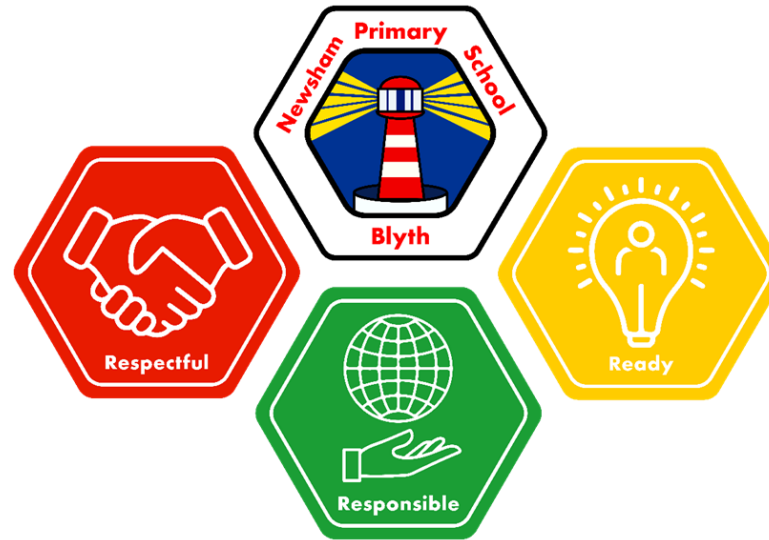


Newsham Primary School



Maths Manipulatives

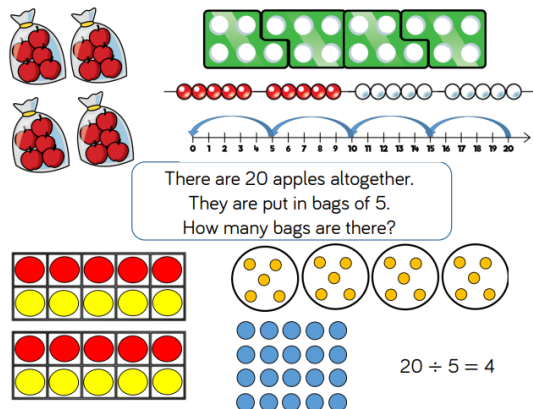
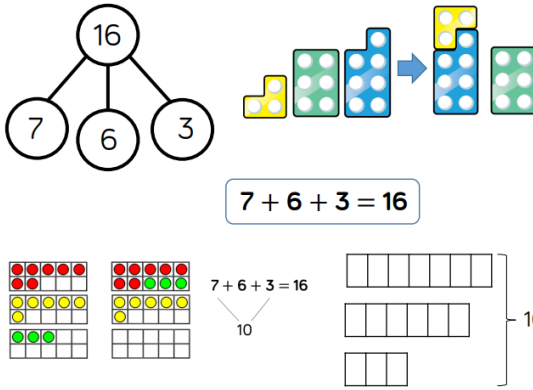
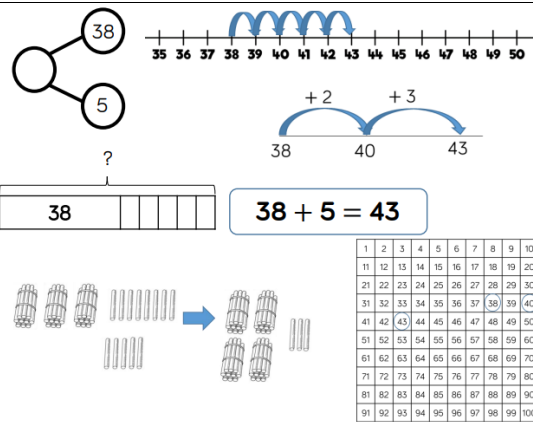
Progression

