

This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.

ST MARGARET'S COLLIER STREET CE SCHOOL

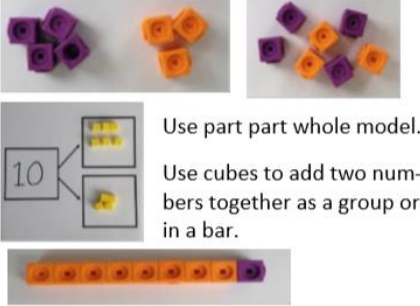
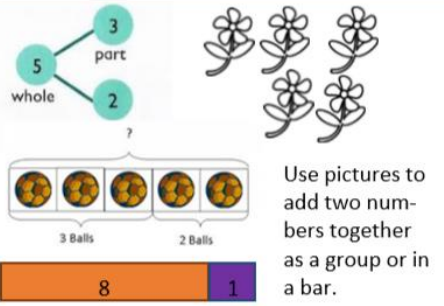
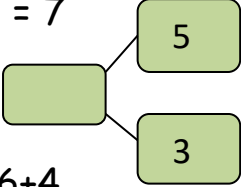
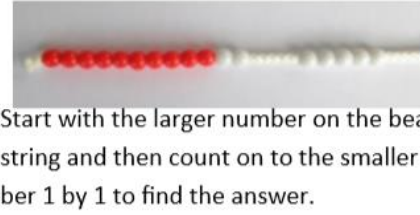
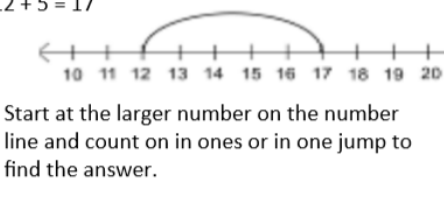
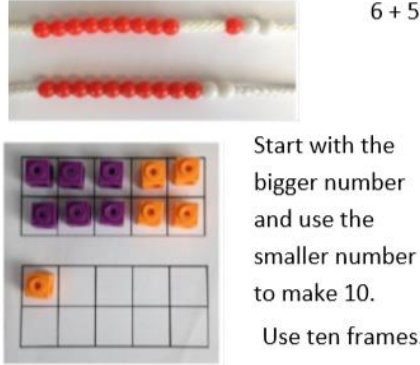
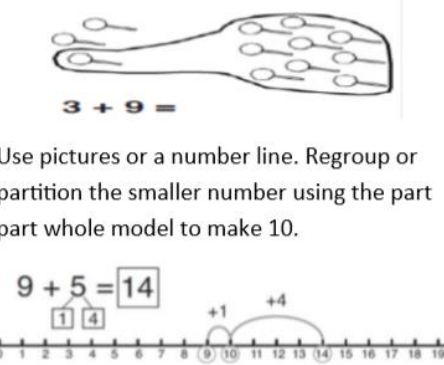
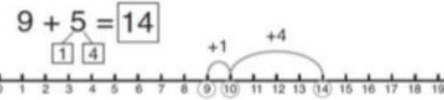
CALCULATION
POLICY

Review: October 2021


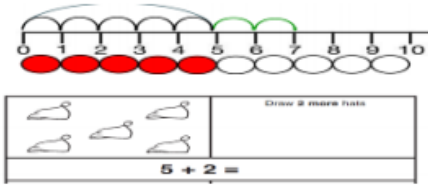
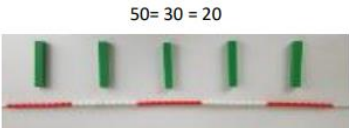

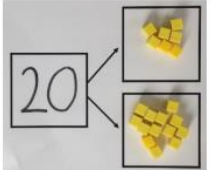
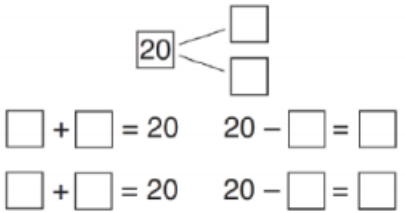
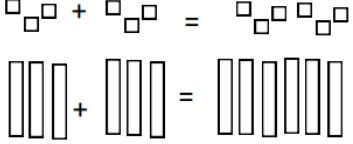
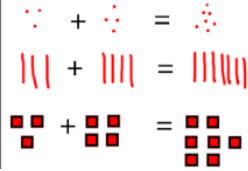
Agreed by Governors: November 2021

Next Review: April 2024



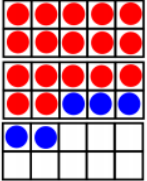
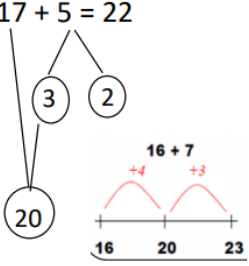

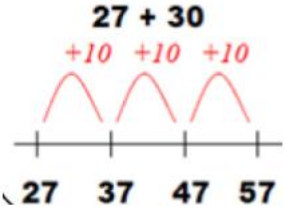

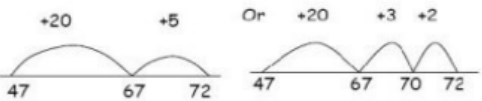
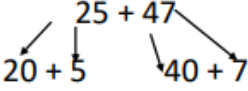
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Year 1			
Objective and Strategy	Concrete	Pictorial	Abstract
Combing two parts to make a part-whole model	 <p>Use part part whole model. Use cubes to add two numbers together as a group or in a bar.</p>	 <p>Use pictures to add two numbers together as a group or in a bar.</p>	$4 + 3 = 7$  <p>$10 = 6 + 4$ Use the part whole model diagram as shown to move into the abstract.</p>
Starting at the bigger number and counting on	 <p>Start with the larger number on the bead string and then count on to the smaller number 1 by 1 to find the answer.</p>	$12 + 5 = 17$  <p>Start at the larger number on the number line and count on in ones or in one jump to find the answer.</p>	$5 + 12 = 17$ Place the larger number in your head and count on the smaller number to find your answer.
Regrouping to make 10 (Vital small step for column addition later)	 <p>$6 + 5 = 11$</p> <p>Start with the bigger number and use the smaller number to make 10. Use ten frames.</p>	 <p>$3 + 9 =$</p> <p>Use pictures or a number line. Regroup or partition the smaller number using the part part whole model to make 10.</p> <p>$9 + 5 = 14$</p> 	$7 + 4 = 11$ If I am at seven, how many more do I need to make 10. How many more do I add on now?

