



# **The Leys Primary & Nursery School**

**Learning Today ....Leading Tomorrow**

## **Calculation Policy 2021-2022**

At The Leys, calculation procedures are taught according to this document so they can be seamlessly built upon year after year, as the child moves through school.

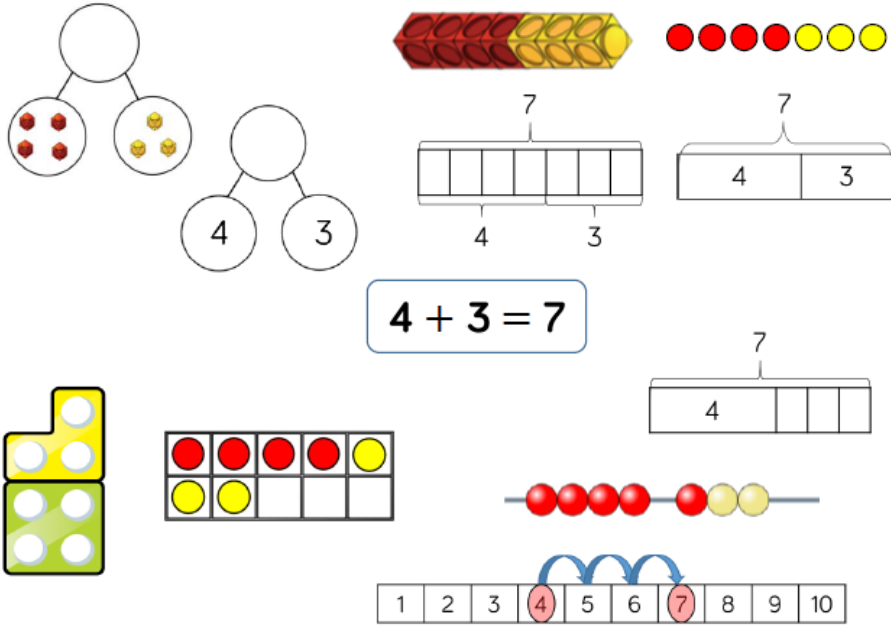
The policy has been taken and adapted to suit from White Rose Maths. We have found their calculation policy to be the one which works for the needs of our children and suits the way in which we teach Maths. The use of concrete resources and visuals underpins this calculation policy, which is what you would see in a maths lesson at The Leys.

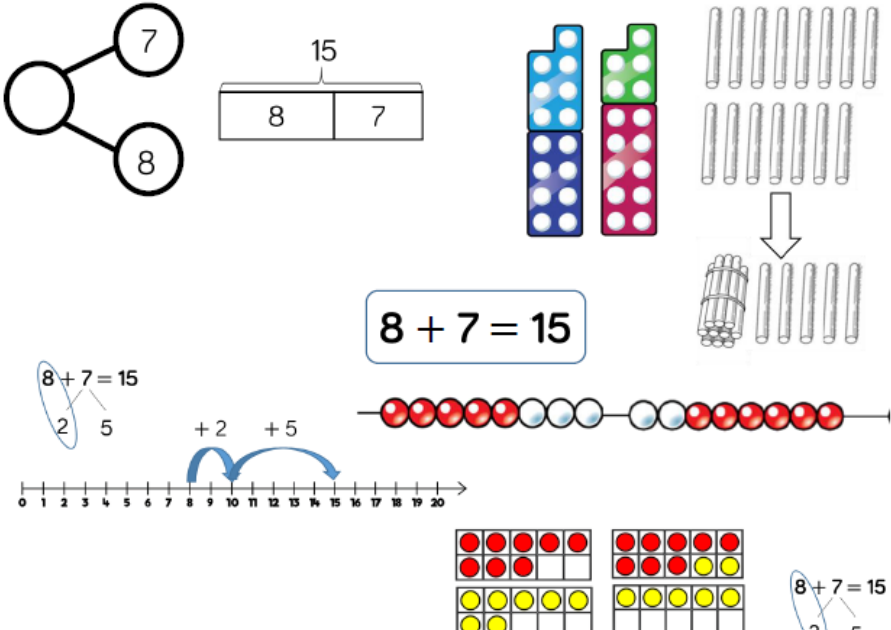
The policy goes through:

- Addition
- Subtraction
- Multiplication
- Division

Each operation is broken down into skills for the year group and shows recommended models and visuals to support the teaching of the corresponding concepts alongside.

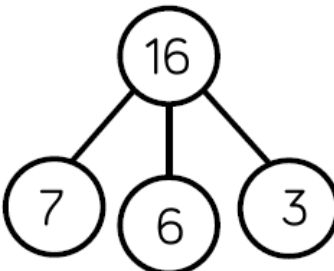
## Addition

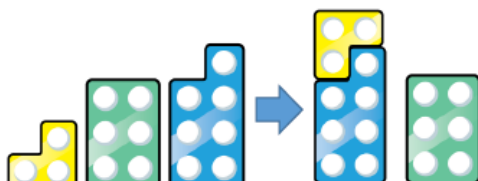
Skill: Add 1-digit numbers within 10	Year: 1
 <p><math>4 + 3 = 7</math></p>	<p>When adding numbers to 10, children can explore both aggregation and augmentation.</p> <p>The part-whole model, discrete and continuous bar model, number shapes and ten frame support aggregation.</p> <p>The combination bar model, ten frame, bead string and number track all support augmentation.</p>

Skill: Add 1 and 2-digit numbers to 20	Year: 1/2
 <p><math>8 + 7 = 15</math></p>	<p>When adding one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.</p> <p>Different manipulatives can be used to represent this exchange. Use concrete resources alongside number lines to support children in understanding how to partition their jumps.</p>

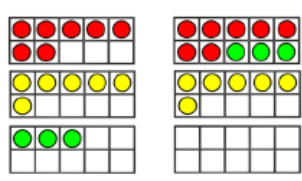
**Skill: Add three 1-digit numbers**


**Year: 2**

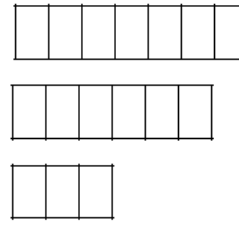




$7 + 6 + 3 = 16$



$7 + 6 + 3 = 16$   




}

16

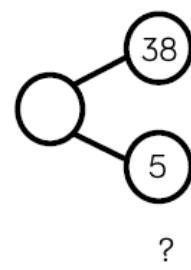
When adding three 1-digit numbers, children should be encouraged to look for number bonds to 10 or doubles to add the numbers more efficiently.

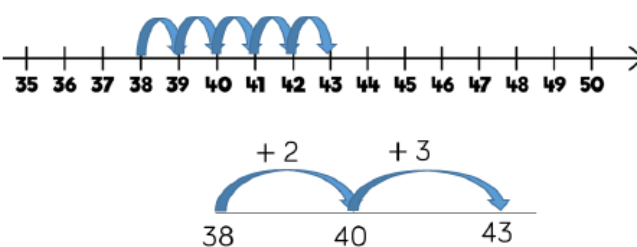
This supports children in their understanding of commutativity.

