



CALCULATION POLICY - STOCK C OF E PRIMARY SCHOOL

This calculation policy has been agreed by the teaching staff as a **guide** for teaching written calculations and forms part of the mathematics policy.

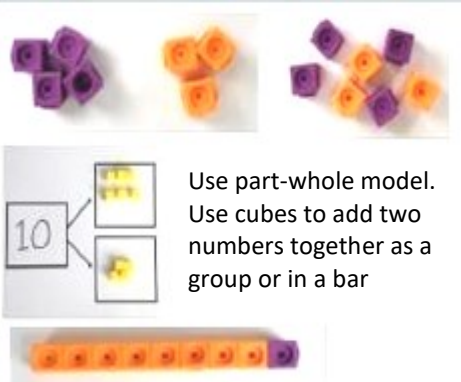
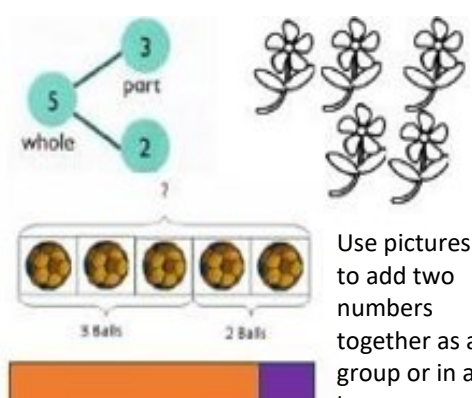


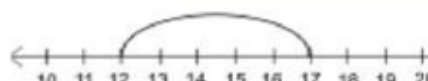
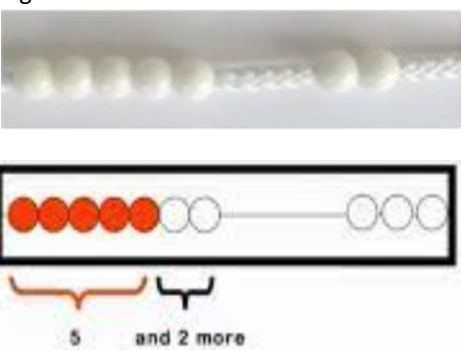
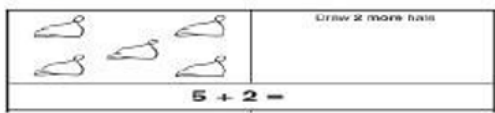
To ensure whole school consistency and progression, the school uses the Small Steps from the White Rose Maths scheme to help deliver the objectives of the national curriculum.

Staff base their planning around these recommended modules, but use materials to deliver these from several sources, in order to match the needs of the children they are teaching.


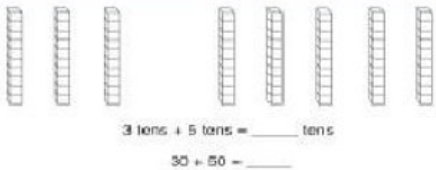
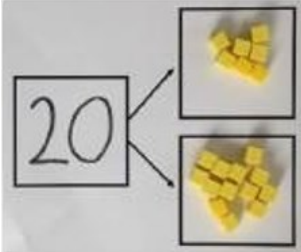
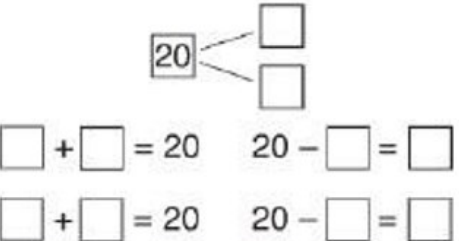
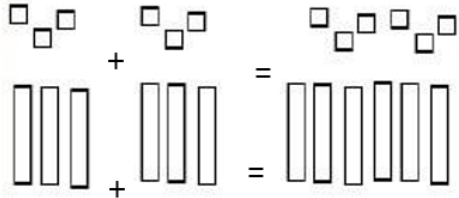
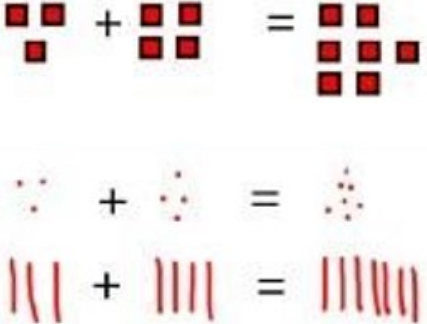
All planning should take account of the requirements of the pupils in terms of where they are in their learning and how they can achieve successful outcomes. Teachers are responsible for making these judgements.

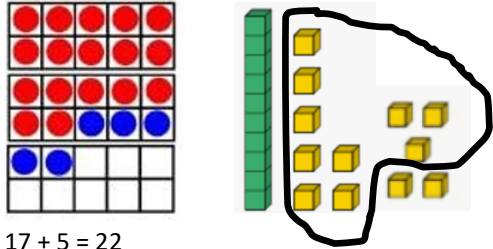
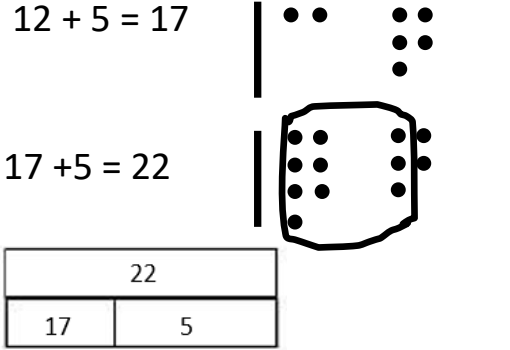

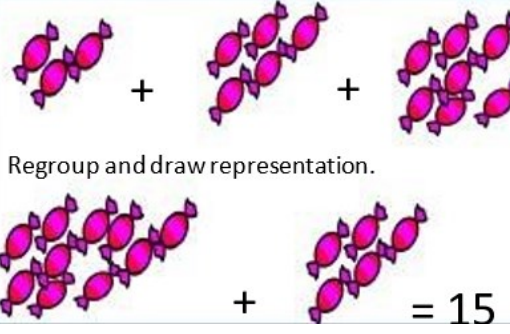
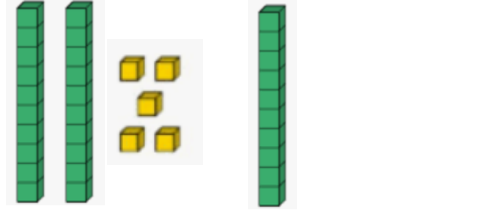
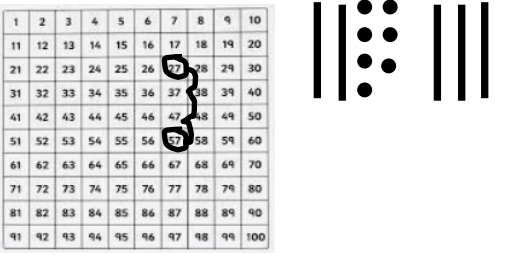
Whilst the calculation policy guidance document is separated into year group phases, these are intended to be used only as a guide and it is the teachers' professional judgement as to when the pupils move on to the next phase.

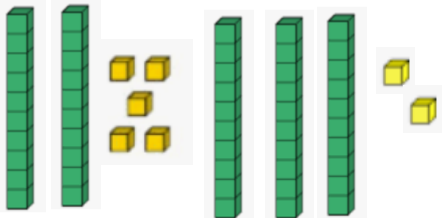

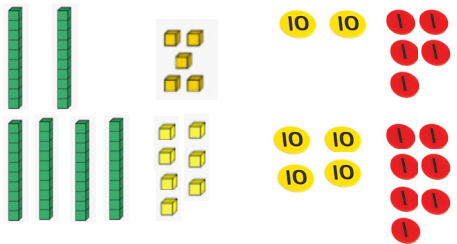
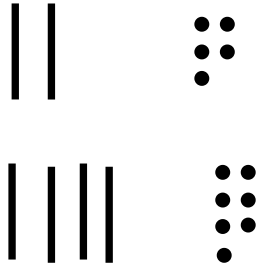
Y1 ADDITION +

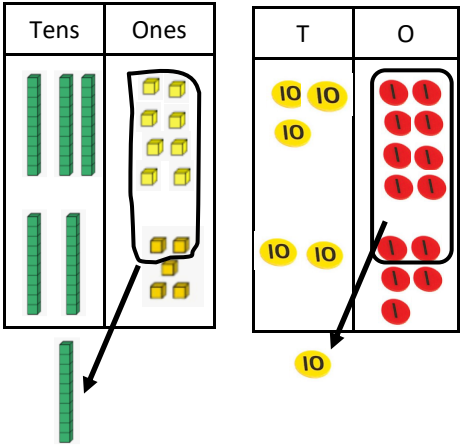
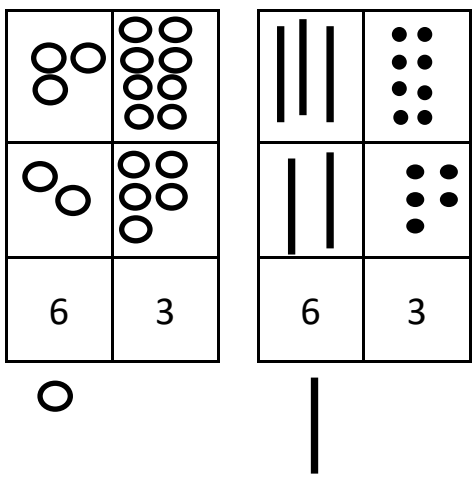
Objective and Strategy	Concrete	Pictorial	Abstract
Combining two parts to make a whole: part whole model	 <p>Use part-whole model. Use cubes to add two numbers together as a group or in a bar</p>	 <p>Use pictures to add two numbers together as a group or in a bar</p>	$4 + 3 = 7$  $10 = 6 + 4$ <p>Use the part-part-whole diagram as shown above to move into the abstract.</p>
Starting at the bigger number and counting on	 <p>Start with the bigger number on the bead string and then count on to the smaller number, 1 by 1, to find the answer.</p>	$12 + 5 = 17$ $12 + \bigcirc \bigcirc \bigcirc \bigcirc \bigcirc$ Mc  <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 (12) in your head and count on to find the your answer.</p>
Represent and use number bonds and related subtraction facts within 20	<p>E.g. 2 more than 5</p>  <p>5 and 2 more</p>		<p>Emphasis should be on the language</p> <ul style="list-style-type: none"> '1 more than 5 is equal to 6.' '2 more than 5 is 7.' '8 is 3 more than 5.'