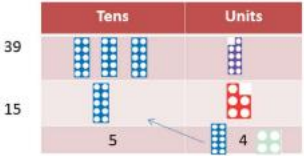
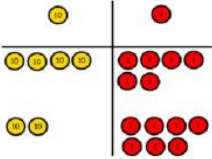
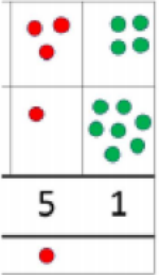


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<p>Represent and use number bonds and subtraction facts to 20</p>	 <p>2 more than 5.</p>		<p>Emphasis on mathematical vocabulary</p> <ul style="list-style-type: none"> • 3 more than 4 is equal to 7 • 3 more than 4 is 7 • 7 is 3 more than 4
<p>Year 2 Addition</p>			
<p>Objective and Strategy</p>	<p>Concrete</p>	<p>Pictorial</p>	<p>Abstract</p>
<p>Adding multiples of ten</p>	 <p>50 = 30 + 20</p> <p>Model using dienes and bead strings</p>	 <p>3 tens + 5 tens = ____ tens</p> <p>30 + 50 = _____</p> <p>Use representations for base ten</p>	<p>20 + 30 = 50</p> <p>70 = 50 + 20</p> <p>40 + ____ = 60</p> <p>Vary the position of the equals sign and missing number problems</p>
<p>Use known number facts</p> <p><i>Part whole model</i></p>	 <p>Explore ways of making numbers up to 20</p>		<p>____ + 1 = 16</p> <p>1 + ____ = 16</p> <p>16 - 1 =</p> <p>16 - ____ = 1</p>
<p>Using known facts</p>		 <p>Draw representations of H, T and O</p>	<p>3 + 4 = 7</p> <p>Leads to 30 + 40 = 70</p> <p>Leads to 300 + 400 = 700</p>

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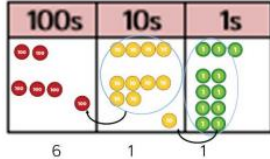
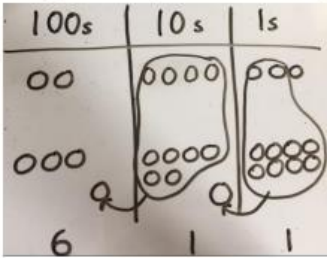
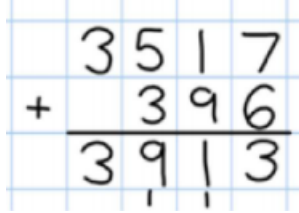
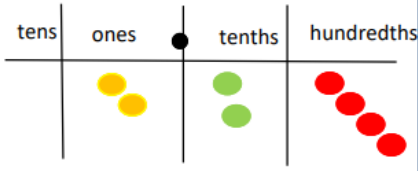
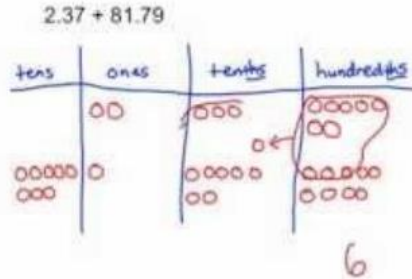
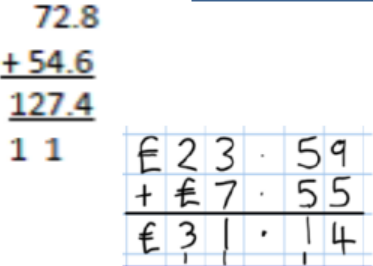
<p>Bar model</p>	 <p>$3 + 4 = 7$</p>	 <p>$7 + 3 = 10$</p>	<table border="1" data-bbox="1547 197 1816 288"> <tr> <td>23</td> <td>24</td> </tr> <tr> <td colspan="2"> </td> </tr> </table> <p>$23 + 24 = 47$</p>	23	24		
23	24						
<p>Add a two-digit number and ones</p>	 <p>$17 + 5 = 22$ Use ten frame to make 'magic ten'</p> <p>Children explore the pattern. $17 + 5 = 22$ $27 + 5 = 32$</p>	<p>Use part part whole and number line to model.</p> <p>$17 + 5 = 22$</p> 	<p>$17 + 5 = 22$</p> <p>Explore the related facts</p> <p>$17 + 5 = 22$ $5 + 17 = 22$ $22 - 17 = 5$ $22 - 5 = 17$</p> <table border="1" data-bbox="1868 568 2051 639"> <tr> <td colspan="2">22</td> </tr> <tr> <td>17</td> <td>5</td> </tr> </table>	22		17	5
22							
17	5						
<p>Add a two-digit number and tens</p>	 <p>$25 + 10 = 35$ Explore the ones digit did not change</p>	<p>$27 + 30$</p> 	<p>$27 + 10 = 37$ $27 + 20 = 47$ $27 + \underline{\quad} = 57$</p>				
<p>Add two two-digit numbers</p>	 <p>Model using dienes, place value counters and numicon</p>	 <p>Use number line and bridge ten using part whole model</p>	 <p>$20 + 40 = 60$ $5 + 7 = 12$ $60 + 12 = 72$</p>				

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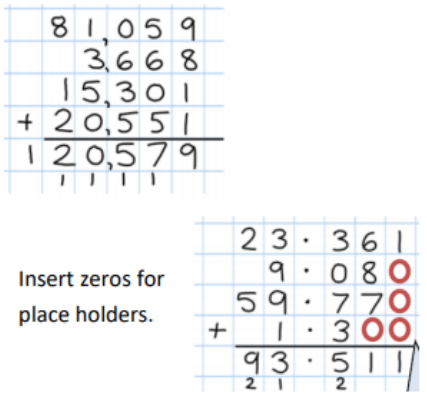
<p>Column addition with exchanging</p>	 <p>Exchange ten ones for a ten. Model using place value counters or numicon.</p>  <p>$46 + 27 = 73$</p>	 <p>Draw a representation of the grid to support understanding, carrying the ten underneath the line after exchanging</p>	<p>$500 + 30 + 6$ $80 + 5$</p> <hr/> <p>$500 + 110 + 11 = 621$</p> <p>Start by partitioning the numbers before formal column to show the exchange.</p> $\begin{array}{r} 536 \\ + 85 \\ \hline 621 \\ 11 \end{array}$
<p>Estimate the answers questions and use inverse operations to check answers</p>	 <p>Estimating $98 + 17 = ?$</p> <p>$100 + 20 = 120$</p>	 <p>Use a number line to illustrate estimation</p>	<p>Building up known facts and using them to illustrate the inverse and to check answers:</p> <p>$98 + 17 = 115$ $17 + 98 = 115$</p> <p>$115 - 98 = 17$ $115 - 17 = 98$</p>