Manipulatives that highlight number bonds to 10 are effective when adding three 1-digit numbers.

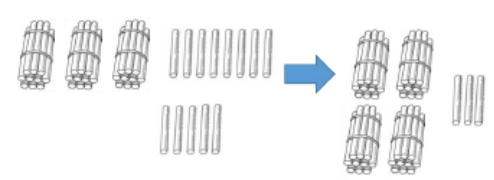
**Skill: Add 1-digit and 2-digit numbers to 100**

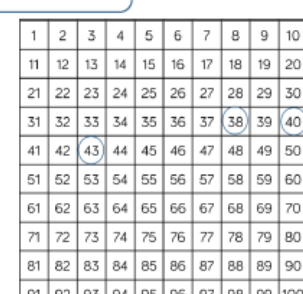
**Year: 2/3**





$38 + 5 = 43$





When adding single digits to a two-digit number, children should be encouraged to count on from the larger number.

They should also apply their knowledge of number bonds to add more efficiently e.g.  $8 + 5 = 13$  so  $38 + 5 = 43$ .

Hundred squares and straws can support children to find the number bond to 10.

Skill: Add two 2-digit numbers to 100	Year: 2/3								
<p>38 + 23 = 61</p> <table border="1"> <thead> <tr> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td>38</td> <td>23</td> </tr> <tr> <td>38</td> <td>23</td> </tr> <tr> <td>61</td> <td>1</td> </tr> </tbody> </table>	Tens	Ones	38	23	38	23	61	1	<p>At this stage, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.</p> <p>Children can also use a blank number line to count on to find the total. Encourage them to jump to multiples of 10 to become more efficient.</p>
Tens	Ones								
38	23								
38	23								
61	1								

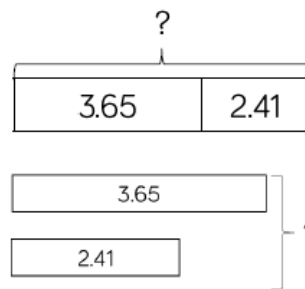
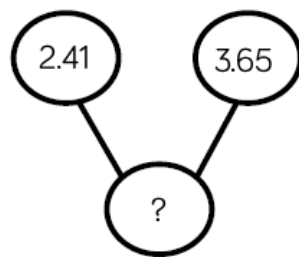
Skill: Add numbers with up to 3 digits	Year: 3												
<p>265 + 164 = 429</p> <table border="1"> <thead> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td>265</td> <td>164</td> <td></td> </tr> <tr> <td>265</td> <td>164</td> <td></td> </tr> <tr> <td>429</td> <td>1</td> <td></td> </tr> </tbody> </table>	Hundreds	Tens	Ones	265	164		265	164		429	1		<p>Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 3 digits.</p> <p>Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.</p> <p>Plain counters on a place value grid can also be used to support learning.</p>
Hundreds	Tens	Ones											
265	164												
265	164												
429	1												

Skill: Add numbers with up to 4 digits	Year: 4																																												
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> <div style="text-align: center;"> <table border="1" style="border-collapse: collapse;"> <tr><td>1</td><td>3</td><td>7</td><td>8</td></tr> <tr><td>+</td><td>2</td><td>1</td><td>4</td></tr> <tr><td colspan="4" style="border-top: 1px solid black;"></td></tr> <tr><td>3</td><td>5</td><td>2</td><td>6</td></tr> <tr><td></td><td>1</td><td>1</td><td></td></tr> </table> </div> </div> <div style="text-align: center; margin: 10px 0;"> <math display="block">1,378 + 2,148 = 3,526</math> </div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <table border="1" style="border-collapse: collapse; width: 100%;"> <thead> <tr style="background-color: #f2f2f2;"> <th>Thousands</th> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> </div> <div style="text-align: center;"> <table border="1" style="border-collapse: collapse; width: 100%;"> <thead> <tr style="background-color: #f2f2f2;"> <th>Thousands</th> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> </div> </div>	1	3	7	8	+	2	1	4					3	5	2	6		1	1		Thousands	Hundreds	Tens	Ones									Thousands	Hundreds	Tens	Ones									<p>Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 4 digits.</p> <p>Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.</p> <p>Plain counters on a place value grid can also be used to support learning.</p>
1	3	7	8																																										
+	2	1	4																																										
3	5	2	6																																										
	1	1																																											
Thousands	Hundreds	Tens	Ones																																										
Thousands	Hundreds	Tens	Ones																																										

Skill: Add numbers with more than 4 digits	Year: 5/6																																																
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> </div> <div style="text-align: center;"> </div> </div> <div style="text-align: center; margin: 10px 0;"> <math display="block">104,328 + 61,731 = 166,059</math> </div> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <table border="1" style="border-collapse: collapse; width: 100%;"> <thead> <tr style="background-color: #f2f2f2;"> <th>HTh</th> <th>TTh</th> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> </div> <div style="text-align: center;"> <table border="1" style="border-collapse: collapse;"> <tr><td>1</td><td>0</td><td>4</td><td>3</td><td>2</td><td>8</td></tr> <tr><td>+</td><td>6</td><td>1</td><td>7</td><td>3</td><td>1</td></tr> <tr><td colspan="6" style="border-top: 1px solid black;"></td></tr> <tr><td>1</td><td>6</td><td>6</td><td>0</td><td>5</td><td>9</td></tr> <tr><td></td><td></td><td></td><td></td><td></td><td></td></tr> </table> </div> </div>	HTh	TTh	Th	H	T	O													1	0	4	3	2	8	+	6	1	7	3	1							1	6	6	0	5	9							<p>Place value counters or plain counters on a place value grid are the most effective concrete resources when adding numbers with more than 4 digits.</p> <p>At this stage, children should be encouraged to work in the abstract, using the column method to add larger numbers efficiently.</p>
HTh	TTh	Th	H	T	O																																												
1	0	4	3	2	8																																												
+	6	1	7	3	1																																												
1	6	6	0	5	9																																												

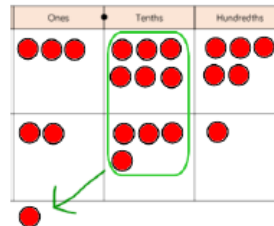
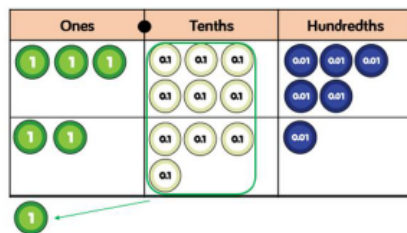
# Skill: Add with up to 3 decimal places