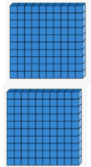


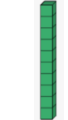

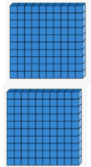


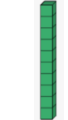













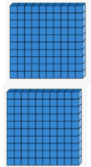


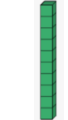








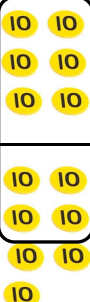


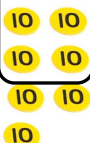



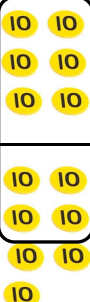


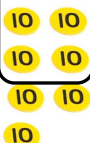















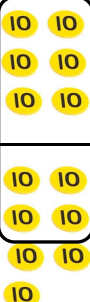


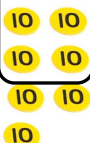







Y2 ADDITION +

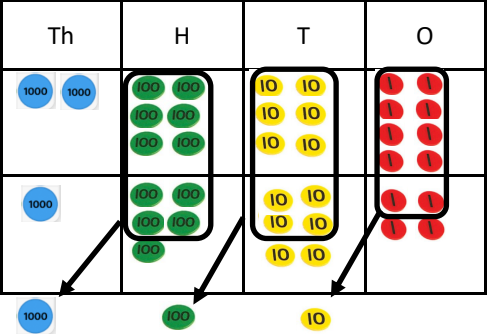
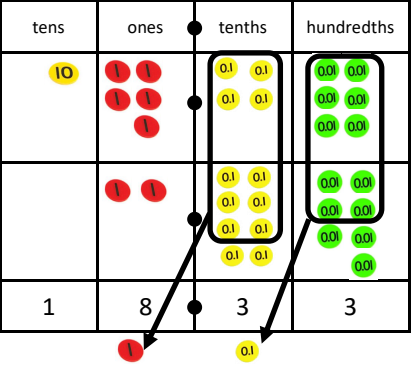
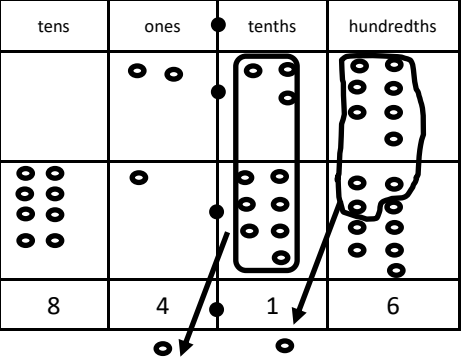
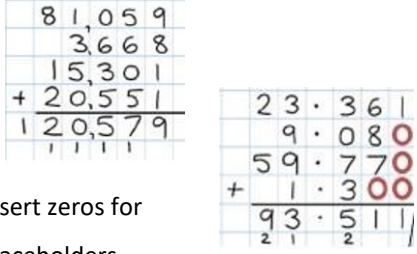
Objective and Strategy	Concrete	Pictorial	Abstract
Adding Multiples of 10 (Totals to no more than 100)	$30 + 20 = 50$  <p>Model using bead strings and Dienes</p>	 <p>Use representations for base ten, including drawing lines for ten.</p> <p>Eg. $50 = \text{ }$</p>	$20 + 30 = 50$ $70 = 50 + 20$ $40 + \square = 60$
Use known Number facts Part-part-whole (Numbers to 20)	 <p>Children explore ways of making numbers within 20</p>		$\square + 1 = 16$ $16 - 1 = \square$ $1 + \square = 16$ $16 - \square = 1$
Use known facts for ones numbers and apply to tens			$3 + 4 = 7$ <p>leads to</p> $30 + 40 = 70$

Objective and Strategy	Concrete	Pictorial	Abstract
<p>Add a 2-digit number and ones</p> <p>No re-grouping to start, E.g. $12 + 5 = 17$</p> <p>Leading to regrouping E.g. $17 + 5 = 22$</p>	 <p>$17 + 5 = 22$</p> <p>Use a ten frame to make tens</p> <p>Use dienes and group ones in tens</p>	<p>$12 + 5 = 17$</p> <p>$17 + 5 = 22$</p> 	<p>$12 + 5 = 17$ $17 + 5 = 22$</p> <p>Explore related facts</p> <p>$17 + 5 = 22$</p> <p>$5 + 17 = 22$</p> <p>$22 = 5 + 17$</p> <p>$22 = 17 + 5$</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>$4 + 7 + 6 = 10 + 7 = 17$</p> <p>Encourage to look for pairs to make 10, and add these first.</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>Count down 3 tens on a hundred square</p> <p>Use lines and dots</p>	<p>$27 + 10 = 37$</p> <p>$27 + 20 = 47$</p> <p>$27 + 30 = 57$</p> <p>33, 43, <input type="text"/> 63, 73</p>

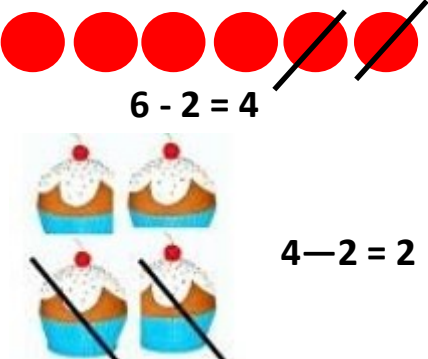
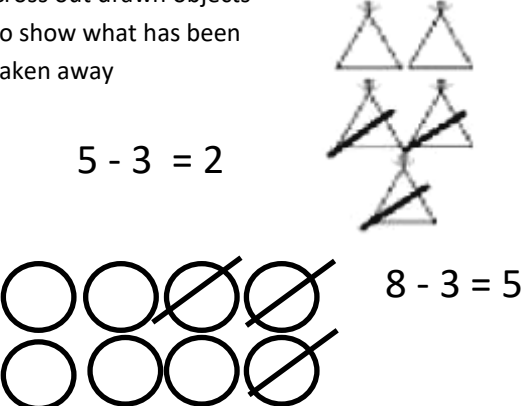
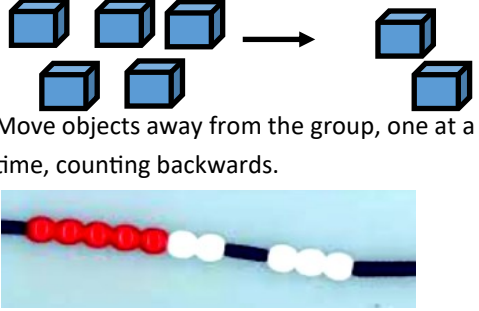
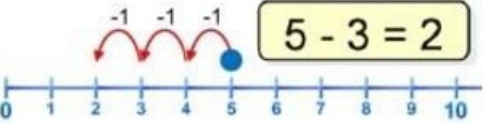
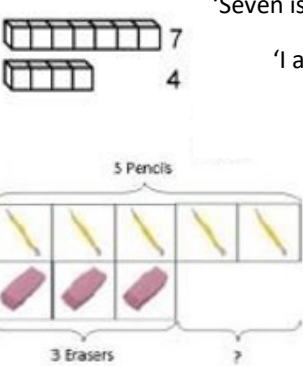
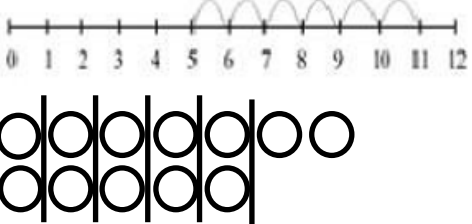
Objective and Strategy	Concrete	Pictorial	Abstract																								
<p>Add two 2-digit numbers</p> <p>No regrouping first e.g.</p> <p>25 + 32</p>	 <p>Model using dienes, and place value counters</p>	 <p>Draw lines and dots</p>	$\begin{array}{r} 25 + 32 \\ \swarrow \quad \searrow \quad \swarrow \quad \searrow \\ 20 + 5 \quad 30 + 2 \\ 20 + 30 = 50 \\ 5 + 2 = 7 \\ 50 + 7 = 57 \end{array}$																								
<p>Add two 2-digit numbers</p> <p>With regrouping</p> <p>E.g. 25 + 47</p>	 <p>Model using dienes as above and place value counters, moving to setting out in columns</p>	 <p>Draw lines and dots as above, then set out in columns</p>	$\begin{array}{r} 25 + 47 \\ \swarrow \quad \searrow \quad \swarrow \quad \searrow \\ 20 + 5 \quad 40 + 7 \\ 20 + 40 = 60 \\ 5 + 7 = 12 \\ 60 + 12 = 72 \end{array}$																								
<p>Column Addition of two 2-digit numbers no regrouping</p> <p>E.g. 34 + 23</p>	<p>Model using dienes or counters</p> <p>Add together the ones first, then the tens</p> <table border="1" data-bbox="394 1098 607 1428"> <thead> <tr> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table> <table border="1" data-bbox="656 1098 869 1428"> <thead> <tr> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table>	Tens	Ones					T	O					<p>Children move to drawing the counters, or sticks and dots using a tens and ones frame</p> <table border="1" data-bbox="920 1082 1133 1409"> <thead> <tr> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table> <table border="1" data-bbox="1173 1082 1386 1409"> <thead> <tr> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table>	Tens	Ones					Tens	Ones					$\begin{array}{r} 34 \\ + 23 \\ \hline 57 \end{array}$ <p>Add the ones first, then the tens</p>
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Objective and Strategy	Concrete	Pictorial	Abstract
<p>Column Addition of two 2-digit numbers with regrouping</p> <p>E.g. 38 + 25</p>	<p>Model using dienes or counters</p> <p>Add together the ones first, exchanging ten ones for a ten. Then add the tens</p> 	 <p>Children can draw a representation of their grid, showing the exchanged ten underneath</p>	$ \begin{array}{r} 38 \\ + 25 \\ \hline 63 \\ \cancel{1} \end{array} $ <p>Add the ones first, putting the exchanged ten under the line in the tens column. Then add the tens, remembering to add in the exchanged ten.</p>

