27 + \square = 57$</p>
<p>Add two 2-digit numbers</p>	 <p>Model using dienes, place value counters and Numicon</p>	 <p>$47 \quad 67 \quad 72$</p> <p>Use number line and bridge ten using part whole if necessary. Or dienes pictures.</p>	<p>$25 + 47$ OR $25 + 47$</p> <p>$20 + 5$ $40 + 7$</p> <p>$20 + 40 = 60$ $25 + 40 = 65$</p> <p>$5 + 7 = 12$ $65 + 7 = 72$</p> <p>$60 + 12 = 72$</p>
<p>Add three 1-digit numbers</p>	 <p>Combine to make 10 first if possible, or bridge 10 then add third digit</p>	 <p>Regroup and draw representation.</p> <p>$4 + 7 + 6 = 15$</p>	 <p>Combine the two numbers that make/bridge ten then add on the third.</p>

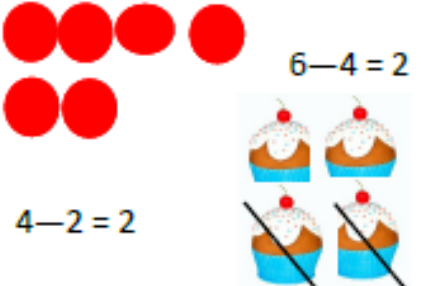
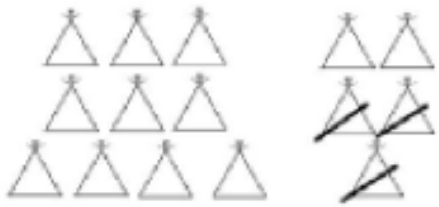
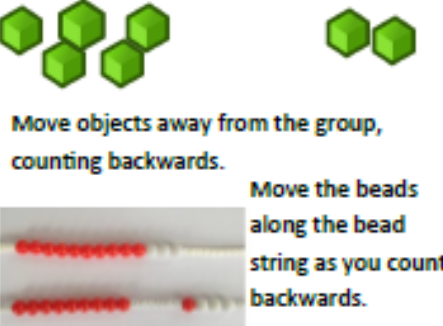
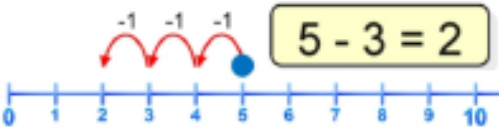
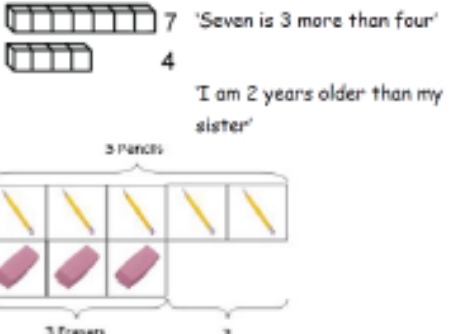
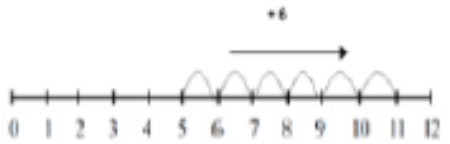
Y3 ADDITION +

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Column Addition—no regrouping (friendly numbers)</p> <p>Add two or three 2 or 3-digit numbers.</p>	 <p>Model using Dienes or numicon</p> <p>Add together the ones first, then the tens.</p> <p>Move to using place value counters</p>	<p>Children move to drawing the counters using a tens and one frame.</p> 	<p>Expanded methods can be set out horizontally or vertically to secure place value before moving on to traditional column methods:</p> $3 + 4 = 7$ $20 + 10 = 30$ $200 + 100 = 300$  <p>Add the ones first, then the tens, then the hundreds.</p>
<p>Column Addition with regrouping.</p>	 <p>Exchange ten ones for a ten. Model using numicon and pv counters.</p>	<p>Children can draw a representation of the grid to further support their understanding, carrying the ten underneath the line</p> 	<p>Start by partitioning the numbers before formal column to show the exchange.</p> 
<p>Add one ones, tens and hundreds and explore patterns regarding place value</p>	<p>As above</p>	<p>As above</p>	 <p>$2 + 3 = 5$ 7 5</p> <p>Move on to crossing boundaries when 9 is exceeded.</p>

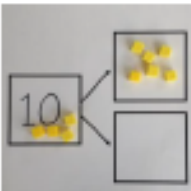
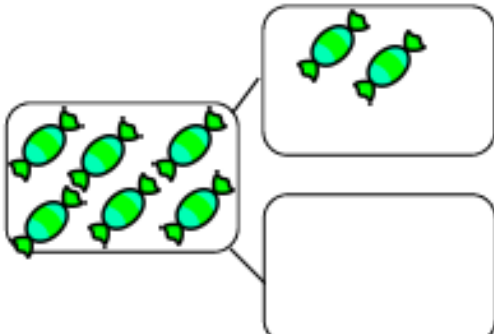


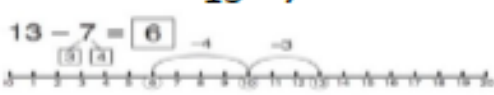


Y4-6

ADDITION +

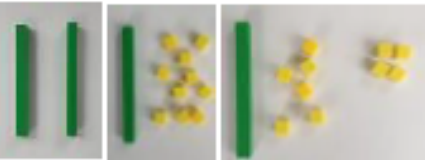
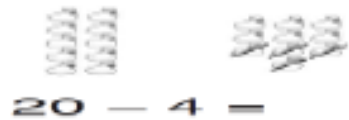


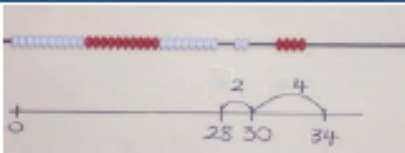
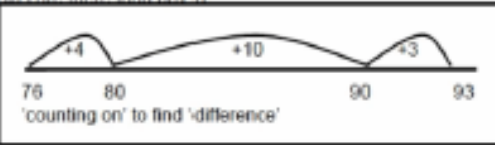
Objective & Strategy	Concrete	Pictorial	Abstract
<p>Y4—add numbers with up to 4 digits</p>	<p>Children continue to use dienes or pv counters to add, exchanging ten ones for a ten and ten tens for a hundred and ten hundreds for a thousand.</p> 	 <p>Draw representations using pv grid.</p>	 <p>Continue from previous work to carry hundreds as well as tens.</p> <p>Relate to money and measures.</p>
<p>Y5—add numbers with more than 4 digits.</p> <p>Add decimals with 2 decimal places, including money.</p>	<p>As year 4</p>  <p>Introduce decimal place value counters and model exchange for addition.</p>	<p>2.37 + 81.79</p> 	
<p>Y6—add several numbers of increasing complexity</p> <p>Including adding money, measure and decimals with different numbers of decimal points.</p>	<p>As Y5</p>	<p>As Y5</p>	 <p>Insert zeros for place holders.</p>

