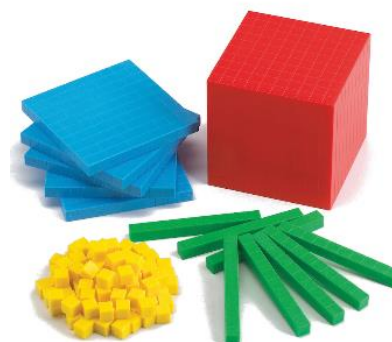
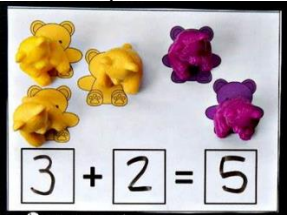
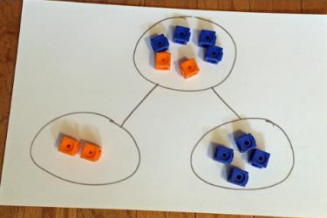


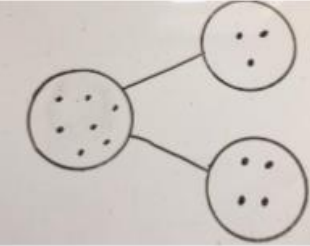
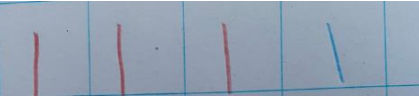

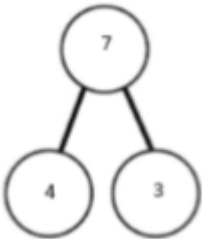



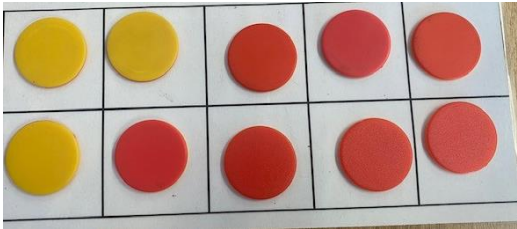



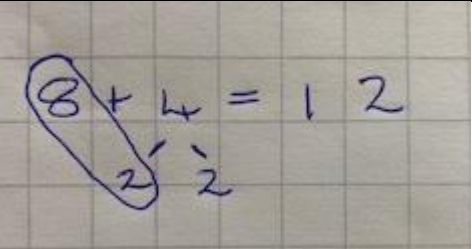
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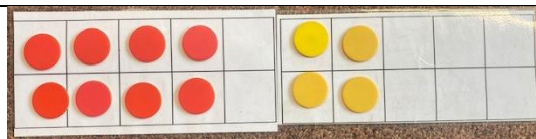
Agreed Approach to Calculation Document

Core Manipulatives to support depth learning from EYFS to Year 6.



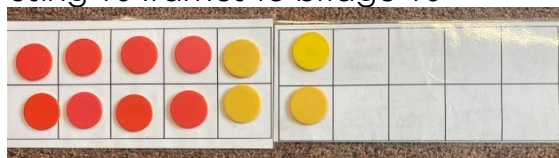
Yr	Addition Strategies	Concrete	Pictorial/Structural	Abstract
R	<p>Finding the sum of two numbers. Combining two parts to make a whole: part part whole model.</p> <p>To know the pairs that total 5.</p> <p>ELG: To add two single digit numbers and count on to find the answer.</p>	<p>Use cubes, objects, Numicon or 10's frames to add two numbers together verbally.</p>    <p>5 frames also used</p> 	<p>Use pictures to add two numbers together. These will be both pictures provided and pictures that the children draw to solve a number sentence.</p>  <p>$3 + 2 = 5$</p>  <p>$2 + 3 = 5$</p> 	<p>Children will begin record addition number sentences. They will solve addition problems by beginning to count on from the first number.</p> <p>$3 + 2 = 5$ Three in your head, two fingers. 3, 4, 5.</p> <p>$4 + 3 = 7$ Four is a part, 3 is a part and the whole is seven.</p> 

1	<p>Use a range of manipulatives to add one digit and two digit numbers to 20.</p>	<p>Use double sided counters and 10 frames to investigate number bonds to 10.</p>  <p>$3 + 7 = 10$</p>  <p>$3 + 7 = 10$</p> <p>Using cubes and counting on from the biggest number.</p>  <p>I know that I have 8, 9, 10, 11, 12</p> <p>$8 + 4 = 12$</p> <p>Use 10 frames to count on from the biggest number.</p>	<p>PPW model</p> <p>Missing numbers</p> <p>Counting on using a number line starting at the largest number.</p>  <p>$8 + 4 = 12$</p> <p>Counting using pictures</p> <p>$8 + 4 = 12$</p> <p>Start at the larger number on the number line and count on in ones or in jumps of one to find the answer.</p> <p>$8 + 4 =$</p> <p>$8 + 2 + 2 =$</p> 	
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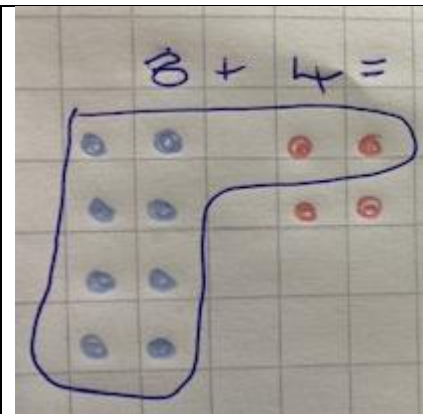


$$8 + 4 = 12$$

Using 10 frames to bridge 10

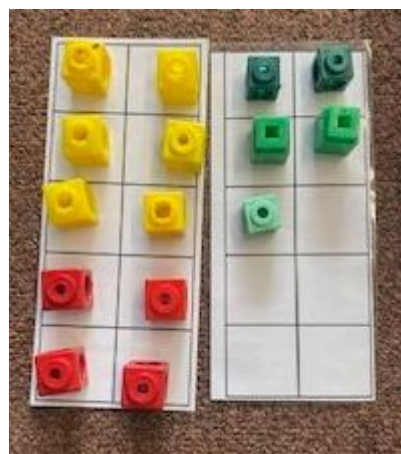


$$8 + 4 = 8 + 2 + 2$$

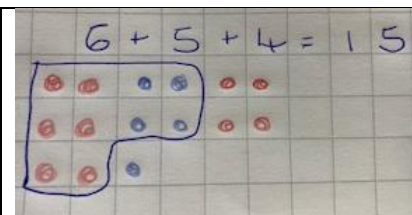


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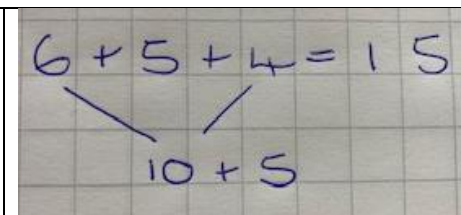
Adding three digits



