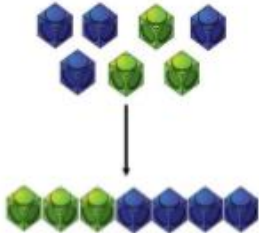
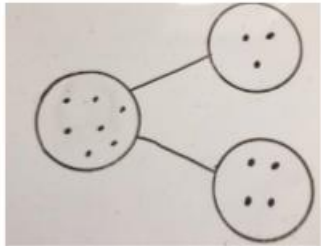
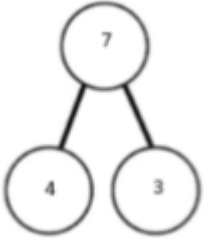
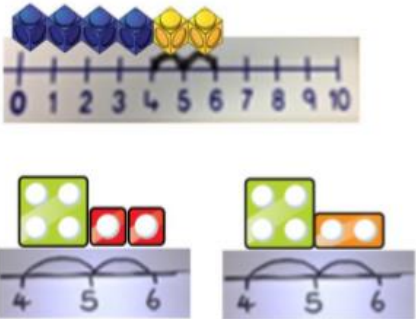
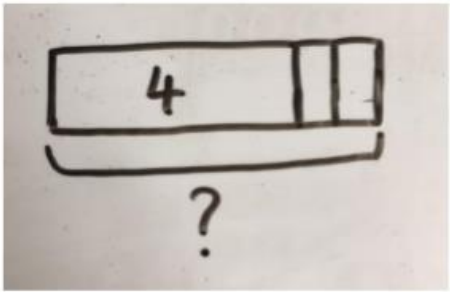





Barnham CEVC Primary School Calculation Policy

Addition

Key Vocabulary: sum, total, parts and wholes, plus, add, altogether, more, 'is equal to', 'is the same as', regroup, exchange

Year Group Guidance	Concrete	Pictorial	Abstract
EYFS Year 1	<p>Combining two parts to make a whole (other resources can be used)</p> 	<p>Children to represent the cubes using dots or crosses; they can use the part, part whole model for this.</p> 	<p>The part, part whole model can be used with numbers; this is the abstract form.</p> 
Year 1 Year 2	<p>Counting on using cubes, Numicon and number lines.</p> 	<p>A bar model which encourages children to count on rather than count all.</p> 	<p>The abstract number line:</p> <ul style="list-style-type: none">• What is 2 more than 4?• What is the sum of 2 and 4?• What is the total of 4 and 2?• $4 + 2 =$ 

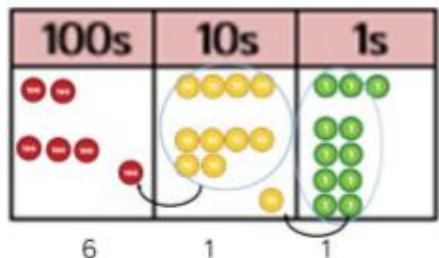


<p>Year 2 Year 3</p>	<p>Regrouping to make 10; using ten frames, counters, cubes, straws or Numicon.</p> <p>6 + 5</p>	<p>The children can draw the ten frames using the images of counters.</p>	<p>Children to develop an understanding of equality.</p> $6 + \square = 11$ $6 + 5 = 5 + \square$ $6 + 5 = \square + 4$
<p>Year 3 Year 4</p>	<p>TO + O using base 10. Continue to develop the children's understanding of partitioning and place value when adding numbers. For example: 41 + 8</p>	<p>Children to represent the base 10 using line and dots/crosses.</p>	<p>Using the part, part whole represent to support forming column addition.</p> <p>41 + 8</p> <p>1 + 8 = 9 40 + 9 = 49</p>
<p>Year 4 Year 5</p>	<p>TO + TO using base 10. The children should use this concrete apparatus to develop their understanding of partitioning and place value when adding.</p> <p>36 + 25</p>	<p>Children to be able to represent the base 10 in a place value chart using lines and dots.</p>	<p>Look for ways to make 10.</p> <p>36 + 25 =</p> <p>30 + 20 = 50 5 + 5 = 10 50 + 10 + 1 = 61</p> <p>36</p> <p>Formal method:</p> $\begin{array}{r} +25 \\ 36 \\ \hline 61 \\ 1 \end{array}$

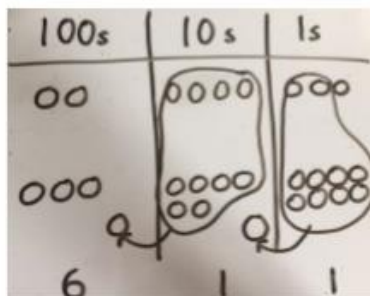


Year 5
Year 6

Use of place value counters to add HTO + TO, HTO + HTO etc. When there are 10 ones in the 1s column, we exchange for 1 ten. When there are 10 tens in the 10s column, we exchange for 1 hundred.