Year: 5



$$\begin{array}{r} 3.65 \\ + 2.41 \\ \hline 6.06 \\ 1 \end{array}$$

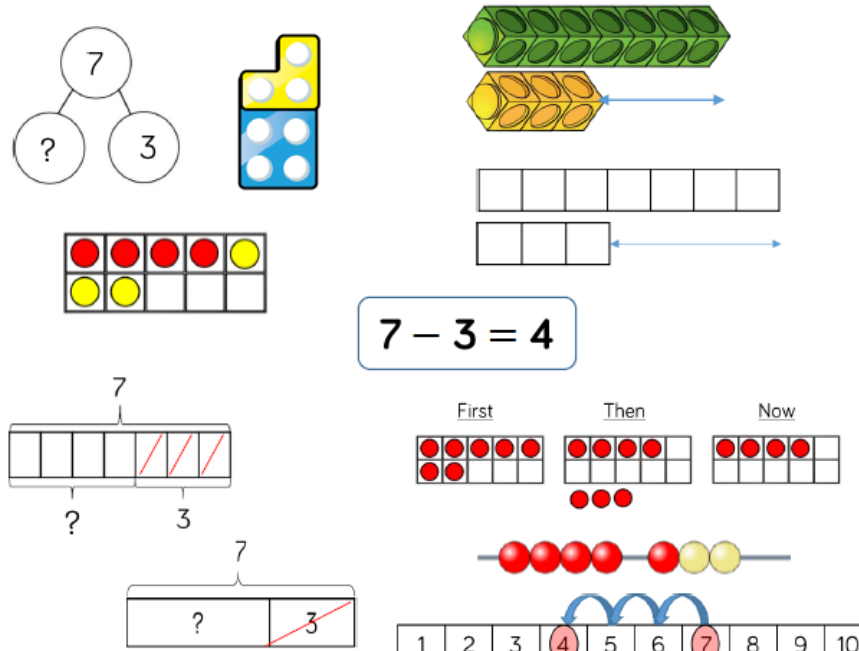
$$3.65 + 2.41 = 6.06$$

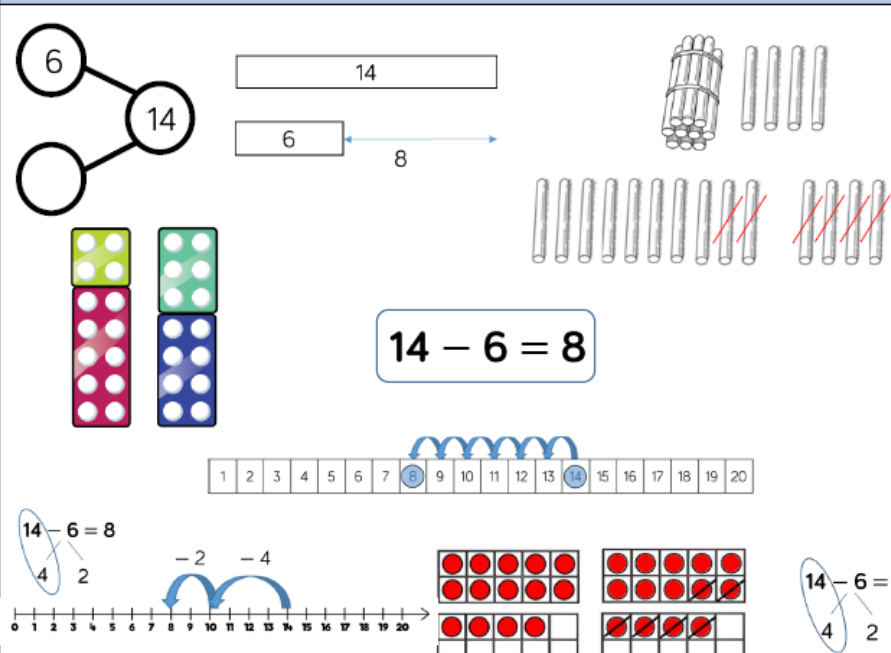


Place value counters and plain counters on a place value grid are the most effective manipulatives when adding decimals with 1, 2 and then 3 decimal places.

Ensure children have experience of adding decimals with a variety of decimal places. This includes putting this into context when adding money and other measures.

## Subtraction

Skill: Subtract 1-digit numbers within 10	Year: 1
 <p>7 - 3 = 4</p>	<p>Part-whole models, bar models, ten frames and number shapes support partitioning.</p> <p>Ten frames, number tracks, single bar models and bead strings support reduction.</p> <p>Cubes and bar models with two bars can support finding the difference.</p>

Skill: Subtract 1 and 2-digit numbers to 20	Year: 1/2
 <p>14 - 6 = 8</p>	<p>When subtracting one-digit numbers that cross 10, it is important to highlight the importance of ten ones equalling one ten.</p> <p>Children should be encouraged to find the number bond to 10 when partitioning the subtracted number. Ten frames, number shapes and number lines are particularly useful for this.</p>



Skill: Subtract 1 and 2-digit numbers to 100	Year: 2												
<div data-bbox="231 291 414 492"> </div> <div data-bbox="478 291 957 403"> </div> <div data-bbox="574 414 1069 571"> </div> <div data-bbox="231 571 534 649"> <table border="1"> <tr> <td colspan="2">65</td> </tr> <tr> <td>?</td> <td>28</td> </tr> </table> </div> <div data-bbox="582 582 893 660"> <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <math>65 - 28 = 37</math> </div> </div> <div data-bbox="239 705 590 896"> <table border="1"> <thead> <tr> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table> </div> <div data-bbox="606 716 718 873"> <math display="block">\begin{array}{r} 5 \quad 1 \\ 65 \\ - 28 \\ \hline 37 \end{array}</math> </div> <div data-bbox="734 705 1085 907"> <table border="1"> <thead> <tr> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> </tr> </tbody> </table> </div>	65		?	28	Tens	Ones			Tens	Ones			<p>At this stage, encourage children to use the formal column method when calculating alongside straws, base 10 or place value counters. As numbers become larger, straws become less efficient.</p> <p>Children can also use a blank number line to count on to find the difference. Encourage them to jump to multiples of 10 to become more efficient.</p>
65													
?	28												
Tens	Ones												
Tens	Ones												

Skill: Subtract numbers with up to 3 digits	Year: 3																			
<div data-bbox="231 1176 462 1422"> </div> <div data-bbox="486 1220 750 1344"> <table border="1"> <tr> <td colspan="2">435</td> </tr> <tr> <td>273</td> <td>?</td> </tr> </table> </div> <div data-bbox="790 1220 1077 1355"> <table border="1"> <tr> <td>435</td> </tr> <tr> <td>273</td> </tr> <tr> <td>← ?</td> </tr> </table> </div> <div data-bbox="510 1467 893 1545"> <div style="border: 1px solid black; padding: 5px; display: inline-block;"> <math>435 - 273 = 162</math> </div> </div> <div data-bbox="223 1601 598 1780"> <table border="1"> <thead> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> </div> <div data-bbox="606 1601 710 1747"> <math display="block">\begin{array}{r} 3 \quad 1 \\ 435 \\ - 273 \\ \hline 162 \end{array}</math> </div> <div data-bbox="734 1601 1101 1780"> <table border="1"> <thead> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> </div>	435		273	?	435	273	← ?	Hundreds	Tens	Ones				Hundreds	Tens	Ones				<p>Base 10 and place value counters are the most effective manipulative when subtracting numbers with up to 3 digits.</p> <p>Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.</p> <p>Plain counters on a place value grid can also be used to support learning.</p>
435																				
273	?																			
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Hundreds	Tens	Ones																		
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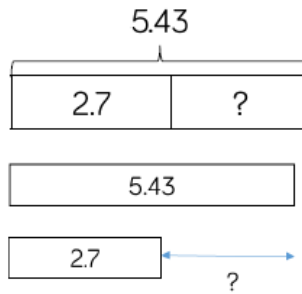
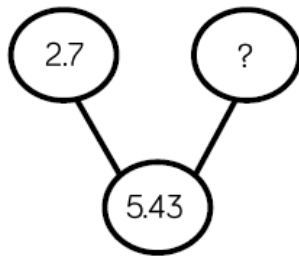