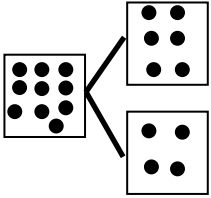

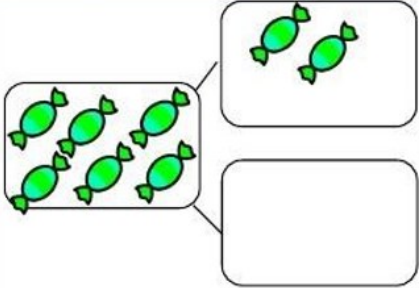
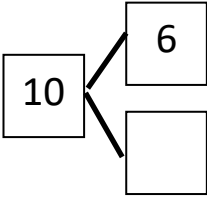


Objective and Strategy	Concrete	Pictorial	Abstract																					
<p>Column Addition no regrouping</p> <p>As for Year 2, then extend to 3 digit numbers</p> <p>E.g. $223 + 114$</p>	<p>Model using dienes or counters</p> <p>Add together the ones first, then the tens, then the hundreds</p> <table border="1" data-bbox="414 255 851 715"> <thead> <tr> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>	H	T	O							<p>Children draw counters, adding the ones, first, then the tens, then the hundreds.</p> <table border="1" data-bbox="940 303 1400 718"> <thead> <tr> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td>3</td> <td>3</td> <td>7</td> </tr> </tbody> </table>	H	T	O							3	3	7	$\begin{array}{r} 223 \\ + 114 \\ \hline 337 \end{array}$ <p>Add the ones first, then the tens, then the hundreds</p>
H	T	O																						
																								
																								
H	T	O																						
																								
																								
3	3	7																						
<p>Column Addition with regrouping</p> <p>As for Year 2, then extend to 3 digit numbers</p> <p>E.g. $265 + 373$</p> <p>Use these methods to add up to 3 two or three-digit numbers</p>	<p>Exchange 10 ones for a ten, then progressing to exchanging 10 tens for a hundred. Model using dienes or place value counters as below.</p> <table border="1" data-bbox="414 925 817 1396"> <thead> <tr> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p> (with arrow pointing from the ten rods in the previous row)</p>	H	T	O							<p>Children draw counters, adding the ones, first, then the tens, then the hundreds, noting any exchanges underneath.</p> <table border="1" data-bbox="929 893 1388 1380"> <thead> <tr> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td>6</td> <td>3</td> <td>8</td> </tr> </tbody> </table> <p></p>	H	T	O							6	3	8	$\begin{array}{r} 265 \\ + 373 \\ \hline 638 \\ 1 \end{array}$ <p>Add the ones first, then the tens, then the hundreds, noting exchange digits underneath in the correct column</p>
H	T	O																						
																								
																								
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Objective and Strategy	Concrete	Pictorial	Abstract																
<p>Year 4: Add numbers with up to 4 digits</p>	<p>Children continue to use dienes or place value counters to add, exchanging ten ones for a ten, ten tens for a hundred and ten hundreds for a thousand.</p> 	<p>Draw representations using a place value grid</p> <table border="1" data-bbox="920 229 1424 667"> <thead> <tr> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>••</td> <td>••••</td> <td>••••</td> <td>••••</td> </tr> <tr> <td>•</td> <td>••••</td> <td>••••</td> <td>••••</td> </tr> <tr> <td>4</td> <td>2</td> <td>3</td> <td>2</td> </tr> </tbody> </table>	Th	H	T	O	••	••••	••••	••••	•	••••	••••	••••	4	2	3	2	<p>Continue from previous work to exchange hundreds as well as tens and ones, noting the exchange digits underneath.</p> $\begin{array}{r} 2668 \\ + 1564 \\ \hline 4232 \\ 111 \end{array}$
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•	••••	••••	••••																
4	2	3	2																
<p>Year 5: add numbers with more than 4 digits</p> <p>Add more than 2 large numbers</p> <p>Add decimals with up to 2 decimal places, including money</p>	<p>As for Year 4, extending to more digits.</p>  <p>Introduce decimal place value counters and model exchange for addition</p>	<p>Draw representations on a place value grid</p> <p>E.g. $2.37 + 81.79$</p> 	<p>Relate to money and measures</p> $\begin{array}{r} 2.37 \\ + 81.79 \\ \hline 84.16 \\ 11 \end{array}$ $\begin{array}{r} \text{£} 23.59 \\ + \text{£} 7.55 \\ \hline \text{£} 31.14 \\ 111 \end{array}$																
<p>Year 6: add several numbers of increasing complexity, including adding money, measures and decimals with different numbers of decimal places.</p>	<p>As for Year 5</p>	<p>As for Year 5</p>	 <p>Insert zeros for placeholders</p>																

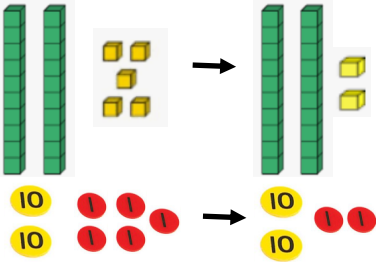

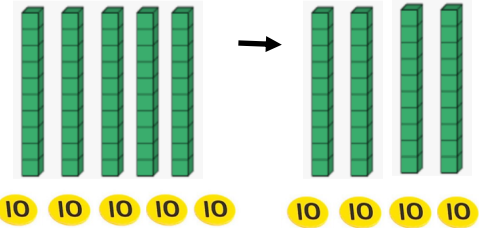

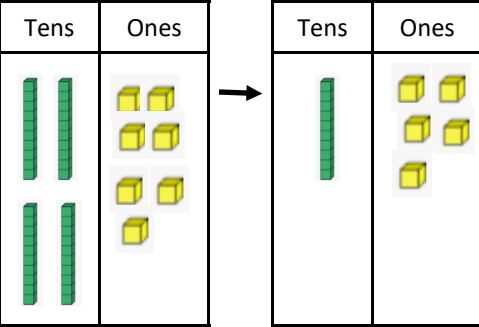
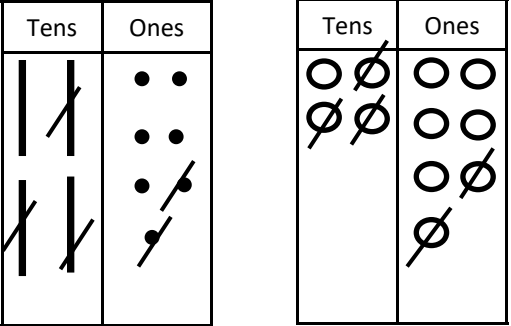
Y1 SUBTRACTION -

Objective and Strategy	Concrete	Pictorial	Abstract
<p>Taking away ones</p>	<p>Use physical objects: counters, cubes etc. to show how objects can be taken away.</p>  <p>$6 - 2 = 4$</p> <p>$4 - 2 = 2$</p>	<p>Cross out drawn objects to show what has been taken away</p>  <p>$5 - 3 = 2$</p> <p>$8 - 3 = 5$</p>	<p>$7 - 4 = 3$</p> <p>$12 - 5 = 7$</p>
<p>Counting Back</p>	 <p>Move objects away from the group, one at a time, counting backwards.</p> <p>Move the beads along the string as you count backwards.</p>	 <p>$5 - 3 = 2$</p> <p>Jumping back on a number line.</p> <p>Remember not to count, until you have jumped</p>	<p>Put 13 in your head, count back 4</p> <p>What number are you at?</p>
<p>Finding the difference</p>	<p>Compare objects and amounts</p>  <p>'Seven is 3 more than 4'</p> <p>'I am 2 years older than my sister'</p> <p>5 Pencils</p> <p>3 Erasers</p> <p>?</p> <p>Lay objects to represent bar model.</p>	<p>Count on a number line to find the difference - focusing on the language e.g.</p> <p>How many jumps is it from 5 to 11?</p> <p>11 is 6 more than 5.</p> <p>The difference between 5 and 11 is 6</p>  <p>The difference between 7 and 5 is 2.</p>	<p>Hannah has 12 sweets and her sister has 5. How many more sweets does Hannah have than her sister?</p>

Y1 SUBTRACTION -

Objective and Strategy	Concrete	Pictorial	Abstract				
<p>Represent and use number bonds and related subtraction facts within 20</p> <p>Part part whole model (PPW)</p>	<p>Link to addition. Use PPW model to model the inverse using counters</p>  <p>Take 10 counters . If 10 is the whole, and 6 is one of the parts, what is the other part?</p>  <p>$10 - 6 = 4$</p>	<p>Use pictorial representations to show the parts</p> 					
<p>Bar model</p>	<p>Lay out objects to represent the bar.</p>  <p>$5 - 2 = 3$</p>	 <p>$8 - 2 = 6$</p> <p>$8 - 6 = 2$</p>	<table border="1" data-bbox="1476 657 1910 801"> <tr> <td colspan="2">10</td> </tr> <tr> <td>8</td> <td>2</td> </tr> </table> <p>$10 = 8 + 2$</p> <p>$10 = 2 + 8$</p> <p>$10 - 2 = 8$</p> <p>$10 - 8 = 2$</p>	10		8	2
10							
8	2						

Y2 SUBTRACTION -

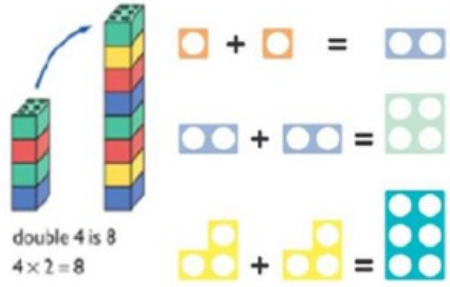


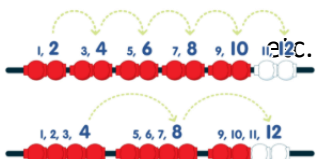
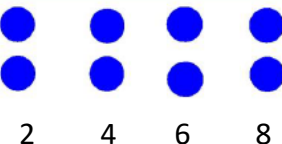
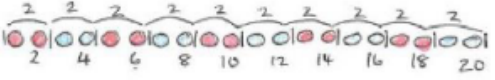


