

**Harbury C of E  
Primary School**

**Calculation Policy  
Sept 2015**

# Year 1

Read, write and interpret mathematical statements involving + - = signs.

Add and subtract one-digit and two-digit numbers to twenty, including zero.

## Addition

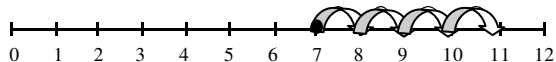
Using concrete objects and pictorial representations:



$10 + 5$

Using a number line counting on in ones.

$7 + 4 = 11$



Using a number line jumping on in tens.

$3 + 20 = 23$

Hundred square used to support addition.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

## Opportunities for reasoning and problem solving and vocabulary.

$3 + \square = 10$

$\square + 5 = 10$

$\square + \square = 10$

$10 - \square = 3$

$10 - 5 = \square$

$10 - \square = \square$

Use the pattern to complete the number sentences



$0 + 5 = 5$



$1 + \square = 5$



$2 + \square = 5$



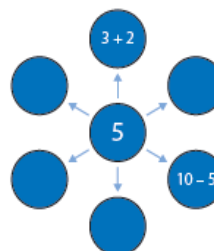
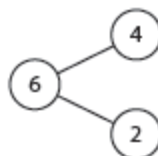
$3 + \square = 5$



$4 + \square = 5$



$5 + \square = 5$



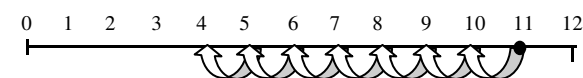
## Subtraction

Using concrete objects and pictorial representations:



Using a number line counting back in ones.

$11 - 7 = 4$



Using a number line jumping back in tens

$18 - 10 = 8$

Hundred square used to support subtraction.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

## Year 2

Add and subtract numbers using concrete objects, pictorial representations and mentally, including: a two digit number and ones; a two digit number and tens; 2 two digit numbers; adding three one digit numbers.

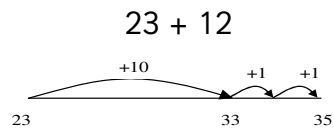
Show that addition of two numbers can be done in any order (commutative) and subtraction of one number from another cannot.

### Addition

Using concrete objects and pictorial representations:

- Numicon showing  $15 + 21$
- Picture of footballs  $9 + 2 + 4$

Using a blank number line counting on in tens and ones.



Using a hundred square.

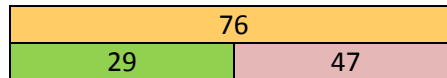
$$\begin{aligned} 53 + 36 &= 53 + 30 \\ &= 83 + 6 \\ &= 89 \end{aligned}$$

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
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71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Exploration of the law of commutativity.

$36 + 53 = 53 + 36$ , however, children encouraged to count on from largest number.

### Opportunities for reasoning and problem solving and vocabulary.



Using the bar model complete the four number sentences.

$$\square + \square =$$

$$\square + \square =$$

$$\square + \square =$$

$$\square + \square =$$

What do I need to add or subtract from each of these numbers to total 60?

40, 44, 66, 69, 76, 86, 99, 89, 79

If each peg on the coat hanger has a value of 10, find three ways to partition the pegs to make the number sentences complete.



What is the total of each addition sentence?

$$\square + \square = \square$$

$$\square + \square = \square$$

$$\square + \square = \square$$

Will the total always be the same?

Explain your reasoning.

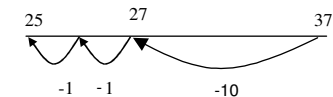
### Subtraction

Using concrete objects and pictorial representations:

- Numicon showing  $42 - 18$
- Picture of footballs  $35 - 12$

Using a blank number line counting back in tens and ones.

$$37 - 12$$



Using a hundred square.

$$\begin{aligned} 87 - 56 &= 87 - 6 \\ &= 81 - 50 \\ &= 31 \end{aligned}$$

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
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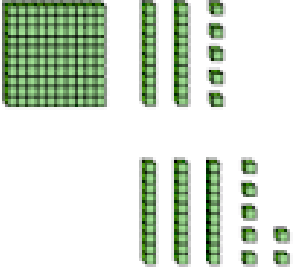
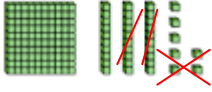
When the difference between two numbers is smaller, children are encouraged to count on.

$$48 - 43 = 5$$

Exploration of fact that  $91 - 75 \neq 75 - 91$



# Year 3

Add and subtract with up to three digits, using formal written methods of columnar addition and subtraction.

