



## Calculation Policy 2022-2023

### Introduction

This calculation guidance has been written in line with the programmes of study taken from the revised National Curriculum for Mathematics (2014)

It provides guidance on appropriate calculation methods and progression. The content is set out in yearly blocks under the following headings: addition, subtraction, multiplication and division. This guidance aims to develop, model and explain core understandings and mathematical principles and progression to ensure consistency in the teaching and learning of mathematics in our school.

This policy supports the White Rose maths scheme used throughout the school. Progression within each area of calculation is in line with the programme of study in the 2014 National Curriculum. This calculation policy should be used to support children to develop a deep understanding of number and calculation. This policy has been designed to teach children through the use of concrete, pictorial and abstract representations.

- Concrete representation— a pupil is first introduced to an idea or skill by acting it out with real objects. This is a 'hands on' component using real objects and is a foundation for conceptual understanding.
- Pictorial representation – a pupil has sufficiently understood the 'hands on' experiences performed and can now relate them to representations, such as a diagram or picture of the problem.
- Abstract representation—a pupil is now capable of representing problems by using mathematical notation, for example  $12 \times 2 = 24$ . It is important that conceptual understanding, supported by the use of representation, is secure for all procedures.

Reinforcement is achieved by going back and forth between these representations.




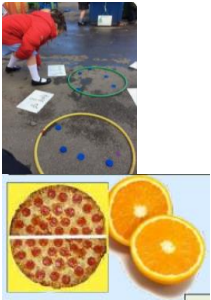
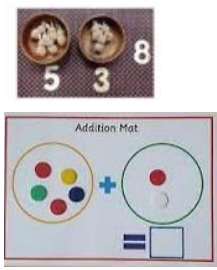

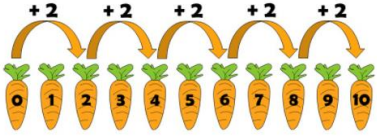
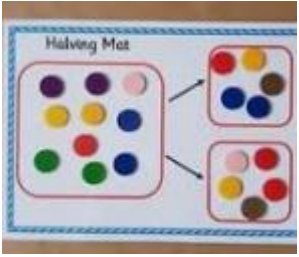

Mathematics Mastery - At the centre of the mastery approach to the teaching of mathematics is the belief that all children have the potential to succeed. They should have access to the same curriculum content and deepen their conceptual understanding by tackling differentiated, challenging and varied problems. Similarly, with calculation strategies, children must not simply rote learn procedures, but demonstrate their understanding of these procedures, through the use of Concrete Pictorial Abstract CPA as appropriate, and in reasoning and problem solving activities

This policy outlines the different calculation methods which should be used as outcomes in the EYFS curriculum and the national curriculum in Y1 to Y6. To ensure consistency throughout school this policy outlines the following Whole School and Year Group expectations:

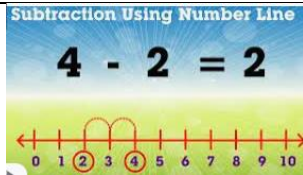
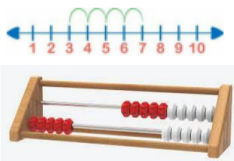
- A consistent approach to teaching and learning
- Agreed calculation strategies
- Non negotiable methods for written and mental calculations
- Precise mathematical vocabulary to be used (see additional guidelines)
- Consistent approach to setting out calculations
- Clear outcomes for every year group and key stage.

## EYFS

Developing a strong grounding in number is essential so that all children develop the necessary building blocks to excel mathematically. Children should be able to count confidently, develop a deep understanding of the numbers to 10, the relationships between them and the patterns within those numbers (Statutory Framework 2021)

Addition	Subtraction	Multiplication	Division
<p>Children are encouraged to gain a sense of the number system through the use of counting concrete objects.</p> 	<p>Children are encouraged to gain a sense of the number system through the use of counting concrete objects.</p> 	<p>Children use concrete objects to make and count equal groups of objects.</p> 	<p>Children use concrete objects to count and share equally into 2 groups</p> 
<p>They combine objects in practical ways and count all.</p> 	<p>They understand subtraction as counting out.</p> 	<p>They will count on in twos using a bead string and number line.</p> 	<p>They count a set of objects and halve them by making two equal groups.</p> 
<p>They understand addition as counting on. They will count on in ones and twos using objects, cubes, bead string,</p>	<p>They begin to count back in ones and twos using objects, cubes, bead string and number line.</p>	<p>They understand doubling as repeated addition. <math>2 + 2 = 4</math></p> 	<p>They understand sharing and halving as dividing by 2.</p> 

reknerik and number line.