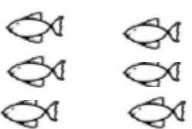
Objective and Strategy	Concrete	Pictorial	Abstract
Subtract 1 digit from a two digit number - no regrouping.	Use place value counters or Dienes to represent the number and physically subtract. E.g. $25 - 3 = 22$ 	Draw lines and dots and cross off.  $36 - 3 = 33$	$48 - 7 = 41$
Multiples of 10, subtracting 10, or multiples of 10	Use place value counters or Dienes to represent the number and physically subtract. $50 - 10 = 40$ 	Draw lines and cross off.  $80 - 20 = 60$	$70 - 10 = 60$ $50 - 30 = 20$
Partitioning to subtract without regrouping.	Use Dienes or place value counters to model, physically subtracting E.g. $47 - 32$ 	Draw lines and dots, or counters and cross off number being subtracted. $47 - 32 = 15$ 	Moving to column subtraction $\begin{array}{r} 47 \\ - 32 \\ \hline 15 \end{array}$



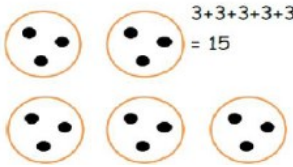




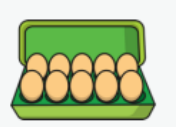

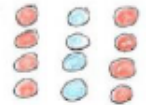
Y3 SUBTRACTION -

Objective and Strategy	Concrete	Pictorial	Abstract																					
<p>Column Subtraction—no grouping</p> <p>2 digits as for Year 2, then extend to 3 digits.</p>	<p>Use base 10 (Dienes) or place value counters to model</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">H</td> <td style="text-align: center;">T</td> <td style="text-align: center;">O</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;">H</td> <td style="text-align: center;">T</td> <td style="text-align: center;">O</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> </table>	H	T	O				H	T	O				<p>As for 2– digits, draw lines and dots, or counters and cross off number being subtracted.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">H</td> <td style="text-align: center;">T</td> <td style="text-align: center;">O</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">2</td> <td style="text-align: center;">4</td> </tr> </table>	H	T	O				3	2	4	<p>Setting out in columns</p> $\begin{array}{r} 367 \\ - 234 \\ \hline 133 \end{array}$
H	T	O																						
H	T	O																						
H	T	O																						
3	2	4																						
<p>Column subtraction with regrouping.</p> <p>Extend to column subtraction of three digits with re-grouping, using same methods as for 2-digits.</p>	<p>Begin with Dienes, then move to Place Value counters, modelling the exchange of a ten into ten ones. Use the phrase, “Exchange a ten for ten ones.”</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Tens</td> <td style="text-align: center;">Ones</td> <td style="text-align: center;">Tens</td> <td style="text-align: center;">Ones</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> </table> <p style="text-align: center;">$45 - 29 = 16$</p>	Tens	Ones	Tens	Ones					<p>Children may draw base ten or place value counters and cross off.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">Tens</td> <td style="text-align: center;">Ones</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> <tr> <td colspan="2" style="text-align: center;"></td> </tr> <tr> <td style="text-align: center;">Tens</td> <td style="text-align: center;">Ones</td> </tr> <tr> <td style="text-align: center;"></td> <td style="text-align: center;"></td> </tr> </table> <p style="text-align: center;">$45 - 29 = 16$</p>	Tens	Ones					Tens	Ones			<p>Formal method, exchanging a ten for ten ones.</p> $\begin{array}{r} 3 \\ 4 \overset{1}{5} \\ - 29 \\ \hline 16 \end{array}$ $\begin{array}{r} 6 \\ 7 \overset{1}{2} 8 \\ - 582 \\ \hline 146 \end{array}$			
Tens	Ones	Tens	Ones																					
Tens	Ones																							
Tens	Ones																							

Objective and Strategy	Concrete	Pictorial	Abstract																																								
<p>Year 4 Subtract with up to 4 digits.</p>	<p>Model the process of exchange using base 10 (Dienes) and Place Value counters.</p> <table border="1" data-bbox="398 295 855 667"> <thead> <tr> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p style="text-align: center;">↓</p> <table border="1" data-bbox="407 750 869 1045"> <thead> <tr> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Th	H	T	O									Th	H	T	O					<p>Children can draw place value counters and show their exchange.</p> <table border="1" data-bbox="936 274 1393 705"> <thead> <tr> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <table border="1" data-bbox="945 750 1400 1181"> <thead> <tr> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>	Th	H	T	O									Th	H	T	O					<p>Formal column method, making exchanges as needed.</p> $\begin{array}{r} \overset{6}{2} \overset{1}{7} 54 \\ - 1562 \\ \hline 1192 \end{array}$ <p>Use the vocabulary: exchange a hundred for ten tens</p> $\begin{array}{r} \overset{2}{\cancel{2}} \overset{10}{\cancel{1}} \overset{1}{\cancel{0}} \overset{14}{\cancel{1}} \overset{1}{\cancel{6}} \\ - 2128 \\ \hline 28928 \end{array}$
Th	H	T	O																																								
Th	H	T	O																																								
Th	H	T	O																																								
Th	H	T	O																																								
<p>Year 5 with more than 4 digits.</p> <p>Introduce decimal subtraction through the concept of money.</p>	<p style="text-align: center;">$2,761 - 1,562 = 1,192$</p>	<p style="text-align: center;">$2,761 - 1,562 = 1,192$</p> <p style="text-align: center;">As above</p>	$\begin{array}{r} \overset{2}{\cancel{2}} \overset{10}{\cancel{1}} \overset{1}{\cancel{0}} \overset{14}{\cancel{1}} \overset{1}{\cancel{6}} \\ - 2128 \\ \hline 28928 \end{array}$ $\begin{array}{r} \overset{6}{\cancel{7}} \overset{10}{\cancel{1}} \overset{1}{\cancel{8}} \overset{1}{\cancel{0}} \\ - 372 \cdot 5 \\ \hline 6796 \cdot 5 \end{array}$																																								
<p>Year 6 Subtract with increasingly large numbers and with decimals.</p>	<p>Use Place value grids and decimal counters</p>	<p>As above</p>	<p>Use zeros for place holders as needed.</p>																																								


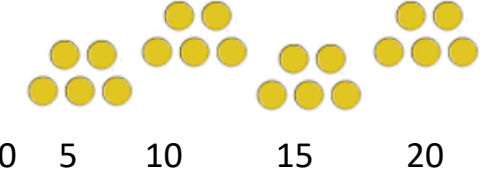
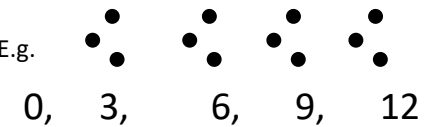
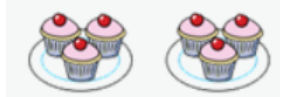


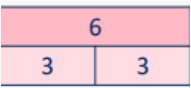
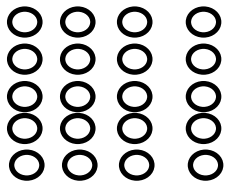
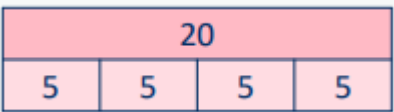
Y4-6
SUBTRACTION -

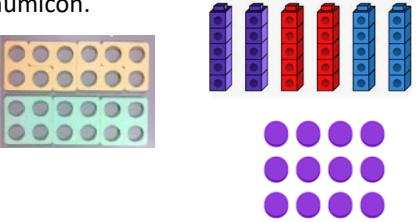
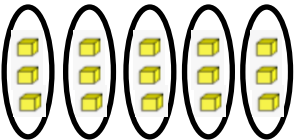
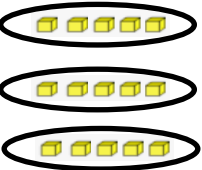
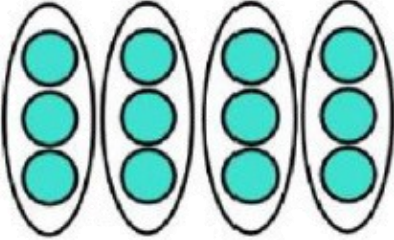
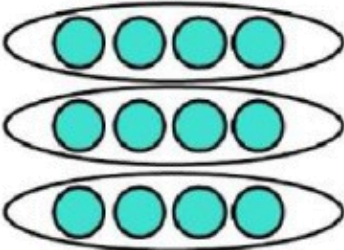


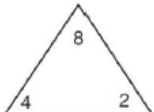
Objective and Strategy	Concrete	Pictorial	Abstract
<p>Doubling (Showing that we are adding the same number to itself)</p>	<p>Use practical activities using manipulatives including cubes and Numicon to demonstrate doubling</p>  <p>double 4 is 8 $4 \times 2 = 8$</p>	<p>Draw pictures to show how to double numbers</p> <p>Double 4 is 8</p> 	<p>$4 + 4 = 8$</p> <p>Double 4 is 8</p>
<p>Counting in multiples (skip counting)</p>	<p>Create equal groups then count the objects as skip counting (Children may use their fingers as they skip count or say the missing numbers in their head)</p> <p>E.g. </p> <p>Count: 2 4 6 8</p> <p>Or </p>	<p>Children make representations to show counting in multiples.</p>  	<p>Count in multiples of a number aloud.</p> <p>Write sequences of multiples of numbers</p> <p>E.g. 2, 4, 6, 8, 10 10, 20, 30, 40, 50, 60, 70 5, 10, 15, 20, 25, 30, 35</p>
<p>Making equal groups and counting the total</p>	<p>Use manipulatives to create equal groups</p>  <p>There are 3 groups of 3. There are 9 bears altogether.</p> <p>4 groups of 2 makes 8 </p>	<p>Draw objects to show equal groups</p>  <p>2 lots of 3 makes 6</p>	<p>Use the vocabulary:</p> <p>___ groups of ___ makes ___</p> <p>___ lots of ___ equals ___</p> <p>There are ___ groups of ___ which makes ___ altogether.</p>