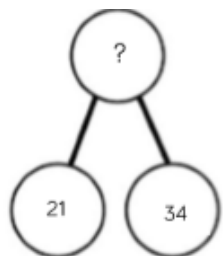


Children to be able to represent the counters in a place value chart, circling when they make an exchange.



$$\begin{array}{r} 243 \\ +368 \\ \hline 611 \\ \hline 11 \end{array}$$

Conceptual Variation: Different ways to ask children to solve 21 + 34



?	
21	34

Word problems:
In year 3, there are 21 children and in year 4, there are 34 children.
How many children in total?

$21 + 34 = 55$. Prove it

21

+34

—

$21 + 34 =$

 = $21 + 34$

Calculate the sum of twenty-one and thirty-four.



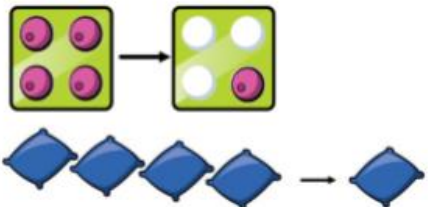
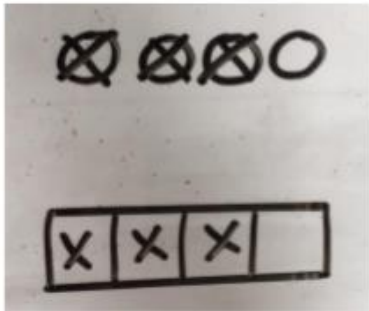
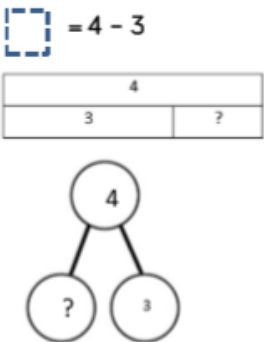
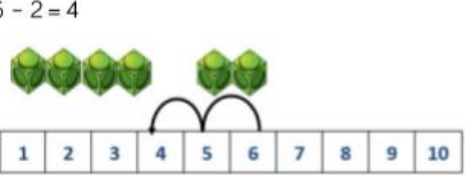
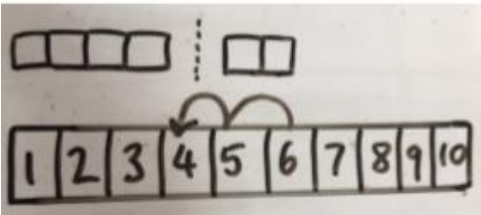
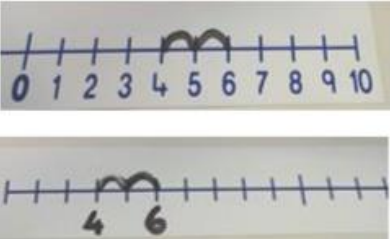
Missing digit problems:

10s	1s
● ●	●
● ● ●	?
?	5

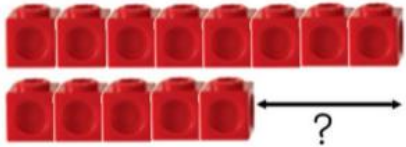
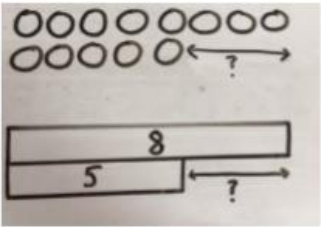
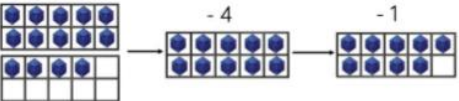