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Year 4 - 6 Addition

Objective and Strategy	Concrete	Pictorial	Abstract
<p>Year 4 - add numbers with up to four-digits</p>	<p>Continue to use dienes and place value counters to add, exchanging ten ones for a ten, ten tens for a hundred and ten hundreds for a thousand</p> 	 <p>Draw representation using place value grid</p>	 <p>Continue to exchange and carry forward tens and hundreds</p> <p>Relate to money and measures</p>
<p>Year 5 - add numbers with more than four-digits</p> <p>Add decimal with two decimal places, including money</p>	<p>Introduce decimal place value counters and model exchange for addition</p> 		

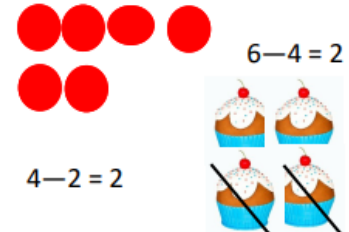
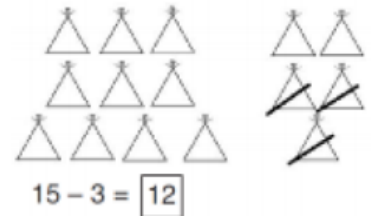
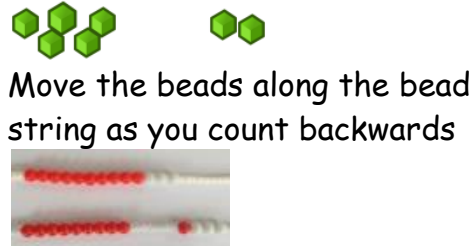
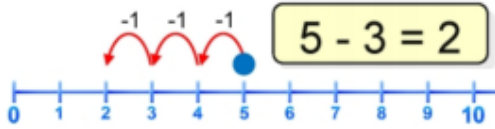
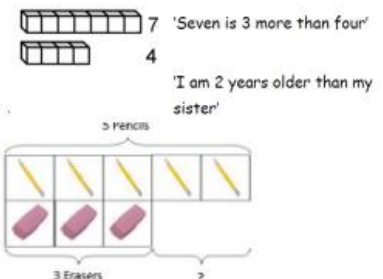
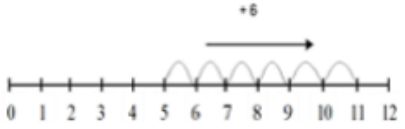
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<p>Year 6 - add several numbers of increasing complexity</p> <p>Including adding money, measure, decimals with different number of decimal points</p>	<p>As Year 5</p>	<p>As Year 5</p>	 <p>Insert zeros for place holders.</p>
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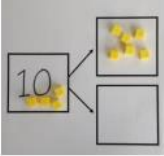
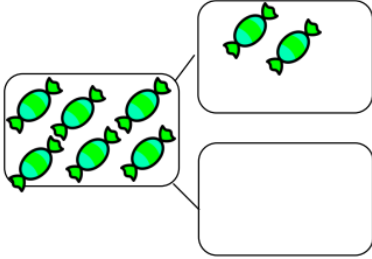
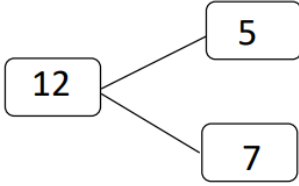

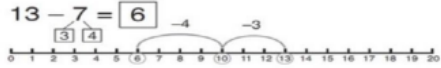


Vocabulary

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

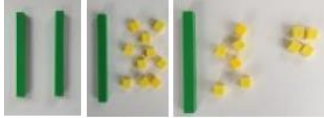
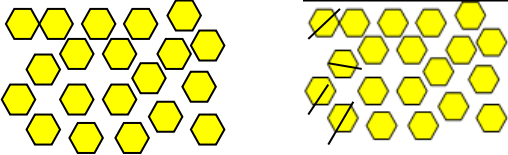


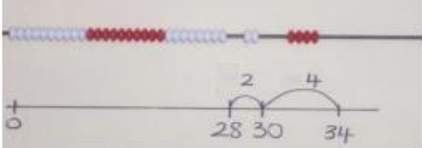
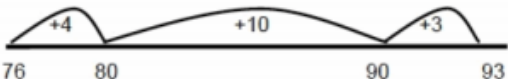
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Year 1			
Objective and Strategy	Concrete	Pictorial	Abstract
Take away ones	<p>Use physical objects, counters, cubes, etc to show how objects can be taken away</p>  <p>6 - 4 = 2</p> <p>4 - 2 = 2</p>	<p>Cross out drawn objects to show what has been taken away</p>  <p>15 - 3 = 12</p>	<p>9 - 4 = 5</p> <p>17 - 8 = 9</p>
Counting back	<p>Move objects away from the group, counting backwards</p>  <p>Move the beads along the bead string as you count backwards</p>	<p>Count backwards in ones using a number line</p>  <p>5 - 3 = 2</p>	<p>Put 14 in your head, count back 5. What number are you at?</p>
Find the difference	<p>Compare objects and amounts</p>  <p>Lay objects to represent bar model</p>	<p>Count on using a number line to find the difference</p> 	<p>Sarah has 11 apples and her brother has 5. How many more does Sarah have than her brother?</p>




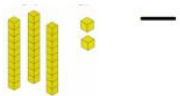
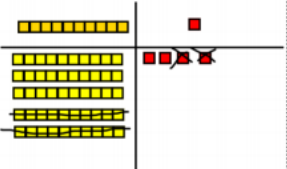
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<p>Represent and use number bonds and related subtraction facts within 20</p> <p><i>Part whole model</i></p>	 <p>Link to addition. Use part whole model to model the inverse.</p> <p>If 10 is the whole and 6 is one of the parts, what is the other part?</p> <p>$10 - 6 = 4$</p>	 <p>Use pictorial representations to show the part</p>	<p>Move to using numbers within the part whole model</p> 		
<p><i>Make 10</i></p>	<p>$14 - 5 = 9$</p>  <p>Make 14 on the ten frame. Take 4 away to make 10, then take one more away so that you have taken 5</p>	<p>$13 - 7$</p>  <p>Jump back 3 first, then another 4. Use 10 as the stopping point.</p>	<p>$17 - 9$</p> <p>How many do we take off first to get to 10? How many left to take off?</p>		
<p><i>Bar model</i></p>	 <p>$5 - 2 = 3$</p>		<table border="1" data-bbox="1648 927 1966 991"> <tr> <td>8</td> <td>2</td> </tr> </table> <p>$10 = 8 + 2$ $10 = 2 + 8$ $10 - 2 = 8$ $10 - 8 = 2$</p>	8	2
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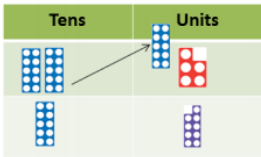
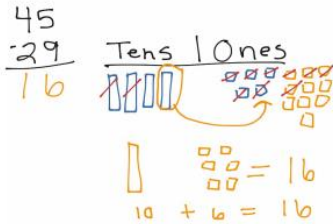