Objective & Strategy	Concrete	Pictorial	Abstract
Taking away ones.	<p>Use physical objects, counters, cubes etc to show how objects can be taken away.</p>  <p>$6 - 4 = 2$</p> <p>$4 - 2 = 2$</p>	 <p>$15 - 3 = 12$</p> <p>Cross out drawn objects to show what has been taken away.</p>	<p>$7 - 4 = 3$</p> <p>$16 - 9 = 7$</p>
Counting back	 <p>Move objects away from the group, counting backwards.</p> <p>Move the beads along the bead string as you count backwards.</p>	 <p>$5 - 3 = 2$</p> <p>Count back in ones using a number line.</p>	<p>Put 13 in your head, count back 4. What number are you at?</p>
Find the Difference	<p>Compare objects and amounts</p>  <p>'Seven is 3 more than four'</p> <p>4</p> <p>'I am 2 years older than my sister'</p> <p>3 Pencils</p> <p>3 Erasers</p> <p>7</p> <p>Lay objects to represent bar model.</p>	<p>Count on using a number line to find the difference.</p>  <p>$+6$</p>	<p>Hannah has 12 sweets and her sister has 5. How many more does Hannah have than her sister.?</p>

Y1 SUBTRACTION -

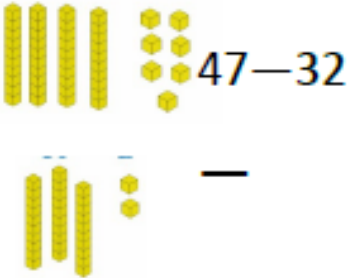
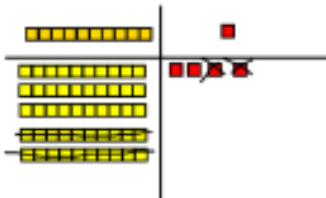
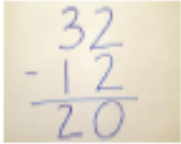
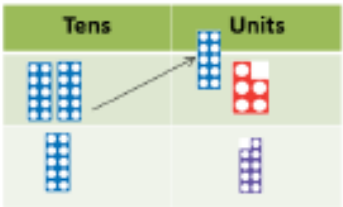
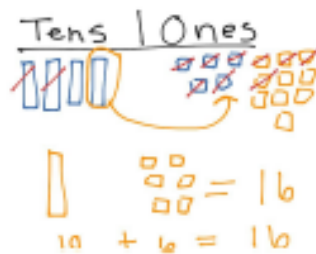
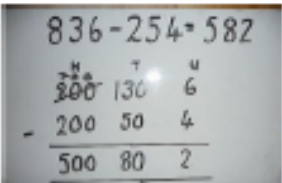
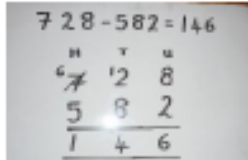
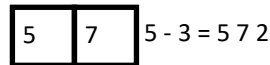
Objective & Strategy	Concrete	Pictorial	Abstract		
<p>Represent and use number bonds and related subtraction facts within 20</p> <p>Part Part Whole model</p>	 <p>Link to addition. Use PPW model to model the inverse.</p> <p>If 10 is the whole and 6 is one of the parts, what is the other part?</p> $10 - 6 = 4$	 <p>Use pictorial representations to show the part.</p>	<p>Move to using numbers within the part whole model.</p> 		
<p>Make 10</p>	<p>14—9</p>  <p>Make 14 on the ten frame. Take 4 away to make ten, then take one more away so that you have taken 5.</p>	<p>13—7</p>  <p>Jump back 3 first, then another 4. Use ten as the stopping point.</p>	<p>16—8</p> <p>How many do we take off first to get to 10? How many left to take off?</p>		
<p>Bar model</p>	 $5 - 2 = 3$		<table border="1" data-bbox="1422 1101 1881 1189"> <tr> <td>8</td> <td>2</td> </tr> </table> $10 = 8 + 2$ $10 = 2 + 8$ $10 - 2 = 8$ $10 - 8 = 2$	8	2
8	2				

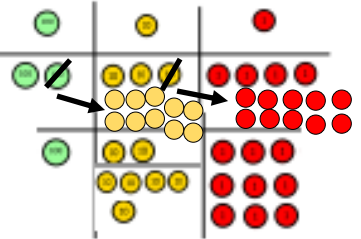
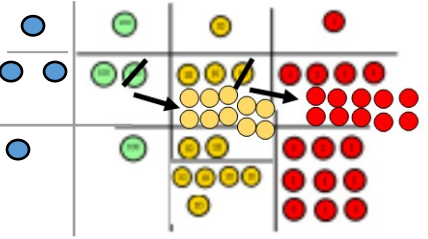
Y1 SUBTRACTION -

Objective & Strategy	Concrete	Pictorial	Abstract
Regroup a ten into ten ones	 <p>Use a PV chart to show how to change a ten into ten ones, use the term 'take and make'</p>	 <p>20 - 4 = 16</p> <p>Pictures of dienes can be drawn,</p>	$20 - 4 = 16$
Partitioning to subtract without regrouping. <i>'Friendly numbers'</i>	$34 - 13 = 21$  <p>Use Dienes to show how to partition the number when subtracting without regrouping.</p>	Children draw representations of Dienes and cross off.  $43 - 21 = 22$	$43 - 21 = 22$
Make ten strategy <i>Progression should be crossing one ten, crossing more than one ten, crossing the hundreds.</i>	 $34 - 28$ <p>Use a bead bar or bead strings to model counting to next ten and the rest.</p>	 <p>76 80 90 93 'counting on' to find 'difference'</p> <p>Use a number line to count on to next ten and then the rest.</p>	$93 - 76 = 17$