Objective and Strategy	Concrete	Pictorial	Abstract
Repeated addition	<p>Use different objects to add equal groups .</p>  $2 + 2 + 2 + 2 + 2 = 10$  $5 + 5 + 5 = 15$	<p>Use pictorial representations to solve problems.</p> <p>E.g. 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>  $5 + 5 + 5 + 5 = 20$  $10 + 10 + 10 = 30$
Understanding arrays	<p>Use objects laid out in arrays (objects laid out in rows and columns) to find the answers to e.g. 2 lots of 5</p>  <p>2 rows of 5 = 10</p>  <p>4 lots of 3 4 columns of 3 = 12</p>  <p>2 lots of 6 2 rows of 6 = 12</p>	<p>Draw representations of arrays to show understanding.</p> <p>E.g. 3 lots of 4</p>  <p>There are 3 rows of 4</p>  <p>There are 3 columns of 4</p> <p>3 lots of 4 makes 12</p>	<p>Using the vocabulary stems:</p> <p>3 rows of 6 makes 18 4 columns of 2 is 8 2 groups of 5 equals 10 5 lots of 4 = 20</p>






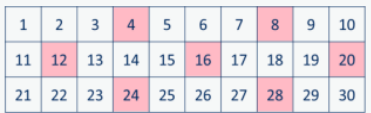
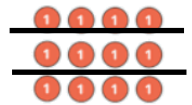
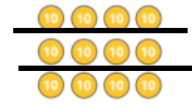

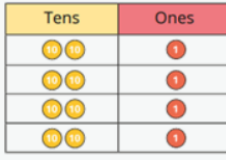
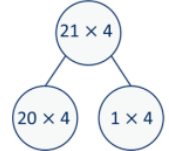

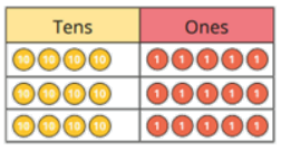
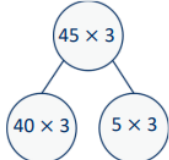
Y1 MULTIPLICATION X

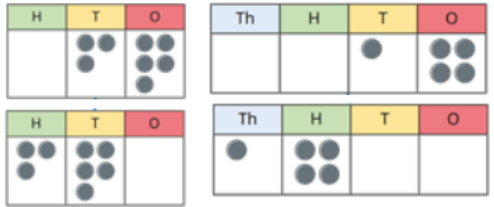
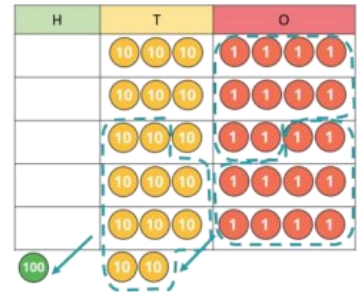
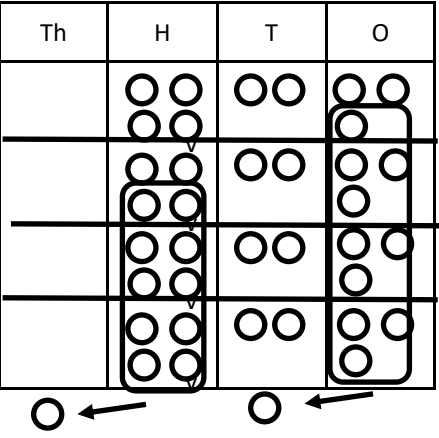
Y2 MULTIPLICATION X

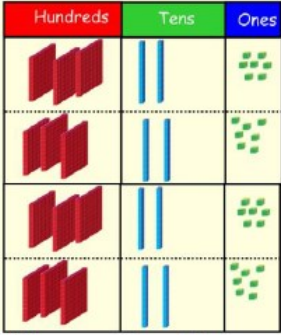
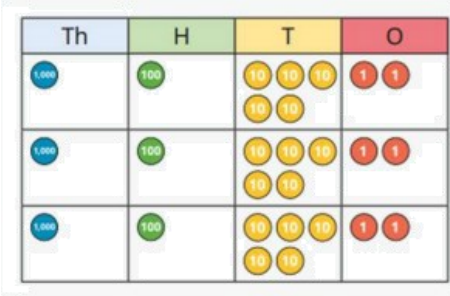

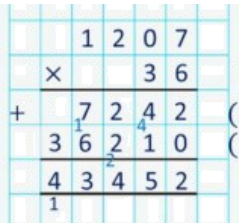
Objective and Strategy	Concrete	Pictorial	Abstract
Repeated addition and understanding arrays	Repeat Year 1 steps and strategies to ensure children are secure .		
Counting in multiples of 2,5,10 and 3 from 0	<p>Make equal groups of objects and count aloud (skip counting)</p>  <p>0, 2, 4, 6, 8, 10</p>  <p>0 5 10 15 20</p>	<p>Draw representations using dots to represent objects and counters and count aloud.</p> <p>E.g.</p>  <p>0, 3, 6, 9, 12</p>	<p>Count in multiples of a number aloud from zero</p> <p>Write sequences with multiples of numbers</p> <p>0, 2, 4, 6, 8, 10, 12 ...</p> <p>0, 5, 10, 15, 20, 25...</p> <p>0, 10, 20, 30, 40, 50...</p> <p>0,3,6, 9, 12, 15, 18...</p>
<p>repeated addition models</p> <p>Leading to the introduction of the multiplication sign X</p>	<p>Encourage children to make the link between repeated addition and multiplication. .E.g.</p> <p>‘There are 2 equal groups with 3 cakes in each group: there are 6 cakes altogether’</p>  <p>Three add three is six; two times three is six</p>  <p>There are 4 stacks of 5 cubes Five add five add five add five equals 20 Four times five equals 20</p>	<p>Draw equal groups of dots or show as a bar model, and use repeated addition, linking to multiplication, using the same language :</p> <p>There are two groups of three</p>  <p>3 add 3 makes 6</p>  <p>2 times 3 is 6</p>  	$3 + 3 = 6$ $2 \times 3 = 6$ $5 + 5 + 5 + 5 = 20$ $4 \times 5 = 20$

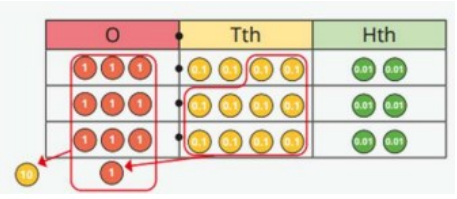
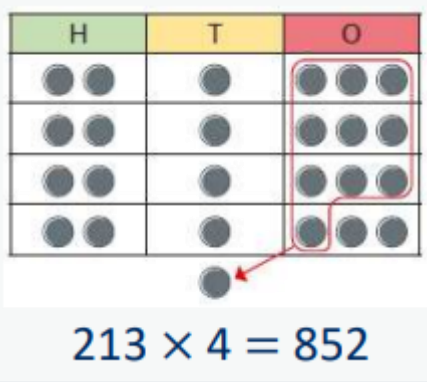
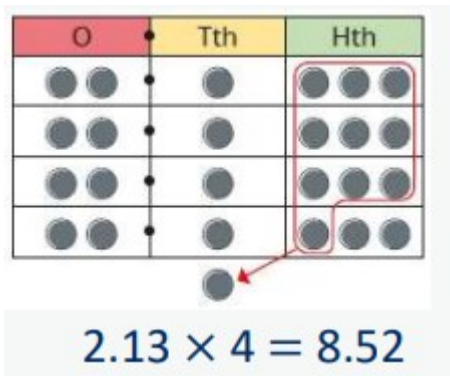
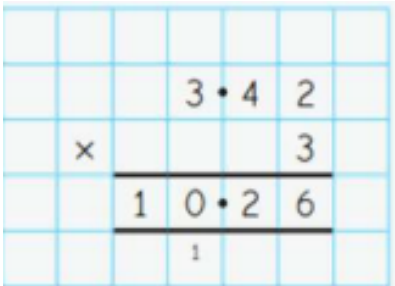
Objective and Strategy	Concrete	Pictorial	Abstract
<p>Introduce the fact that multiplication is commutative</p> <p>(it can be carried out in any order and the answer is the same e.g. $2 \times 5 = 5 \times 2$)</p>	<p>Create arrays using counters, cubes and numicon.</p>  <p>Pupils should understand that an array can represent different equations (number facts) and that as multiplication is commutative, the order of the multiplication does not affect the answer.</p>  <p>5 columns with 3 in each = 15</p>  <p>5 rows of 3 each</p>	<p>Use representations of arrays to show different calculations and explore commutativity</p>  	<p>Use an array to write multiplication sentences and reinforce repeated addition</p>  <p>$5 + 5 + 5 = 15$ $3 + 3 + 3 + 3 + 3 = 15$ $5 \times 3 = 15$ $3 \times 5 = 15$</p> <p>$3 \times 4 = 12$ $4 \times 3 = 12$ $12 = 3 \times 4$ $12 = 4 \times 3$</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>Make an array and use it to show that</p> <p>E.g. 2 lots of 4 is 8 8 shared into 2 groups is 4</p>  <p>4 groups of 2 makes 8 8 grouped in 4s is 2</p>	 <p><input type="checkbox"/> \times <input type="checkbox"/> = <input type="checkbox"/> <input type="checkbox"/> \times <input type="checkbox"/> = <input type="checkbox"/> <input type="checkbox"/> \div <input type="checkbox"/> = <input type="checkbox"/> <input type="checkbox"/> \div <input type="checkbox"/> = <input type="checkbox"/></p>	<p>Show all 8 related fact family sentences</p> <p>$2 \times 4 = 8$ $8 = 2 \times 4$ $4 \times 2 = 8$ $8 = 4 \times 2$ $8 \div 4 = 2$ $2 = 8 \div 4$ $8 \div 2 = 4$ $4 = 8 \div 2$</p>