Skill: Subtract numbers with up to 4 digits	Year: 4																
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> </div> <div style="text-align: center;"> <math display="block">\begin{array}{r} 4,357 \\ - 2,735 \\ \hline \end{array}</math> </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="text-align: center;"> <math display="block">\begin{array}{ c c } \hline 4,357 &amp; ? \\ \hline \end{array}</math> </div> <div style="text-align: center;"> <math display="block">\begin{array}{ c } \hline 4,357 \\ \hline \end{array}</math> </div> <div style="text-align: center;"> <math display="block">\begin{array}{ c } \hline 2,735 \\ \hline \end{array} \leftarrow ?</math> </div> </div> <div style="text-align: center; margin-top: 10px; border: 1px solid black; padding: 5px; border-radius: 10px;"> <math>4,357 - 2,735 = 1,622</math> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <table border="1" style="font-size: 8px; text-align: center;"> <thead> <tr style="background-color: #f2f2f2;"> <th>Thousands</th> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <table border="1" style="font-size: 8px; text-align: center;"> <thead> <tr style="background-color: #f2f2f2;"> <th>Thousands</th> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> </div>	Thousands	Hundreds	Tens	Ones					Thousands	Hundreds	Tens	Ones					<p>Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 4 digits.</p> <p>Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.</p> <p>Plain counters on a place value grid can also be used to support learning.</p>
Thousands	Hundreds	Tens	Ones														
Thousands	Hundreds	Tens	Ones														

Skill: Subtract numbers with more than 4 digits	Year: 5/6																																				
<div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> </div> <div style="text-align: center;"> <math display="block">\begin{array}{r} 294,382 \\ - 182,501 \\ \hline \end{array}</math> </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 10px;"> <div style="text-align: center;"> <math display="block">\begin{array}{ c c } \hline 294,382 &amp; ? \\ \hline \end{array}</math> </div> <div style="text-align: center;"> <math display="block">\begin{array}{ c } \hline 294,382 \\ \hline \end{array}</math> </div> <div style="text-align: center;"> <math display="block">\begin{array}{ c } \hline 182,501 \\ \hline \end{array} \leftarrow ?</math> </div> </div> <div style="text-align: center; margin-top: 10px; border: 1px solid black; padding: 5px; border-radius: 10px;"> <math>294,382 - 182,501 = 111,881</math> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <table border="1" style="font-size: 8px; text-align: center;"> <thead> <tr style="background-color: #f2f2f2;"> <th>HTh</th> <th>TTh</th> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table> <table border="1" style="font-size: 8px; text-align: center;"> <tbody> <tr> <td></td> <td>2</td> <td>9</td> <td>3</td> <td>1</td> <td>3</td> <td>8</td> <td>2</td> </tr> <tr> <td>-</td> <td>1</td> <td>8</td> <td>2</td> <td>5</td> <td>0</td> <td>1</td> <td></td> </tr> <tr> <td></td> <td>1</td> <td>1</td> <td>1</td> <td>8</td> <td>8</td> <td>1</td> <td></td> </tr> </tbody> </table> </div>	HTh	TTh	Th	H	T	O								2	9	3	1	3	8	2	-	1	8	2	5	0	1			1	1	1	8	8	1		<p>Place value counters or plain counters on a place value grid are the most effective concrete resource when subtracting numbers with more than 4 digits.</p> <p>At this stage, children should be encouraged to work in the abstract, using column method to subtract larger numbers efficiently.</p>
HTh	TTh	Th	H	T	O																																
	2	9	3	1	3	8	2																														
-	1	8	2	5	0	1																															
	1	1	1	8	8	1																															

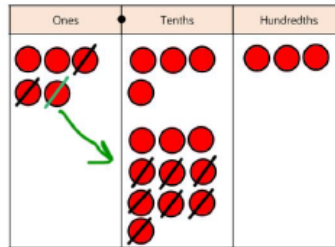
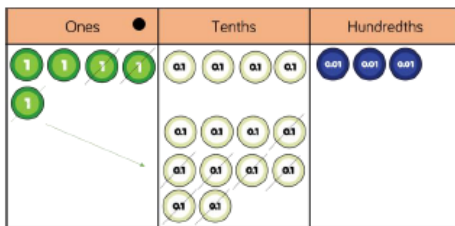
# Skill: Subtract with up to 3 decimal places

Year: 5



$$\begin{array}{r} 4 \quad 1 \\ 5.43 \\ - 2.7 \\ \hline 2.73 \end{array}$$

$$5.43 - 2.7 = 2.73$$



Place value counters and plain counters on a place value grid are the most effective manipulative when subtracting decimals with 1, 2 and then 3 decimal places.

Ensure children have experience of subtracting decimals with a variety of decimal places. This includes putting this into context when subtracting money and other measures.

## Multiplication

Our calculation policy for multiplication starts with a breakdown of times tables; what should be taught when and what that teaching should look like.

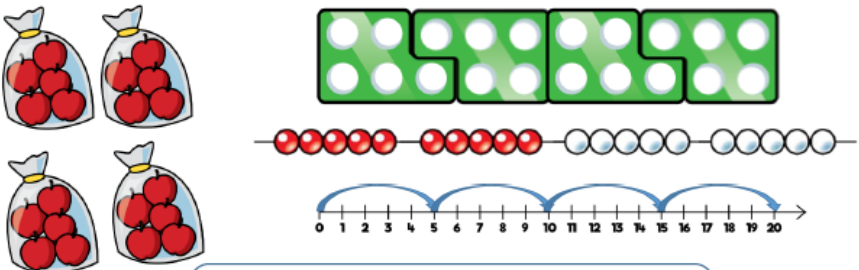
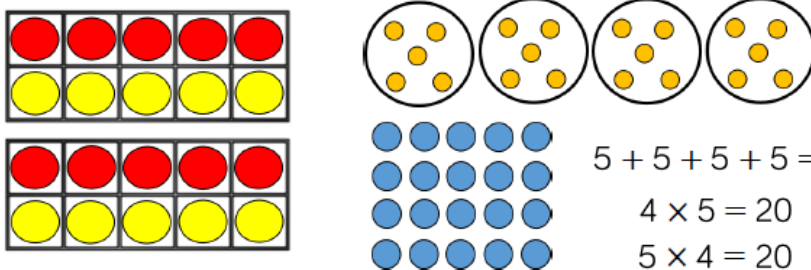
During the Summer Term, the children in Year 4 sit the Multiplication Tables Check in line with the Government's assessment framework.