Nursery-Y6

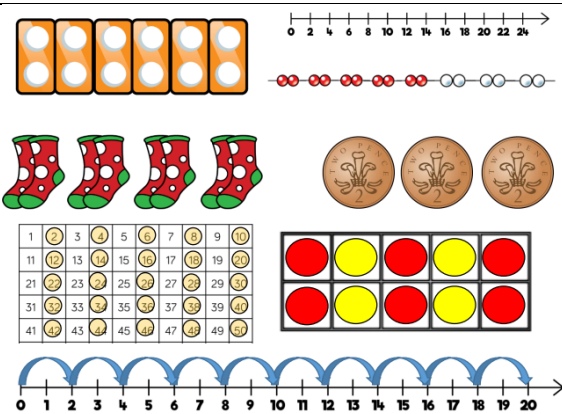
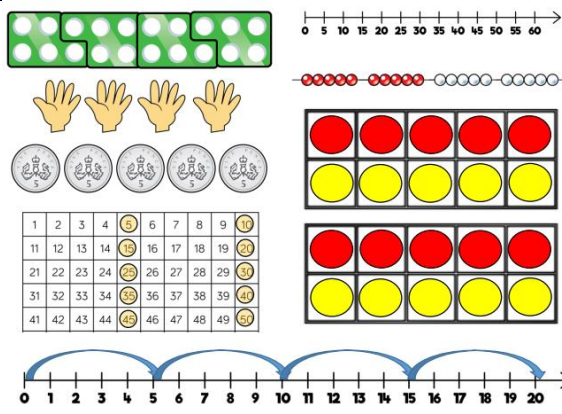
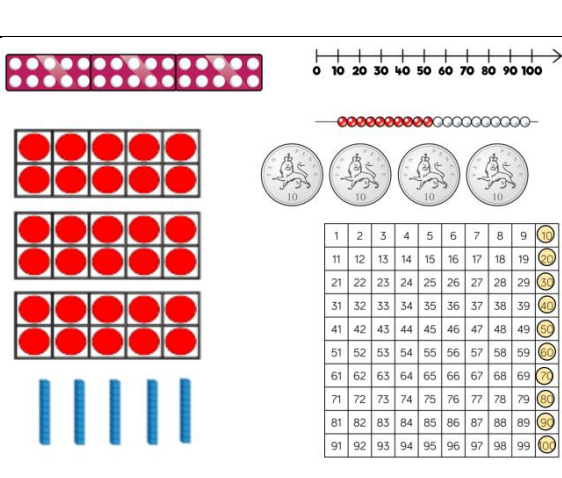
<u>Year</u>	<u>Skill</u>	<u>Representations and models</u>	<u>Visual</u>
EYFS	Link numerals and amounts	Part-whole model Numicon	
EYFS	Count objects, actions and sounds.	Five frames Ten frames (within 10)	
EYFS	Compare numbers.	Bead strings (10) Number tracks	
EYFS	Say one number for each item in order: 1, 2, 3, 4, 5.		
EYFS	Develop fast recognition of up to 3 objects, without having to count them individually ('subitising').		
EYFS	Know that the last number reached when counting a small set of objects tells you how many there are in total ('cardinal principle').		
EYFS	Understand the 'one more than/one less than' relationship between consecutive numbers.		
EYFS	Explore the composition of numbers to 10.		
EYFS	Automatically recall number bonds for numbers 0-5 and some to 10		

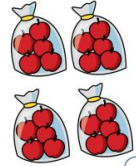
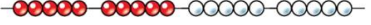
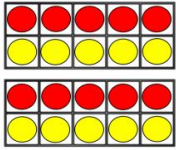
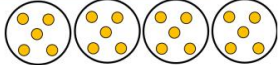
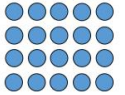
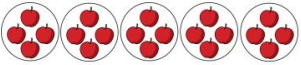
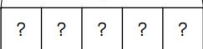
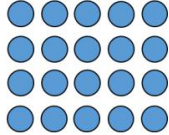
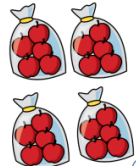
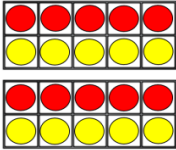
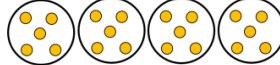
1	Add two 1-digit numbers to 10	Part-whole model Bar model Numicon Ten frames (within 10) Bead strings (10) Number tracks	$4 + 3 = 7$
1	Add 1 and 2-digit numbers to 20	Part-whole model Bar model Numicon Ten frames (within 20) Bead strings (20) Number tracks Number lines (labelled) Straws	$8 + 7 = 15$
1	Subtract two 1-digit numbers to 10	Part-whole model Bar model Numicon Ten frames (within 10) Bead strings (10) Number tracks	$7 - 3 = 4$