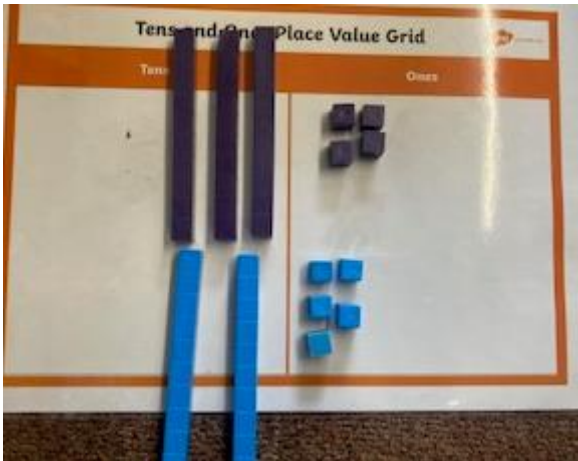
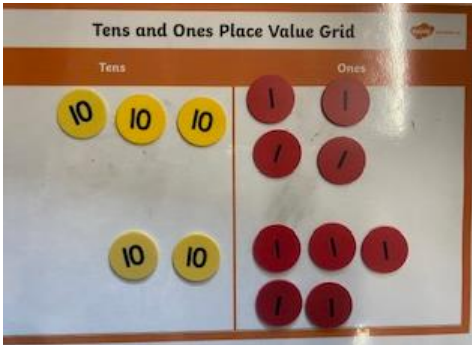
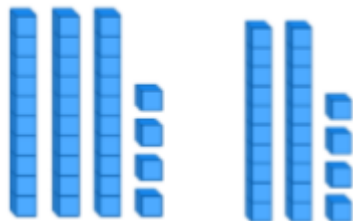
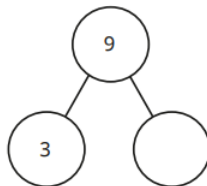
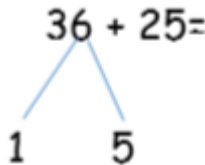
$6 + 5 + 4 = 15$
Adding by manipulating the apparatus to make 10 before adding the ones.

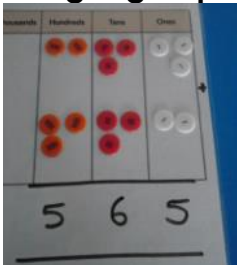
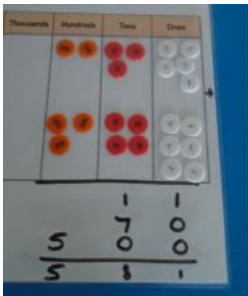
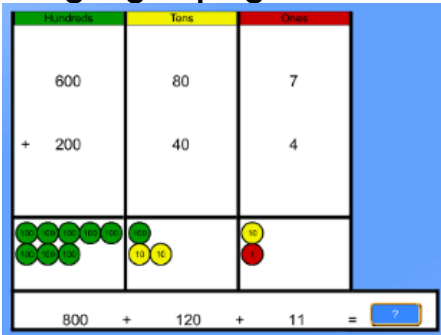
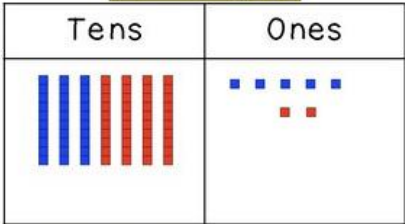
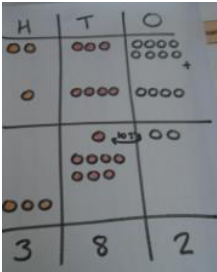


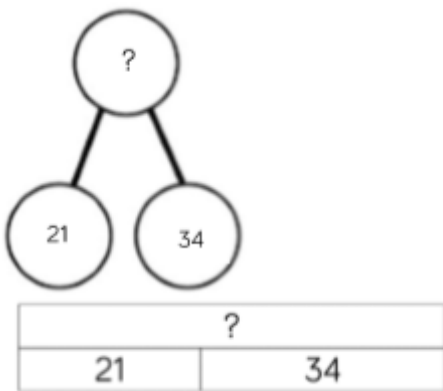
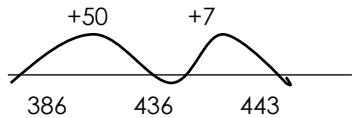
Add three digits by finding 10, partitioning the 5 and recombining. $10 + 5$.

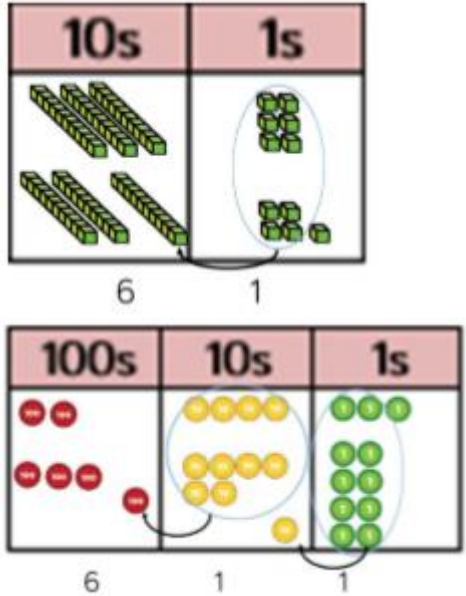
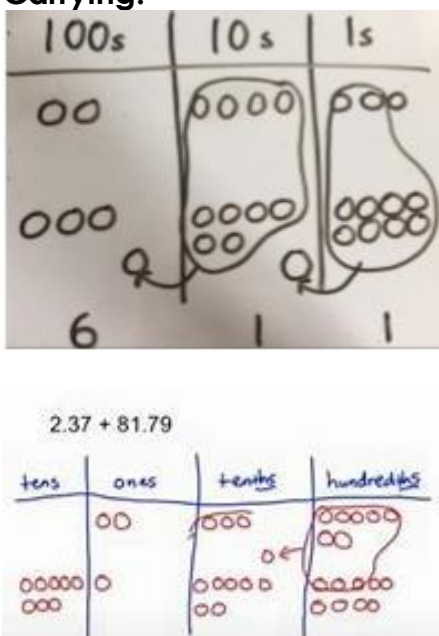


Finding number bonds to 10 before adding the ones and exploring what happens if there isn't a number bond to use.