Y2 SUBTRACTION -

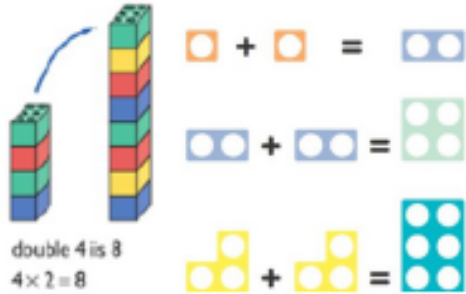

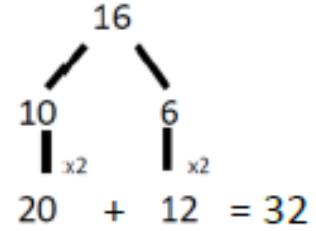
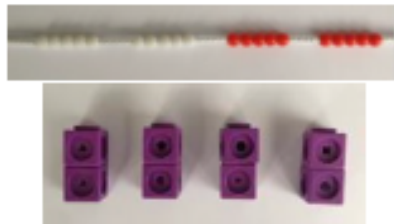

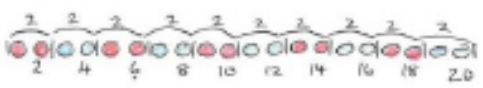
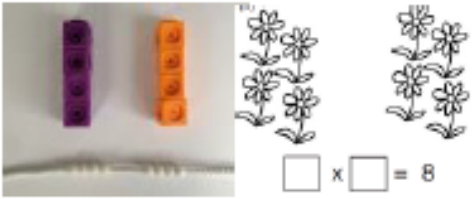

Y3 SUBTRACTION -

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Column subtraction without regrouping (friendly numbers)</p>	 <p>Use base 10 or Numicon to model</p>	 <p>Calculations</p> $\begin{array}{r} 54 \\ - 22 \\ \hline 32 \end{array}$ <p>Darw representations to support understanding</p>	$47 - 24 = 23$ $\begin{array}{r} 40 + 7 \\ - 20 + 4 \\ \hline 20 + 3 \end{array}$ <p>Intermediate step may be needed to lead to clear subtraction understanding.</p> 
<p>Column subtraction with regrouping</p>	 <p>Begin with base 10 or Numicon. Move to pv counters, modelling the exchange of a ten into ten ones. Use the phrase 'take and make' for exchange.</p>	$\begin{array}{r} 45 \\ - 29 \\ \hline 16 \end{array}$ <p>Tens Ones</p>  <p>Children may draw base ten or PV counters and cross off.</p>	$836 - 254 = 582$  <p>Begin by partitioning into pv columns</p> $728 - 582 = 146$  <p>Then move to formal method.</p>
<p>Subtract ones, tens and hundreds and explore patterns regarding place value</p>	<p>As above</p>	<p>As above. Number line may also be used to represent subtraction.</p>	 <p>Move on to crossing boundaries</p>

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Subtracting tens and ones</p> <p>Year 4 subtract with up to 4 digits.</p> <p><i>Introduce decimal subtraction through context of money</i></p>	<p>234 - 179</p>  <p>Model process of exchange using Numicon, base ten and then move to PV counters.</p>	<p>Children to draw place value counters to show their exchange.</p>	<p>Begin with expanded versions</p> $\begin{array}{r} 200 \\ - 100 \\ \hline 100 \end{array}$ $\begin{array}{r} 30 \\ - 70 \\ \hline 0 \end{array}$ $\begin{array}{r} 14 \\ - 14 \\ \hline 0 \end{array}$ $\begin{array}{r} 234 \\ - 179 \\ \hline 55 \end{array}$ <p>Use language of 'exchange' rather than borrow.</p>
<p>Year 5- Subtract with at least 4 digits, including money and measures.</p> <p><i>Subtract with decimal values, including mixtures of integers and decimals and aligning the decimal</i></p>	<p>2234 - 1179 =</p> 	<p>Children to draw place value counters to show their exchange.</p>	<p>Start with expanded versions as above.</p> $\begin{array}{r} 2000 \\ - 1000 \\ \hline 1000 \end{array}$ $\begin{array}{r} 200 \\ - 100 \\ \hline 100 \end{array}$ $\begin{array}{r} 30 \\ - 70 \\ \hline 0 \end{array}$ $\begin{array}{r} 14 \\ - 14 \\ \hline 0 \end{array}$ <p>Use zeros for place-holders.</p> $\begin{array}{r} 2234 \\ - 1179 \\ \hline 1055 \end{array}$
<p>Year 6—Subtract with increasingly large and more complex numbers and decimal values.</p>			$\begin{array}{r} 8999 \\ - 2949 \\ \hline 6050 \end{array}$ $\begin{array}{r} 36.080 \text{ kg} \\ - 3.749 \text{ kg} \\ \hline 32.331 \text{ kg} \end{array}$

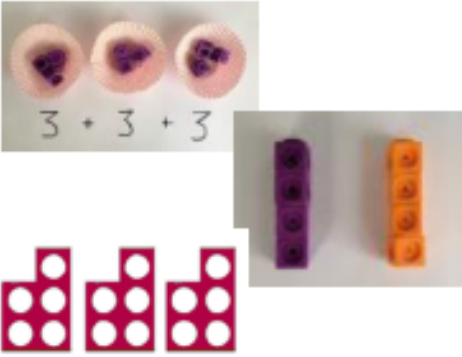
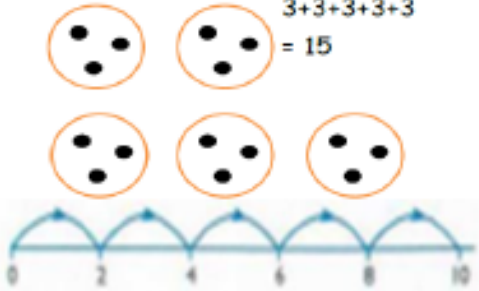

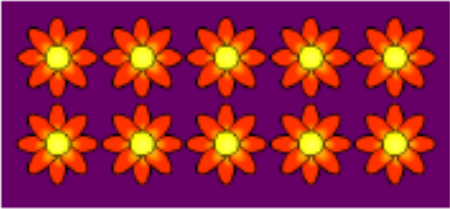
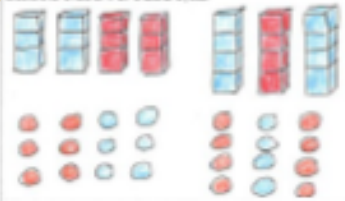
Y1