Y3 MULTIPLICATION X

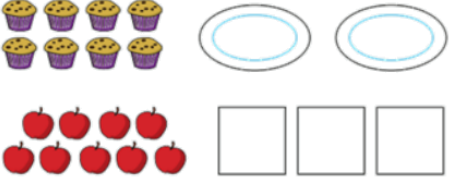
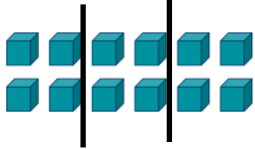

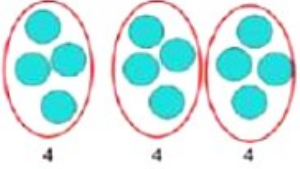


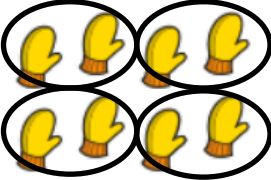
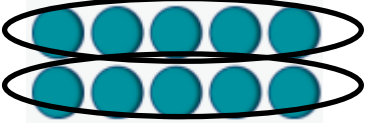
Objective and Strategy	Concrete	Pictorial	Abstract
<p>Revising, Learning and Practising multiplication tables (2X, 5X, 10X, 3X, 4X and 8X) and extending to related facts</p> <p>Use knowledge of multiplying by 10 to scale X table facts</p>	<p>Use apparatus to create tables facts e.g</p> <p>$3 \times 4 = 12$  </p> <p>$4 \times 3 = 12$</p> <p>Counting along a number line</p>  <p>$3 \times 4 + 12$ </p> <p>$3 \times 40 = 120$ </p>	<p>Colouring multiples on a grid/100 square</p>  <p>Draw counters to represent tables and related facts</p> <p>$3 \times 4 = 12$ </p> <p>$3 \times 40 = 120$ </p>	<p>Encourage daily counting; notice the link between 4X and 8X tables</p> <p>... groups of 4 = ... groups of 4 = ... $\times 4 =$... $\times 4 =$ 4, ... times = 4, ... times = $4 \times \dots =$ $4 \times \dots =$</p> <p>... \times ... ones is equal to ... ones so ... \times ... tens is equal to ... tens.</p>
<p>Multiply a 2-digit number by a 1-digit number (no exchanging)</p>	<p>Represent the multiplication with dienes or place value counters, totalling the ones first, then the tens and regrouping.</p> <p>$2 \times 2 = 4$ </p> <p>$30 \times 2 = 60$</p> <p>$60 + 4 = 64$</p> <p>$32 \times 2 = 64$</p>	<p>Draw counters on place value grids to represent the multiplication e.g.</p> <p>21×4</p>  <p>80 + 4</p> <p>Use a part whole diagram to partition, multiply</p>  <p>80 + 4</p> <p>$21 \times 4 = 84$</p>	<p>Leading to expanded formal multiplication</p> <p>Multiply the ones first, then the tens and add the answers</p> $\begin{array}{r} 23 \\ \times 3 \\ \hline 9 \quad (3 \times 3) \\ + 60 \quad (20 \times 3) \\ \hline 69 \end{array}$
<p>Multiply a 2-digit number by a 1-digit number (with exchanging)</p>	<p>Represent the multiplication with dienes or place value counters, totalling the ones first, then the tens and regrouping.</p> <p>$4 \times 4 = 16$ </p> <p>$20 \times 4 = 80$</p> <p>$80 + 16 = 96$</p> <p>$24 \times 4 = 96$</p>	<p>Draw counters on place value grids to represent the multiplication e.g.</p> <p>45×3</p>  <p>120 + 15</p> <p>Use a part whole diagram to partition, multiply</p>  <p>120 + 15</p> <p>$45 \times 3 = 135$</p>	<p>Leading to expanded formal multiplication (with exchanging)</p> <p>Multiply the ones first, then the tens and add the answers</p> $\begin{array}{r} 45 \\ \times 3 \\ \hline 15 \quad (5 \times 3) \\ + 120 \quad (40 \times 3) \\ \hline 135 \end{array}$



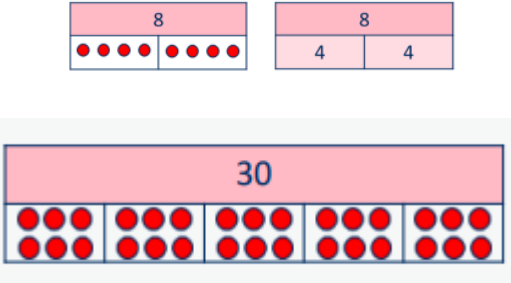

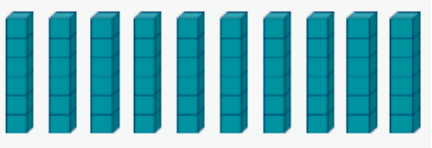
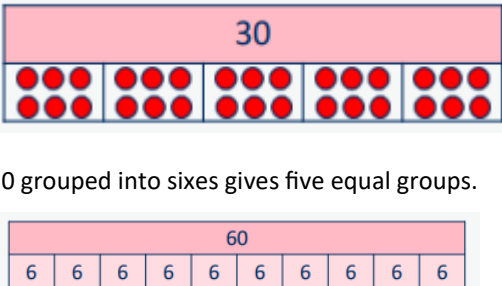
Objective and Strategy	Concrete	Pictorial	Abstract												
Revising, Learning and Practising multiplication tables (up to 12) and extending to related facts, including using knowledge of multiplying by 10 to scale X table facts	As for Year 3 above														
Multiplying 2 and 3 digit numbers by 10 and 100	<p>Create the number using counters on a place value grid and move the counters one place to the left when multiplying by 10, and two places to the left when multiplying by 100.</p>  <p>$35 \times 10 = 350$ $14 \times 100 = 1,400$</p>	<p>Write the number on a place value grid and move the digits the correct number of places to the left, remembering to put in any zeros needed as place holders.</p> <table border="1" data-bbox="974 622 1332 798"> <tr><th>Th</th><th>H</th><th>T</th><th>O</th></tr> <tr><td></td><td>3</td><td>4</td><td>7</td></tr> <tr><td>3</td><td>4</td><td>7</td><td>0</td></tr> </table> <p>$347 \times 10 = 3470$</p>	Th	H	T	O		3	4	7	3	4	7	0	<p>Some children may overgeneralise that multiplying by 10 or 100 always results in adding zeros. This will cause issues later when multiplying decimals. Instead children should be encouraged to always move the digits.</p> <p><i>“When I multiply by 10, the digits move one place value column to the left.”</i></p> <p><i>“When I, multiply by 100, the digits move two place value columns to the left.”</i></p>
Th	H	T	O												
	3	4	7												
3	4	7	0												
Multiply a 2 or 3 - digit number by a 1 - digit number At all times, multiplying the ones, first, then tens, then hundreds etc.	<p>Use dienes or place value counters to represent the calculation as for Year 3, regrouping to exchange when there are more than 9 counters in one place value place.</p> <p>E.g. $5 \times 34 = 170$</p> 	<p>Written representations can be used showing counters or dots. $4 \times 423 = 1,692$</p> 	<p>Represent the calculation using the column method - expanded first</p> $\begin{array}{r} 34 \\ \times 5 \\ \hline 20 \quad (4 \times 5) \\ + 150 \quad (30 \times 5) \\ \hline 170 \end{array}$ <p>Then Formal compact method, with exchanges written below as for addition</p> $\begin{array}{r} 423 \\ \times 4 \\ \hline 1692 \\ 1 \quad 1 \end{array}$												

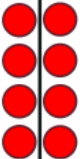


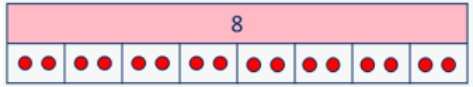

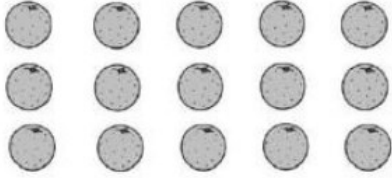

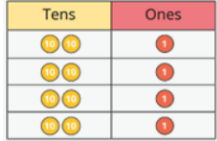
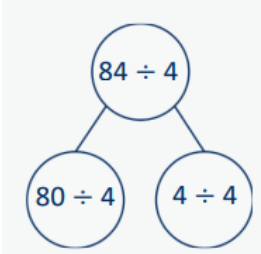
Objective and Strategy	Concrete	Pictorial	Abstract
<p>Column Multiplication for up to 4 digit numbers by one digit in Year 5 and larger numbers by 1-digit in Year 6</p>	<p>Children can continue to be supported by place value counters/dienes at this stage, remembering to regroup as needed.</p>  <p style="text-align: center;">$4 \times 327 = 1,308$</p> <p>It is important to remember to multiply the ones first</p>	<p>Children can continue to draw counters/dots on place value grids to support with multiplying.</p>  <p style="text-align: center;">$3 \times 1,152 = 3,456$</p>	<p>Compact formal method</p> $\begin{array}{r} 327 \\ \times 4 \\ \hline 1308 \\ 112 \end{array}$ $\begin{array}{r} 1152 \\ \times 3 \\ \hline 3456 \\ 1 \end{array}$
<p>Column for 2-digits X 2-digit numbers, extending to 3 digit X 2 digits and 4 digits X 2 digits .</p> <p>Introduced in Year 5 and consolidated in Year 6.</p>	<p>Manipulatives may still be used to with the correct long multiplication modelled alongside.</p>		<p>To multiply by a 2-digit number, first multiply by the ones, then multiply by the tens (and so on) and then find the total.</p>  <p style="text-align: right;"><i>Show multiplying by the tens digit, by putting a 0 in the ones space first</i></p> 