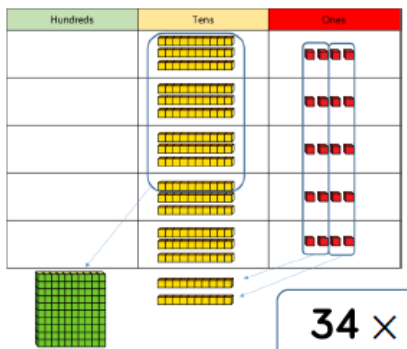

Times tables continue to be recalled and tested throughout Years 5 and 6.

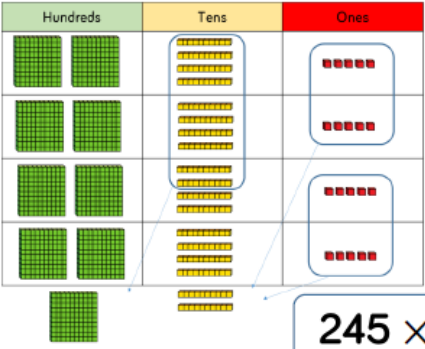
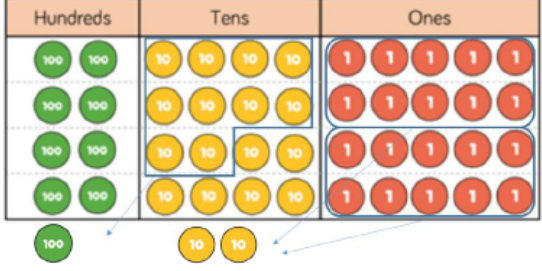
Skill	Year	Representations and models	
Recall and use multiplication and division facts for the 2-times table	2	Bar model Number shapes Counters Money	Ten frames Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 5-times table	2	Bar model Number shapes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

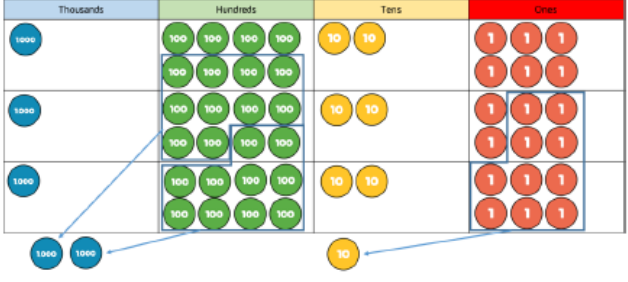
Skill	Year	Representations and models	
Recall and use multiplication and division facts for the 3-times table	3	Hundred square Number shapes Counters	Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 4-times table	3	Hundred square Number shapes Counters	Bead strings Number lines Everyday objects
Recall and use multiplication and division facts for the 8-times table	3	Hundred square Number shapes	Bead strings Number tracks Everyday objects
Recall and use multiplication and division facts for the 6-times table	4	Hundred square Number shapes	Bead strings Number tracks Everyday objects

Skill	Year	Representations and models	
Recall and use multiplication and division facts for the 7-times table	4	Hundred square Number shapes	Bead strings Number lines
Recall and use multiplication and division facts for the 9-times table	4	Hundred square Number shapes	Bead strings Number lines
Recall and use multiplication and division facts for the 11-times table	4	Hundred square Base 10	Place value counters Number lines
Recall and use multiplication and division facts for the 12-times table	4	Hundred square Base 10	Place value counters Number lines

Skill: Solve 1-step problems using multiplication	Year: 1/2
 <p data-bbox="422 548 949 660">One bag holds 5 apples. How many apples do 4 bags hold?</p>  <div data-bbox="821 795 1109 952"> <math>5 + 5 + 5 + 5 = 20</math>  <math>4 \times 5 = 20</math>  <math>5 \times 4 = 20</math> </div>	<p data-bbox="1133 302 1380 436">Children represent multiplication as repeated addition in many different ways.</p> <p data-bbox="1133 481 1380 728">In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record multiplication formally.</p> <p data-bbox="1133 761 1380 862">In Year 2, children are introduced to the multiplication symbol.</p>

Skill: Multiply 2-digit numbers by 1-digit numbers	Year: 3/4																																								
 <div data-bbox="534 1422 853 1512"> <math>34 \times 5 = 170</math> </div> <div data-bbox="327 1512 622 1792"> <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>1</td> <td>7</td> <td>0</td> </tr> </tbody> </table> <p>1 2</p> </div> <div data-bbox="774 1142 1037 1411"> <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> <p>(5 x 4) (5 x 30)</p> </div> 		H	T	O			3	4	x			5		1	7	0		H	T	O			3	4	x			5			2	0	+	1	5	0		1	7	0	<p data-bbox="1133 1131 1380 1377">Teachers may decide to first look at the expanded column method before moving on to the short multiplication method.</p> <p data-bbox="1133 1377 1380 1736">The place value counters should be used to support the understanding of the method rather than supporting the multiplication, as children should use times table knowledge.</p>
	H	T	O																																						
		3	4																																						
x			5																																						
	1	7	0																																						
	H	T	O																																						
		3	4																																						
x			5																																						
		2	0																																						
+	1	5	0																																						
	1	7	0																																						

Skill: Multiply 3-digit numbers by 1-digit numbers				Year: 3/4																			
 <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 10px auto;"> <math>245 \times 4 = 980</math> </div>	<table border="1" style="border-collapse: collapse; text-align: center; margin: 0 auto;"> <tr><td></td><td>H</td><td>T</td><td>O</td></tr> <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 style="border-top: 1px solid black;"><td></td><td>9</td><td>8</td><td>0</td></tr> <tr><td></td><td>1</td><td>2</td><td></td></tr> </table>		H	T	O		2	4	5	x			4		9	8	0		1	2		<p>When moving to 3-digit by 1-digit multiplication, encourage children to move towards the short, formal written method. Base 10 and place value counters continue to support the understanding of the written method. Limit the number of exchanges needed in the questions and move children away from resources when multiplying larger numbers.</p>	
	H	T	O																				
	2	4	5																				
x			4																				
	9	8	0																				
	1	2																					
																							