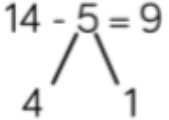
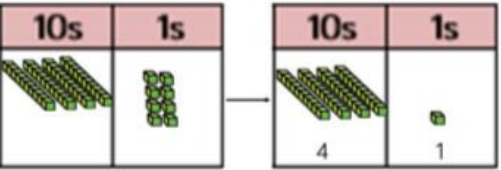
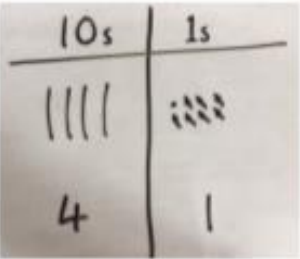
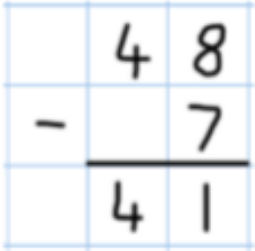


Subtraction

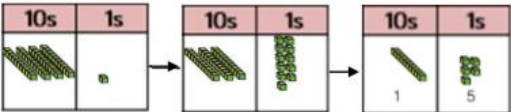
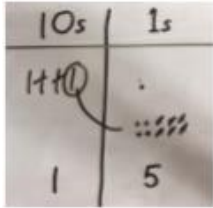
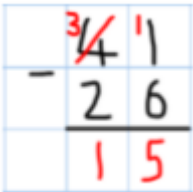
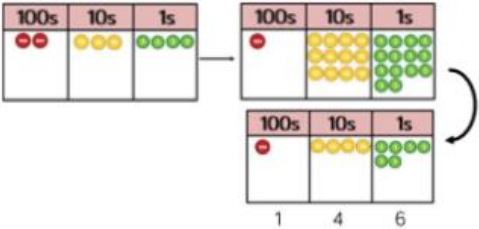
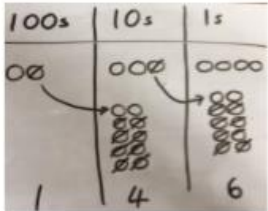
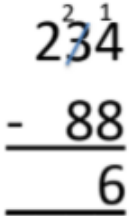
Key Vocabulary: take away, less than, the difference, subtract, minus, fewer, decrease, count on, change

Year Group Guidance	Concrete	Pictorial	Abstract
<p>EYFS Year 1</p>	<p>Physically taking away and removing objects from a whole. (ten frames, Numicon, cubes and other objects).</p> <p>$4 - 3 = 1$</p> 	<p>Children to draw the concrete resources they are using and cross out the correct amount. The bar model could also be used for this.</p> 	<p>$4 - 3 =$</p> <p>$\square = 4 - 3$</p> 
<p>Year 1 Year 2</p>	<p>Counting back. Children should be able to use number lines or number tracks to count back.</p> <p>$6 - 2 = 4$</p> 	<p>Children to represent counting back pictorially. The bar model is good for supporting this outcome.</p> 	<p>Children to represent the calculation on a number line or number track and show their jumps. Encourage children to use an empty number line.</p> 




<p>Year 2 Year 3</p>	<p>Finding the difference. Children should do this using cubes, Numicon, rods or other objects),</p> <p>Calculate the difference between 8 and 5.</p> 	<p>Children to draw the concrete objects which they have used or use the bar model to find the difference.</p> 	<p>Find the difference between two numbers. For example: $8 - 5 =$</p> <p>$8 - 5$, the difference is <input type="text"/></p> <p>Children to explore why $9 - 6 = 8 - 5 = 7 - 4$ have the same difference.</p>
<p>Year 2 Year 3</p>	<p>Making 10 using the ten frames. For example, $15 - 5$, you can show how bridging 10 affects the number.</p> 	<p>Children to present the ten frame pictorially and discuss what they did to make 10.</p> 	<p>Children to show how they can make 10 by partitioning the subtrahend.</p> $14 - 5 = 9$  $14 - 4 = 10$ $10 - 1 = 9$
<p>Year 3 Year 4</p>	<p>Column method using base 10. For example: $48 - 7 =$</p> 	<p>Children to represent the calculation using base ten pictorially.</p> 	<p>Use of column method for subtractions.</p> 



<p>Year 4 Year 5</p>	<p>Column method using base 10 and having to exchange. For example: $41 - 26 =$</p> 	<p>Children to represent the base 10 pictorially, remembering to show the exchange.</p> 	<p>Formal column method. Children must understand that when they have exchanged the 10, they still have 41 because $41 = 30 + 11$</p> 
<p>Year 5 Year 6</p>	<p>Column method using place value counters. $234 - 88 =$</p> 	<p>Represent the place value counters pictorially; remember to show what has been exchanged.</p> 	<p>Formal column method. Children must understand what has happened when they have crossed out digits.</p> 