They begin to use + and =  
They are encouraged to develop a mental picture of the number system in their heads to use for calculations.  
Higher attaining children may be able to represent their calculations using symbols and numbers within a written calculation



They use concrete and pictorial representation to record their calculations. They begin to use - and =  
Higher attaining children may be able to represent their calculations using symbols and numbers within a written calculation



They use concrete and pictorial representation to record their calculations.



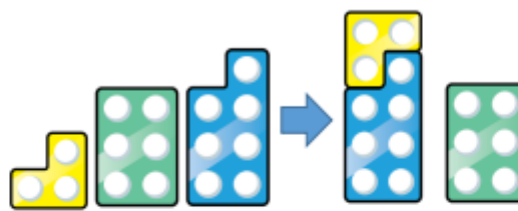
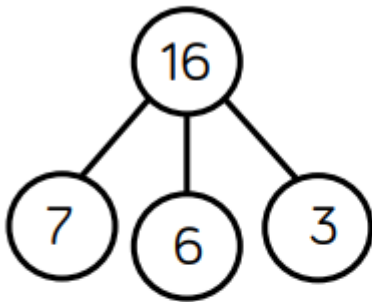
They use concrete and pictorial representation to record their calculations.



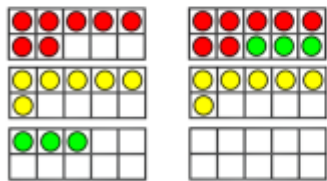


**Skill: Add three 1-digit numbers**

**Year: 2**

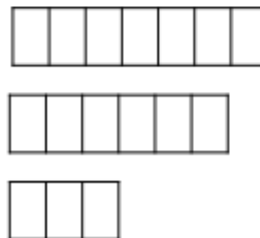


$$7 + 6 + 3 = 16$$



$$7 + 6 + 3 = 16$$

10



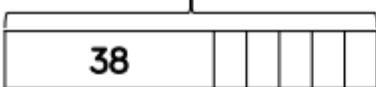
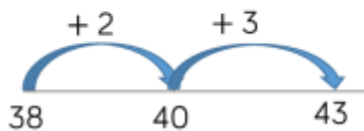
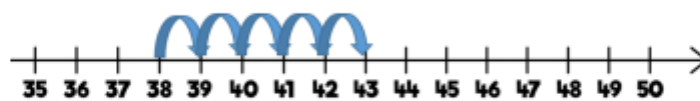
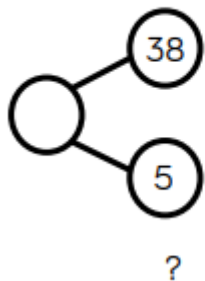
When adding three 1-digit numbers, children should be encouraged to look for number bonds to 10 or doubles to add the numbers more efficiently.

This supports children in their understanding of commutativity.

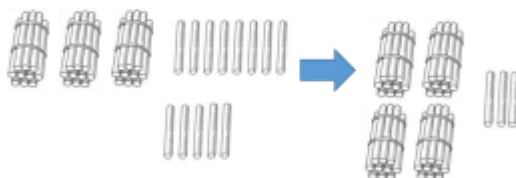
Manipulatives that highlight number bonds to 10 are effective when adding three 1-digit numbers.

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

**Year: 2/3**



$$38 + 5 = 43$$



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

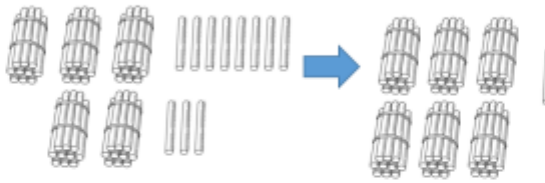
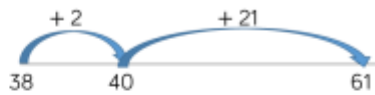
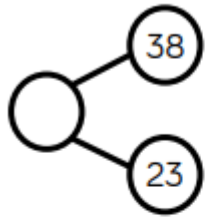
When adding single digits to a two-digit number, children should be encouraged to count on from the larger number.

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**



?	
38	23

$$38 + 23 = 61$$

Tens	Ones
	.....
	.....

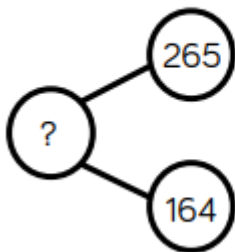
$$\begin{array}{r} 38 \\ + 23 \\ \hline 61 \\ 1 \end{array}$$

Tens	Ones
10 10 10	1 1 1 1 1 1 1 1
10 10	1 1 1 1

Children can use a blank number line and other representations to count on to find the total. Encourage them to jump to multiples of 10 to become more efficient. From Year 3, 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.

**Skill: Add numbers with up to 3 digits**

**Year: 3**



?	
265	164

265
164

$$265 + 164 = 429$$

Hundreds	Tens	Ones
■■■		.....
■		.....

$$\begin{array}{r} 265 \\ + 164 \\ \hline 429 \\ 1 \end{array}$$

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

Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 3 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

**Skill: Add numbers with up to 4 digits**

**Year: 4**

1,378

?