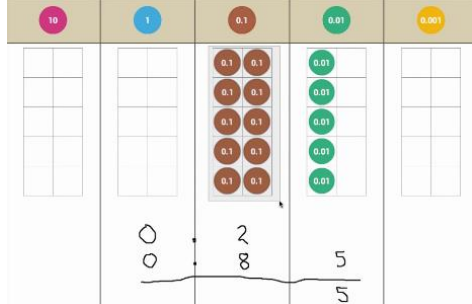
2	<p>Adding two 2 digit numbers up to 100</p>	<div></div> <p>34 + 25 = 59</p> <p>Using base 10 to add ones first and then the tens.</p> <div></div> <p>Using different representations of the same number problem.</p>	<p>Adding with Base 10 : Drawing ten sticks (lines) and ones (small circles).</p> <div></div> <p>Using base ten to model the carrying of a ten:</p> <div><table><tr><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td></tr><tr><td>+</td><td></td></tr></table></div> <p>Using the part whole model to calculate missing numbers:</p> <div></div>	Tens	Ones			+		<p>Partition:</p> <div></div> <p>30 + 20 = 50 5 + 5 = 10 50 + 10 + 1 = 61</p> <p>Or expanded method:</p> <div><table><tr><td>30</td><td>6</td><td>+</td></tr><tr><td>20</td><td>5</td><td></td></tr><tr><td colspan="3"><hr/></td></tr><tr><td>50</td><td>11</td><td>= 61</td></tr></table></div> <p>Partition numbers into T U, developing to H T U (support with arrow cards) Eg: 379 = 300 + 70 + 9</p>	30	6	+	20	5		<hr/>			50	11	= 61
Tens	Ones																					
+																						
30	6	+																				
20	5																					
<hr/>																						
50	11	= 61																				

Yr	Addition Strategies	Concrete	Pictorial/Structural	Abstract
3	Column method including regrouping up to 3 digit numbers including tenths	<p>Using regrouping:</p>  <p>Using the expanded column method:</p>  <p>Begin in the ones column and move to the left.</p> <p>Using Tenths: As children move on to decimals and money, decimal place value counters can be used to support learning.</p> <p>Using money- represented at pounds and pence.</p>	<p>Using regrouping:</p>  <p>Base 10 Blocks</p> <p>35 + 42 = _____</p>  <p>Using the expanded column method:</p> 	<p>Using the column method:</p> <p>HTO</p> $\begin{array}{r} 256 \\ + 137 \\ \hline 393 \\ 1 \end{array}$

		<p>e.g £4 and 32p £3 and 24p</p>	<p>This informal representation is used to clarify understanding and can be used alongside number lines.</p> <p>The bar model and part part whole model reinforces the concept of parts and wholes.</p>  <p>Mentally counting on in multiples of 100, 10 and 1 $386 + 57 \rightarrow 386 + 50 + 7 \rightarrow 436 + 7 = 443$</p> 	
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4	<p>Column method increasing in place value to 4 digit numbers</p>	<p>Column Addition with Carrying: Recap on use of place value counters and Base 10 to show 'carrying'.</p>  <p>Begin in the ones column. For every ten created exchange for a 10 counter.</p> <p>As children move on to decimals and money, decimal place value counters can be used to support learning.</p>	<p>Column Addition with Carrying:</p>  <p>This informal representation is used to clarify understanding and can be used alongside number lines.</p> <p>Worded problems supported by the bar model or part part whole: There were 6000 books for sale at a book fair. 3419 books were sold on the first day of the fair and 2268 books were</p>	<p>Column Addition with Carrying:</p> <p>H T O $\begin{array}{r} 256 \\ + 137 \\ \hline 393 \\ 1 \end{array}$</p> <p>As the children move on, introduce decimals with the same number of decimal places and different. Money can be used here.</p> <p>Use the inverse to check answers.</p>
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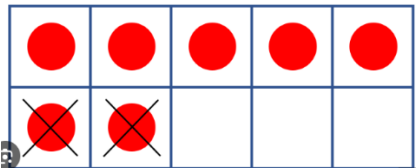

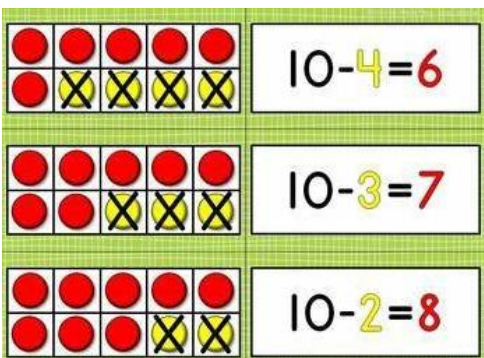
Clarendon Federation Agreed Approach to Calculations

			<p>sold on the second day. How many books were left at the end of the second day?</p> <table data-bbox="994 349 1476 437"><tr><td colspan="3">6000</td></tr><tr><td>3419</td><td>2268</td><td>?</td></tr></table> <pre>graph TD A((6000)) --- B((3419)) A --- C((2268)) A --- D((?)) </pre>	6000			3419	2268	?	
6000										
3419	2268	?								