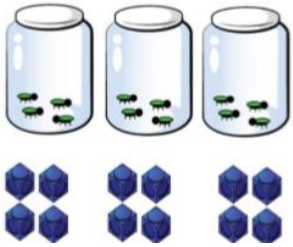
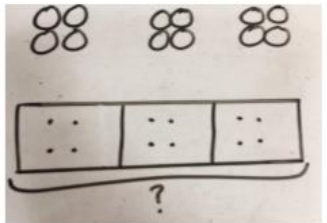

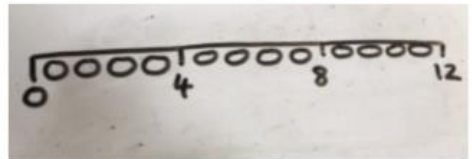
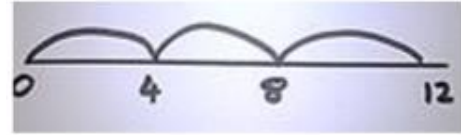
Conceptual Variation: Different ways to ask children to solve 391 - 186

	<p>Raj spent £391, Timmy spent £186. How much more did Raj spend?</p> <p>Calculate the difference between 391 and 186.</p>	<p>$\square = 391 - 186$</p> $\begin{array}{r} 391 \\ -186 \\ \hline \end{array}$ <p>What is 186 less than 391?</p>	<p>Missing digit calculations</p> $\begin{array}{r} 39\square \\ -\square\square 6 \\ \hline \square 05 \end{array}$
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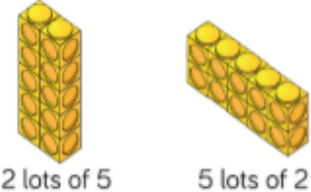
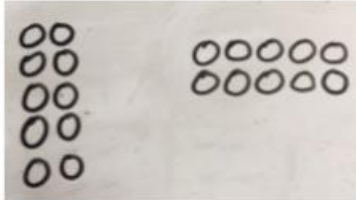
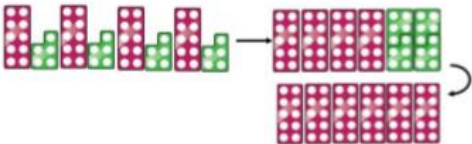
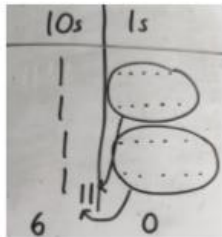
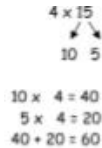
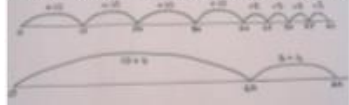
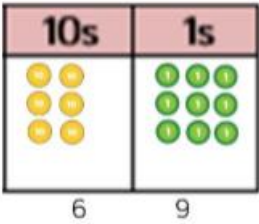
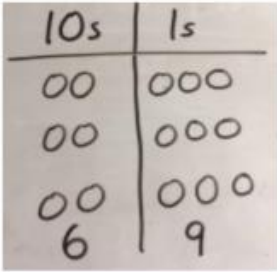


Multiplication

Key Vocabulary: double, times, multiplied by, the product of, groups of, lots of, equal groups.

Year Group Guidance	Concrete	Pictorial	Abstract
EYFS Year 1	<p>Repeated grouping/repeated addition using objects. There are 3 equal groups, with 4 in each group.</p> 	<p>Children to represent the practical resources in a picture and use a bar model.</p> 	<p>Writing multiplication number sentences in the abstract form.</p> $3 \times 4 =$ $4 + 4 + 4 =$
Year 1 Year 2	<p>Repeated groups. Number lines to show repeated groups.</p> 3×4 	<p>Children to represent this pictorially using a number line.</p> 	<p>Abstract number line showing the jumps. This should be a blank number line.</p> $3 \times 4 = 12$ 