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Year 2			
Objective and Strategy	Concrete	Pictorial	Abstract
Exchange a ten into ten ones	Use place value chart to show how to exchange a ten for 10 ones 	 $20 - 4$	$20 - 4 = 16$
Partition to subtract without exchanging	$34 - 13 = 21$ Use Dienes to show how to partition the number when subtracting without exchanging 	Draw representations of Dienes and cross off  $43 - 21 = 22$	$43 - 21 = 22$
Make ten strategy <i>Progression should be crossing one ten, crossing more than one ten, crossing the hundreds.</i>	 $34 - 28$ Use a bead string to model counting to the next ten and the rest	 $76 \quad 80 \quad 90 \quad 93$ 'counting on' to find 'difference' Use a number line to count on to the next ten and then the rest	$93 - 76 = 17$

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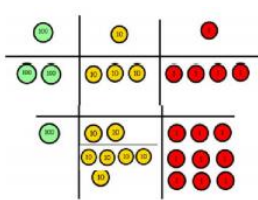
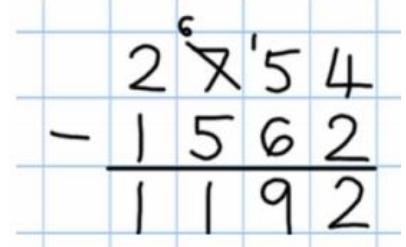
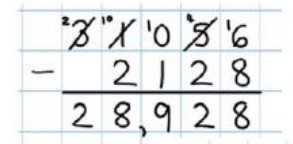
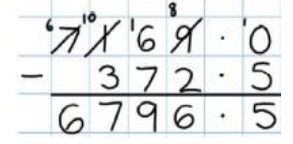
Year 3			
Objective and Strategy	Concrete	Pictorial	Abstract
Subtract numbers mentally, including: <ul style="list-style-type: none"> • Three digit number + ones • Three digit number + tens • Three digit number + hundreds 			$678 = ? - 1$ $688 - 10 = ?$ $678 = ? - 100$ <p style="text-align: center;">Vary the position of the answers and questions. Expose children to missing number questions and vary the missing part of the calculation.</p>
Column subtraction without exchanging	 <p style="text-align: center;">47 - 32</p>  <p style="text-align: center;">Use Dienes or Numicon to model</p>	Draw representations to support understanding  <div style="display: inline-block; vertical-align: middle; margin-left: 20px;"> <p style="text-align: center;">Calculations</p> $\begin{array}{r} 54 \\ - 22 \\ \hline 32 \end{array}$ </div>	Intermediate step may be needed to lead to clear subtraction understanding $47 - 24 = 23$ <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> $\begin{array}{r} 40 + 7 \\ - 20 + 4 \\ \hline 20 + 3 \end{array}$ </div> <div style="border: 1px solid black; padding: 5px; text-align: center;"> $\begin{array}{r} 32 \\ - 12 \\ \hline 20 \end{array}$ </div> </div>

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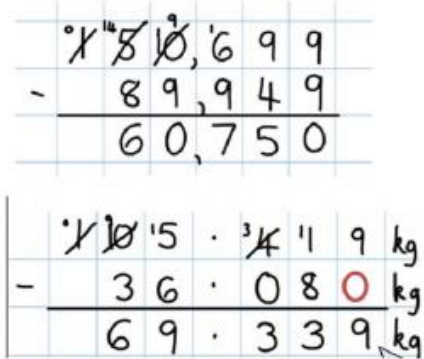
<p>Column subtraction with exchanging</p>	<p>Begin with Dienes or Numicon. Move to place value counters, modelling the exchange of a ten into 10 ones.</p> 	<p>Draw Dienes or place value counters and cross off</p> 	 <p>Begin by partitioning into pv columns</p>  <p>Then move to formal method.</p>
Empty space for further content			

This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.

Year 4 - 6 Addition

Objective and Strategy	Concrete	Pictorial	Abstract
<p>Subtracting tens and ones</p> <p>Year 4 subtract with up to four-digits</p> <p><i>Introduce decimal subtraction through context of money</i></p>	<p>234 - 179</p>  <p>Model process of exchange using Numicon, Dienes and then move to place value counters</p>	<p>Draw place value counters and show exchange - see Year 3</p>	
<p>Year 5 - subtract with at least four-digits, including money and measures</p> <p><i>Subtract with decimal values, including mixtures of integers and decimals and aligning the decimal</i></p>	<p>As Year 4</p>	<p>Draw place value counters and show exchange - see Year 3</p>	 <p>Use zeros for placeholder s.</p> 

This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.

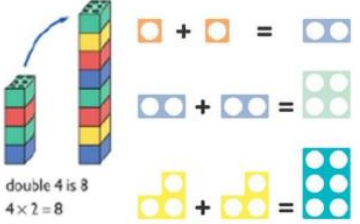

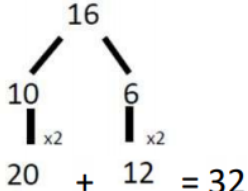
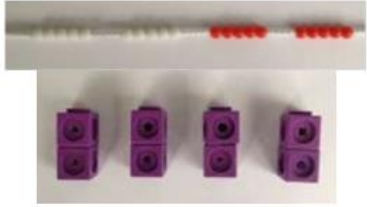

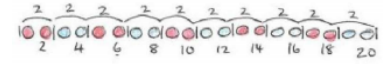
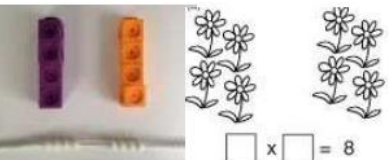
Year 6 - subtract with increasingly large and more complex and decimal values			
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Vocabulary

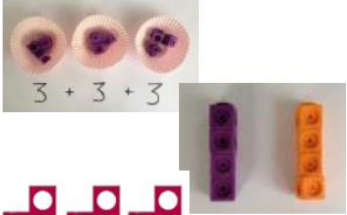
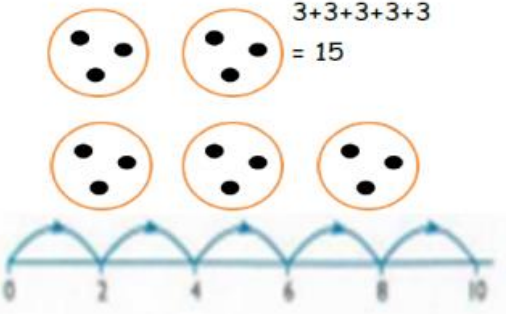

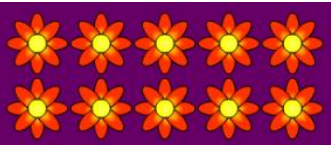
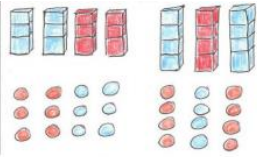
Key vocabulary : take away, less than, the difference, subtract, minus, fewer, decrease, '7 take away 3, the difference is four'

This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.