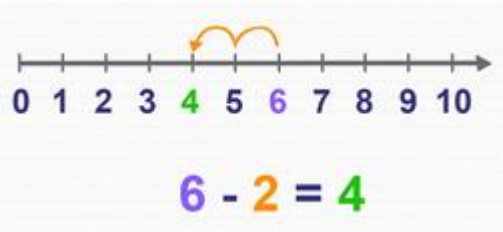
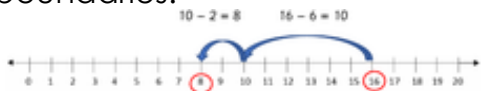
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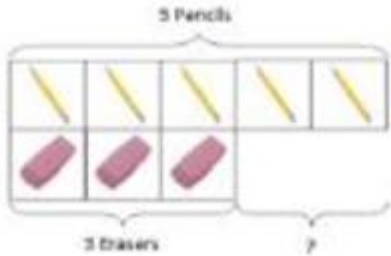
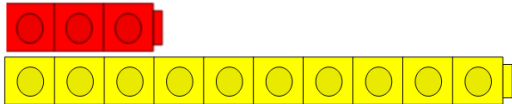
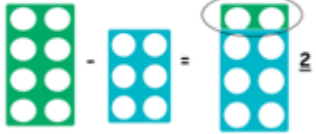
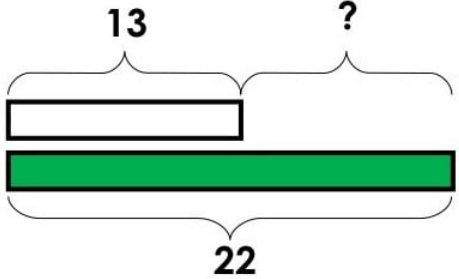
5	<p>Column method increasing in place value to 5 and 6 digit numbers including those with up to two decimal places</p> <p>Mental methods for addition</p>		<p>Use written methods to support record and explain calculations, achieving consistent accuracy. Discuss, explain and compare methods.</p>	<p>Develop an efficient standard method that can be applied generally using whole numbers and those with decimal places.</p> <p>For example:</p> $ \begin{array}{r} 366.7 \\ + 85.4 \\ \hline 452.1 \\ 111 \end{array} $
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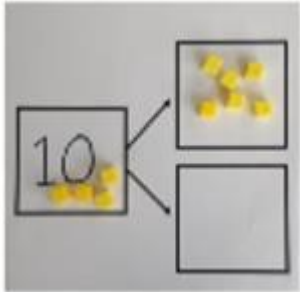
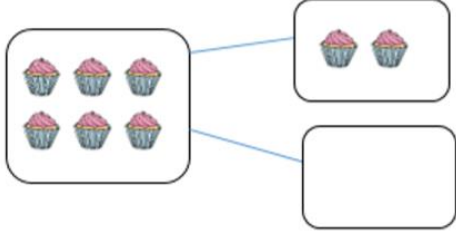
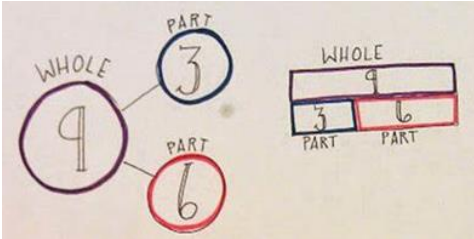
6	<p>Column method increasing in place value to 5 and 6 digit numbers including those with up to two decimal places</p> <p>Mental methods for addition</p>		Continuation of Y5	<p>Continue developing efficiency of written methods using carrying.</p> <p>Extend methods to numbers with any number of digits.</p> $ \begin{array}{r} 23.361 \\ 9.080 \\ 59.770 \\ + 1.300 \\ \hline 93.511 \\ 212 \end{array} $ <p>Add several numbers with different numbers of digits. For example: Find the total of: 42 6432 786 3 and 4681</p> <p>Extend to decimals, add two or more decimal fractions with up to four digits and either one or two decimal places.</p> $124.9 + 7.25$ $401.2 + 26.85 + 0.71$
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Yr	Subtraction Strategies	Concrete	Pictorial/Structural	Abstract
R/ 1	<p>Taking away ones</p> <p>ELG: To know 1 more/1 less.</p> <p>Subtract 2 single digit numbers and count back to find the answer.</p>	<p>Use physical objects, counters, cubes etc to show how objects can be taken away.</p>  $6 - 2 = 4$  <p>Using tens frames and counters:</p> 	<p>Cross out drawn objects to show what has been taken away. 8 bees take away 3 bees makes 5 bees.</p>  	$8 - 3 = 5$ $8 - 2 = 6$



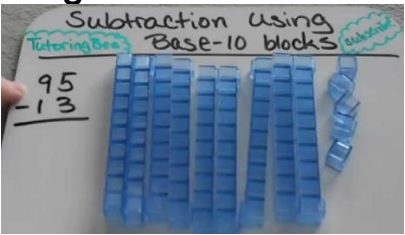
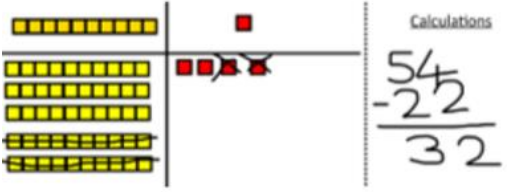
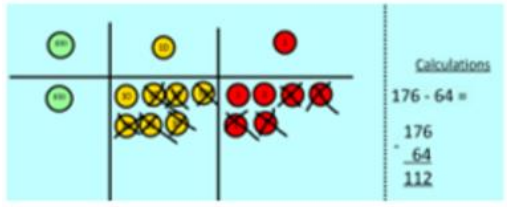
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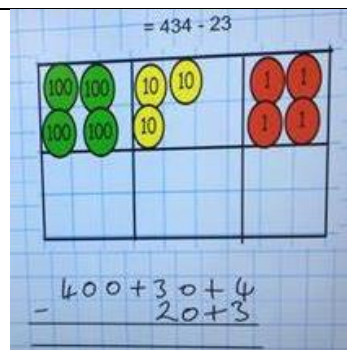
1/ 2	Counting back	<p>Make the larger number in your subtraction. Use counters and move them away from the group as you take them away counting backwards as you go.</p> 	<p>Count back on a number line or number track.</p>  <p>Start at the bigger number and count back the smaller number showing the jumps on the number line.</p> <p>Using partitioning to cross boundaries:</p>  <p>Put 13 in your head, count back 4. What number are you at? Use your fingers to help.</p>	<p>Subtract mentally using number bonds.</p> <p>Explore empty boxes counting back:</p> <p>13 - ? = 9</p>
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<p>1/ 2</p>	<p>Find the difference</p>	<p>Compare amounts and objects to find the difference.</p> <p>Use cubes to build towers or make bars to find the difference.</p>  <p>Use basic bar models with items to find the difference.</p> 	 <p>Use pictorial representations to find the difference.</p> <p>What is the difference between 8 and 6?</p>  <p>Draw bars to find the difference between 2 numbers.</p> 	<p>Solve problems involving finding the difference using a place value chart:</p> <p>Hannah has 23 sandwiches. Helen has 15 sandwiches. Find the difference between the number of sandwiches.</p> <p>Lisa is 13 years old. Her sister is 22 years old. Find the difference in age between the sisters.</p>
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1/ 2	Part/Part Whole	<p>Link to addition- use the part part whole model to help explain the inverse between addition and subtraction.</p>  <p>If 10 is the whole and 6 is one of the parts. What is the other part?</p> <p>$10 - 6 =$</p>	<p>Use pictorial representation of objects or counters to show the part part whole model. For example (this may use counters rather than pictures)</p> 	<p>Move to representing pictures in each part and then on to using numbers within the part whole and bar model.</p> <p>$9 - 3 =$</p> 
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1/ 2	Making 10	$14 - 9 =$  <p>Make 14 on the ten frame. Take away the four first to make 10 and then take away 1 more so you have taken away 5. You are left with the answer of 9.</p>	 $- 7 =$ <p>Exchange ten into ones to model crossing the boundary.</p>	$16 - 8 =$ <p>How many do we take off to reach the next 10?</p> <p>How many do we have left to take off?</p>																				
2/ 3	Column method without grouping	<p>Use place value counters and base ten to make the bigger number then take the smaller number away.</p> <p>Using Base 10:</p>  <p>Show how you partition numbers to subtract. Again make the larger number first.</p>	<p>Draw the base ten or place value counters alongside the written calculation to help to show working.</p>  	<p>Expanded column method to condensed.</p> $47 - 23 =$ <table border="0"> <tr> <td>T</td><td>O</td><td></td><td></td><td>TO</td> </tr> <tr> <td>40</td><td>7</td><td>-</td><td></td><td>47</td> </tr> <tr> <td>20</td><td>3</td><td></td><td>→</td><td>23</td> </tr> <tr> <td>20</td><td>4</td><td></td><td></td><td>24</td> </tr> </table> $300 \ 70 \ 5 -$ $100 \ 20 \ 4$ $200 \ 50 \ 1$ $= 251$ <p>Then...</p> $3 \ 7 \ 5 -$ $1 \ 2 \ 4$ $2 \ 5 \ 1$	T	O			TO	40	7	-		47	20	3		→	23	20	4			24
T	O			TO																				
40	7	-		47																				
20	3		→	23																				
20	4			24																				