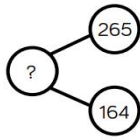
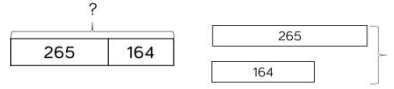
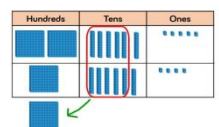
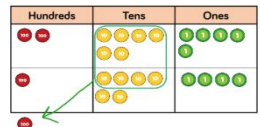
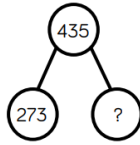
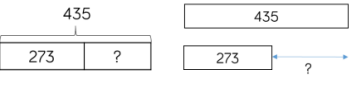
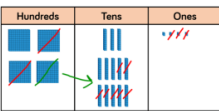
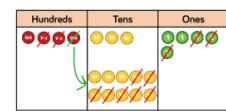
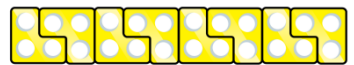
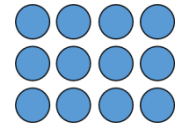
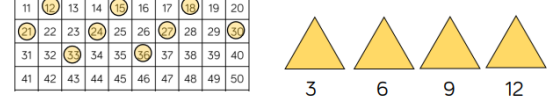
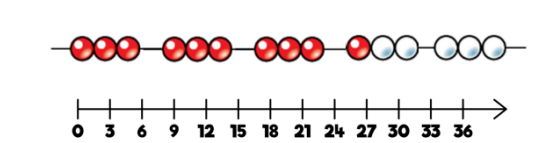
1	Subtract 1 and 2-digit numbers to 20	Part-whole model Bar model Numicon Ten frames (within 20) Bead string (20) Number tracks Number lines (labelled) Straws	
1	Solve one-step problems with multiplication	Bar model Number shapes Counters Ten frames Bead strings Number lines	
1	Solve one-step problems with division(sharing)	Bar model Real life objects Arrays Counters	

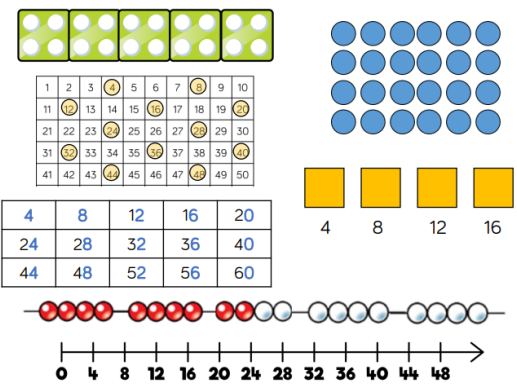
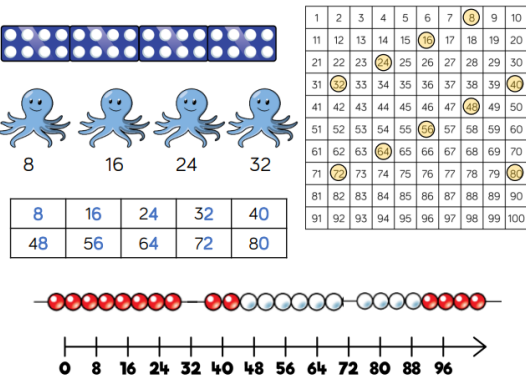
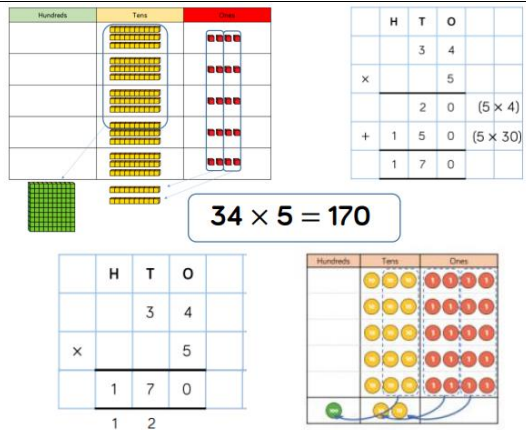
1	Solve one-step problems with division(grouping)	Real life objects Numicon Bead strings Ten frames Number lines Arrays Counters	 There are 20 apples altogether. They are put in bags of 5. How many bags are there? $20 \div 5 = 4$
2	Add three 1-digit numbers	Part-whole model Bar model Ten frames (within 20) Number shapes	 $7 + 6 + 3 = 16$ $7 + 6 + 3 = 16$
2	Add 1 and 2-digit numbers to 100	Part-whole model Bar model Number lines (labelled) Number lines (blank) Straws Hundred square	 $38 + 5 = 43$

