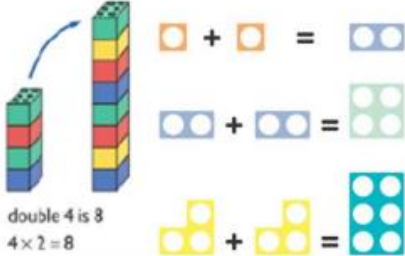

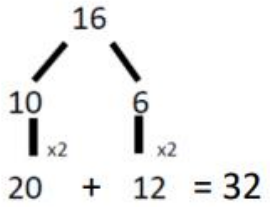
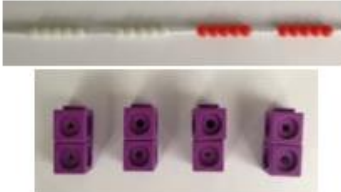
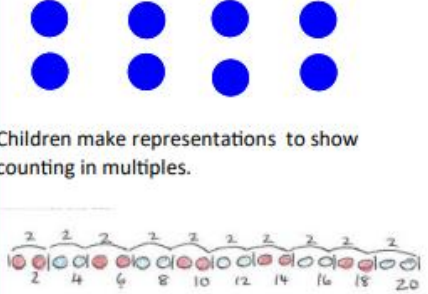




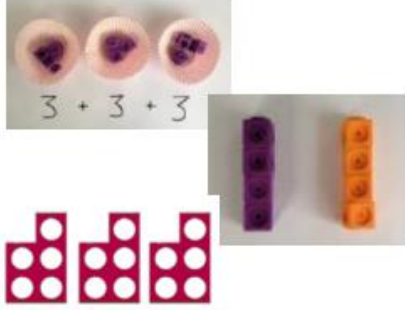
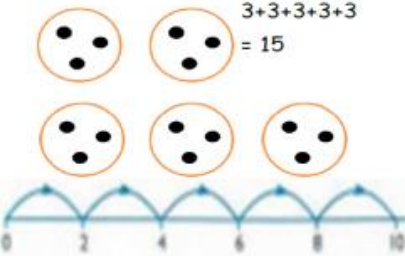

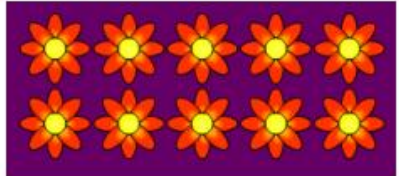
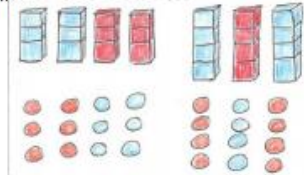
Brandesburton Primary School Calculation Policy



Y1 MULTIPLICATION X

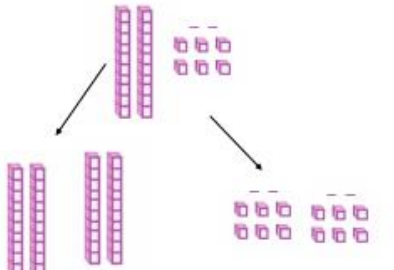
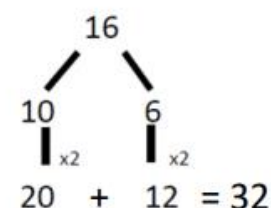






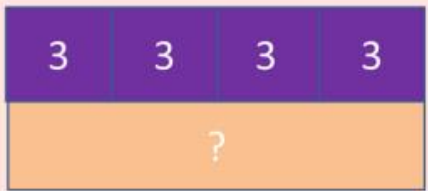
Objective & Strategy	Concrete	Pictorial	Abstract
<p>Doubling</p>	<p>Use practical activities using manipulatives including cubes and Numicon to demonstrate doubling</p>  <p>double 4 is 8 $4 \times 2 = 8$</p>	<p>Draw pictures to show how to double numbers</p> <p>Double 4 is 8</p> 	<p>Partition a number and then double each part before recombining it back together.</p>  <p>16 10 6 $\downarrow \times 2$ $\downarrow \times 2$ 20 $+$ 12 $=$ 32</p>
<p>Counting in multiples</p>	<p>Count the groups as children are skip counting, children may use their fingers as they are skip counting.</p> 	 <p>Children make representations to show counting in multiples.</p>	<p>Count in multiples of a number aloud.</p> <p>Write sequences with multiples of numbers.</p> <p>2, 4, 6, 8, 10</p> <p>5, 10, 15, 20, 25, 30</p>
<p>Making equal groups and counting the total</p>	 <p>Use manipulatives to create equal groups.</p> <p>$\square \times \square = 8$</p>	<p>Draw  to show $2 \times 3 = 6$</p> <p>Draw and make representations</p>	<p>$2 \times 4 = 8$</p>