$234 - 88$

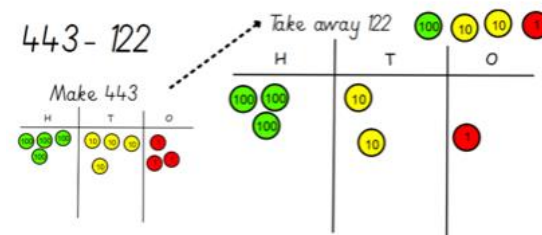


Start with the ones, can I take away 8 from 4 easily? I need to exchange one of my tens for ten ones.

Now I can subtract my ones.

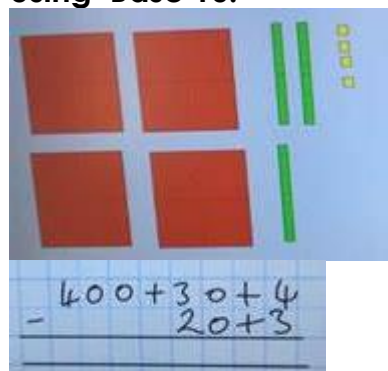


Now look at the tens, can I take away 8 tens easily? I need to exchange one hundred for ten tens.

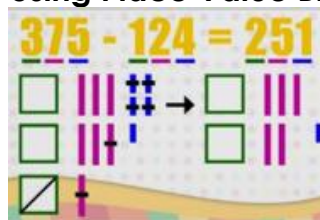


$443 -$
 122
 321


Using Base 10:



Using Place Value Blocks:

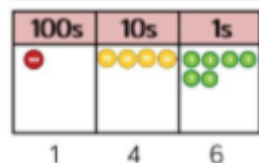


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		<p>Now I can take away eight tens and complete my subtraction.</p>  <p>1 4 6</p> <p>Show children how the concrete method links to the written method alongside your working. Cross out the numbers with exchanging and show where we write our new amount.</p>		
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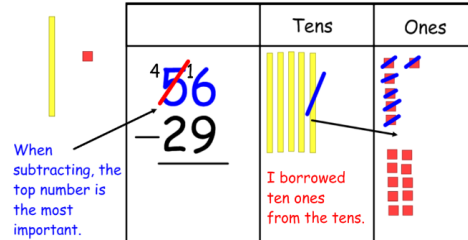
4	Column method with grouping	<p>Use place value counters. Start with one exchange before moving one subtraction with 2 exchanges.</p> <p>Make the larger number with the place value counters.</p> <p>234 - 88</p> <table border="1"><thead><tr><th>100s</th><th>10s</th><th>1s</th></tr></thead><tbody><tr><td>2</td><td>3</td><td>4</td></tr></tbody></table> <p>Start with the ones, can I take away 8 from 4 easily? I need to exchange one of my tens for ten ones.</p> <p>Now I can subtract my ones.</p> <table border="1"><thead><tr><th>100s</th><th>10s</th><th>1s</th></tr></thead><tbody><tr><td>2</td><td>2</td><td>14</td></tr></tbody></table> <p>Now look at the tens, can I take away 8 tens easily? I need to exchange one hundred for ten tens.</p>	100s	10s	1s	2	3	4	100s	10s	1s	2	2	14	<div><div><div><div>Hundreds</div><div><div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100</div><div>100<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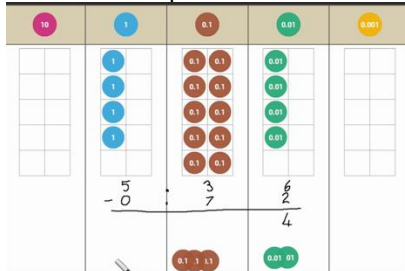
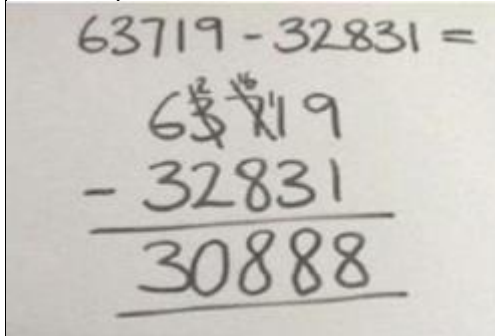
Now I can take away eight tens and complete my subtraction.

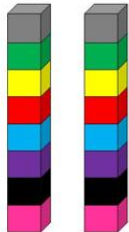






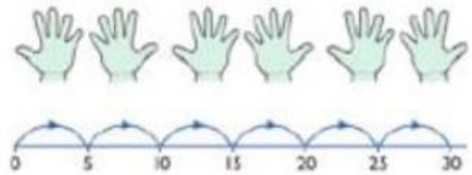



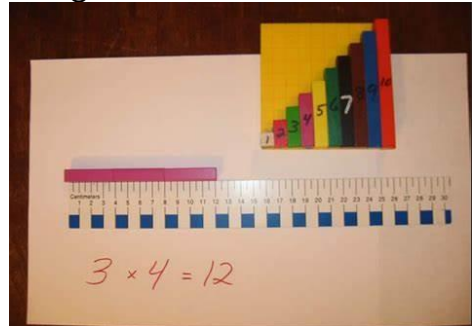

Show children how the concrete method links to the written method alongside your working. Cross out the numbers with exchanging and show where we write our new amount.