Addition	Opportunities for reasoning and problem solving and vocabulary.	Subtraction																						
<p>Using concrete objects and pictorial representations and apparatus:</p> <p><math>125 + 37 = 162</math></p>  <p>Using expanded columnar method.</p> $\begin{array}{r} 358 \\ + 73 \\ \hline 11 \text{ (8 + 3)} \\ 120 \text{ (70 + 50)} \\ \hline 300 \text{ (300 + 0)} \\ \hline 431 \end{array}$ <p>Only written out initially, later becomes spoken.</p> <p>Becoming more compact as appropriate.</p>	<p>Hundreds place    Tens place    Ones place</p> <table border="1" data-bbox="824 497 1189 710"> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </table> <div style="border: 1px solid black; padding: 5px; display: inline-block; margin: 10px 0;"> <math display="block">\begin{array}{r} 325 \\ + 247 \\ \hline \end{array}</math> </div> <p>Sam has completed these calculations but is he correct.</p> $\begin{array}{r} 325 \quad 355 \\ + 247 \quad - 247 \\ \hline \end{array}$ $\begin{array}{r} 589 \quad 112 \end{array}$ <p>Complete these calculations. What do you notice?</p> <table data-bbox="824 1002 1299 1225"> <tr> <td><math>3+7=</math></td> <td><math>8+2=</math></td> <td><math>6+4=</math></td> </tr> <tr> <td><math>30+70=</math></td> <td><math>80+20=</math></td> <td><math>60+40=</math></td> </tr> <tr> <td><math>33+7=</math></td> <td><math>88+2=</math></td> <td><math>66+4=</math></td> </tr> <tr> <td><math>333+7=</math></td> <td><math>888+2=</math></td> <td><math>666+4=</math></td> </tr> </table> <p>Write the four number facts that this bar model shows.</p> <table border="1" data-bbox="1160 1273 1451 1353"> <tr> <td colspan="2" style="background-color: yellow;">540</td> </tr> <tr> <td style="background-color: green;">300</td> <td style="background-color: blue;">240</td> </tr> </table>							$3+7=$	$8+2=$	$6+4=$	$30+70=$	$80+20=$	$60+40=$	$33+7=$	$88+2=$	$66+4=$	$333+7=$	$888+2=$	$666+4=$	540		300	240	<p>Using concrete objects and pictorial representations and apparatus:</p> <p><math>137 - 24 = 113</math></p>  <p>Using expanded columnar method:</p> <p><math>185 - 24 = 161</math></p> $\begin{array}{r} 185 \\ - 24 \\ \hline 161 \end{array}$ <p>Becoming more compact as appropriate.</p>
$3+7=$	$8+2=$	$6+4=$																						
$30+70=$	$80+20=$	$60+40=$																						
$33+7=$	$88+2=$	$66+4=$																						
$333+7=$	$888+2=$	$666+4=$																						
540																								
300	240																							


# Year 4

Add and subtract numbers with up to four digits

Addition	Opportunities for reasoning and problem solving and vocabulary.	Subtraction				
<p>Using expanded vertical algorithm building up to contracted with the support of apparatus if required.</p> <p>5327 + 2855</p> $\begin{array}{r} 5327 \\ +2855 \\ \hline 12\ (7 + 5) \\ 70\ (20 + 50) \\ 1100\ (300 + 800) \\ \underline{7000}\ (5000 + 2000) \\ 8182 \end{array}$ <p style="text-align: center;"></p> $\begin{array}{r} 5327 \\ + 2855 \\ \hline 8182 \\ 1\ 1 \end{array}$	<p><math>\boxed{7}\ \boxed{\phantom{0}}\ \boxed{1} + \boxed{\phantom{0}}\ \boxed{3}\ \boxed{\phantom{0}} = 999</math></p> <p><math>\boxed{7}\ \boxed{\phantom{0}}\ \boxed{1} + \boxed{\phantom{0}}\ \boxed{3}\ \boxed{\phantom{0}} = 1000</math></p> <table border="1" data-bbox="1140 608 1451 703" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="2" style="text-align: center;">1000</td> </tr> <tr> <td style="text-align: center;">353</td> <td style="text-align: center;">354</td> </tr> </table> <p>1023 + 24 + 24 ○ 1023 + 48</p> <p>1232 - 232 ○ 1355 - 252</p> <p>1237 - 68 + 32 ○ 1242 - 69 + 31</p> <ul style="list-style-type: none"> <li>■ 64 + 36</li> <li>■ 640 + 360</li> <li>■ 64 + 79 + 36</li> <li>■ 378 + 562</li> <li>■ 876 + 921</li> <li>■ 999 + 999</li> <li>■ 1447 + 2362</li> <li>■ 1999 + 874</li> </ul>	1000		353	354	<p>Using expanded vertical algorithm building up to contracted with the support of apparatus if required.</p> <p>4579 - 383</p> $\begin{array}{r} 4^4 5^1 79 \\ - \quad 383 \\ \hline 6\ (9-3) \\ 90\ (170 - 80) \\ 100\ (400 - 300) \\ \underline{4000}\ (4000 - 0) \\ 4196 \end{array}$ <p style="text-align: center;"></p> $\begin{array}{r} 4^4 5^1 79 \\ - \quad 383 \\ \hline 4196 \end{array}$
1000						
353	354					