<p>Year 2 Year 3</p>	<p>Use arrays to illustrate commutativity counters and other objects can also be used. $2 \times 5 = 5 \times 2$</p> 	<p>Children to represent the arrays pictorially.</p> 	<p>Children to be able to use an array to write a range of calculation</p> $10 = 2 \times 5$ $5 \times 2 = 10$ $2 + 2 + 2 + 2 + 2 = 10$ $10 = 5 + 5$
<p>Year 2 Year 3</p>	<p>Partition to multiply using Numicon, base 10 or rods. For example: $4 \times 15 =$</p> 	<p>Children to represent the concrete manipulatives pictorially.</p> 	<p>Children to be encouraged to show the steps they have taken.</p>  <p>A number line can also be used</p> 
<p>Year 3 Year 4</p>	<p>Formal column method with place value counters (bas 10 can also be used) $3 \times 32 =$</p> 	<p>Children to represent the counters pictorially.</p> 	<p>Children to record what it is they are doing to show understanding.</p> $3 \times 23 \quad 3 \times 20 = 60$ $20 \quad 3 \quad 3 \times 3 = 9$ $60 + 9 = 69$ $\begin{array}{r} 23 \\ \times 3 \\ \hline 69 \end{array}$

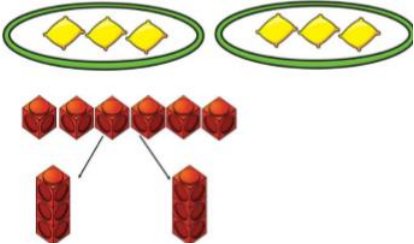
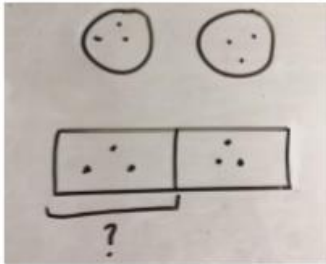

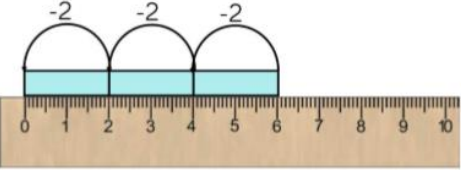
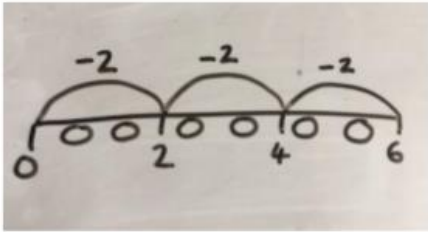
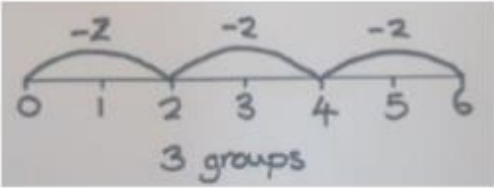


<p>Year 4 Year 5</p>	<p>Formal column method with place value counters. $6 \times 23 =$</p>	<p>Children to represent the counters/base 10, pictorially.</p>	<p>The formal written method.</p> $6 \times 23 =$ $\begin{array}{r} 23 \\ \times 6 \\ \hline 138 \\ \hline 11 \end{array}$
<p>Year 5 Year 6</p>	<p>When children start to multiply $3d \times 3d$ and $4d \times 2d$, they should be confident with the abstract of long multiplication:</p> <p>To get 744 children have solved 6×124 To get 2480 they have solved 20×124</p>	<p>Answer: 3224</p>	
<p>Conceptual Variation: Different ways to ask children to solve 6×23</p>			
	<p>Mai had to swim 23 lengths, 6 times a week. How many lengths did she swim in one week?</p> <p>With the counters, prove that $6 \times 23 = 138$</p>	<p>Find the product of 6 and 23</p> $6 \times 23 =$ $\square = 6 \times 23$ $\begin{array}{r} 6 \quad 23 \\ \times 23 \\ \hline \end{array}$ $\begin{array}{r} 6 \quad 23 \\ \times 6 \\ \hline \end{array}$	<p>What is the calculation? What is the product?</p>