Using Base 10:


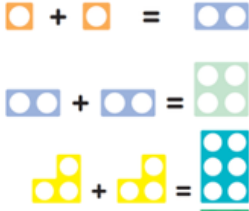
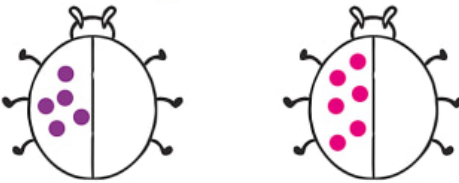




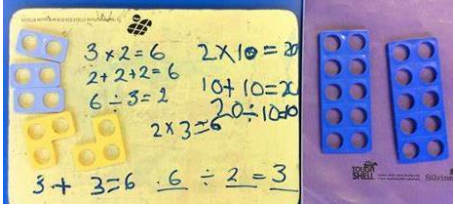
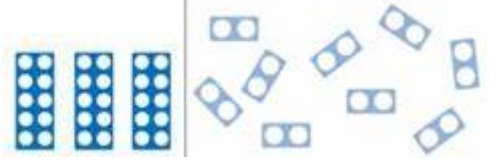
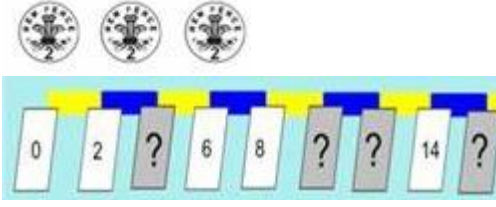
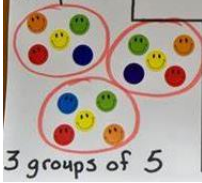

5	To use decomposition with efficiency when exchanging		<p>Use place value counters to show exchanging of amounts including numbers up to 2 decimal places..</p> 	<p>Revise exchanging of amounts in formal written form including numbers up to 2 decimal places. Use variation of measures and money.</p> 
6		To recap Year 5 to ensure efficiency with any size of digit.		



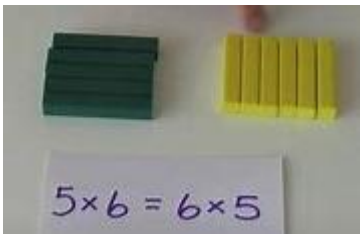
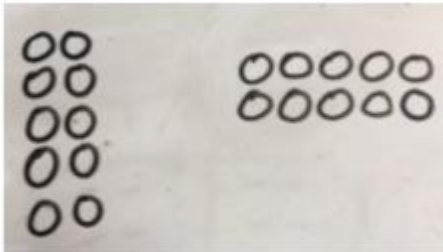

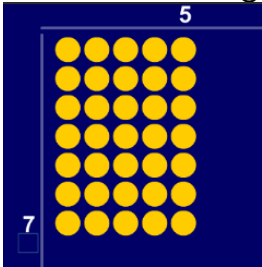
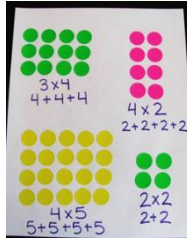
Yr	Multiplication Strategies	Concrete	Pictorial/Structural	Abstract
R	<p>Doubling and finding lots of</p> <p>ELG: solve problems involving doubling and halving</p> <p>Tables: 2 and 10</p>	<p>Use practical activities to show how to double a number.</p> <p>Start off with a tower of 8 cubes</p> <p>Build a tower the same as the one you have already.</p>  <p>How many do you have altogether now? What is double 8?</p> <p>Real life problems: One teddy has two buttons, how many buttons will we need for 3 teddies?</p> 	<p>Draw pictures to show how to double a number.</p> <p>Double 4 is 8</p> 	<p>Count in multiples of a number aloud using actions.</p>  <p>Using Mastering Number approach- I can see two twos/ two fours.</p>

1	Counting in multiples Tables: 2, 5 and 10	Count in multiples supported by concrete objects in equal groups. Adding equal groups. 	Use a number line or pictures to continue to support in counting in multiples.  	Write in sequences with multiples of numbers. 2, 4, 6, 8, 10 5, 10, 15, 20, 25, 30 Write addition sentences to describe objects and pictures.  $2 + 2 + 2 + 2 + 2 = 10$
1	Repeated addition	Use different objects to add equal groups. $5 + 5 + 5 + 5 + 5$  Using Cuisenaire, multilink, number tracks and bead strings: 	Use pictures and number lines to show repeated addition:  There are 5 pairs of socks on the washing line. $5 \text{ pairs of } 2 = 10$ $5 \text{ } 2\text{s} = 10$ $2 + 2 + 2 + 2 + 2 = 10$ $2 \times 5 = 10$ $5 \text{ lots of } 2 = 10$ $2 \text{ multiplied by } 5$ $5 \text{ hops of } 2$ There are 10 altogether.	Record in number sentences: $5 + 5 + 5 + 5 = 20$ $2 + 2 + 2 + 2 = 8$

Clarendon Federation Agreed Approach to Calculations

<p>1/ 2</p>	<p>Partitioning to double (pre-grid)</p>	<p>Use objects to model doubling ten and ones practically.</p> 	<p>Use place value cards and Numicon to show:</p> <p> $10 \times 2 =$ $4 \times 2 =$ </p>   <p> Double 5 is _____ Double 6 is _____ </p>	
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2	Understanding multiplication	<p>Model number sentences linking repeated addition and multiplication.</p>    <p> $3 \times 2 = 6$ $2 \times 10 = 20$ $2 + 2 + 2 = 6$ $10 + 10 = 20$ $6 \div 3 = 2$ $20 \div 10 = 2$ $2 \times 3 = 6$ $3 + 3 = 6$ $6 \div 2 = 3$ </p>	<p>Use pictorial form to model number sentences linking repeated addition and multiplication.</p>  	<p>Link multiplication to doubling facts in numbers using equals as a balance.</p> <p> $4 \times 5 = 10 + 10$ $6 \times 5 = 15 + 15$ </p>   <p> Commutative Property $5 \times 3 = 15$ </p> <p> Repeated Addition $3 + 3 + 3 + 3 + 3 = 15$ </p> <p> 3 groups of 5 3 x 5 = 15 An Array </p>
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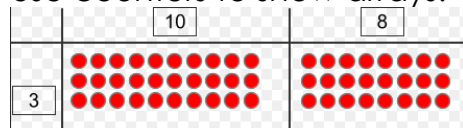
3	<p>Using arrays to show commutative multiplication</p> <p>Using arrays to lead to grid method</p>	<p>Create arrays using counters/cubes to show multiplication sentences.</p>   	<p>Draw arrays to represent multiplication sentences.</p>  <p>Use arrays in different orientations to find commutative multiplication sentences.</p>  <p>3×6 6×3</p> <p>Grid Method:</p> <p>ITP array to support the introduction of grid TU x U</p>  <p>Children can draw the counters, using different colours for different</p>	<p>Use an array to write multiplication sentences and reinforce repeated addition.</p>  <p>Empty box sentences using known facts.</p> <p>$3 \times \underline{\quad} = 12$</p> <p>Grid Method:</p> <p>Introduce the grid method TU x U using multiplication tables that they know to match related facts.</p> <table data-bbox="1565 979 1935 1137"><tr><td></td><td>20</td><td>8</td></tr><tr><td>X 4</td><td>80</td><td>32</td></tr></table> <p>→ $80 + 32 = 114$</p>		20	8	X 4	80	32
	20	8								
X 4	80	32								



Grid Method:

Show the link with arrays first to introduce the grid method.