MULTIPLICATION X

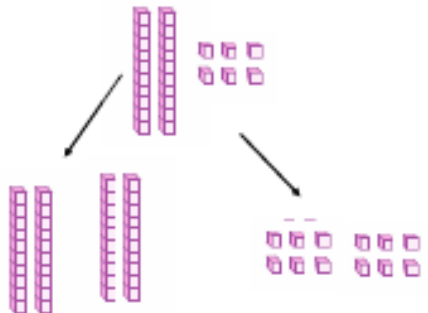
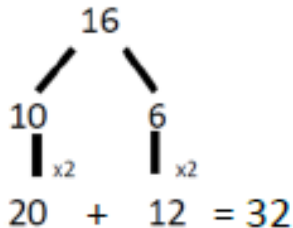
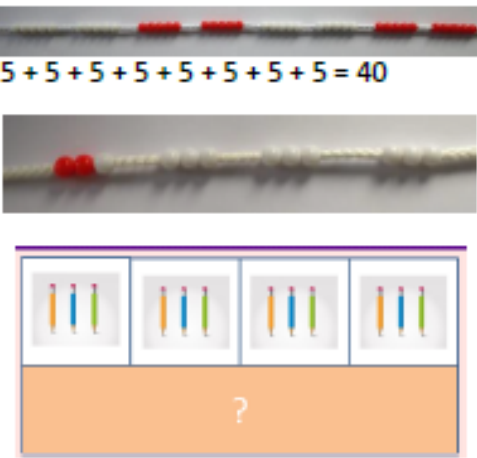
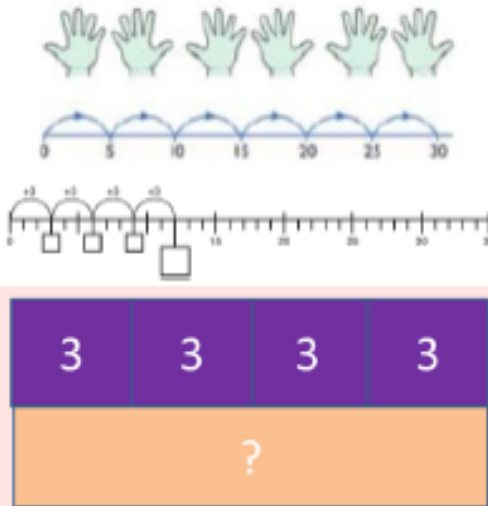
Objective & Strategy	Concrete	Pictorial	Abstract
<p>Doubling</p>	<p>Use practical activities using manipulatives including cubes and Numicon to demonstrate doubling</p> 	<p>Draw pictures to show how to double numbers</p> <p>Double 4 is 8</p> 	<p>Partition a number and then double each part before recombining it back together.</p> 
<p>Counting in multiples</p>	<p>Count the groups as children are skip counting, children may use their fingers as they are skip counting.</p> 	 <p>Children make representations to show counting in multiples.</p> 	<p>Count in multiples of a number aloud.</p> <p>Write sequences with multiples of numbers.</p> <p>2, 4, 6, 8, 10</p> <p>5, 10, 15, 20, 25, 30</p>
<p>Making equal groups and counting the total</p>	 <p>Use manipulatives to create equal groups.</p>	<p>Draw  to show $2 \times 3 = 6$</p> <p>Draw and make representations</p>	<p>$2 \times 4 = 8$</p>

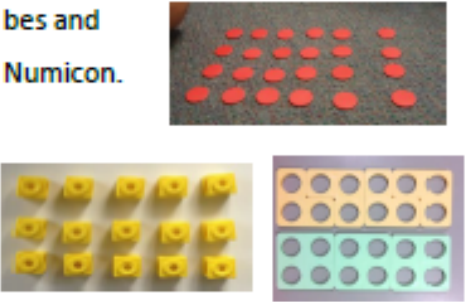

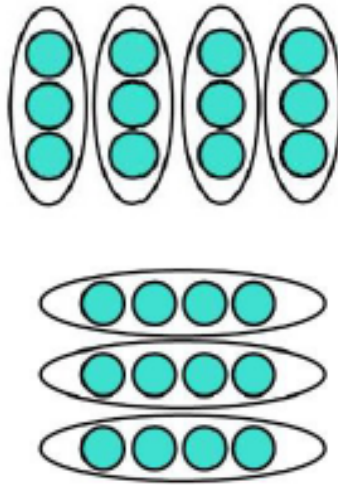



Y1

MULTIPLICATION X

Objective & Strategy	Concrete	Pictorial	Abstract
Repeated addition	 <p>Use different objects to add equal groups</p>	<p>Use pictorial including number lines to solve prob</p> <p>There are 3 sweets in one bag. How many sweets are in 5 bags altogether?</p> $3+3+3+3+3 = 15$ 	<p>Write addition sentences to describe objects and pictures.</p>  $2 + 2 + 2 + 2 + 2 = 10$
Understanding arrays	<p>Use objects laid out in arrays to find the answers to 2 lots 5, 3 lots of 2 etc.</p> 	<p>Draw representations of arrays to show understanding.</p> 	$3 \times 2 = 6$ $2 \times 5 = 10$

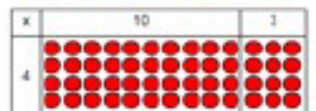
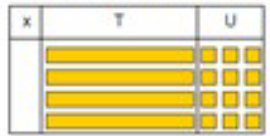

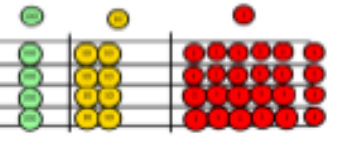
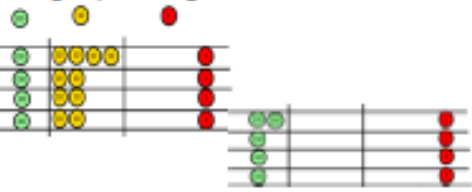
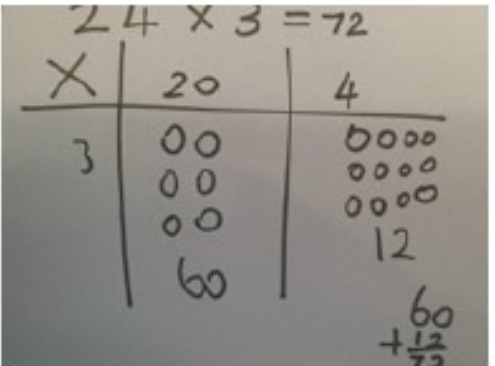
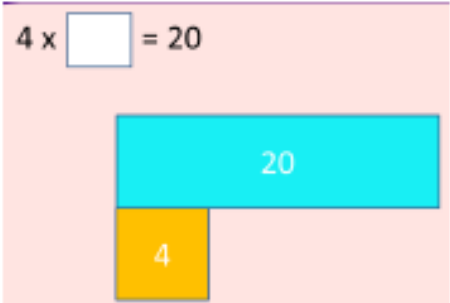
Y2 MULTIPLICATION X