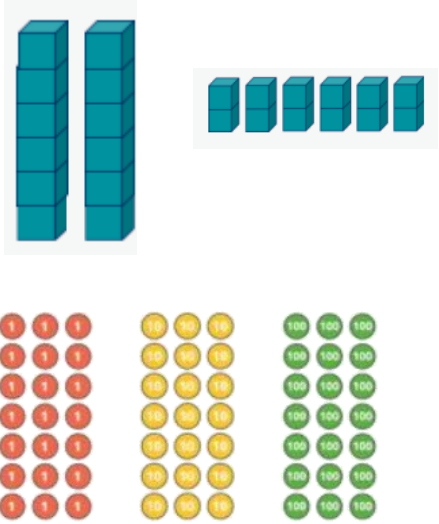
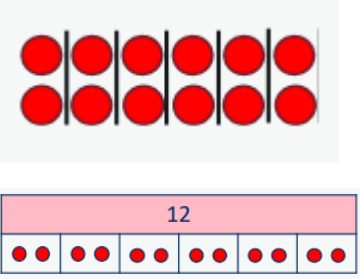

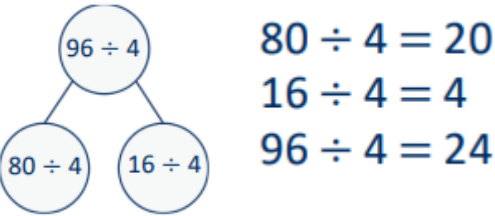
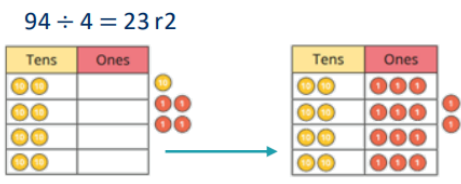
Objective and Strategy	Concrete	Pictorial	Abstract
<p>Multiplying decimals up to 2 decimal places by a single digit</p>	<p>Use place value charts and counters to model.</p> <p>Make the links between known facts and whole number multiplication</p>  <p>Here we need to exchange ten Tenths for One whole.</p>	<p>Use place value grid and dots as for whole numbers, showing the links</p> <p>E.g.</p>  $213 \times 4 = 852$ <p style="text-align: center;">↓</p>  $2.13 \times 4 = 8.52$ <p>What is the same? What is different?</p>	<p>Using the formal column method for multiplication: remind the children to line up the decimal point in the answer with the question.</p> 


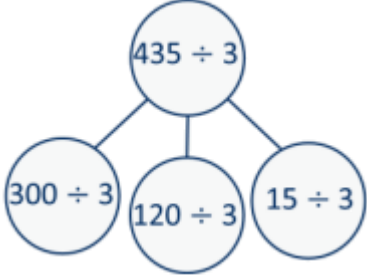
Y6 MULTIPLICATION X

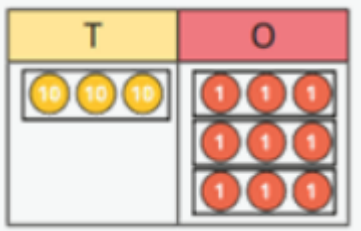
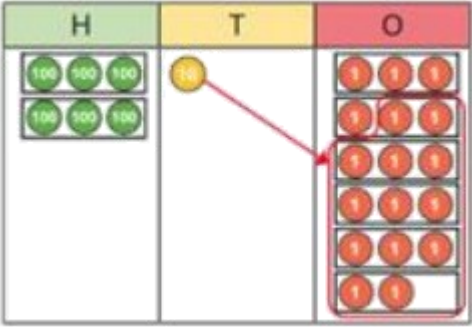
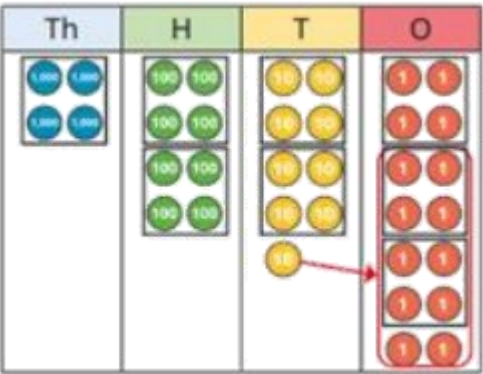
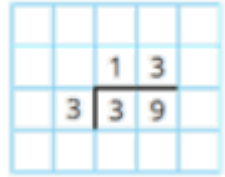
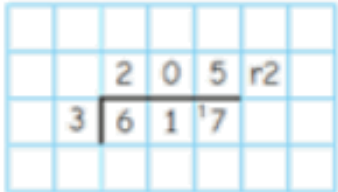
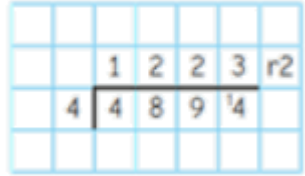
Objective and Strategy	Concrete	Pictorial	Abstract
<p>Division as equal sharing</p> <p>Link to finding a half (sharing into two equal groups) and finding a quarter (sharing into 4 equal groups)</p>	<p>Use practical activities to share objects equally</p> <p>... have been shared equally between... There are ... on/in each ...</p>  <p>Take 12 cubes, share them equally between 3 groups</p>  <p>12 shared equally between 3 is 4</p>	<p>Use pictorial representations to show equal sharing</p>  <p>8 shared equally between 2 is 4</p>  <p>4 4 4</p> <p>12 shared between 3 is 4</p>	<p>12 shared equally between 3 is 4</p> <p>10 sweets shared equally between 5 people is 2 sweets each.</p>
<p>Division as making equal groups</p>	<p>Children physically move objects into equal sized groups</p> <p>E.g. there are 6 children altogether. How many groups of two can you make?</p>  <p>I can make 3 groups of 2 from 6 children.</p> <p>Take 12 cubes. How many groups of 4 can you make?</p> 	<p>Circle equal sized groups when objects are represented as pictures</p> <p>Circle groups of 2. How many groups can you make?</p>  <p>There are 4 groups of 2.</p> <p>If you have 10 counters how many groups of 5 can you make?</p> 	<p>If I have 10 counters I can make 2 groups of 5.</p> <p>If I have 12 cubes I can make 3 groups of 4.</p>

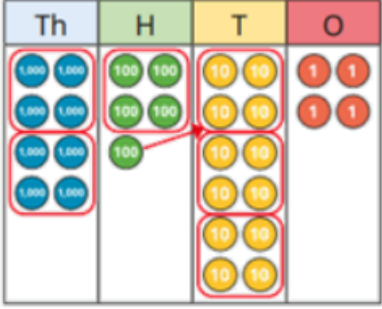
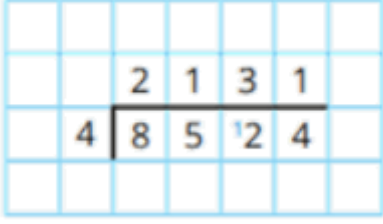
Objective and Strategy	Concrete	Pictorial	Abstract
<p>Division as equal sharing (dividing by 2, 5, and 10)</p>	<p>Practical activities sharing into equal groups as above.</p>  <p>8 shared equally between 2 = 4</p>  <p>30 sweets shared equally between 5 equals 6 sweets each</p>	<p>Sharing as for Year 1 plus introduce the bar model to represent the whole divided into equal shares:</p>  <p>30 shared equally between 5 equals 6 each</p>	<p>Introduce the division symbol to represent equal shares :</p> $8 \div 2 = 4$ $30 \div 5 = 6$ <p>Encourage children to see the link with multiplication e.g</p> $4 \times 2 = 8 \quad \text{so} \quad 8 \div 2 = 4$ $6 \times 5 = 30 \quad \text{so} \quad 30 \div 5 = 6$
<p>Division as equal grouping (dividing by 2, 5, and 10)</p>	<p>Practical activities grouping into equal groups as above.</p>  <p>There are six equal groups of 5.</p>  <p>There are 10 equal groups of 6</p>	<p>Sharing as for Year 1 plus use the bar model to represent the whole divided into equal groups:</p>  <p>30 grouped into sixes gives five equal groups.</p> <p>60 grouped into sixes gives 10 equal groups.</p>	<p>Using the division symbol to represent the equal groups:</p> $30 \div 5 = 6$ $60 \div 6 = 10$ <p>Again, encourage the children to use related multiplication facts</p> $6 \times 5 = 30 \quad \text{so} \quad 30 \div 5 = 6$ $6 \times 10 = 60 \quad \text{so} \quad 60 \div 6 = 10$

Objective and Strategy	Concrete	Pictorial	Abstract
Division as equal sharing and equal grouping as for Years 1 and 2 - extended to dividing by 3, 4 and 8	Using counters/dienes and other objects and grouping or sharing equally. 8 grouped into four equals two groups.   16 shared equally between 8 equals 2	Continue to show using dots and counters, as well as bar models .  	$6 \div 3 = 2$ $6 \div 2 = 3$ $16 \div 8 = 2$ $12 \div 4 = 3$ Continuing to make links with related multiplication facts
Division with arrays	Link division to multiplication by creating an array and thinking about the number sentences that can be created.  $5 \times 3 = 15$ $3 \times 5 = 15$ $15 \div 3 = 5$ $15 \div 5 = 3$	Draw an array and use lines to split the array into groups to make division and multiplication facts. 	Find the inverse of multiplication and division sentences by creating eight related number sentences. $4 \times 8 = 32$ $8 \times 4 = 32$ $32 \div 4 = 8$ $32 \div 8 = 4$ $32 = 4 \times 8$ $32 = 8 \times 4$ $4 = 32 \div 8$ $8 = 32 \div 4$
Divide a 2-digit number by a 1-digit number - no exchange	Use dienes of place value counters to create the number. Partition into tens and ones to divide, then recombine. Eg. $64 \div 2$ $60 \div 2 = 30$ $4 \div 2 = 2$ $30 + 2 = 32$ 	Draw place value counters or part whole diagrams to show partitioning, dividing and recombining. E.g. for $84 \div 4$  	$6 \text{ tens divided by } 2 \text{ equals } 3 \text{ tens}$ $4 \text{ divided by } 2 \text{ equals } 2$ $80 \div 2 = 40$ $4 \div 2 = 2$ $40 + 2 = 42$ so $84 \div 2 = 42$