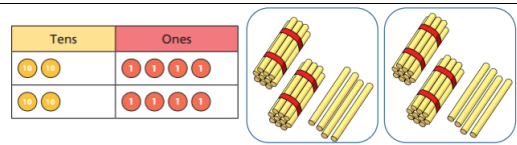
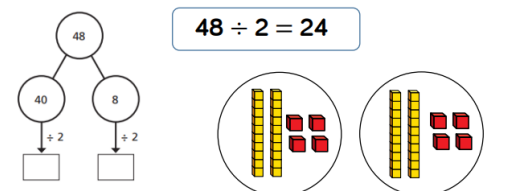
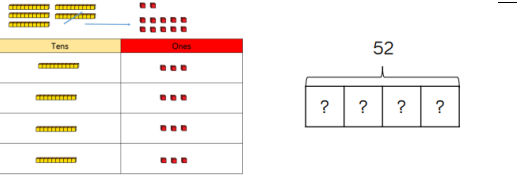
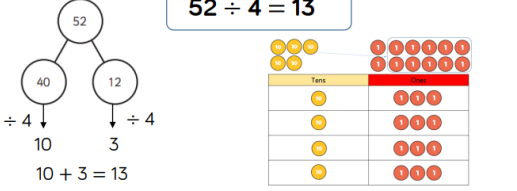
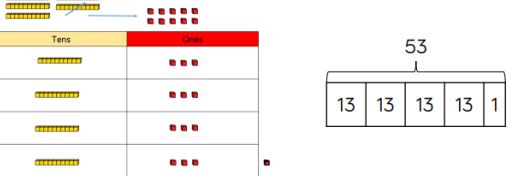
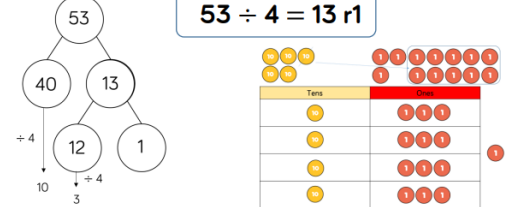
2	Add two 2-digit numbers	Part-whole model Bar model Number lines (blank) Straws Base 10 Place value counters	 $\begin{array}{r} 38 \\ + 23 \\ \hline 61 \end{array}$ $38 + 23 = 61$
2	Subtract 1 and 2-digit numbers to 100	Part-whole model Bar model Number lines (labelled) Number lines (blank) Straws Hundred square	 $\begin{array}{r} 65 \\ - 28 \\ \hline 37 \end{array}$ $65 - 28 = 37$
2	Subtract two 2-digit numbers	Part-whole model Bar model Number lines (blank) Straws Base 10 Place value counters	 $\begin{array}{r} 65 \\ - 28 \\ \hline 37 \end{array}$ $65 - 28 = 37$

2	Recall and use multiplication and division facts for the 2-times table	Bar model Numicon Counters Money Ten frames Bead strings Number lines Everyday objects	
2	Recall and use multiplication and division facts for the 5-times table	Bar model Numicon Counters Money Ten frames Bead strings Number lines Everyday objects	
2	Recall and use multiplication and division facts for the 10-times table	Hundred square Number shapes Counters Money Ten frames Bead strings Number lines Base 10	