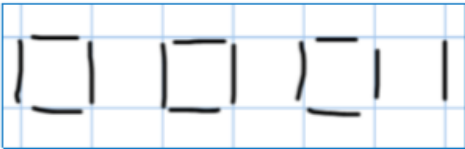
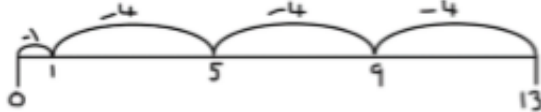
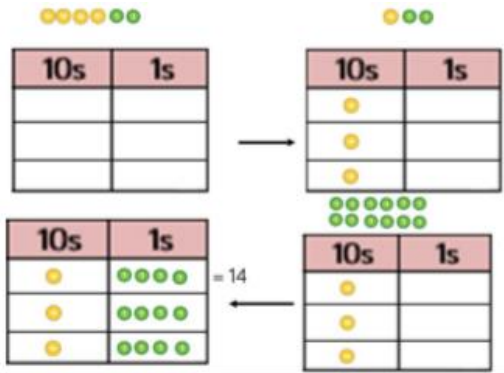
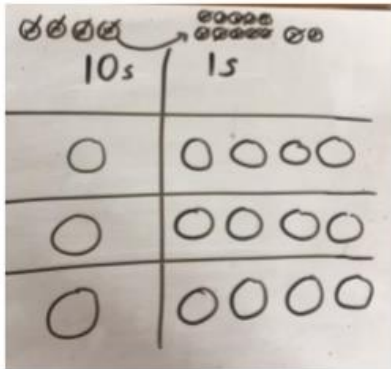


Division

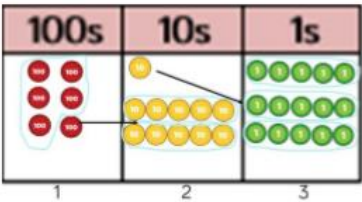
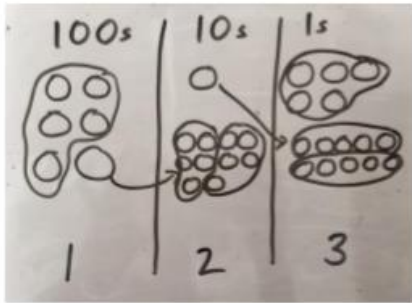
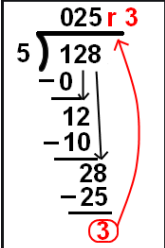

Key Vocabulary: share, group, divided by, halved, divide, each, equal groups, repeated subtraction

Year Group Guidance	Concrete	Pictorial	Abstract
<p>EYFS Year 1</p>	<p>Sharing using a range of objects. For example: $6 \div 2 =$</p> 	<p>Represent sharing pictorially.</p> 	<p>Abstract form: $6 \div 2 =$</p>  <p>Children should also be encouraged to use their 2 times tables facts.</p>
<p>Year 1 Year 2</p>	<p>Repeated subtraction. Using number lines or rulers.</p>  <p>Children need to understand the term 'groups of'</p>	<p>Children to represent repeated addition (groups of) pictorially.</p> 	<p>Use an abstract number line to represent the equal groups that have been subtracted.</p> 



<p>Year 2 Year 3</p>	<p>2d ÷ 1d with remainders, using lollipop sticks or rods. For example: $13 \div 4 =$</p> <p>Use of lollipop sticks to form wholes- squares are made because we are dividing by 4.</p>  <p>There are 3 whole squares, with 1 left over.</p>	<p>Children to represent the lollipop sticks pictorially.</p>  <p>There are 3 whole squares, with 1 left over.</p>	<p>$13 \div 4 = 3$ remainder 1 Children should be encouraged to represent repeated addition on a number line; they could use their times tables to support</p> <p>'3 groups of 4, with 1 left over'</p> 
<p>Year 2 Year 3</p>	<p>Grouping using place value counters. $42 \div 3 = 14$</p> 	<p>Children to represent the place value counters pictorially.</p> 	<p>Children to be able to make sense of the place value counters and write calculations to show the process.</p> $42 \div 3$ $42 = 30 + 12$ $30 \div 3 = 10$ $12 \div 3 = 4$ $10 + 4 = 14$



<p>Year 4 Year 5</p>	<p>Short division using place value counters to group. For example: $615 \div 5 =$</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>Children to represent the place value counters pictorially.</p> 	<p>Children to use the formal written method for short division;</p> $5 \overline{) 615}$
<p>Year 6</p>	<p>When children start to divide $3d$ by $2d$ and $4d$ by $2d$, they should be confident with the abstract of long division.</p>		
<p>Conceptual Variation: Different ways to ask children to solve $615 \div 5$</p>			
<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>	$5 \overline{) 615}$ <p>$615 \div 5 =$</p> <p>$\square = 615 \div 5$</p>	<p>What is the calculation? What is the answer?</p> 