2,148

?

2,138

1,378

?

1	3	7	8	
+	2	1	4	8
	3	5	2	6
		1	1	

**1,378 + 2,148 = 3,526**

Base 10 and place value counters are the most effective manipulatives when adding numbers with up to 4 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

Thousands	Hundreds	Tens	Ones

Thousands	Hundreds	Tens	Ones

**Skill: Add numbers with more than 4 digits**

**Year: 5/6**

?

104,328

61,731

?

104,328

61,731

?

**104,328 + 61,731 = 166,059**

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.

At this stage, children should be encouraged to work in the abstract, using the column method to add larger numbers efficiently.

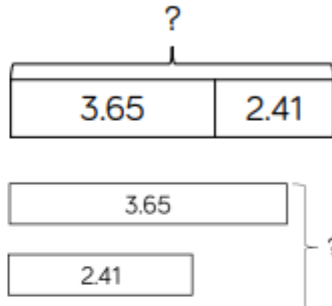
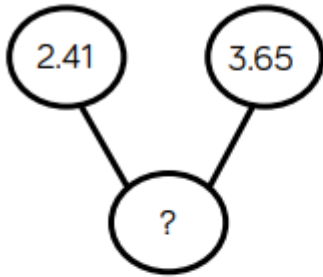
HTh	TTh	Th	H	T	O

1	0	4	3	2	8	
+	6	1	7	3	1	
	1	6	6	0	5	9
				1		



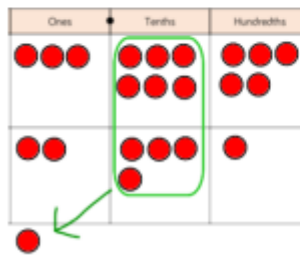
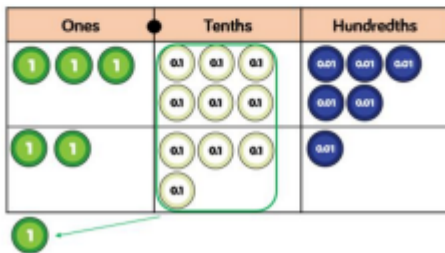
Skill: Add with up to 3 decimal places

Year: 5



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

**$3.65 + 2.41 = 6.06$**



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.



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

**Year: 2/3**

65

28

65

?

28

$65 - 28 = 37$

Children can also use a blank number line to count back to find the difference. Encourage them to jump to multiples of 10 to become more efficient. From Year 3, 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.

Tens	Ones

$$\begin{array}{r} 5 \quad 1 \\ 65 \\ - 28 \\ \hline 37 \end{array}$$

Tens	Ones

**Skill: Subtract numbers with up to 3 digits**

**Year: 3**

435

273

?

435

273

?

$435 - 273 = 162$

Base 10 and place value counters are the most effective manipulative when subtracting numbers with up to 3 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Hundreds	Tens	Ones

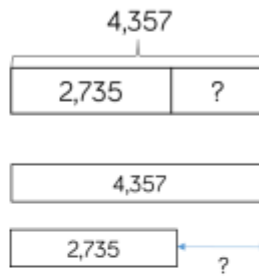
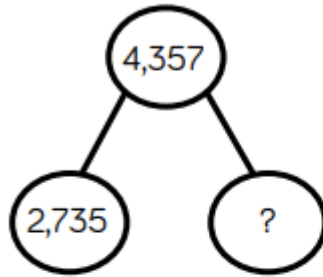
$$\begin{array}{r} 3 \quad 1 \\ 435 \\ - 273 \\ \hline 162 \end{array}$$

Hundreds	Tens	Ones

Plain counters on a place value grid can also be used to support learning.

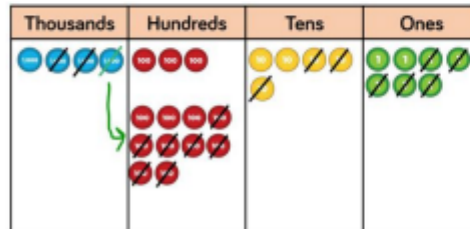
**Skill: Subtract numbers with up to 4 digits**

**Year: 4**



$$\begin{array}{r} 3 \ 1 \\ 4357 \\ - 2735 \\ \hline 1622 \end{array}$$

$$4,357 - 2,735 = 1,622$$



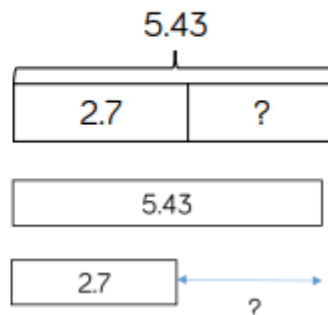
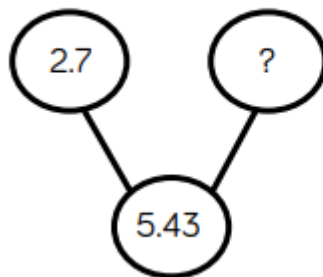
Base 10 and place value counters are the most effective manipulatives when subtracting numbers with up to 4 digits.