Year 1 Multiplication

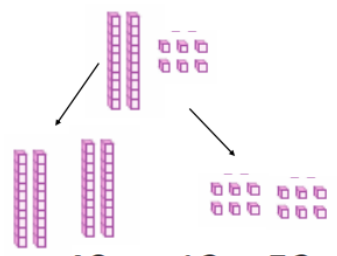
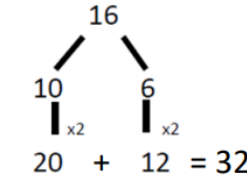


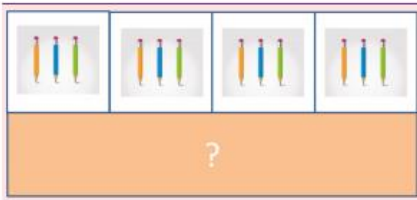



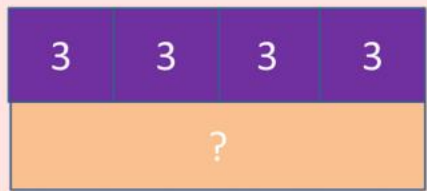
Objective and Strategy	Concrete	Pictorial	Abstract
<p>Doubling</p>	<p>Use practical activities using manipulatives including cubes and Numicon to demonstrate doubling</p> 	<p>Draw pictures to show how to double numbers</p> <p>Double 4 is 8</p> 	<p>Partition a number and then double each part before recombining it back together</p> 
<p>Counting in multiples</p>		 <p>Make representations to show counting in multiples</p> 	<p>Count in multiples of a number aloud</p> <p>Write sequences with multiples of numbers</p> <p>2, 4, 6, 8, 10</p> <p>5, 10, 15, 20, 25, 30</p>
<p>Making equal groups and counting the total</p>	<p>Use manipulatives to create equal groups</p>  <p><input type="text"/> x <input type="text"/> = 8</p>	<p>Draw and make representations</p>	<p>$2 \times 4 = 8$</p>

This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.






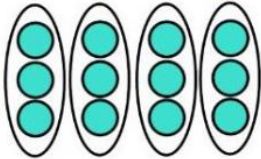
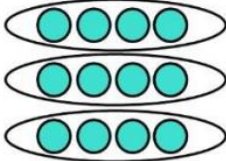


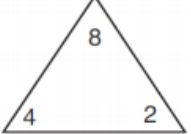
<p>Repeated addition</p>	 <p>Use different objects to add equal groups</p>	<p>Use pictures including number lines to solve problems</p> 	<p>Write addition sentences to describe objects and pictures</p> 
<p>Understanding arrays</p>	<p>Use objects laid out in arrays to find the answers to 2 lots of 5, 3 lots of 2 etc.</p> 	<p>Draw representations of arrays to show understanding</p> 	$3 \times 2 = 6$ $2 \times 5 = 10$

This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.

Year 2 Multiplication

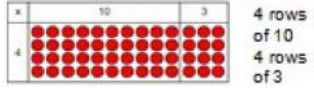
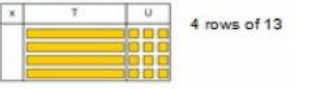
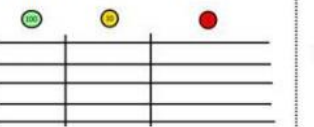
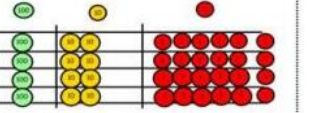
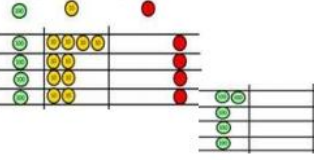
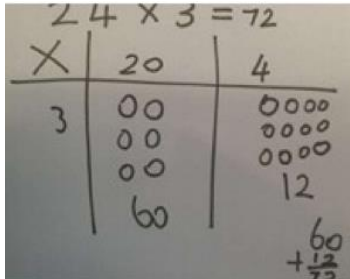
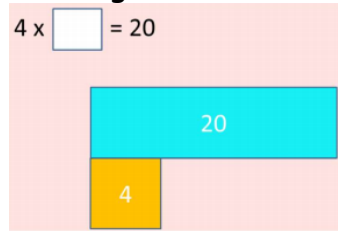
Objective and Strategy	Concrete	Pictorial	Abstract
<p>Doubling</p>	<p>Model doubling using Dienes and place value counters</p>  <p>$40 + 12 = 52$</p>	<p>Draw pictures and representations to show how to double numbers</p>	<p>Partition a number and then double each part before recombining it back together.</p>  <p>$20 + 12 = 32$</p>
<p>Counting in multiples of 2, 3, 4, 5, 10 from 0</p> <p>Repeated addition</p>	 <p>$5 + 5 + 5 + 5 + 5 + 5 + 5 + 5 = 40$</p>  	<p>Number lines, counting sticks and bar models should be used to show representation of counting in multiples</p>    	<p>Count in multiples of a number aloud.</p> <p>Write sequences with multiples of numbers.</p> <p>0, 2, 4, 6, 8, 10</p> <p>0, 3, 6, 9, 12, 15</p> <p>0, 5, 10, 15, 20, 25, 30</p> <p>$4 \times 3 = \underline{\quad}$</p>

This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.