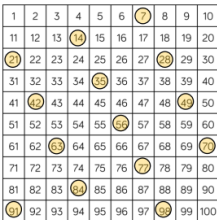
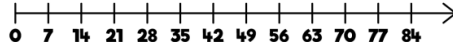
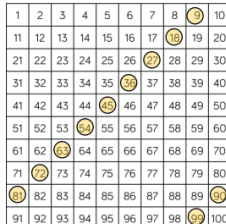
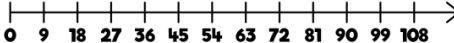
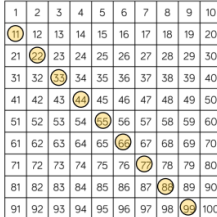
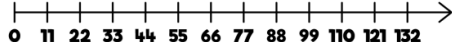
2	Solve one-step problems with multiplication	Bar model Number shapes Counters Ten frames Bead strings Number lines	    One bag holds 5 apples. How many apples do 4 bags hold?    $5 + 5 + 5 + 5 = 20$ $4 \times 5 = 20$ $5 \times 4 = 20$
2	Solve one-step problems with division(sharing)	Bar model Real life objects Arrays Counters	  There are 20 apples altogether. They are shared equally between 5 bags. How many apples are in each bag?   $20 \div 5 = 4$
2	Solve one-step problems with division(grouping)	Real life objects Numicon Bead strings Ten frames Number lines Arrays Counters	    There are 20 apples altogether. They are put in bags of 5. How many bags are there?    $20 \div 5 = 4$

3	Add with up to 3-digits	Part-whole model Bar model Base 10 Place value counters Column addition	  $265 + 164 = 429$  
3	Subtract with up to 3-digits	Part-whole model Bar model Base 10 Place value counters Column subtraction	  $435 - 273 = 162$  
3	Recall and use multiplication and division facts for the 3-times table	Hundred square Numicon Counters Bead strings Number lines Everyday objects	   

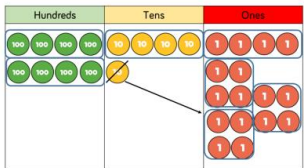
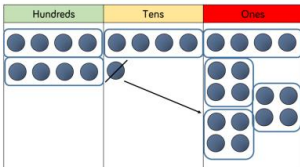
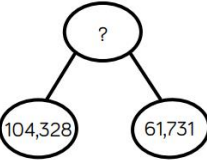
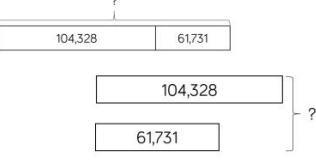
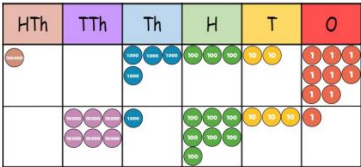
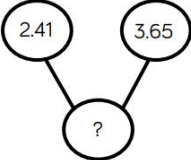
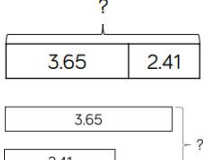
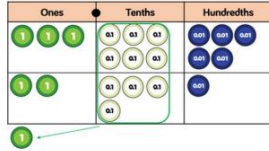
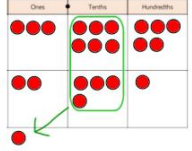
3	Recall and use multiplication and division facts for the 4-times table	Hundred square Numicon Counters Bead strings Number lines Everyday objects	
3	Recall and use multiplication and division facts for the 8-times table	Hundred square Number shapes Bead strings Number tracks Everyday objects	
3	Multiply 2-digit by 1-digit numbers	Place value counters Base 10 Expanded written method Short written method	

3	Divide 2-digits by 1-digit (no exchange sharing)	Straws Base 10 Bar model Place value counters Part-whole model	 $48 \div 2 = 24$ 
3	Divide 2-digits by 1-digit (sharing with exchange)	Straws Base 10 Bar model Place value counters Part-whole model	 $52 \div 4 = 13$ 
3	Divide 2-digits by 1-digit (sharing with remainders)	Straws Base 10 Bar model Place value counters Part-whole model	 $53 \div 4 = 13 \text{ r}1$ 