# Year 5

Add and subtract numbers with more than four digits, including using formal written methods of columnar addition and subtraction.

Addition	Opportunities for reasoning and problem solving and vocabulary.	Subtraction				
<p>Using contracted algorithm with larger numbers.</p> $\begin{array}{r} 53219 \\ + 4724 \\ \hline 57943 \\ \hline 1 \end{array}$ <hr/> <p>True or False?</p> <ul style="list-style-type: none"> <li>■ <math>3999 - 2999 = 4000 - 3000</math></li> <li>■ <math>3999 - 2999 = 3000 - 2000</math></li> <li>■ <math>2741 - 1263 = 2742 - 1264</math></li> <li>■ <math>2741 + 1263 = 2742 + 1264</math></li> <li>■ <math>2741 - 1263 = 2731 - 1253</math></li> <li>■ <math>2741 - 1263 = 2742 - 1252</math></li> </ul> <p>Explain your reasoning.</p> <p>Using this number statement, <math>5222 - 3111 = 5223 - 3112</math> write three more pairs of equivalent calculations.</p>	<p>True or False? Explain your reasoning.</p> <ul style="list-style-type: none"> <li>• <math>3999 - 2999 = 4000 - 3000</math></li> <li>• <math>3999 - 2999 = 3000 - 2000</math></li> <li>• <math>2741 - 1263 = 2742 - 1264</math></li> <li>• <math>2741 + 1263 = 2742 + 1264</math></li> <li>• <math>2741 - 1263 = 2731 - 1253</math></li> <li>• <math>2741 - 1263 = 2742 - 1252</math></li> </ul> <p>Set out and solve these calculations using a column method.</p> $3254 + \square = 7999$ $2431 = \square - 3456$ $6373 - \square = 3581$ $6719 = \square - 4562$ <p>Write four number facts that this bar diagram shows.</p> <table border="1" style="margin-left: auto; margin-right: auto;"> <tr> <td colspan="2" style="background-color: #d9e1f2;">95</td> </tr> <tr> <td style="background-color: #f4cccc;">38</td> <td style="background-color: #d9e1f2;">57</td> </tr> </table> $\square + \square = \square$ $\square + \square = \square$ $\square - \square = \square$ $\square - \square = \square$ <p>Captain Conjecture says 'When working with whole numbers, if you add two 2-digit numbers together the answer cannot be a 4-digit number'.</p> 	95		38	57	<p>Using contracted algorithm with larger numbers.</p> $43024 - 21253$ $\begin{array}{r} 4^2 3^0 2^1 4 \\ - 21253 \\ \hline 21771 \end{array}$ <p>Including further development of compensation of digits.</p> $43004 - 26259$ $\begin{array}{r} 4^3 1^2 3^0 0^1 4 \\ - 26259 \\ \hline 16745 \end{array}$
95						
38	57					

## Year 6

Use knowledge of the order of operations to carry out calculations involving the four operations.

Solve addition and subtraction multi-step problems in contexts, deciding which operations and methods to use and why.

### Opportunities for reasoning and problem solving and vocabulary.

Ensure year 5 methods are secure.