Objective & Strategy	Concrete	Pictorial	Abstract
Doubling	<p>Model doubling using dienes and PV counters.</p>  <p>$40 + 12 = 52$</p>	<p>Draw pictures and representations to show how to double numbers</p>	<p>Partition a number and then double each part before recombining it back together.</p>  <p>$20 + 12 = 32$</p>
<p>Counting in multiples of 2, 3, 4, 5, 10 from 0 (repeated addition)</p>	<p>Count the groups as children are skip counting, children may use their fingers as they are skip counting. Use bar models.</p>  <p>$5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 40$</p>	<p>Number lines, counting sticks and bar models should be used to show representation of counting in multiples.</p> 	<p>Count in multiples of a number aloud.</p> <p>Write sequences with multiples of numbers.</p> <p>0, 2, 4, 6, 8, 10 0, 3, 6, 9, 12, 15 0, 5, 10, 15, 20, 25, 30</p> <p>$4 \times 3 = \square$</p>

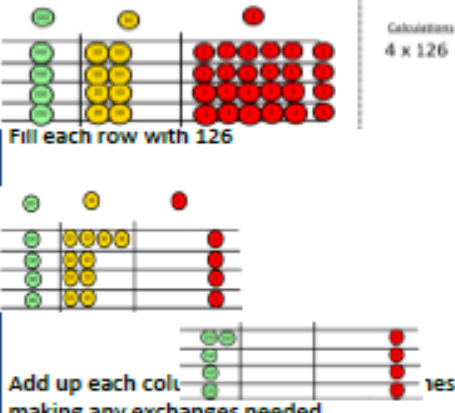
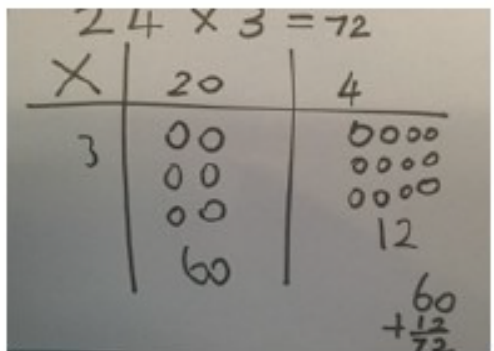
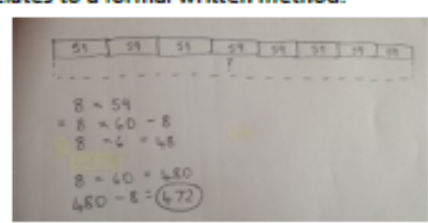
Objective & Strategy	Concrete	Pictorial	Abstract
<p>Multiplication is commutative</p>	<p>Create arrays using counters and cubes and Numicon.</p>  <p>Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer.</p> 	<p>Use representations of arrays to show different calculations and explore commutativity.</p> 	<p>$12 = 3 \times 4$</p> <p>$12 = 4 \times 3$</p> <p>Use an array to write multiplication sentences and reinforce repeated addition.</p>  <p>$5 + 5 + 5 = 15$</p> <p>$3 + 3 + 3 + 3 + 3 = 15$</p> <p>$5 \times 3 = 15$</p> <p>$3 \times 5 = 15$</p>
<p>Using the Inverse</p> <p><i>This should be taught alongside division, so pupils learn how they work alongside each other.</i></p>		 <p><input type="text"/> \times <input type="text"/> = <input type="text"/></p> <p><input type="text"/> \times <input type="text"/> = <input type="text"/></p> <p><input type="text"/> \div <input type="text"/> = <input type="text"/></p> <p><input type="text"/> \div <input type="text"/> = <input type="text"/></p>	<p>$2 \times 4 = 8$</p> <p>$4 \times 2 = 8$</p> <p>$8 \div 2 = 4$</p> <p>$8 \div 4 = 2$</p> <p>$8 = 2 \times 4$</p> <p>$8 = 4 \times 2$</p> <p>$2 = 8 \div 4$</p> <p>$4 = 8 \div 2$</p> <p>Show all 8 related fact family sentences.</p>

Y3


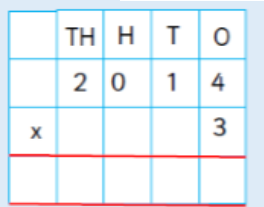
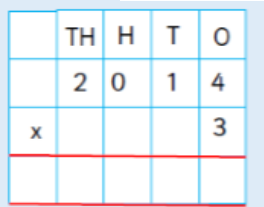
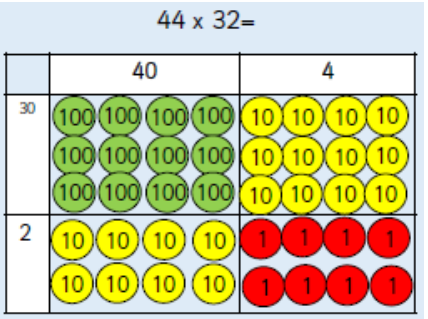
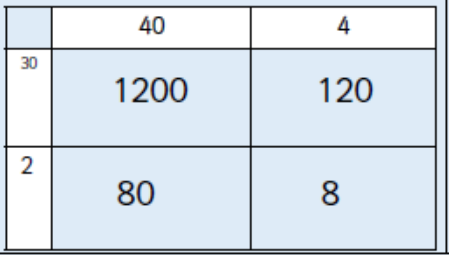
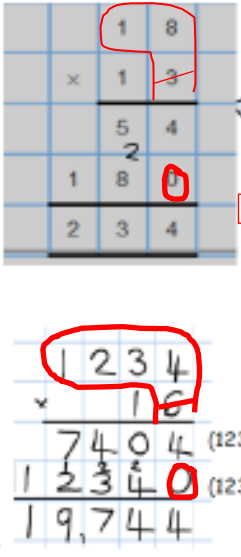
MULTIPLICATION X

Objective & Strategy	Concrete	Pictorial	Abstract															
<p>Grid method</p>	<p>Show the links with arrays to first introduce the grid method</p>  <p>4 rows of 10 4 rows of 3</p> <p>Move onto base ten to move towards a more compact method.</p>  <p>4 rows of 13</p> <p>Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows</p>  <p>Calculations 4×126</p> <p>Fill each row with 126</p>  <p>Calculations 4×126</p> <p>Add up each column, starting with the ones making any exchanges needed</p>  <p>Then you have your answer.</p>	<p>Children can represent their work with place value counters in a way that they understand.</p> <p>They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.</p>  <p>Bar model are used to explore missing numbers</p> 	<p>Start with multiplying by one digit numbers and showing the clear addition alongside the grid.</p> <table border="1" data-bbox="1512 383 1825 478"> <tr> <td>x</td> <td>30</td> <td>5</td> </tr> <tr> <td>7</td> <td>210</td> <td>35</td> </tr> </table> <p>$210 + 35 = 245$</p> <p>Moving forward, multiply by a 2 digit number showing the different rows within the grid method.</p> <table border="1" data-bbox="1512 774 1825 973"> <tr> <td></td> <td>10</td> <td>8</td> </tr> <tr> <td>10</td> <td>100</td> <td>80</td> </tr> <tr> <td>3</td> <td>30</td> <td>24</td> </tr> </table> <p>Recombine by adding together</p>	x	30	5	7	210	35		10	8	10	100	80	3	30	24
x	30	5																
7	210	35																
	10	8																
10	100	80																
3	30	24																