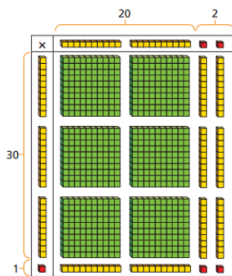
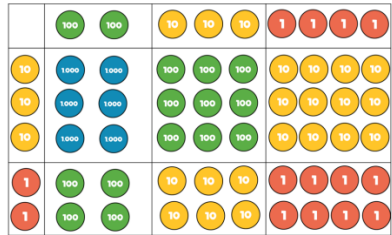
4	Add with up to 4-digits	Part-whole model Bar model Base 10 Place value counters Column addition	$1,378 + 2,148 = 3,526$
4	Subtract with up to 4-digits	Part-whole model Bar model Base 10 Place value counters Column subtraction	$4,357 - 2,735 = 1,622$
4	Recall and use multiplication and division facts for the 6-times table	Hundred square Numicon Bead strings Number tracks Everyday objects	

4	Recall and use multiplication and division facts for the 7-times table	Hundred square Numicon Bead strings Number tracks Everyday objects	 <table><tr><td>7</td><td>14</td><td>21</td><td>28</td><td>35</td></tr><tr><td>42</td><td>49</td><td>56</td><td>63</td><td>70</td></tr></table>   	7	14	21	28	35	42	49	56	63	70		
7	14	21	28	35											
42	49	56	63	70											
4	Recall and use multiplication and division facts for the 9-times table	Hundred square Numicon Bead strings Number tracks Everyday objects	 <table><tr><td>9</td><td>18</td><td>27</td><td>36</td><td>45</td></tr><tr><td>54</td><td>63</td><td>72</td><td>81</td><td>90</td></tr></table>   	9	18	27	36	45	54	63	72	81	90		
9	18	27	36	45											
54	63	72	81	90											
4	Recall and use multiplication and division facts for the 11-times table	Hundred square Base 10 Place value counters Number lines	 <table><tr><td>11</td><td>22</td><td>33</td><td>44</td><td>55</td><td>66</td></tr><tr><td>77</td><td>88</td><td>99</td><td>110</td><td>121</td><td>132</td></tr></table>  	11	22	33	44	55	66	77	88	99	110	121	132
11	22	33	44	55	66										
77	88	99	110	121	132										

4	Recall and use multiplication and division facts for the 12-times table	Hundred square Base 10 Place value counters Number lines																									
4	Multiply 2-digit by 1-digit numbers	Place value counters Base 10 Expanded written method Short written method	<table border="1"> <thead> <tr> <th></th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td>3</td> <td>4</td> </tr> <tr> <td>x</td> <td></td> <td></td> <td>5</td> </tr> <tr> <td></td> <td></td> <td>2</td> <td>0</td> </tr> <tr> <td>+</td> <td>1</td> <td>5</td> <td>0</td> </tr> <tr> <td></td> <td>1</td> <td>7</td> <td>0</td> </tr> </tbody> </table> $34 \times 5 = 170$		H	T	O			3	4	x			5			2	0	+	1	5	0		1	7	0
	H	T	O																								
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	1	7	0																								
4	Multiply 3-digit by 1-digit numbers	Place value counters Base 10 Short written method	<table border="1"> <thead> <tr> <th></th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td>2</td> <td>4</td> <td>5</td> </tr> <tr> <td>x</td> <td></td> <td></td> <td>4</td> </tr> <tr> <td></td> <td>9</td> <td>8</td> <td>0</td> </tr> </tbody> </table> $245 \times 4 = 980$		H	T	O		2	4	5	x			4		9	8	0								
	H	T	O																								
	2	4	5																								
x			4																								
	9	8	0																								