Year 6 addition and subtraction is mainly focussed on problem solving combining both operations and multi-step problems

Choose digits to go in the empty boxes to make these number sentences true.

$$41781 - 6 \square 53 = 8528$$

$$23.12 + 22 \cdot \square = 45.23$$

Choose operations to go in the empty boxes to make these sentences true.

$$6 \square 3 \square 7 = 16$$

$$6 \square 3 \square 7 = 27$$

$$6 \square 3 \square 7 = 9$$

Can you use five of the digits 1 to 9 to make this number sentence true?

$$\square \square \cdot \square + \square \cdot \square = 31 \cdot 7$$

A shop sells boxes of chocolates. One box costs £3.99. A second box costs £2.60. A third box costs £6.45.

What is the difference in price between the most and least expensive boxes?

The shop also sells packets of sweets. One packet costs £1.39. Ramesh has a £10 note and wants to buy the chocolates £2.60.

x and y represent whole numbers.

Their sum is 1000.

x is more than y.

What are the values of x and y?

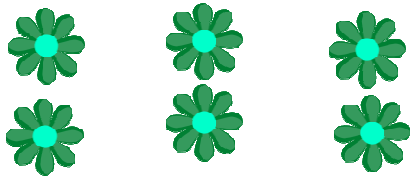



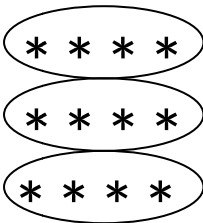
Two numbers have a difference of 2.38. What could the numbers be if:

- the two numbers add up to 6?
- one of the numbers is three times as big as the other number?

Two numbers have a difference of 2.3. To the nearest 10, they are both 10. What could the numbers be?

# Year 1

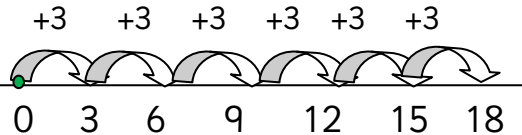
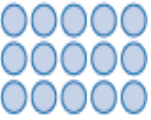
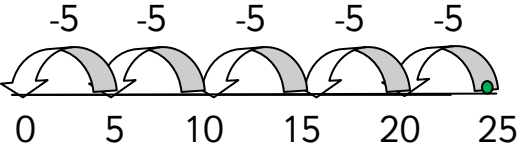
Solve one step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of teacher.

<h2>Multiplication</h2>	<h2>Opportunities for reasoning and problem solving and vocabulary.</h2>	<h2>Division</h2>															
<p>Using concrete objects and pictorial representations:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><math>3 \times 2</math></p> </div> <div style="text-align: center;">  <p><math>3 \times 10</math></p> </div> </div> <p>Using arrays:</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <p>* * *</p> <p>* * *</p> </div> <div style="text-align: center;"> <p><math>2 \times 3</math></p> </div> </div> <p>Using repeated addition:</p> <p style="text-align: center;"><math>2 + 2 + 2 = 3 \times 2</math></p>	<p style="text-align: center;">5, 10, <input type="text"/>, 20, <input type="text"/>, <input type="text"/>, .....</p> <p>Ali buys 3 bags of apples. Each bag has 4 apples in it. How many apples does he buy?</p> <p>Sam and Tom share the fruit equally. There are 4 apples, 4 oranges, 2 pears and 2 bananas. How many of each fruit do they receive? Complete the table below.</p> <div style="text-align: center;">  </div> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th></th> <th>Apples</th> <th>Oranges</th> <th>Bananas</th> <th>Pears</th> </tr> </thead> <tbody> <tr> <td>Sam</td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td>Tom</td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p style="text-align: center;">Circle half of this group of strawberries</p> <div style="text-align: center;">  </div>		Apples	Oranges	Bananas	Pears	Sam					Tom					<p>Using concrete objects and pictorial representations to share fairly:</p> <ul style="list-style-type: none"> <li>Plates and cubes <math>6 \div 3</math></li> <li>Teams <math>12 \div 4</math></li> </ul> <p>Using arrays:</p> <div style="text-align: center;">  </div>
	Apples	Oranges	Bananas	Pears													
Sam																	
Tom																	




## Year 2

Calculate mathematical statements for multiplication and division with the multiplication tables and write them using the  $\times$   $\div$   $=$  signs.  
Show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot.