Y1 MULTIPLICATION X

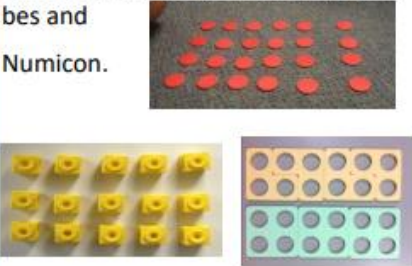
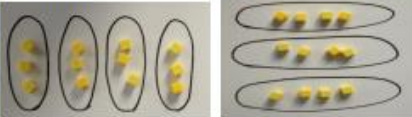
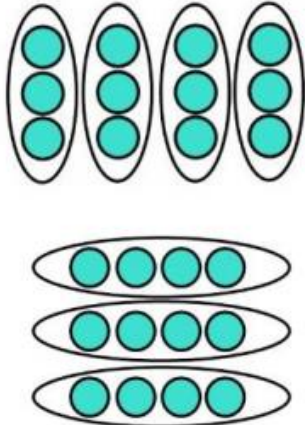


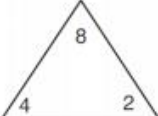
Objective & Strategy	Concrete	Pictorial	Abstract
Repeated addition	 <p>Use different objects to add equal groups</p>	<p>Use pictorial including number lines to solve prob</p> <p>There are 3 sweets in one bag. How many sweets are in 5 bags altogether?</p> $3+3+3+3+3 = 15$ 	<p>Write addition sentences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

Y2

MULTIPLICATION X

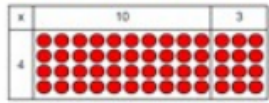
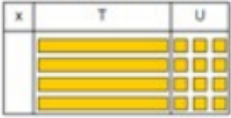


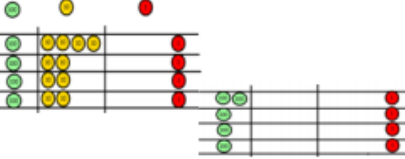
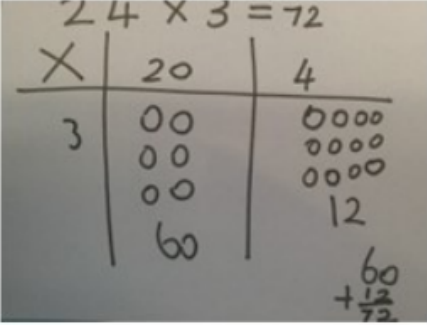
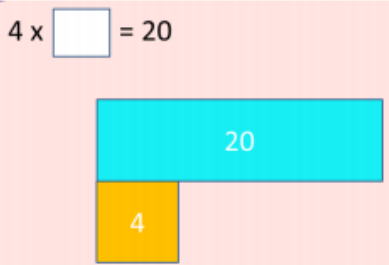
Objective & Strategy	Concrete	Pictorial	Abstract
Doubling	<p>Model doubling using dienes and PV counters.</p>  $40 + 12 = 52$	<p>Draw pictures and representations to show how to double numbers</p>	<p>Partition a number and then double each part before recombining it back together.</p>  $20 + 12 = 32$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

Y2 MULTIPLICATION X

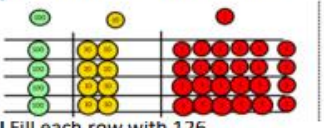
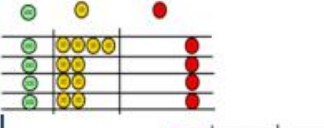
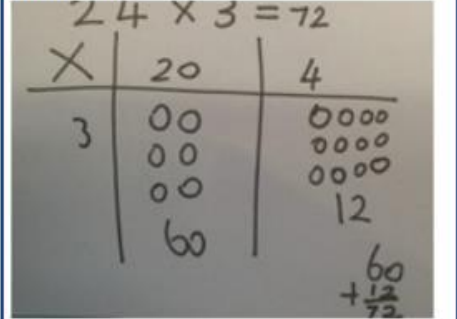
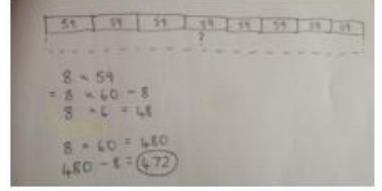
Objective & Strategy	Concrete	Pictorial	Abstract
<p>Multiplication is commutative</p>	<p>Create arrays using counters and cubes and Numicon.</p>  <p>Pupils should understand that an array can represent different equations and that, as multiplication is commutative, the order of the multiplication does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