Skill: Multiply 4-digit numbers by 1-digit numbers				Year: 5																								
 <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 10px auto;"> <math>1,826 \times 3 = 5,478</math> </div>	<table border="1" style="border-collapse: collapse; text-align: center; margin: 0 auto;"> <tr><td></td><td>Th</td><td>H</td><td>T</td><td>O</td></tr> <tr><td></td><td>1</td><td>8</td><td>2</td><td>6</td></tr> <tr><td>x</td><td></td><td></td><td></td><td>3</td></tr> <tr style="border-top: 1px solid black;"><td></td><td>5</td><td>4</td><td>7</td><td>8</td></tr> <tr><td></td><td>2</td><td></td><td>1</td><td></td></tr> </table>		Th	H	T	O		1	8	2	6	x				3		5	4	7	8		2		1		<p>When multiplying 4-digit numbers, place value counters are the best manipulative to use to support children in their understanding of the formal written method. If children are multiplying larger numbers and struggling with their times tables, encourage the use of multiplication grids so children can focus on the use of the written method.</p>	
	Th	H	T	O																								
	1	8	2	6																								
x				3																								
	5	4	7	8																								
	2		1																									

**Skill: Multiply 2-digit numbers by 2-digit numbers**

**Year: 5**

	10	10	1	1
10	100	100	10	10
10	100	100	10	10
10	100	100	10	10
1	10	10	1	1

When multiplying a multi-digit number by 2-digits, use the area model to help children understand the size of the numbers they are using. This links to finding the area of a rectangle by finding the space covered by the Base 10.

The grid method matches the area model as an initial written method before moving on to the formal written multiplication method.

×	20	2
30	600	60
1	20	2

	H	T	O
		2	2
×		3	1
		2	2
	6	6	0
	6	8	2

$22 \times 31 = 682$

**Skill: Multiply 3-digit numbers by 2-digit numbers**

**Year: 5**

	100	100	10	10	10	1	1	1	1
10	1000	1000	100	100	100	10	10	10	10
10	1000	1000	100	100	100	10	10	10	10
10	1000	1000	100	100	100	10	10	10	10
1	100	100	10	10	10	1	1	1	1
1	100	100	10	10	10	1	1	1	1

Children can continue to use the area model when multiplying 3-digits by 2-digits. Place value counters become more efficient to use but Base 10 can be used to highlight the size of numbers.

Encourage children to move towards the formal written method, seeing the links with the grid method.

×	200	30	4
30	6,000	900	120
2	400	60	8

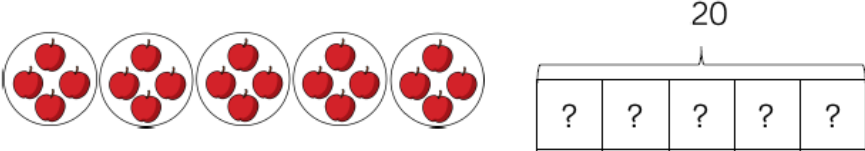
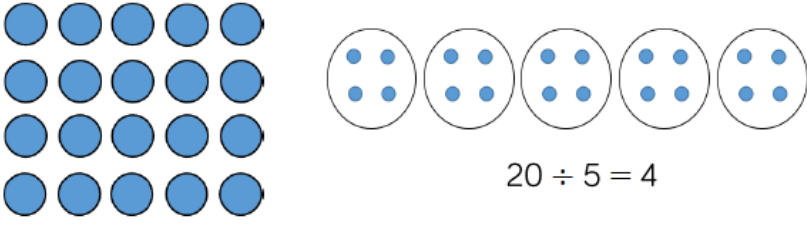
Th	H	T	O
	2	3	4
×		3	2
	4	6	8
1 7	1 0	2	0
7	4	8	8

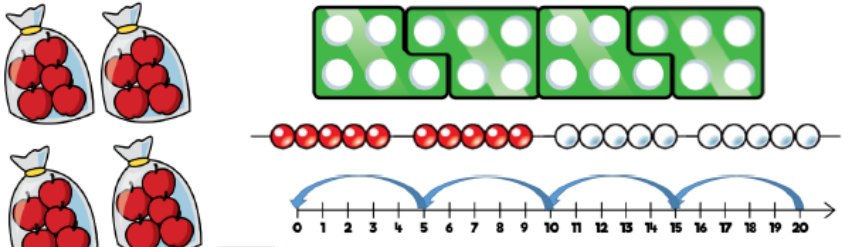
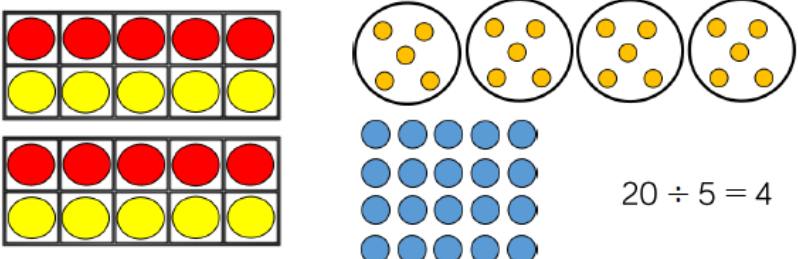
$234 \times 32 = 7,488$



Skill: Multiply 4-digit numbers by 2-digit numbers	Year: 5/6																																													
<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 colspan="5"><hr/></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> <p>1</p>	TTh	Th	H	T	O		2	7	3	9	×			2	8	<hr/>					2	1	9	1	2	2	5	3	7		5	4	7	8	0	1		1			7	6	6	9	2	<p>When multiplying 4-digits by 2-digits, children should be confident in the written method.</p> <p>If they are still struggling with times tables, provide multiplication grids to support when they are focusing on the use of the method.</p> <p>Consider where exchanged digits are placed and make sure this is consistent.</p>
TTh	Th	H	T	O																																										
	2	7	3	9																																										
×			2	8																																										
<hr/>																																														
2	1	9	1	2																																										
2	5	3	7																																											
5	4	7	8	0																																										
1		1																																												
7	6	6	9	2																																										
<div>2,739 × 28 = 76,692</div>																																														

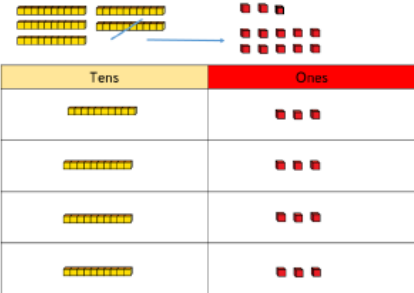
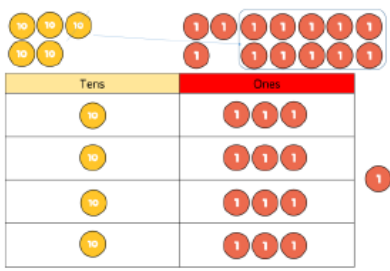
## Division