Y4 MULTIPLICATION X

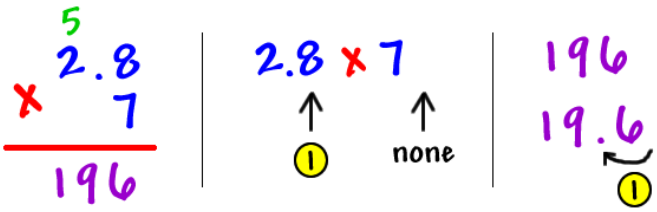
Objective & Strategy	Concrete	Pictorial	Abstract																																																											
<p>Grid method recap from year 3 for 2 digits x 1 digit</p> <p>Move to multiplying 3 digit numbers by 1 digit. (year 4 expectation)</p>	<p>Use place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows</p>  <p>Calculations 4×126</p> <p>Fill each row with 126</p> <p>Add up each col. making any exchanges needed</p>	<p>Children can represent their work with place value counters in a way that they understand.</p> <p>They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.</p> 	<p>Start with multiplying by one digit numbers and showing the clear addition alongside the grid.</p> <table border="1" data-bbox="1500 383 1814 478"> <tr> <td>x</td> <td>30</td> <td>5</td> </tr> <tr> <td>7</td> <td>210</td> <td>35</td> </tr> </table> <p>$210 + 35 = 245$</p>	x	30	5	7	210	35																																																					
x	30	5																																																												
7	210	35																																																												
<p>Column multiplication</p>	<p>Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. $321 \times 2 = 642$</p> <table border="1" data-bbox="398 957 716 1324"> <thead> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>It is important at this stage that they always multiply the ones first.</p> <p>The corresponding long multiplication is modelled alongside</p>	Hundreds	Tens	Ones													<p>The grid method may be used to show how this relates to a formal written method.</p> <table border="1" data-bbox="985 845 1321 941"> <tr> <td>x</td> <td>300</td> <td>20</td> <td>7</td> </tr> <tr> <td>4</td> <td>1200</td> <td>80</td> <td>28</td> </tr> </table>  <p>Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.</p>	x	300	20	7	4	1200	80	28	<table border="1" data-bbox="1433 829 1747 1388"> <tr> <td></td> <td>327</td> <td></td> </tr> <tr> <td>x</td> <td>4</td> <td></td> </tr> <tr> <td colspan="3"><hr/></td> </tr> <tr> <td>(7 x 4)</td> <td>28</td> <td></td> </tr> <tr> <td>(20 x 4)</td> <td>80</td> <td></td> </tr> <tr> <td>(300 x 4)</td> <td>1200</td> <td></td> </tr> <tr> <td colspan="3"><hr/></td> </tr> <tr> <td></td> <td>1308</td> <td></td> </tr> </table> <p>This may lead to a compact method.</p> <table border="1" data-bbox="1433 1212 1657 1388"> <tr> <td></td> <td>327</td> <td></td> </tr> <tr> <td>x</td> <td>4</td> <td></td> </tr> <tr> <td colspan="3"><hr/></td> </tr> <tr> <td></td> <td>1308</td> <td></td> </tr> </table>		327		x	4		<hr/>			(7 x 4)	28		(20 x 4)	80		(300 x 4)	1200		<hr/>				1308			327		x	4		<hr/>				1308	
Hundreds	Tens	Ones																																																												
x	300	20	7																																																											
4	1200	80	28																																																											
	327																																																													
x	4																																																													
<hr/>																																																														
(7 x 4)	28																																																													
(20 x 4)	80																																																													
(300 x 4)	1200																																																													
<hr/>																																																														
	1308																																																													
	327																																																													
x	4																																																													
<hr/>																																																														
	1308																																																													

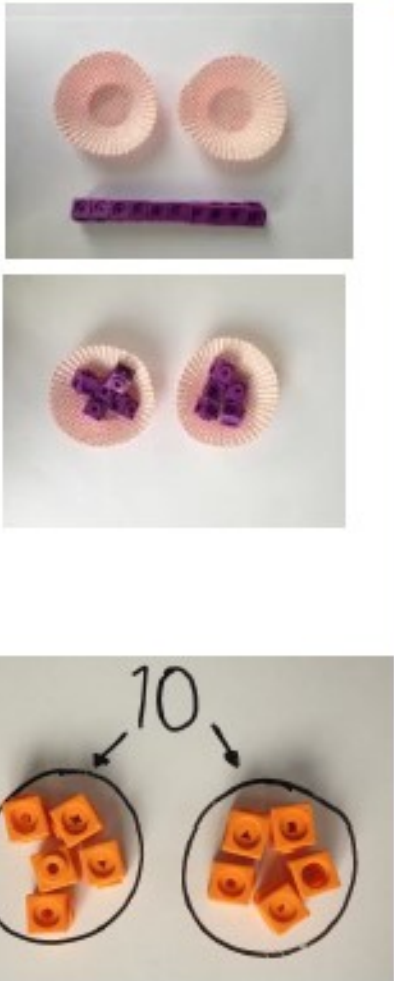
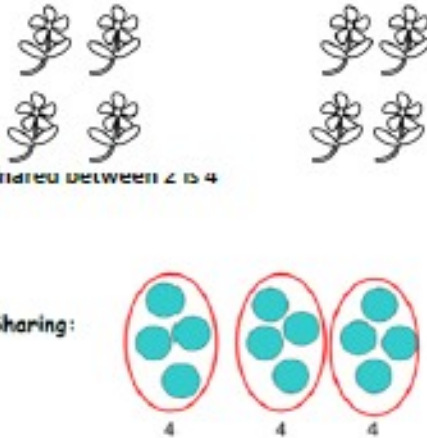

Children should be fluent in their table facts up to 12 x 12 by the end of year 4.