Y3

MULTIPLICATION X

Objective & Strategy	Concrete	Pictorial	Abstract															
<p>Grid method</p>	<p>Show the links with arrays to first introduce the grid method.</p>  <p>4 rows of 10 4 rows of 3</p> <p>Move onto base ten to move towards a more compact method.</p>  <p>4 rows of 13</p> <p>Move on to place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows</p>  <p>Calculations 4 x 126</p>  <p>Fill each row with 126</p> <p>Calculations 4 x 126</p> <p>Add up each column, starting with the ones making any exchanges needed</p>  <p>Then you have your answer.</p>	<p>Children can represent their work with place value counters in a way that they understand.</p> <p>They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.</p>  <p>Bar model are used to explore missing numbers</p>  <p>4 x <input type="text"/> = 20</p>	<p>Start with multiplying by one digit numbers and showing the clear addition alongside the grid.</p> <table border="1" data-bbox="1355 402 1635 486"> <tr> <td>x</td> <td>30</td> <td>5</td> </tr> <tr> <td>7</td> <td>210</td> <td>35</td> </tr> </table> <p>$210 + 35 = 245$</p> <p>Moving forward, multiply by a 2 digit number showing the different rows within the grid method.</p> <table border="1" data-bbox="1355 742 1630 917"> <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>	x	30	5	7	210	35		10	8	10	100	80	3	30	24
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7	210	35																
	10	8																
10	100	80																
3	30	24																

Y4 MULTIPLICATION X

Objective & Strategy	Concrete	Pictorial	Abstract																																
<p>Grid method recap from year 3 for 2 digits x 1 digit</p> <p>Move to multiplying 3 digit numbers by 1 digit. (year 4 expectation)</p>	<p>Use place value counters to show how we are finding groups of a number. We are multiplying by 4 so we need 4 rows</p>  <p>Calculations 4 x 126</p> <p>Fill each row with 126</p>  <p>Add up each col. making any exchanges needed</p>	<p>Children can represent their work with place value counters in a way that they understand.</p> <p>They can draw the counters using colours to show different amounts or just use the circles in the different columns to show their thinking as shown below.</p> 	<p>Start with multiplying by one digit numbers and showing the clear addition alongside the grid.</p> <table border="1" data-bbox="1344 406 1624 486"> <tr> <td>x</td> <td>30</td> <td>5</td> </tr> <tr> <td>7</td> <td>210</td> <td>35</td> </tr> </table> <p>210 + 35 = 245</p>	x	30	5	7	210	35																										
x	30	5																																	
7	210	35																																	
<p>Column multiplication</p>	<p>Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. 321 x 2 = 642</p> <table border="1" data-bbox="383 949 672 1284"> <thead> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p>It is important at this stage that they always multiply the ones first.</p> <p>The corresponding long multiplication is modelled alongside</p>	Hundreds	Tens	Ones													<p>The grid method may be used to show how this relates to a formal written method.</p>  <p>Bar modelling and number lines can support learners when solving problems with multiplication alongside the formal written methods.</p>	<table border="1" data-bbox="896 845 1198 917"> <tr> <td>x</td> <td>300</td> <td>20</td> <td>7</td> </tr> <tr> <td>4</td> <td>1200</td> <td>80</td> <td>28</td> </tr> </table> <p>→</p> <table border="1" data-bbox="1400 821 1568 1149"> <tr> <td>327</td> </tr> <tr> <td>x 4</td> </tr> <tr> <td>28</td> </tr> <tr> <td>80</td> </tr> <tr> <td>1200</td> </tr> <tr> <td>1308</td> </tr> </table> <p>↻</p> <table border="1" data-bbox="1299 1173 1500 1332"> <tr> <td>327</td> </tr> <tr> <td>x 4</td> </tr> <tr> <td>1308</td> </tr> </table> <p>This may lead to a compact method.</p>	x	300	20	7	4	1200	80	28	327	x 4	28	80	1200	1308	327	x 4	1308
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Y5-6 MULTIPLICATION X