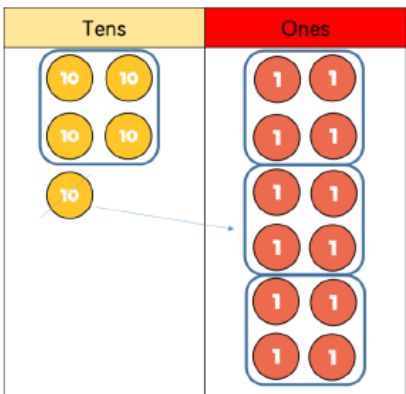
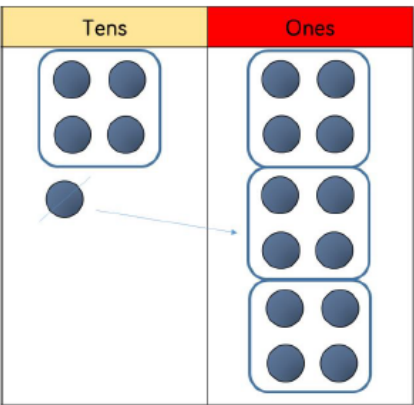
Skill: Solve 1-step problems using multiplication (sharing)	Year: 1/2
 <p>20</p> <p>There are 20 apples altogether. They are shared equally between 5 bags. How many apples are in each bag?</p>  <p><math>20 \div 5 = 4</math></p>	<p>Children solve problems by sharing amounts into equal groups.</p> <p>In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record division formally.</p> <p>In Year 2, children are introduced to the division symbol.</p>

Skill: Solve 1-step problems using division (grouping)	Year: 1/2
 <p>There are 20 apples altogether. They are put in bags of 5. How many bags are there?</p>  <p><math>20 \div 5 = 4</math></p>	<p>Children solve problems by grouping and counting the number of groups. Grouping encourages children to count in multiples and links to repeated subtraction on a number line. They can use concrete representations in fixed groups such as number shapes which helps to show the link between multiplication and division.</p>

Skill: Divide 2-digits by 1-digit (sharing with no exchange)		Year: 1/2						
<table border="1"> <thead> <tr> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td>10 10</td> <td>1 1 1 1</td> </tr> <tr> <td>10 10</td> <td>1 1 1 1</td> </tr> </tbody> </table>	Tens	Ones	10 10	1 1 1 1	10 10	1 1 1 1		<p>When dividing larger numbers, children can use manipulatives that allow them to partition into tens and ones.</p>
Tens	Ones							
10 10	1 1 1 1							
10 10	1 1 1 1							
	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <math>48 \div 2 = 24</math> </div>	<p>Straws, Base 10 and place value counters can all be used to share numbers into equal groups.</p>						
		<p>Part-whole models can provide children with a clear written method that matches the concrete representation.</p>						

Skill: Divide 2-digits by 1-digit (sharing with exchange)		Year: 3/4										
	<table border="1"> <thead> <tr> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td>10</td> <td>1 1 1</td> </tr> <tr> <td>10</td> <td>1 1 1</td> </tr> <tr> <td>10</td> <td>1 1 1</td> </tr> <tr> <td>10</td> <td>1 1 1</td> </tr> </tbody> </table>	Tens	Ones	10	1 1 1	10	1 1 1	10	1 1 1	10	1 1 1	<p>When dividing numbers involving an exchange, children can use Base 10 and place value counters to exchange one ten for ten ones. Children should start with the equipment outside the place value grid before sharing the tens and ones equally between the rows.</p>
Tens	Ones											
10	1 1 1											
10	1 1 1											
10	1 1 1											
10	1 1 1											
	<div style="border: 1px solid black; padding: 5px; display: inline-block;"> <math>52 \div 4 = 13</math> </div>	<p>Flexible partitioning in a part-whole model supports this method.</p>										

Skill: Divide 2-digits by 1-digit (sharing with remainders)	Year: 3/4
 <div style="display: flex; justify-content: space-around; align-items: center;"> <div data-bbox="263 582 510 918"> <p>53</p> <p>40   13</p> <p>÷ 4</p> <p>10   12   1</p> <p>3</p> </div> <div data-bbox="526 582 837 660" style="border: 1px solid black; padding: 5px;"> <math>53 \div 4 = 13 \text{ r}1</math> </div> <div data-bbox="654 660 1045 929">  </div> </div>	<p>When dividing numbers with remainders, children can use Base 10 and place value counters to exchange one ten for ten ones.</p> <p>Starting with the equipment outside the place value grid will highlight remainders, as they will be left outside the grid once the equal groups have been made.</p> <p>Flexible partitioning in a part-whole model supports this method.</p>

Skill: Divide 2-digits by 1-digit (grouping)	Year: 4/5
 <div style="display: flex; justify-content: space-around; align-items: center;"> <div data-bbox="263 1635 582 1713" style="border: 1px solid black; padding: 5px;"> <math>52 \div 4 = 13</math> </div> <div data-bbox="678 1377 1093 1780">  </div> </div>	<p>When using the short division method, children use grouping. Starting with the largest place value, they group by the divisor.</p> <p>Language is important here. Children should consider 'How many groups of 4 tens can we make?' and 'How many groups of 4 ones can we make?'</p> <p>Remainders can also be seen as they are left ungrouped.</p>

**Skill: Divide 3-digits by 1-digit (sharing)**

**Year: 4**

**$844 \div 4 = 211$**

844

?	?	?	?

H	T	O
100 100	10	1
100 100	10	1
100 100	10	1
100 100	10	1

844

800  
↓  
÷ 4  
□

40  
↓  
÷ 4  
□

4  
↓  
÷ 4  
□

Children can continue to use place value counters to share 3-digit numbers into equal groups. Children should start with the equipment outside the place value grid before sharing the hundreds, tens and ones equally between the rows. This method can also help to highlight remainders. Flexible partitioning in a part-whole model supports this method.

**$844 \div 4 = 211$**

856

800  
↓  
÷ 4  
200

40  
↓  
÷ 4  
10

16  
↓  
÷ 4  
4

856

800  
↓  
÷ 4  
200

40  
↓  
÷ 4  
10

16  
↓  
÷ 4  
4

Hundreds	Tens	Ones
100 100	10	1 1 1 1
100 100	10	1 1 1 1
100 100	10	1 1 1 1
100 100	10	1 1 1 1

Children can continue to use grouping to support their understanding of short division when dividing a 3-digit number by a 1-digit number. Place value counters or plain counters can be used on a place value grid to support this understanding. Children can also draw their own counters and group them through a more pictorial method.

**Skill: Divide 3-digits by 1-digit (grouping)**

**Year: 5**

**$856 \div 4 = 214$**

856

?	?	?	?

H	T	O
100 100	10	1
100 100	10	1
100 100	10	1
100 100	10	1

856

800  
↓  
÷ 4  
200

40  
↓  
÷ 4  
10

16  
↓  
÷ 4  
4

Children can continue to use grouping to support their understanding of short division when dividing a 3-digit number by a 1-digit number. Place value counters or plain counters can be used on a place value grid to support this understanding. Children can also draw their own counters and group them through a more pictorial method.

**$856 \div 4 = 214$**

856

800  
↓  
÷ 4  
200

40  
↓  
÷ 4  
10

16  
↓  
÷ 4  
4

Hundreds	Tens	Ones
100 100	10	1 1 1 1
100 100	10	1 1 1 1
100 100	10	1 1 1 1
100 100	10	1 1 1 1

Children can continue to use grouping to support their understanding of short division when dividing a 3-digit number by a 1-digit number. Place value counters or plain counters can be used on a place value grid to support this understanding. Children can also draw their own counters and group them through a more pictorial method.