4	Divide 3-digits by 1-digit (grouping)	Place value counters Counters Place value grid Written short division	  $856 \div 4 = 214$
5	Add with more than 4 digits	Part-whole model Bar model Place value counters Column addition	  $104,328 + 61,731 = 166,059$  
5	Add with up to 3 decimal places	Part-whole model Bar model Place value counters Column addition	  $3.65 + 2.41 = 6.06$  

5	Subtract with more than 4 digits	Part-whole model Bar model Place value counters Column subtraction	294,382 182,501 ? 294,382 182,501 ? </
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5	Multiply 2-digit by 2-digit numbers	Place value counters Base 10 Short written method Grid method	<table><tr><td>10</td><td>10</td><td>10</td><td>1</td><td>1</td></tr><tr><td>10</td><td>100</td><td>100</td><td>10</td><td>10</td></tr><tr><td>10</td><td>100</td><td>100</td><td>10</td><td>10</td></tr><tr><td>10</td><td>100</td><td>100</td><td>10</td><td>10</td></tr><tr><td>1</td><td>10</td><td>10</td><td>1</td><td>1</td></tr></table><table><tr><td>×</td><td>20</td><td>2</td></tr><tr><td>30</td><td>600</td><td>60</td></tr><tr><td>1</td><td>20</td><td>2</td></tr></table><table><tr><td></td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td></td><td>2</td><td>2</td></tr><tr><td>×</td><td></td><td>3</td><td>1</td></tr><tr><td></td><td></td><td>2</td><td>2</td></tr><tr><td></td><td>6</td><td>6</td><td>0</td></tr><tr><td></td><td>6</td><td>8</td><td>2</td></tr></table> 22 × 31 = 682	10	10	10	1	1	10	100	100	10	10	10	100	100	10	10	10	100	100	10	10	1	10	10	1	1	×	20	2	30	600	60	1	20	2		H	T	O			2	2	×		3	1			2	2		6	6	0		6	8	2
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5	Multiply 2-digit by 3-digit numbers	Place value counters Short written method Grid method	<table><tr><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td>2</td><td>3</td><td>4</td></tr><tr><td>×</td><td></td><td>3</td><td>2</td></tr><tr><td></td><td>4</td><td>6</td><td>8</td></tr><tr><td>1</td><td>7</td><td>0</td><td>2</td></tr><tr><td>7</td><td>4</td><td>8</td><td>8</td></tr></table><table><tr><td>×</td><td>200</td><td>30</td><td>4</td></tr><tr><td>30</td><td>6,000</td><td>900</td><td>120</td></tr><tr><td>2</td><td>400</td><td>60</td><td>8</td></tr></table> 234 × 32 = 7,488	Th	H	T	O		2	3	4	×		3	2		4	6	8	1	7	0	2	7	4	8	8	×	200	30	4	30	6,000	900	120	2	400	60	8																						
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30	6,000	900	120																																																										
2	400	60	8																																																										
5	Multiply 2-digit by 4-digit numbers	Formal written method	<table><tr><td>TTh</td><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td>2</td><td>7</td><td>3</td><td>9</td></tr><tr><td>×</td><td></td><td></td><td>2</td><td>8</td></tr><tr><td>2</td><td>1</td><td>9</td><td>1</td><td>2</td></tr><tr><td>2</td><td>5</td><td>3</td><td>7</td><td></td></tr><tr><td>5</td><td>4</td><td>7</td><td>8</td><td>0</td></tr><tr><td>1</td><td></td><td>1</td><td></td><td></td></tr><tr><td>7</td><td>6</td><td>6</td><td>9</td><td>2</td></tr></table> 2,739 × 28 = 76,692	TTh	Th	H	T	O		2	7	3	9	×			2	8	2	1	9	1	2	2	5	3	7		5	4	7	8	0	1		1			7	6	6	9	2																		
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5	Divide 2-digits by 1-digit (grouping)	Place value counters Counters Place value grid Written short division	$52 \div 4 = 13$
5	Divide 3-digits by 1-digit (grouping)	Place value counters Counters Place value grid Written short division	$844 \div 4 = 211$ $856 \div 4 = 214$
5	Divide 4-digits by 1-digit (grouping)	Place value counters Counters Place value grid Written short division	$856 \div 4 = 214$