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Column Multiplication for 3 and 4 digits x 1 digit.</p>	 <p>6000 30 12</p> <p>Counters can be used on place value grids, and then can be represented in pictures</p>	 <p>This will lead to a compact method.</p>	<p>2014 Expanded: start with ones first</p> <p>x 3</p> <p>12 (4 x 3)</p> <p>30 (10 x 3)</p> <p>6000 (2000 x 3)</p> 
<p>Column multiplication</p> <p>In year 5 children must be able to multiply up to a four digit number by a 2 digit number using the formal method of long multiplication</p>	<p>Manipulatives may still be used with the corresponding long multiplication modelled alongside.</p> <p>44 x 32 =</p> 		 <p>18 x 3 on the first row</p> <p>Draw turtle's head</p> <p>(8 x 3 = 24, carrying the 2 for 20, then 1 x 3)</p> <p>'Put a collar on the turtle'</p> <p>18 x 10 on the 2nd row. Show multiplying by 10 by putting zero in units first</p> <p>'Lay an egg'</p>

Y5-6

MULTIPLICATION X

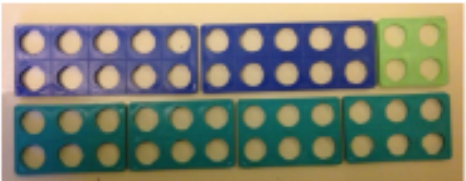

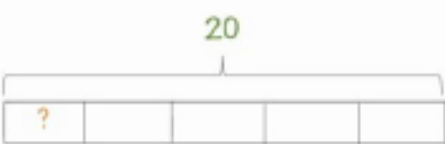
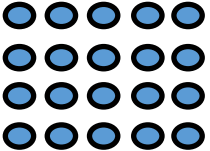

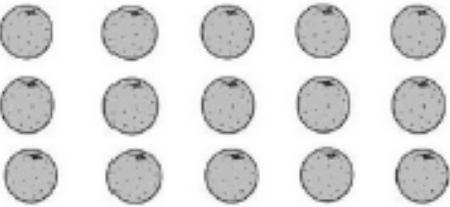
Objective & Strategy	Concrete	Pictorial	Abstract																		
<p>Multiplying decimals up to 2 decimal places by a single digit.</p>		 <p>So, $2.8 \times 7 = 19.6$</p>	<p>Children should estimate first using rounding strategies.</p> <p>They multiply as normal, ignoring the decimal point and adjust the place value at the end, using their knowledge of multiplying and dividing by ten (see below).</p>																		
<p>To multiply a whole number and decimal up to 3 decimal places, by 10, 100 and 1000</p>	<p>Identify the number represented on the place value chart.</p> <table border="1" data-bbox="533 949 1272 1204"> <thead> <tr> <th>Thousands</th> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> <th>Tenths</th> <th>Hundredths</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td>● ●</td> <td>●</td> <td></td> </tr> <tr> <td></td> <td>● ●</td> <td>●</td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>200 10 0 placeholder</p> <p>$2.1 \times 100 = 210$</p> <p>Use place value charts to model the movement of the digits and adding placeholders where necessary.</p>	Thousands	Hundreds	Tens	Ones	Tenths	Hundredths				● ●	●			● ●	●					<p>Children should move towards mental methods and use estimation to check place value.</p>
Thousands	Hundreds	Tens	Ones	Tenths	Hundredths																
			● ●	●																	
	● ●	●																			

Objective & Strategy	Concrete	Pictorial	Abstract
<p>Division as sharing</p> <p><i>Use Gordon ITPs for modelling</i></p>	 <p>I have 10 cubes, can you share them equally in 2 groups?</p>	<p>Children use pictures or shapes to share quantities.</p>  <p>8 shared between 2 is 4</p> <p>Sharing:</p> <p>12 shared between 3 is 4</p> <p>Or use a number line to show jumps:</p>  <p>0 8 16</p> <p>16 divided by 8 = 2</p>	<p>12 shared between 3 is</p> <p>4</p>

Y2

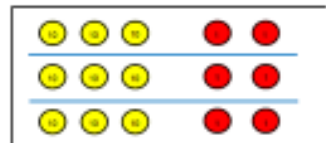

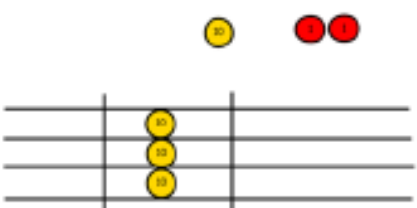

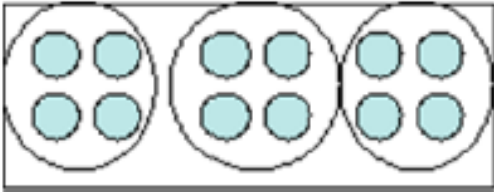
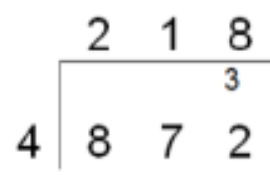
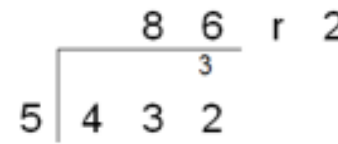
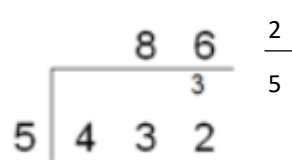
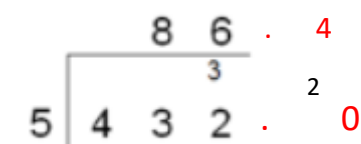
DIVISION ÷

Y3 DIVISION ÷

Objective & Strategy	Concrete	Pictorial	Abstract
Division as grouping	<p>Use cubes, counters, objects or place value counters to aid understanding.</p>  <p>24 divided into groups of 6 = 4</p> $96 \div 3 = 32$ 	<p>Continue to use bar modelling to aid solving division problems. Or make use of arrays.</p>  <p>20</p> $20 \div 5 = ?$ $5 \times ? = 20$  <p>How many groups of five make 20?</p>	<p>How many groups of 6 in 24?</p> $24 \div 6 = 4$
Division with arrays	 <p>Link division to multiplication by creating an array and thinking about the number sentences that can be created.</p> <p>Eg $15 \div 3 = 5$ $5 \times 3 = 15$</p> <p>$15 \div 5 = 3$ $3 \times 5 = 15$</p>	<p>Draw an array and use lines to split the array into groups to make multiplication and division sentences</p> 	<p>Find the inverse of multiplication and division sentences by creating eight linking number sentences.</p> $7 \times 4 = 28$ $4 \times 7 = 28$ $28 \div 7 = 4$ $28 \div 4 = 7$ $28 = 7 \times 4$ $28 = 4 \times 7$ $4 = 28 \div 7$ $7 = 28 \div 4$