Multiplication	Opportunities for reasoning and problem solving and vocabulary.	Division																																								
<p>Using arrays: <math>3 \times 10</math></p> <p>***** ***** *****</p> <p>Using number lines to model repeated addition: <math>6 \times 3</math></p>  <p>Using hundred square to count in multiples.</p> <table border="1" data-bbox="116 1077 439 1209"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> <tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr> </table> <p>Exploration of law of commutativity.</p> <p><math>4 \times 5 = 5 \times 4</math></p>	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	<p>True or False?</p> <p><math>5 \times 4 = 4 \times 5</math> <math>5 \times 4 = 10 \times 2</math> <math>5 \times 4 = 2 \times 10</math></p> <p>Explain your reasoning. What do you notice?</p> <p>This array represents <math>5 \times 3 = 15</math></p>  <p>Write three other multiplication or addition facts that this array shows.</p> <p>Write one division fact that this array shows.</p>	<p>Using arrays: <math>25 \div 5</math></p> <p>***** ***** ***** ***** *****</p> <p>Using number lines to model repeated subtraction:</p>  <p>Introduction to remainders:</p> <p><math>16 \div 3 = 5 \text{ r } 1</math></p> <p>***      ***      * remainder ***      *** ***      ***</p> <p>Explanation of fact that</p> <p><math>30 \div 10 \neq 10 \div 30</math></p>
1	2	3	4	5	6	7	8	9	10																																	
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21	22	23	24	25	26	27	28	29	30																																	
31	32	33	34	35	36	37	38	39	40																																	

## Year 3

Write and calculate mathematical statements for multiplication and division using the multiplication tables that they know, including two –digit numbers times one-digit numbers, using mental and progressing to formal written methods.

Multiplication	Opportunities for reasoning and problem solving and vocabulary.	Division									
<p>Using partitioning:</p> $35 \times 2 = (30 \times 2) + (5 \times 2)$ $= 60 + 10$ $= 70$ <p>Using grid method:</p> $4 \times 15$ <table border="1" data-bbox="98 817 622 912"> <tr> <td>x</td> <td>10</td> <td>5</td> </tr> <tr> <td>4</td> <td>40</td> <td>20</td> </tr> </table> <p>Progressing to expanding formal written methods (long multiplication)</p> $\begin{array}{r} 35 \\ \times 2 \\ \hline 70 \end{array}$	x	10	5	4	40	20	<p>What is <math>3 \times 4</math>? What is <math>13 \times 4</math>?</p> <p>Asking ‘How did you get that?’ can help you decide whether children are working efficiently with questions like <math>13 \times 4</math> by, for example calculating <math>10 \times 4</math> and adding <math>3 \times 4</math>, and that <math>3 \times 4</math> is not obtained by counting in 1s.</p> <p>Find the missing digits.</p> <table style="width: 100%; text-align: center;"> <tr> <td><math>\begin{array}{r} 2 \square \\ \times 8 \\ \hline 176 \end{array}</math></td> <td><math>\begin{array}{r} 2 \square \\ \times \square \\ \hline 112 \end{array}</math></td> <td><math>\begin{array}{r} 1 \square 4 \\ \times \square \\ \hline 736 \end{array}</math></td> </tr> </table> <p>Roger is laying tiles. He has 84 tiles altogether. How many complete rows of tiles can he make?</p> 	$\begin{array}{r} 2 \square \\ \times 8 \\ \hline 176 \end{array}$	$\begin{array}{r} 2 \square \\ \times \square \\ \hline 112 \end{array}$	$\begin{array}{r} 1 \square 4 \\ \times \square \\ \hline 736 \end{array}$	<p>Using known multiplication facts:</p> $4 \times 6 = 24$ <p>So: <math>24 \div 6 = 4</math> And <math>24 \div 4 = 6</math></p> <p>Use repeated subtraction (chunking method/ long division)</p> $\begin{array}{r} 25 \\ 5 \overline{) 125} \\ - 50 \text{ (10 x 5)} \\ \hline 75 \\ - 50 \text{ (10 x 5)} \\ \hline 25 \\ - 25 \text{ (5 x 5)} \\ \hline 0 \end{array}$
x	10	5									
4	40	20									
$\begin{array}{r} 2 \square \\ \times 8 \\ \hline 176 \end{array}$	$\begin{array}{r} 2 \square \\ \times \square \\ \hline 112 \end{array}$	$\begin{array}{r} 1 \square 4 \\ \times \square \\ \hline 736 \end{array}$									

# Year 4


Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.