6	Multiply 2-digit by 4-digit numbers	Formal written method	<table><tr><td>TTh</td><td>Th</td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td>2</td><td>7</td><td>3</td><td>9</td></tr><tr><td>×</td><td></td><td></td><td>2</td><td>8</td></tr><tr><td>2</td><td>1</td><td>9</td><td>1</td><td>2</td></tr><tr><td>2</td><td>5</td><td>3</td><td>7</td><td></td></tr><tr><td>5</td><td>4</td><td>7</td><td>8</td><td>0</td></tr><tr><td>1</td><td></td><td></td><td></td><td></td></tr><tr><td>7</td><td>6</td><td>6</td><td>9</td><td>2</td></tr></table> 1 2,739 × 28 = 76,692	TTh	Th	H	T	O		2	7	3	9	×			2	8	2	1	9	1	2	2	5	3	7		5	4	7	8	0	1					7	6	6	9	2																																						
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6	Divide multi-digits by 2-digits (short division)	Written short division List of multiples	<table><tr><td></td><td></td><td>0</td><td>3</td><td>6</td></tr><tr><td></td><td>12</td><td>4</td><td>4</td><td>7</td></tr><tr><td></td><td></td><td></td><td>3</td><td>2</td></tr></table> 432 ÷ 12 = 36 <table><tr><td></td><td></td><td>0</td><td>4</td><td>8</td><td>9</td></tr><tr><td></td><td>15</td><td>7</td><td>7</td><td>13</td><td>13</td></tr><tr><td></td><td></td><td></td><td>3</td><td>5</td><td></td></tr></table> 7,335 ÷ 15 = 489 <table><tr><td>15</td><td>30</td><td>45</td><td>60</td><td>75</td><td>90</td><td>105</td><td>120</td><td>135</td><td>150</td></tr></table>			0	3	6		12	4	4	7				3	2			0	4	8	9		15	7	7	13	13				3	5		15	30	45	60	75	90	105	120	135	150																																			
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6	Divide multi-digits by 2-digits (long division)	Written long division List of multiples	<table><tr><td></td><td></td><td>0</td><td>3</td><td>6</td></tr><tr><td>1</td><td>2</td><td>4</td><td>3</td><td>2</td></tr><tr><td></td><td>—</td><td>3</td><td>6</td><td>0</td></tr><tr><td></td><td></td><td></td><td>7</td><td>2</td></tr><tr><td></td><td>—</td><td></td><td>7</td><td>2</td></tr><tr><td></td><td></td><td></td><td></td><td>0</td></tr></table> (×30) (×6) 12 × 1 = 12 12 × 2 = 24 12 × 3 = 36 12 × 4 = 48 12 × 5 = 60 12 × 6 = 72 12 × 7 = 84 12 × 8 = 96 12 × 9 = 108 12 × 10 = 120 432 ÷ 12 = 36 <table><tr><td></td><td></td><td>0</td><td>4</td><td>8</td><td>9</td></tr><tr><td>15</td><td>7</td><td>3</td><td>3</td><td>5</td><td></td></tr><tr><td>—</td><td>6</td><td>0</td><td>0</td><td>0</td><td></td></tr><tr><td></td><td>1</td><td>3</td><td>3</td><td>5</td><td></td></tr><tr><td>—</td><td>1</td><td>2</td><td>0</td><td>0</td><td></td></tr><tr><td></td><td></td><td>1</td><td>3</td><td>5</td><td></td></tr><tr><td>—</td><td></td><td>1</td><td>3</td><td>5</td><td></td></tr><tr><td></td><td></td><td></td><td></td><td>0</td><td></td></tr></table> (×400) (×80) (×9) 1 × 15 = 15 2 × 15 = 30 3 × 15 = 45 4 × 15 = 60 5 × 15 = 75 10 × 15 = 150 7,335 ÷ 15 = 489			0	3	6	1	2	4	3	2		—	3	6	0				7	2		—		7	2					0			0	4	8	9	15	7	3	3	5		—	6	0	0	0			1	3	3	5		—	1	2	0	0				1	3	5		—		1	3	5						0	
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