Y3

DIVISION ÷

Objective & Strategy	Concrete	Pictorial	Abstract				
<p>Divide at least 3 digit numbers by 1 digit.</p> <p>Short Division</p>	<p>$96 \div 3$</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="padding: 5px;">Tens</td> <td style="padding: 5px;">Units</td> </tr> <tr> <td style="text-align: center; padding: 5px;">3</td> <td style="text-align: center; padding: 5px;">2</td> </tr> </table>  <p>Use place value counters to divide using the bus stop method alongside</p>  <p>$42 \div 3 =$</p> <p>Start with the biggest place value, we are sharing 40 into three groups. We can put 1 ten in each group and we have 1 ten left over.</p>  <p>We exchange this ten for ten ones and then share the ones equally among the groups.</p>  <p>We look how much in 1 group so the answer is 14.</p>	Tens	Units	3	2	<p>Students can continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.</p>  <p>Encourage them to move towards counting in multiples to divide more efficiently.</p>	<p>Begin with divisions that divide equally with no remainder.</p>  <p>Children can write out multiple lists to support</p> <p>Move onto divisions with a remainder.</p>  <p>By year 6, children need to be able to write remainders as fractions, decimals and whole numbers and apply to the context. Answers may need rounding up or down.</p>  
Tens	Units						
3	2						

Objective & Strategy	Concrete	Pictorial	Abstract																					
<p>To divide a whole number or decimal by 10, 100 and 1000</p>	<p>Identify the number represented on the place value chart.</p> <table border="1" data-bbox="528 284 1379 544"> <thead> <tr> <th>Thousands</th> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> <th>Tenths</th> <th>Hundredths</th> <th></th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td>● ●</td> <td>●</td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td>●</td> <td>●</td> </tr> </tbody> </table> <p>$2.1 \div 100 = 0.021$</p> <p>Use place value charts to model the movement of the digits and adding placeholders where necessary.</p>		Thousands	Hundreds	Tens	Ones	Tenths	Hundredths					● ●	●								●	●	<p>Children should move towards mental methods and use estimation to check place value.</p>
Thousands	Hundreds	Tens	Ones	Tenths	Hundredths																			
			● ●	●																				
					●	●																		
<p>To divide decimal numbers by a single digit, including those with remainders</p>	<p>Divide 3.69 by 3. Concrete and pictorial methods can be used to model both grouping and sharing to support concepts.</p> <table border="1" data-bbox="477 959 875 1158"> <thead> <tr> <th>Ones</th> <th>Tenths</th> <th>Hundredths</th> </tr> </thead> <tbody> <tr> <td>● ●</td> <td>● ● ● ●</td> <td>● ● ● ● ● ● ● ●</td> </tr> </tbody> </table> <table border="1" data-bbox="949 959 1323 1158"> <thead> <tr> <th>Ones</th> <th>Tenths</th> <th>Hundredths</th> </tr> </thead> <tbody> <tr> <td>●</td> <td>● ●</td> <td>● ● ● ● ● ●</td> </tr> <tr> <td>●</td> <td>● ●</td> <td>● ● ● ● ● ●</td> </tr> <tr> <td>●</td> <td>● ●</td> <td>● ● ● ● ● ●</td> </tr> </tbody> </table>		Ones	Tenths	Hundredths	● ●	● ● ● ●	● ● ● ● ● ● ● ●	Ones	Tenths	Hundredths	●	● ●	● ● ● ● ● ●	●	● ●	● ● ● ● ● ●	●	● ●	● ● ● ● ● ●	<p>No carrying of digits</p> $\begin{array}{r} 1.23 \\ 3 \overline{) 3.69} \end{array}$ <p>0.89</p> $\begin{array}{r} 0.89 \\ 4 \overline{) 3.536} \end{array}$ <p>0.26</p> $\begin{array}{r} 0.26 \\ 5 \overline{) 1.30} \end{array}$ <p>Progress to where 0s need adding for remainders</p>			
Ones	Tenths	Hundredths																						
● ●	● ● ● ●	● ● ● ● ● ● ● ●																						
Ones	Tenths	Hundredths																						
●	● ●	● ● ● ● ● ●																						
●	● ●	● ● ● ● ● ●																						
●	● ●	● ● ● ● ● ●																						

Method for Long Division

<p>Step 1: Set out sum (commonly referred to as 'bus shelter')</p>	<p>Step 2: Work out how many 14's are in 7 as there are 0 you work out how many 14's are in 73</p>	<p>Step 3: 5 lots of 14 are 70. We write this under the sum as shown below. We then subtract and bring down the next number.</p>
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> $14 \overline{) 7322}$ </div> <div style="flex: 1; text-align: right; color: red;"> <p>WIK</p> <p>14</p> <p>28</p> <p>42</p> <p>56</p> <p>70</p> <p>84</p> </div> </div> <p style="color: red; font-size: small;">Children write out a list of multiples of the divisor to help them with their calculations. Written methods may be used to ensure this list is</p>	<div style="display: flex; align-items: center;"> <div style="flex: 1;"> $14 \overline{) 7322}$ </div> <div style="flex: 1; text-align: right; color: red;"> <p>WIK</p> <p>14</p> <p>28</p> <p>42</p> <p>56</p> <p>70</p> <p>84</p> </div> </div>	<div style="display: flex; align-items: center;"> <div style="flex: 1;"> $14 \overline{) 7322}$ </div> <div style="flex: 1; text-align: right; color: red;"> <p>WIK</p> <p>14</p> <p>28</p> <p>42</p> <p>56</p> <p>70</p> <p>84</p> </div> </div>
<p>Step 4: Work out how many 14's are in 32. Write the answer above and then repeat step 3.</p>	<p>Step 5: Work out how many 14's are in 42 and write above.</p>	<p>Answer</p>
<div style="display: flex; align-items: center;"> <div style="flex: 1;"> $14 \overline{) 7322}$ </div> <div style="flex: 1; text-align: right; color: red;"> <p>WIK</p> <p>14</p> <p>28</p> <p>42</p> <p>56</p> <p>70</p> <p>84</p> </div> </div>	<div style="display: flex; align-items: center;"> <div style="flex: 1;"> $14 \overline{) 7322}$ </div> <div style="flex: 1; text-align: right; color: red;"> <p>WIK</p> <p>14</p> <p>28</p> <p>42</p> <p>56</p> <p>70</p> <p>84</p> </div> </div>	<p>523</p>

Y6 DIVISION ÷

WIK