Use counters to show arrays:



Move on to Base 10 to move towards a more compact method.



Use place value counters to show how to find groups of a number.

For example:

$$26 \times 4$$

"We are multiplying by 4 so we need 4 rows."

amounts or just circles within the place value columns to show their thinking as shown below:

Use the bar model:

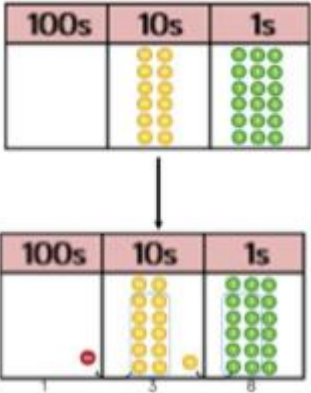
35						
5	5	5	5	5	5	5

$$7 \times 5 = 35$$

$$5 \times 7 = 35$$

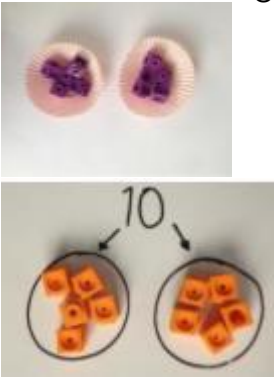
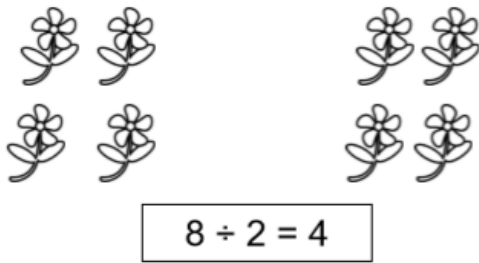
$$35 \div 5 = 7$$

$$35 \div 7 = 5$$



4	Column Multiplication	<p>Children continue to use place value counters at this stage of calculation.</p> <p>6×23</p>  <p>It is important that they always multiply the ones first, note the answers and follow with the tens that they note below.</p>	<p>Develop fluency through variation:</p> <p> $2 \times 3 =$ $2 \times 30 =$ $2 \times 300 =$ $20 \times 3 =$ $200 \times 3 =$ </p>	<p>Start with long multiplication, reminding the children about lining up their numbers clearly in columns.</p> <p>Children to write out the calculation that they are solving next to their answer.</p> <p>23×6</p> $ \begin{array}{r} 23 \\ \times 6 \\ \hline 18 \quad (3 \times 6) \\ 120 \quad (20 \times 6) \\ \hline 138 \end{array} $ <p>Move to short multiplication (to include TU x U and HTU x U)</p> <p>$6 \times 23 =$</p> $ \begin{array}{r} 23 \\ \times 6 \\ \hline 138 \\ \hline 11 \end{array} $
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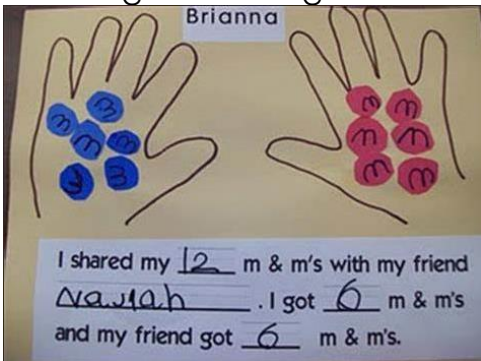
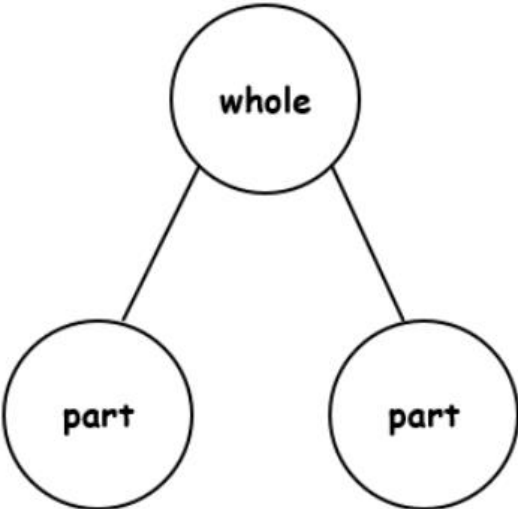
Clarendon Federation Agreed Approach to Calculations

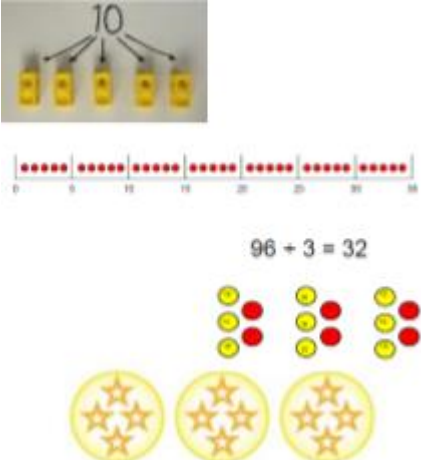
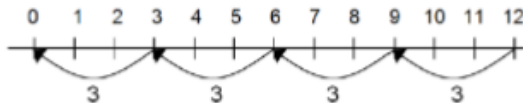
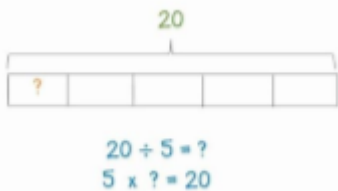
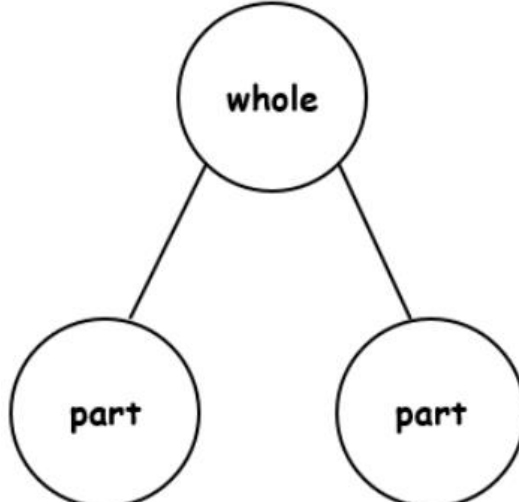
5	<p>Develop efficiency in short multiplication</p> <p>Long multiplication for TU x TU</p>		<p>Recap any Year 4 methods/visuals as necessary.</p>	<p>Recap short multiplication up to 4 digits by 1 digit.</p> <p>Introduce long multiplication when using TU x TU and increase to HTU and ThHTU by U.</p> $ \begin{array}{r} \text{T} \quad \text{O} \\ 3 \quad 2 \\ \times 2 \quad 4 \\ \hline 8 \quad (2 \times 4) \\ 1 \quad 2 \quad 0 \quad (30 \times 4) \\ 4 \quad 0 \quad (2 \times 20) \\ 6 \quad 0 \quad 0 \quad (20 \times 30) \\ \hline 7 \quad 6 \quad 8 \end{array} $
6	Develop efficiency in written methods			<p>Short multiplication and long multiplication methods revised and developed in terms of accuracy and efficiency.</p> <p>Extend to multiplying with decimals up to two decimal places. Know that decimal points should line up under each other.</p>