Skill: Divide 4-digits by 1-digit (grouping)	Year: 5																																										
<div style="display: flex; align-items: center; justify-content: center; margin-bottom: 20px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <thead> <tr style="background-color: #d9e1f2;"> <th style="width: 15%;">Th</th> <th style="width: 15%;">H</th> <th style="width: 15%;">T</th> <th style="width: 15%;">O</th> </tr> </thead> <tbody> <tr> <td><div>1,000 1,000</div></td> <td><div>100 100</div></td> <td><div>10 10</div></td> <td><div>1 1</div></td> </tr> <tr> <td><div>1,000 1,000</div></td> <td><div>100 100</div></td> <td><div>10 →</div></td> <td><div>1 1</div></td> </tr> <tr> <td><div>1,000 1,000</div></td> <td><div>100 →</div></td> <td><div>10 10</div></td> <td><div>1 1</div></td> </tr> <tr> <td><div>1,000 1,000</div></td> <td></td> <td><div>10 10</div></td> <td><div>1 1</div></td> </tr> <tr> <td></td> <td></td> <td><div>10 10</div></td> <td><div>1 1</div></td> </tr> <tr> <td></td> <td></td> <td><div>10 10</div></td> <td><div>1 1</div></td> </tr> <tr> <td></td> <td></td> <td><div>10 10</div></td> <td><div>1 1</div></td> </tr> </tbody> </table> <div style="margin-left: 20px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td></td> <td>4</td> <td>2</td> <td>6</td> <td>6</td> </tr> <tr> <td>2</td> <td style="border-left: 2px solid black;">8</td> <td>5</td> <td>13</td> <td>12</td> </tr> </table> </div> </div> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; width: fit-content; margin: 0 auto;"> <math>8,532 \div 2 = 4,266</math> </div>	Th	H	T	O	<div>1,000 1,000</div>	<div>100 100</div>	<div>10 10</div>	<div>1 1</div>	<div>1,000 1,000</div>	<div>100 100</div>	<div>10 →</div>	<div>1 1</div>	<div>1,000 1,000</div>	<div>100 →</div>	<div>10 10</div>	<div>1 1</div>	<div>1,000 1,000</div>		<div>10 10</div>	<div>1 1</div>			<div>10 10</div>	<div>1 1</div>			<div>10 10</div>	<div>1 1</div>			<div>10 10</div>	<div>1 1</div>		4	2	6	6	2	8	5	13	12	<p>Place value counters or plain counters can be used on a place value grid to support children to divide 4-digits by 1-digit. Children can also draw their own counters and group them through a more pictorial method.</p> <p>Children should be encouraged to move away from the concrete and pictorial when dividing numbers with multiple exchanges.</p>
Th	H	T	O																																								
<div>1,000 1,000</div>	<div>100 100</div>	<div>10 10</div>	<div>1 1</div>																																								
<div>1,000 1,000</div>	<div>100 100</div>	<div>10 →</div>	<div>1 1</div>																																								
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		<div>10 10</div>	<div>1 1</div>																																								
	4	2	6	6																																							
2	8	5	13	12																																							

Skill: Divide multi digits by 2-digits (short division)	Year: 6																														
<div style="display: flex; align-items: center; justify-content: center; margin-bottom: 20px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td></td> <td></td> <td>0</td> <td>3</td> <td>6</td> </tr> <tr> <td></td> <td>12</td> <td style="border-left: 2px solid black;">4</td> <td><sup>4</sup>3</td> <td><sup>7</sup>2</td> </tr> </table> <div style="margin-left: 20px;"> <div style="border: 1px solid black; border-radius: 10px; padding: 5px;"> <math>432 \div 12 = 36</math> </div> </div> </div> <div style="display: flex; align-items: center; justify-content: center; margin-bottom: 20px;"> <div style="border: 1px solid black; border-radius: 10px; padding: 5px; margin-right: 20px;"> <math>7,335 \div 15 = 489</math> </div> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td></td> <td>0</td> <td>4</td> <td>8</td> <td>9</td> </tr> <tr> <td>15</td> <td style="border-left: 2px solid black;">7</td> <td><sup>7</sup>3</td> <td><sup>13</sup>3</td> <td><sup>13</sup>5</td> </tr> </table> </div> <table border="1" style="border-collapse: collapse; text-align: center; width: 100%;"> <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	<sup>4</sup> 3	<sup>7</sup> 2		0	4	8	9	15	7	<sup>7</sup> 3	<sup>13</sup> 3	<sup>13</sup> 5	15	30	45	60	75	90	105	120	135	150	<p>When children begin to divide up to 4-digits by 2-digits, written methods become the most accurate as concrete and pictorial representations become less effective. Children can write out multiples to support their calculations with larger remainders. Children will also solve problems with remainders where the quotient can be rounded as appropriate.</p>
		0	3	6																											
	12	4	<sup>4</sup> 3	<sup>7</sup> 2																											
	0	4	8	9																											
15	7	<sup>7</sup> 3	<sup>13</sup> 3	<sup>13</sup> 5																											
15	30	45	60	75	90	105	120	135	150																						

Skill: Divide multi-digits by 2-digits (long division)

Year: 6

		0	3	6
1	2	4	3	2
	-	3	6	0
			7	2
	-		7	2
				0

(x30)

(x6)

12 x 1 = 12

12 x 2 = 24

12 x 3 = 36

12 x 4 = 48

12 x 5 = 60

12 x 6 = 72

12 x 7 = 84

12 x 8 = 96

12 x 9 = 108

12 x 10 = 120

432 ÷ 12 = 36

7,335 ÷ 15 = 489

	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

(x400)

(x80)

(x9)

1 x 15 = 15

2 x 15 = 30

3 x 15 = 45

4 x 15 = 60

5 x 15 = 75

10 x 15 = 150

Children can also divide by 2-digit numbers using long division.

Children can write out multiples to support their calculations with larger remainders.

Children will also solve problems with remainders where the quotient can be rounded as appropriate.

# Skill: Divide multi digits by 2-digits (long division)

Year: 6

$$372 \div 15 = 24 \text{ r}12$$

			2	4	r	1	2
1	5	3	7	2			
	-	3	0	0			
			7	2			
	-		6	0			
			1	2			

$$1 \times 15 = 15$$

$$2 \times 15 = 30$$

$$3 \times 15 = 45$$

$$4 \times 15 = 60$$

$$5 \times 15 = 75$$

$$10 \times 15 = 150$$

When a remainder is left at the end of a calculation, children can either leave it as a remainder or convert it to a fraction.

This will depend on the context of the question.

Children can also answer questions where the quotient needs to be rounded according to the context.

			2	4	$\frac{4}{5}$
1	5	3	7	2	
	-	3	0	0	
			7	2	
	-		6	0	
			1	2	

$$372 \div 15 = 24 \frac{4}{5}$$