Objective & Strategy	Concrete	Pictorial	Abstract																																																						
Column Multiplication for 3 and 4 digits x 1 digit.	<div style="display: flex; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="background-color: #ff0000; color: white;">Hundreds</td> <td style="background-color: #00ff00; color: white;">Tens</td> <td style="background-color: #0000ff; color: white;">Ones</td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table> <div style="margin-left: 10px;"> <p>It is important at this stage that they always multiply the ones first.</p> <p>Children can continue to be supported by place value counters at the stage of multiplication. This initially done where there is no regrouping. $321 \times 2 = 642$</p> </div> </div>	Hundreds	Tens	Ones													<div style="display: flex; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td>x</td> <td>300</td> <td>20</td> <td>7</td> </tr> <tr> <td>4</td> <td>1200</td> <td>80</td> <td>28</td> </tr> </table> <div style="margin-left: 20px; color: red; font-size: 2em;">→</div> </div>	x	300	20	7	4	1200	80	28	<div style="text-align: center;"> $\begin{array}{r} 327 \\ \times 4 \\ \hline 28 \\ 80 \\ 1200 \\ \hline 1308 \end{array}$ </div> <div style="text-align: center; color: red; font-size: 2em; margin: 10px 0;">↻</div> <div style="display: flex; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>3</td><td>2</td><td>7</td></tr> <tr><td>x</td><td></td><td>4</td></tr> <tr><td>1</td><td>3</td><td>0</td><td>8</td></tr> <tr><td></td><td>1</td><td>2</td><td></td></tr> </table> <div style="margin-left: 10px;"> <p>This will lead to a compact method.</p> </div> </div>	3	2	7	x		4	1	3	0	8		1	2																		
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Column multiplication	Manipulatives may still be used with the corresponding long multiplication modelled alongside.	<div style="display: flex; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td></td> <td style="background-color: #ff0000; color: white;">10</td> <td style="background-color: #ff0000; color: white;">8</td> </tr> <tr> <td style="background-color: #ff0000; color: white;">10</td> <td style="background-color: #ff0000; color: white;">100</td> <td style="background-color: #ff0000; color: white;">80</td> </tr> <tr> <td style="background-color: #ff0000; color: white;">3</td> <td style="background-color: #ff0000; color: white;">30</td> <td style="background-color: #ff0000; color: white;">24</td> </tr> </table> <div style="margin-left: 20px; color: red; font-size: 2em;">→</div> </div> <p style="margin-top: 20px;">Continue to use bar modelling to support problem solving</p>		10	8	10	100	80	3	30	24	<div style="display: flex; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td></td><td>1</td><td>8</td></tr> <tr><td>x</td><td>1</td><td>3</td></tr> <tr><td></td><td>5</td><td>4</td></tr> <tr><td></td><td>2</td><td></td></tr> <tr><td></td><td>1</td><td>8</td><td>0</td></tr> <tr><td></td><td>2</td><td>3</td><td>4</td></tr> </table> <div style="margin-left: 10px;"> <p>18 x 3 on the first row (8 x 3 = 24, carrying the 2 for 20, then 1 x 3)</p> <p>18 x 10 on the 2nd row. Show multiplying by 10 by putting zero in units first</p> </div> </div> <div style="margin-top: 20px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td>1</td><td>2</td><td>3</td><td>4</td></tr> <tr><td>x</td><td></td><td>1</td><td>6</td></tr> <tr><td></td><td>7</td><td>4</td><td>0</td><td>4</td></tr> <tr><td></td><td>1</td><td>2</td><td>3</td><td>4</td><td>0</td></tr> <tr><td></td><td>1</td><td>9</td><td>7</td><td>4</td><td>4</td></tr> </table> <p style="margin-left: 10px;">(1234 x 6) (1234 x 10)</p> </div>		1	8	x	1	3		5	4		2			1	8	0		2	3	4	1	2	3	4	x		1	6		7	4	0	4		1	2	3	4	0		1	9	7	4	4
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Y6

MULTIPLICATION X

Objective & 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 units column. Line up the decimal points in the question and the answer.</p> $\begin{array}{r} 3.19 \\ \times 8 \\ \hline 25.52 \end{array}$