<p>Multiplication is commutative</p>	<p>Create arrays using counters and cubes and Numicon.</p>    <p>Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does not affect the answer.</p>  	<p>Use representations of arrays to show different calculations and explore commutatively</p>  	<p>$12 = 3 \times 4$ $12 = 4 \times 3$</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>Using the inverse <i>This should be taught alongside division, so pupils learn how they work alongside each other</i></p>		 <p>$\square \times \square = \square$ $\square \times \square = \square$ $\square \div \square = \square$ $\square \div \square = \square$</p>	<p>$2 \times 4 = 8$ $4 \times 2 = 8$ $8 \div 2 = 4$ $8 \div 4 = 2$ $8 = 2 \times 4$ $8 = 4 \times 2$ $2 = 8 \div 4$ $4 = 8 \div 2$</p> <p>Show all 8 related fact family sentence</p>

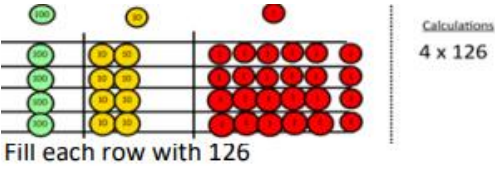
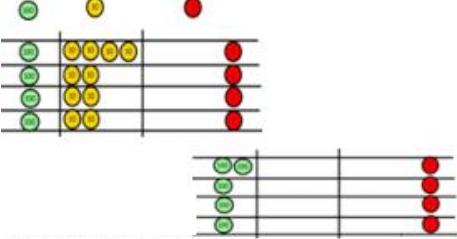
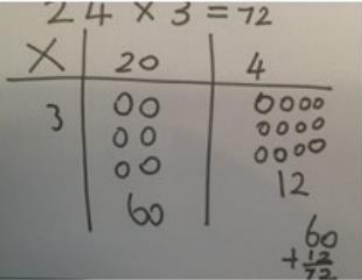
This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.

Year 3 Multiplication

Objective and Strategy	Concrete	Pictorial	Abstract																			
<p>Grid method</p>	<p>Show the links with arrays to first introduce the grid method</p>  <p>4 rows of 10 4 rows of 3</p> <p>Move onto base ten to move towards a more compact method.</p>  <p>4 rows of 13</p> <p>Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows</p>  <p>Calculations 4 x 126</p>  <p>Calculations 4 x 126</p> <p>Fill each row with 126. Add up each column, starting with the ones making any exchanges needed Then you have your answer.</p> 	<p>Represent work with place value counters in a way that they understand</p> <p>Draw the counters using colours to show different amounts or just use circles in different columns to show their thinking</p>  <p>Bar models are used to explore missing numbers</p> 	<p>Start with multiplying by one-digit numbers and showing the clear addition alongside the grid.</p> <table border="1" data-bbox="1668 518 1971 614"> <tr> <td>x</td> <td>30</td> <td>5</td> </tr> <tr> <td>7</td> <td>210</td> <td>35</td> </tr> </table> <p>210 + 35 = 245</p> <p>The next step is to multiply by a two-digit number showing the different rows within the grid method</p> <table border="1" data-bbox="1747 893 2049 1077"> <tr> <td></td> <td>10</td> <td>8</td> </tr> <tr> <td>10</td> <td>100</td> <td>80</td> </tr> <tr> <td>3</td> <td>30</td> <td>24</td> </tr> </table> <p>Move to formal written method</p> <table data-bbox="1579 1189 1736 1348"> <tr> <td>35</td> </tr> <tr> <td>x 7</td> </tr> <tr> <td>245</td> </tr> <tr> <td>3</td> </tr> </table>	x	30	5	7	210	35		10	8	10	100	80	3	30	24	35	x 7	245	3
x	30	5																				
7	210	35																				
	10	8																				
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This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.

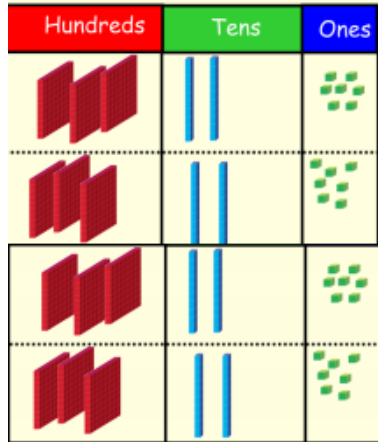
Year 4

Objective and Strategy	Concrete	Pictorial	Abstract						
<p>Grid method recap from Year 3 for two-digits x one-digit</p> <p>Move to multiplying three-digit numbers by one-digit</p>	<p>Use place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows</p>   <p>Add up each column making any exchanges needed</p>	<p>Represent work with place value counters in a way that they understand.</p> <p>Draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking</p> 	<p>Start with multiplying by one-digit numbers and showing the clear addition alongside the grid</p> <table border="1" data-bbox="1579 529 1877 619"> <tr> <td>x</td> <td>30</td> <td>5</td> </tr> <tr> <td>7</td> <td>210</td> <td>35</td> </tr> </table> <p>$210 + 35 = 245$</p>	x	30	5	7	210	35
x	30	5							
7	210	35							

This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.

Column multiplication

Continue to use place value counters to support. Start with no exchanging



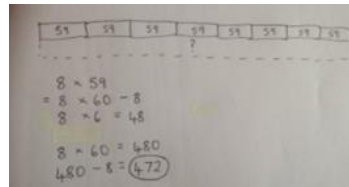
It is important at this stage that they always multiply the ones first.

The corresponding long multiplication is modelled alongside

x	300	20	7
4	1200	80	28



The grid method may be used to show how this relates to a formal written method.



Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.

$$\begin{array}{r}
 327 \\
 \times 4 \\
 \hline
 28 \\
 80 \\
 1200 \\
 \hline
 1308
 \end{array}$$



	3	2	7
x			4
<hr/>			
	1	3	0
		1	2

This may lead to a compact method.

This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.



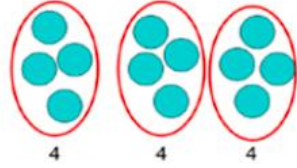
Year 5 and 6 Multiplication

Objective and Strategy	Concrete	Pictorial	Abstract
<p>Column multiplication for 3 and 4 digit x 1 digit</p>	<p>It is important at this stage that they always multiply the ones first.</p> <p>Use place value counters to support understanding. This initially is done with no exchanging $321 \times 2 = 642$</p>		<p>This will lead to a compact method.</p>
<p>Column multiplication</p>	<p>Manipulatives may still be used with the corresponding long multiplication modelled alongside</p>	<p>Continue to use bar models to support problem solving</p>	<p>18 x 3 on the first row $(8 \times 3 = 24, \text{ carrying the } 2 \text{ for } 20, \text{ then } 1 \times 3)$ 18 x 10 on the 2nd row. Show multiplying by 10 by putting zero in units first</p>

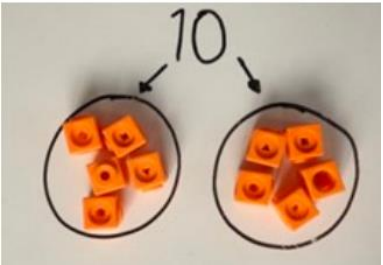
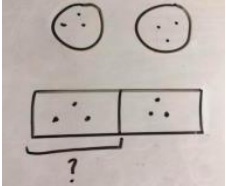
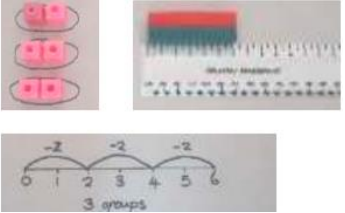
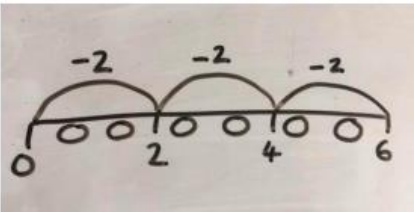
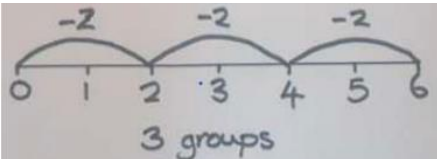
This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.