<h2>Multiplication</h2>	<h2>Opportunities for reasoning and problem solving and vocabulary.</h2>	<h2>Division</h2>										
<p>Using grid method:</p> $123 \times 3$ <table border="1" data-bbox="96 480 759 568"> <tr> <td></td> <td>100</td> <td>20</td> <td>3</td> </tr> <tr> <td>3</td> <td>300</td> <td>60</td> <td>9</td> </tr> </table> <p style="text-align: center;"><math>300 + 60 + 9</math></p> <p>Progressing to formal written methods (long multiplication)</p> $\begin{array}{r} 342 \\ \times 7 \\ \hline 14 \\ 280 \\ \hline 2100 \\ \hline 2394 \end{array}$ <p>Using (contracted) short multiplication.</p> <table style="width: 100%; text-align: center;"> <tr> <td><math>\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ \hline 2 \end{array}</math></td> <td><math>\begin{array}{r} 342 \\ \times 7 \\ \hline 2394 \\ \hline 2 \quad 1 \end{array}</math></td> </tr> </table>		100	20	3	3	300	60	9	$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ \hline 2 \end{array}$	$\begin{array}{r} 342 \\ \times 7 \\ \hline 2394 \\ \hline 2 \quad 1 \end{array}$	<p>Can you write the number 30 as the product of 3 numbers?</p> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <math>8 \times 50</math> ○ <math>50 \times 8</math>  <math>8 \times 50</math> ○ <math>80 \times 5</math>  <math>300 \times 3</math> ○ <math>5 \times 200</math> </div> <div style="border: 1px solid black; padding: 10px; margin: 10px 0;"> <math>12 \times 6 =</math>  <math>13 \times 6 =</math>  <math>12 \times 12 =</math>  <math>12 \times 13 =</math>  <math>12 \times 0 =</math> </div> <p>True or False?</p> <p><math>7 \times 6 = 7 \times 3 \times 2</math></p> <p><math>7 \times 6 = 7 \times 3 + 3</math></p> <p>Explain your reasoning.</p>	<p>Using repeated subtraction ( chunking method/ long division)</p> $\begin{array}{r} 72 \div 5 = 72 \\ - 50 (5 \times 10) \\ \hline - 20 (5 \times 4) \\ \hline 2 \end{array}$ <p><math>72 \div 5 = 14 \text{ remainder } 2</math></p> <p>Using short division.</p> $\begin{array}{r} 322 \text{ remainder } 2 \\ 3 \overline{) 968} \end{array}$ <p>No need to carry at this stage.</p>
	100	20	3									
3	300	60	9									
$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ \hline 2 \end{array}$	$\begin{array}{r} 342 \\ \times 7 \\ \hline 2394 \\ \hline 2 \quad 1 \end{array}$											

## Year 5

Multiply numbers up to 4 digits by a one or two-digit number using a formal written method, including long multiplication for two-digit numbers.

Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context.

<h3>Multiplication</h3>	<h3>Opportunities for reasoning and problem solving and vocabulary.</h3>	<h3>Division</h3>																													
<p>Using grid method: 2093 x 13</p> <table border="1" data-bbox="96 523 759 651"> <tr> <td></td> <td>2000</td> <td>0</td> <td>90</td> <td>3</td> </tr> <tr> <td>10</td> <td>20000</td> <td>0</td> <td>900</td> <td>30</td> </tr> <tr> <td>3</td> <td>6000</td> <td>0</td> <td>270</td> <td>9</td> </tr> </table> <p>20000 + 6000 + 900 + 270 + 30 + 9</p> <p>Using long multiplication: 524 x 16</p> $\begin{array}{r} 524 \\ \times 16 \\ \hline 3144 \\ 5240 \\ \hline 8384 \end{array}$ <p>understanding of place value</p> <p>Using short multiplication.</p> <table data-bbox="185 1284 555 1439"> <tr> <td><math>\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ 2 \end{array}</math></td> <td><math>\begin{array}{r} 342 \\ \times 7 \\ \hline 2394 \\ 21 \end{array}</math></td> </tr> </table>		2000	0	90	3	10	20000	0	900	30	3	6000	0	270	9	$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ 2 \end{array}$	$\begin{array}{r} 342 \\ \times 7 \\ \hline 2394 \\ 21 \end{array}$	<p><input type="text"/> 8 is a multiple of <input type="text"/> 4 and a factor of <input type="text"/> 16</p> <p><input type="text"/> 6 is a multiple of <input type="text"/> 3 and a factor of <input type="text"/></p> <p><input type="text"/> is a multiple of <input type="text"/> 5 and a factor of <input type="text"/></p> <p><input type="text"/> is a multiple of <input type="text"/> and a factor of <input type="text"/></p> <p>Fill in the missing numbers in this multiplication pyramid.</p> <table border="1" data-bbox="875 890 1285 1091"> <tr> <td></td> <td>108</td> <td></td> </tr> <tr> <td></td> <td></td> <td>6</td> </tr> <tr> <td></td> <td></td> <td>3</td> </tr> <tr> <td>2</td> <td></td> <td></td> </tr> </table> <p>Captain Conjecture says 'Factors come in pairs so all numbers have an even number of factors.'</p> <p>Do you agree?</p> <p>Explain your reasoning.</p> 		108				6			3	2			<p>Developing long division</p> $\begin{array}{r} 9 \overline{) 8725} \\ \underline{8100} \quad (900 \times 9) \\ 625 \\ \underline{540} \quad (60 \times 9) \\ 85 \\ \underline{81} \quad (9 \times 9) \\ 4 \end{array}$ <p>Answer= 969r4</p> <p>Developing short division.</p> $\begin{array}{r} 0661 \text{ remainder } 4 \\ 7 \overline{) 4631} \end{array}$ <p>Children need the opportunity to use division in problem solving and deciding whether to round up or down.</p>
	2000	0	90	3																											
10	20000	0	900	30																											
3	6000	0	270	9																											
$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ 2 \end{array}$	$\begin{array}{r} 342 \\ \times 7 \\ \hline 2394 \\ 21 \end{array}$																														
	108																														
		6																													
		3																													
2																															