Objective and Strategy	Concrete	Pictorial	Abstract
<p>Continue to learn, practise and consolidate multiplication tables to 12 X 12 and related division facts,</p> <p>Including linking to known tables for multiples of 10 and 100</p>	<p>Children should compare the grouping and sharing structures and of division and make links with times-table facts</p> 	<p>Continue to draw arrays and bar models to show divisions</p>  <p>21 divided by 3 is equal to 7 so 21 tens divided by 3 is equal to 7 tens and 21 hundreds divided by 3 is equal to 7 hundreds</p>	<p>There are ... groups of ... in ÷ ... =</p> <p>$2 \times 6 = 12$ $12 \div 6 = 2$</p> <p>$21 \div 7 = 3$ $210 \div 7 = 30$ $2,100 \div 7 = 300$</p>
<p>Divide a 2-digit number by a 1-digit number with remainders</p> <p>(using partitioning and flexible partitioning)</p>	<p>Encourage children to partition numbers flexibly to help them to divide more efficiently</p> <p>E.g. $96 \div 4$ Partition 96 into 80 and 16 (both numbers are divisible by 4)</p> 	 <p>$96 \div 4$ $80 \div 4$ $16 \div 4$ $80 \div 4 = 20$ $16 \div 4 = 4$ $96 \div 4 = 24$</p> <p>$94 \div 4 = 23 \text{ r}2$</p> 	<p>$31 \div 4 = 7 \text{ r}3$</p> <p>$95 \div 4$ $= (80 \div 4) + (15 \div 4)$ $= 20 + 3 \text{ r}3$ $= 23 \text{ r}3$</p>

Objective and Strategy	Concrete	Pictorial	Abstract
<p>Divide a 3 -digit number by a 1 digit number</p>	<p>Progress from division with no exchanges, to divisions with exchanges, to division with remainders</p> <p>E.g. $435 \div 3$</p>  <p>I cannot share the hundreds equally, so I need to exchange 1 hundred for 10 tens.</p> <p>I now have 13 tens.</p> <p>I cannot share the tens equally so I need to exchange 1 ten for 10 ones.</p>	<p>I cannot share the hundreds/tens equally, so I need to exchange 1 ... for 10 ...</p> <p>Use part , whole diagrams to represent the calculation</p> 	$300 \div 3 = 100$ $120 \div 3 = 40$ $15 \div 3 = 5$ $435 \div 3 = 145$

Objective and Strategy	Concrete	Pictorial	Abstract
<p>Divide numbers up to 4 digits by a single digit.</p> <p>The formal method (bus stop method) is introduced for the first time</p> <p>Move to numbers where there are remainders, and where exchanges are needed</p>	<p>Continue to show using counters as before alongside the written method.</p>   	<p>Children can continue to use drawn diagrams.</p> <p>Begin with division that divide equally, with dots or circles to help them divide numbers with no remainder into equal groups.</p> <p>Encourage to move to counting in multiples to divide more efficiently.</p>	 <p>“3 tens, divided by 3 is 1 ten 9 ones, divided by 3 is 3 so 39 divided by 3 is 13.”</p>  <p>“6 hundreds divided by 3 is 2 hundreds 1 ten divided by 3 is zero with one ten remaining. Exchange the ten for ten ones, we now have 17 ones. 17 ones divided by 3 is 5 remainder 2. So 617 divided by 3 is 205 remainder 2</p>  <p>“4 thousands divided by 4 is 1 thousand 8 hundreds divided by 4 is 2 hundreds 9 tens divided by 4 is 2 tens, remainder 1 ten: exchange the ten for 10 ones 14 ones divided by 4 is 3 remainder 2 so 4894 divided by 4 is 1233 remainder 2”</p>

Objective and Strategy												
<p>Short Division</p> <p>Encourage children to interpret remainders in context, for example knowing that “remainder 1” could mean 4 complete boxes with 1 left over so 5 boxes will be needed.</p>	<p>As for Year 5, exchanging as necessary</p> 	<p>With real life problems, encourage children to interpret remainders in context, for example knowing that “remainder 1” could mean 4 complete boxes with 1 left over: either there are 4 full boxes, or 5 boxes will be needed, depending on what has been asked.</p>	<p>There are ... groups of ... hundreds/tens/ ones/ in ... I can exchange 1 ... for 10 ...</p> 									
<p>Long division</p> <p>Introduce the method with a single digit divisor</p> <p style="text-align: right;">continued</p>	<table border="1" style="width: 100%; border-collapse: collapse;"> <thead> <tr style="background-color: #e0f7fa;"> <th style="width: 33%;">1. Divide.</th> <th style="width: 33%;">2. Multiply & subtract.</th> <th style="width: 33%;">3. Drop down the next digit.</th> </tr> </thead> <tbody> <tr> <td style="text-align: center;"> $\begin{array}{r} \text{t o} \\ 2 \\ \hline 2 \overline{) 58} \end{array}$ <p>Two goes into 5 two times, or 5 tens ÷ 2 = 2 whole tens -- but there is a remainder!</p> </td> <td style="text-align: center;"> $\begin{array}{r} \text{t o} \\ 2 \\ \hline 2 \overline{) 58} \\ -4 \\ \hline 1 \end{array}$ <p>To find it, multiply $2 \times 2 = 4$, write that 4 under the five, and subtract to find the remainder of 1 ten.</p> </td> <td style="text-align: center;"> $\begin{array}{r} \text{t o} \\ 29 \\ \hline 2 \overline{) 58} \\ -4 \\ \hline 18 \end{array}$ <p>Next, drop down the 8 of the ones next to the leftover 1 ten. You combine the remainder ten with 8 ones, and get 18.</p> </td> </tr> <tr> <td style="text-align: center;"> $\begin{array}{r} \text{t o} \\ 29 \\ \hline 2 \overline{) 58} \\ -4 \\ \hline 18 \end{array}$ <p>Divide 2 into 18. Place 9 into the quotient.</p> </td> <td style="text-align: center;"> $\begin{array}{r} \text{t o} \\ 29 \\ \hline 2 \overline{) 58} \\ -4 \\ \hline 18 \\ -18 \\ \hline 0 \end{array}$ <p>Multiply $9 \times 2 = 18$, write that 18 under the 18, and subtract.</p> </td> <td style="text-align: center;"> $\begin{array}{r} \text{t o} \\ 29 \\ \hline 2 \overline{) 58} \\ -4 \\ \hline 18 \\ -18 \\ \hline 0 \end{array}$ <p>The division is over since there are no more digits in the dividend. The quotient is 29.</p> </td> </tr> </tbody> </table>			1. Divide.	2. Multiply & subtract.	3. Drop down the next digit.	$\begin{array}{r} \text{t o} \\ 2 \\ \hline 2 \overline{) 58} \end{array}$ <p>Two goes into 5 two times, or 5 tens ÷ 2 = 2 whole tens -- but there is a remainder!</p>	$\begin{array}{r} \text{t o} \\ 2 \\ \hline 2 \overline{) 58} \\ -4 \\ \hline 1 \end{array}$ <p>To find it, multiply $2 \times 2 = 4$, write that 4 under the five, and subtract to find the remainder of 1 ten.</p>	$\begin{array}{r} \text{t o} \\ 29 \\ \hline 2 \overline{) 58} \\ -4 \\ \hline 18 \end{array}$ <p>Next, drop down the 8 of the ones next to the leftover 1 ten. You combine the remainder ten with 8 ones, and get 18.</p>	$\begin{array}{r} \text{t o} \\ 29 \\ \hline 2 \overline{) 58} \\ -4 \\ \hline 18 \end{array}$ <p>Divide 2 into 18. Place 9 into the quotient.</p>	$\begin{array}{r} \text{t o} \\ 29 \\ \hline 2 \overline{) 58} \\ -4 \\ \hline 18 \\ -18 \\ \hline 0 \end{array}$ <p>Multiply $9 \times 2 = 18$, write that 18 under the 18, and subtract.</p>	$\begin{array}{r} \text{t o} \\ 29 \\ \hline 2 \overline{) 58} \\ -4 \\ \hline 18 \\ -18 \\ \hline 0 \end{array}$ <p>The division is over since there are no more digits in the dividend. The quotient is 29.</p>
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Objective and Strategy

Long division continued:

2 digit divisor with remainders

Continue to use divide, multiply and subtract, drop down the next digit

		0	3	6	
12	4	3	2		
	3	6			
		7	2		
		7	2		
				0	

		0	1	0	9	r	9
13	1	4	2	6			
	1	3	0				
		1	2	6			
		1	1	7			
							9


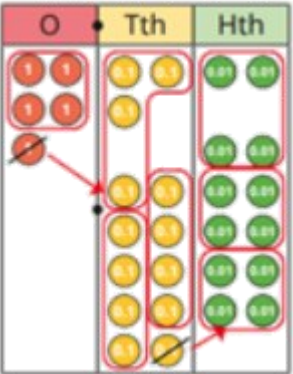
- 1 X 13 = 13
- 2 X 13 = 26
- 3 X 13 = 39
- 4 X 13 = 52
- 5 X 13 = 65
- 6 X 13 = 78
- 7 X 13 = 91
- 8 X 13 = 104
- 9 X 13 = 117

When dividing by larger numbers, encourage children to list multiples of the divisor: partitioning will aid this.

Calculating multiples of 32

		1	3	5	
32	4	3	2	0	
-	3	2			
	1	1	2		
-		9	6		
		1	6	0	
-		1	6	0	
				0	

X	30	2	=
1	30	2	32
2	60	3	63
3	90	6	96
4	120	8	128
5	150	10	160
6	180	12	192

Objective and Strategy	
<p>Divide decimals by integers</p> <p>This is the first time children divide decimals by numbers other than 10, 100 or 1,000</p>	<p>Using known number facts:</p> <p>E.g. I know so I also know and</p> <p>$39 \div 3 = 13$ $3.9 \div 3 = 1.3$ $0.39 \div 3 = 0.13$</p> 
	<p>Using formal methods already taught and extending to decimals</p>  <p>I need to exchange 1 one for 10 tenths</p> 