Year 6 Multiplication			
Objective and Strategy	Concrete	Pictorial	Abstract
Multiplying decimals up to 2 decimal places by a single digit			<p>Remind children that the single digit belongs in the ones column. Line up the decimal point in the question and answer.</p> $ \begin{array}{r} 3.19 \\ \times 8 \\ \hline 25.52 \end{array} $ <p>Number of decimal places in the question is reflected in the answer.</p>
<p><u>Vocabulary</u></p> <p>Key vocabulary: double, times, multiplied by, the product of, groups of, lots of, equal groups.</p>			


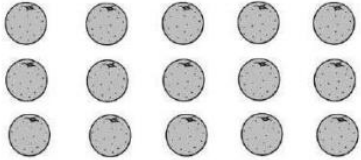
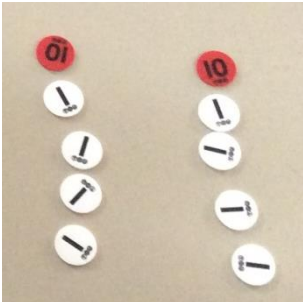
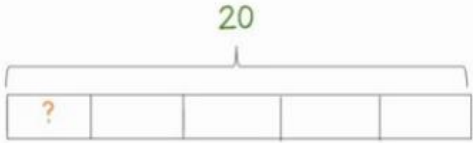
This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.

Year 1 Division			
Objective and Strategy	Concrete	Pictorial	Abstract
Division as sharing	 <p>The concrete materials section shows three images. The first image shows two empty pink paper cups and a purple stick. The second image shows the same two cups, each containing four purple sticks. The third image shows two cups, each containing five orange blocks. A handwritten number '10' is written above the cups, with arrows pointing to each cup, indicating that there are 10 blocks in total.</p>	<p>Pictures or shapes used to share quantities</p>  <p>The pictorial representation shows eight simple line drawings of flowers arranged in two groups of four. Below this, the text reads "8 shared between 2 is 4."</p> <p>Sharing:</p>  <p>The pictorial representation shows twelve blue circles arranged in three groups of four. Each group is enclosed in a red oval. Below each oval is the number '4'. Below the entire arrangement, the text reads "12 shared between 3 is 4" in red.</p>	8 shared between 2 is 4.

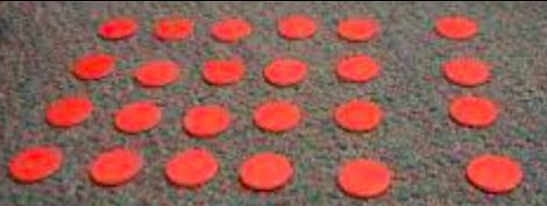
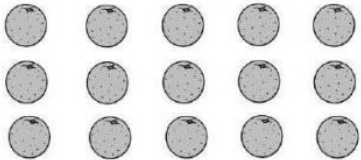
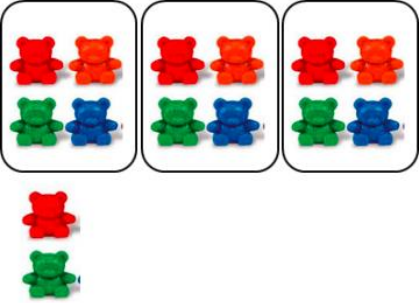
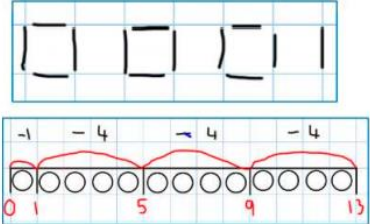
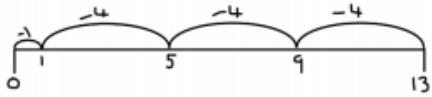
This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.

	I have 10 cubes. Can you share them equally into 2 groups?										
Year 2 Division											
Objective and Strategy	Concrete	Pictorial	Abstract								
Division as sharing	 <p>Joe has 10 cubes. Can you share them into 2 equal groups?</p>	 <p>Representing sharing pictorially.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="3" style="text-align: center;">?</td> </tr> <tr> <td style="text-align: center;">2</td> <td style="text-align: center;">2</td> <td style="text-align: center;">2</td> </tr> </table> <p>Bar models used to share and to support understanding of equal parts.</p>	?			2	2	2	<p>$6 \div 2 = 3$ What's the calculation?</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td style="text-align: center;">3</td> <td style="text-align: center;">3</td> </tr> </table>	3	3
?											
2	2	2									
3	3										
Division as repeated subtraction	 <p>Understanding division as repeated</p>		<p>Abstract numberline</p> 								

This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.

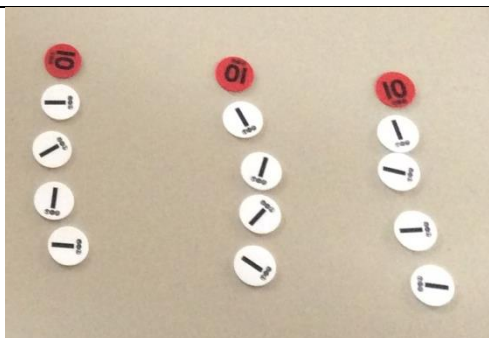
	subtraction and groupings		
Division within arrays	 <p>Link division to multiplication using an array. Think about the number sentences that can be created.</p> <p> $5 \times 2 = 10$ $2 \times 5 = 10$ $10 \div 2 = 5$ $10 \div 5 = 2$ </p>	 <p>Draw an array and use lines to split the array into groups. Which multiplication and division sentences can be made?</p>	<p>Find the inverse of multiplication and division sentences by creating four linking number sentences.</p> <p> $3 \times 4 = 12$ $4 \times 3 = 12$ $12 \div 3 = 4$ $12 \div 4 = 3$ </p>
Year 3 -4 Division			
Objective and Strategy	Concrete	Pictorial	Abstract
Division as grouping	<p>Use cubes, counters, objects or place value counters to support understanding.</p> 	 <p> $20 \div 5 = ?$ $5 \times ? = 20$ </p>	<p>How many groups of 8 are in 24?</p> <p>$24 \div 8 =$</p>

This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.