Yr	Division Strategies	Concrete	Pictorial/Structural	Abstract
R/ 1	Sharing objects into groups	<p>Sharing objects equally into groups. 10 shared into 2 groups.</p> 	<p>Sharing pictures equally into groups. <i>Children use pictures or shapes to share quantities.</i></p> 	<p>Sharing amounts in numbers. 9 buns shared between three people: $9 \div 3 = 3$</p>

Clarendon Federation Agreed Approach to Calculations

R/ 1	ELG: To solve problems using halving, doubling and sharing.	<p>Children understand sharing and halving in <u>equal</u> groups practically.</p> 	<p>Children understand sharing and halving in <u>equal</u> groups in pictures.</p> 	Verbal recall in stem sentences
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<p>1/ 2</p>	<p>Division as sharing</p>	<p>Practical division (as grouping) of buttons, wheels etc. to see how many, for example cars, can be constructed. Focusing on equal groups/lots of 4 wheels per car.</p>  <p>Would move on to represent in a part whole model.</p>	<p>Children become confident with the image of sharing:</p>  <p>Again, to be represented in a part whole model.</p> 	<p>Children explain there are 15 eggs shared with 5 people.</p> $15 \div 5 = 3$
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<p>1/ 2</p>	<p>Division as grouping</p>	<p>Divide quantities into equal groups. Use cubes, counters, objects, Numicon, place value counters or bead strings to aid understanding.</p> 	<p>Use a number line to show jumps in groups. The number of jumps equals the number of groups.</p>  <p>Think of the bar as a whole. Split it into the number of groups you are dividing by and work out how many would be within each group.</p>  	<p>$28 \div 7 = 4$</p> <p>Divide 28 into 7 groups. How many are in each group</p>
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3

Division as grouping and arrays

Division with a remainder

Use physical objects to show division. Use tens and ones counters to show division

$$62 \div 2$$

Divide objects into groups and see how much is left over.

There are 3 whole squares, with 1 left over.

Children continue to use drawn diagrams with dots or circles to help them divide numbers into equal groups.

Encourage moving to counting multiples to divide more efficiently.

Use place value counters to divide into groups:

Problem Solving
Cameron uses place value counters to help him calculate $66 \div 3$

Tens	Ones
10 10 10	10 10 10
10 10 10	10 10 10
10 10 10	10 10 10

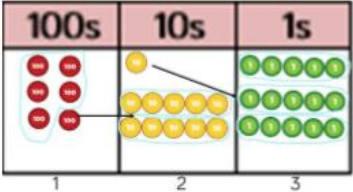
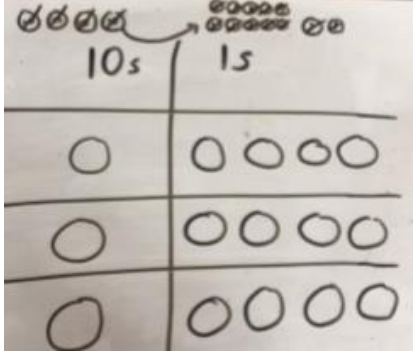
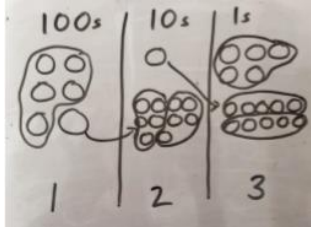
He gets the answer of 13.
Is he correct?
Use place value counters to explain how you know.

Problem Solving
Carson uses place value counters to help him calculate $93 \div 3$

Tens	Ones
10 10 10	10 10 10
10 10 10	10 10 10
10 10 10	10 10 10

He gets the answer of 22.
Is he correct?
Use place value counters to explain how you know.

No abstract method covered as the concept of division is explored verbally and physically.








4	Short division	<p>Sharing using place value counters: Short division: $615 \div 5$</p>  <ol style="list-style-type: none"> 1. Make 615 with place value counters. 2. How many groups of 5 hundreds can you make with 6 hundred counters? 3. Exchange 1 hundred for 10 tens. 4. How many groups of 5 tens can you make with 11 ten counters? 5. Exchange 1 ten for 10 ones. 6. How many groups of 5 ones can you make with 15 ones? 	<p>Representing this pictorially:</p>  <p>Short division:</p> 	<p>Expressing what is happening using short numerical expressions:</p> $42 \div 3$ $42 = 30 + 12$ $30 \div 3 = 10$ $12 \div 3 = 4$ $10 + 4 = 14$ <p>Introduce short division: Begin with divisors that divide equally with no remainder</p> $\begin{array}{r} 123 \\ 5 \overline{) 615} \end{array}$
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5	Short division with larger numbers	<div><div><div><div><div>1000s</div><div>100s</div><div>10s</div><div>1s</div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div></div></div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></div><div></div><div></div><div></div></div><div><div><div></d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To ensure the children gain fluency and competence with each operation, we will provide them with a wide range of procedural and conceptual variation questions that will strengthen and develop the depth of each child's understanding of each method and process.

Examples of Conceptual Variation Ideas for Each Operation:

Addition:	Conceptual variation; different ways to ask children to solve $21 + 34$			
Subtraction:	Conceptual variation; different ways to ask children to solve $391 - 186$			
Multiplication:	Conceptual variation; different ways to ask children to solve 6×23			

Division:	Conceptual variation; different ways to ask children to solve $615 \div 5$								
	<p>Using the part whole model below, how can you divide 615 by 5 without using short division?</p> 	<p>I have £615 and share it equally between 5 bank accounts. How much will be in each account?</p> <p>615 pupils need to be put into 5 groups. How many will be in each group?</p>	<div><div>$5 \overline{)615}$</div><div>$615 \div 5 =$ <div><div></div></div>$= 615 \div 5$</div></div> <div><p>What is the calculation? What is the answer?</p><table><tr><th>100s</th><th>10s</th><th>1s</th></tr><tr><td></td><td></td><td></td></tr></table></div>	100s	10s	1s			
100s	10s	1s							