## Year 6

Multiply decimal numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.

Divide numbers up to 4-digits by a two-digit whole number using the formal written method of long division and interpret remainders as whole number remainders, fractions or by rounding, as appropriate, for the context.

<p style="text-align: center;"><b>Multiplication</b></p>	<p style="text-align: center;"><b>Opportunities for reasoning and problem solving and vocabulary.</b></p>	<p style="text-align: center;"><b>Division</b></p>
<p>Using short multiplication with decimals.</p> $  \begin{array}{r}  12.4 \\  \times 26 \\  \hline  74.4 \\  1 \quad 2 \\  \hline  248 \\  \hline  322.4 \\  1 \quad 1  \end{array}  $	<p>In each pair of calculations, which one would you prefer to work out?</p> <ul style="list-style-type: none"> <li>▪ (a) <math>35 \times 0.3 + 35 \times 0.7</math> or (b) <math>3.5 \times 0.3 + 35 \times 7</math></li> <li>▪ (c) <math>64 \times 1.27 - 64 \times 0.1</math> or (d) <math>64 \times 1.27 - 64 \times 0.027</math></li> <li>▪ (e) <math>52.4 \div 0.7 + 524 \div 7</math> or (f) <math>52.4 \div 0.7 - 524 \div 7</math></li> <li>▪ (a) <math>31.2 \div 3 - 24 \div 6</math> or (h) <math>31.2 \div 3 - 1.2 \div 0.3</math></li> </ul> <p>A box of labels costs £63. There are 140 sheets in the box. There are 15 labels on each sheet. Sara, Ramesh and Trevor want to calculate the cost of one label in pence. Ramesh uses the number sentence <math>(6300 \div 14 \div 15) \times 15</math>. Sara uses the number sentence <math>15 \div 14 \div 15</math>. Trevor uses the number sentence <math>(15 \times 140) \div 6300</math>.</p> <p>Who is using the right number sentence? Explain your choice.</p> <p>A box of labels costs £24. There are 100 sheets in the box. There are 10 labels on each sheet.</p> <p>Calculate the cost of one label, in pence.</p>	<p>Using long division and interpret remainder</p> <p>There are 4567 people going to a football match and they are going by bus. Each bus holds 53 people. How many buses are needed?</p> $  \begin{array}{r}  \phantom{53} \overline{) 4567} \\  \phantom{53} \underline{4240} \quad (80 \times 53) \\  \phantom{53} \phantom{4240} \underline{327} \\  \phantom{53} \phantom{4240} \phantom{327} \underline{318} \quad (6 \times 53) \\  \phantom{53} \phantom{4240} \phantom{327} \phantom{318} \phantom{9} \\  \phantom{53} \phantom{4240} \phantom{327} \phantom{318} \phantom{9} \phantom{0}  \end{array}  $ <p>Answer is 87 as you will need an extra coach for the remainder.</p>