<p>Division with arrays</p>	<p style="text-align: center;">$28 \div 2 = 14$</p>  <p>Link division to multiplication using an array. Think about the number sentences that can be created.</p> <p style="text-align: center;"> $4 \times 6 = 24$ $6 \times 4 = 24$ $24 \div 4 = 6$ $24 \div 6 = 4$ </p>	 <p>Draw an array and use lines to split the array into groups. Which multiplication and division sentences can be made?</p>	<p>Find the inverse of multiplication and division facts by creating linking number sentences.</p> <p style="text-align: center;"> $4 \times 6 = 24$ $6 \times 4 = 24$ $24 \div 4 = 6$ $24 \div 6 = 4$ $24 = 4 \times 6$ $24 = 6 \times 4$ $6 = 24 \div 4$ $4 = 24 \div 6$ </p>
<p>Division with remainders</p>	 <p>Divide into equal groups. How many are left over?</p> <p style="text-align: center;">$14 \div 3 =$</p>	 <p>A pictorial representation of the practical resources used.</p>	 <p style="text-align: center;">$13 \div 4 = 3$ remainder 1</p> <p>Children should use their times table facts and also represented as repeated subtraction on a number line.</p>

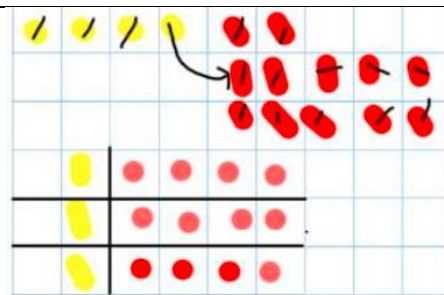
This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.

Division as sharing



Using place value counters share into equal groups. Exchange if necessary

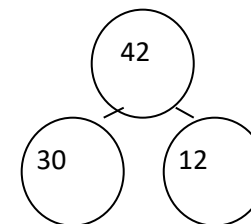
$$42 \div 3 = 14$$



Drawing of the resources used

Partitioning to divide using a whole-part model.

$$42 \div 3 = 14$$



Partition so that each part is divisible.

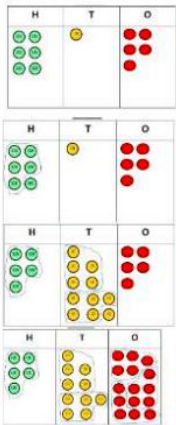
$$42 = 30 + 12$$

$$30 \div 3 = 10$$

$$12 \div 3 = 4$$

$$10 + 4 = 14$$

This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.

Year 5 - 6 Division			
Objective and Strategy	Concrete	Pictorial	Abstract
<p>Divide at least 3-digit numbers by 1-digit</p> <p>Short division</p>	<p>$615 \div 5$</p>  <p>Step 1: make 615</p> <p>Step 2: Circle your groups of 5</p> <p>Step 3: Exchange 1H for 10T and circle groups of 5</p> <p>Step 4: exchange 1T for 10ones and circles groups of 5</p> <p>Use of the 'bus stop' method using place value counters.</p>	<p>Pictorial representations to show grouping of concrete resources whilst the children need it.</p>	$ \begin{array}{r} 123 \\ 5 \overline{) 615} \\ \underline{5 } \\ 11 \\ \underline{10 } \\ 15 \\ \underline{15} \\ 0 \end{array} $

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Long Division

Concrete

Pictorial

Children can represent place value counters and record the subtractions beneath.

Abstract

$$12 \overline{) 2544}^0$$

Step one- exchange 2 thousand for 20 hundreds so we now have 25 hundreds.

$$12 \overline{) 2544}^{02}$$

$$\underline{24}$$

$$1$$

Step two- How many groups of 12 can I make with 25 hundreds? The 24 shows the hundreds we have grouped. The one is how many hundreds we have left.

$$12 \overline{) 2544}^{021}$$

$$\underline{24}$$

$$14$$

$$\underline{12}$$

$$2$$

Exchange the one hundred for 10 tens. How many groups of 12 can I make with 14 tens? The 14 shows how many tens I have, the 12 is how many I grouped and the 2 is how many tens I have left.

$$12 \overline{) 2544}^{0212}$$

$$\underline{24}$$

$$14$$

$$\underline{12}$$

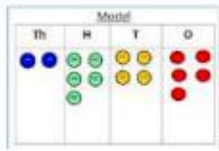
$$24$$

$$\underline{24}$$

$$0$$

Exchange the 2 tens for 20 ones. The 24 is how many ones I have grouped and the 0 is what I have left.

This policy has been adapted from the White Rose Maths Hub Calculation Policy with further material added.

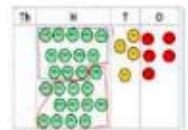


$$\begin{array}{r} 0212 \\ 12 \overline{)2544} \\ \underline{24} \\ 14 \\ \underline{12} \\ 24 \\ \underline{24} \\ 0 \end{array}$$

$2544 \div 12$
How many groups of 12 thousands do we have? None



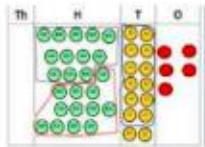
Exchange 2 thousand for 20 hundreds.



$$\begin{array}{r} 02 \\ 12 \overline{)2544} \\ \underline{24} \\ 1 \end{array}$$

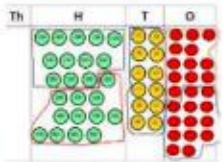
How many groups of 12 are in 25 hundreds? 2 groups. Circle them.

We have grouped 24 hundreds so can take them off and we are left with one.



$$\begin{array}{r} 021 \\ 12 \overline{)2544} \\ \underline{24} \\ 14 \\ \underline{12} \\ 2 \end{array}$$

Exchange the one hundred for ten tens so now we have 14 tens. How many groups of 12 are in 14? 1 remainder 2.



Exchange the two tens for twenty ones so now we have 24 ones. How many groups of 12 are in 24? 2

Vocabulary

Key vocabulary: share, group, divide, divided by, half, repeated subtraction.

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Calculation Policy

April 2021

Aims

The aims of the policy are to provide guidance on the steps needed when teaching the four main operations: addition, subtraction, division and multiplication; as well as provide guidance on mental maths expectations for each year group.

- To ensure consistency across the school
- To outline a consistent approach to progression
- Use assessment for learning to identify suitable next steps in calculation for groups of children
- The mathematical language used to describe each operation should be encouraged and displayed on learning walls
- Children will be taught each stage through variation of question type and context