Ensure children write out their calculation alongside any concrete resources so they can see the links to the written column method.

Plain counters on a place value grid can also be used to support learning.

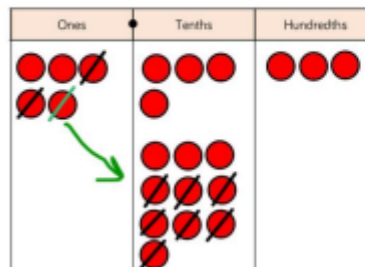
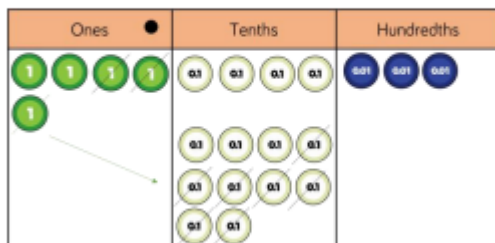
**Skill: Subtract with up to 3 decimal places**

**Year: 5/6**



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

$$5.43 - 2.7 = 2.73$$




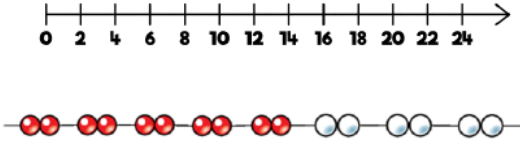


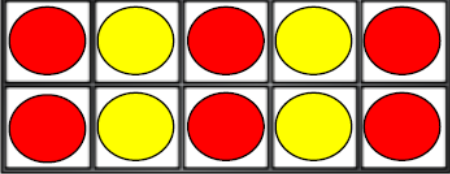
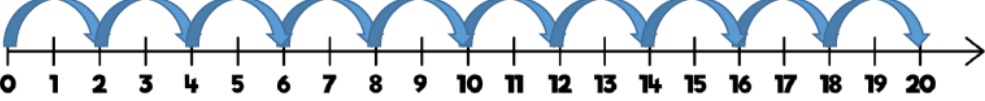
Place value counters and plain counters on a place value grid are the most effective manipulative when subtracting decimals with 1, 2 and then 3 decimal places.

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

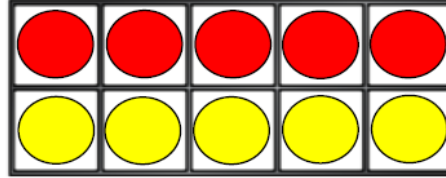
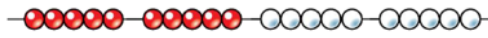
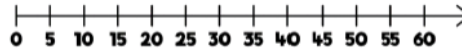
Our calculation policy for multiplication starts with a breakdown of times tables; what should be taught, when it should be taught and what that teaching should look like.

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

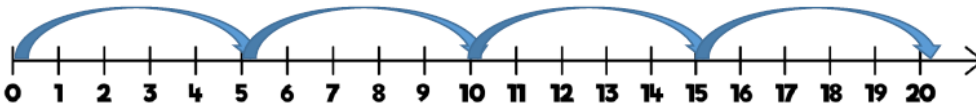
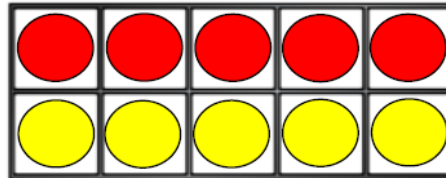
Skill: 2 times table	Year: 2																																																		
<div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <table border="1" style="border-collapse: collapse; text-align: center; width: 25%;"> <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> <tr><td>41</td><td>42</td><td>43</td><td>44</td><td>45</td><td>46</td><td>47</td><td>48</td><td>49</td><td>50</td></tr> </table> <div style="text-align: center;">  </div> </div> <div style="margin-top: 20px;">  </div>	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	<p>Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.</p> <p>Look for patterns in the two times table, using concrete manipulatives to support. Notice how all the numbers are even and there is a pattern in the ones.</p> <p>Use different models to develop fluency.</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																																										
41	42	43	44	45	46	47	48	49	50																																										

### Skill: 5 times table

Year: 2



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

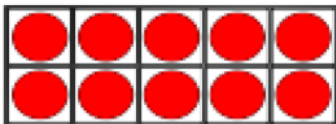
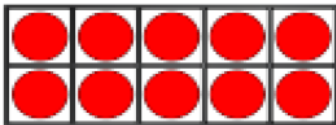
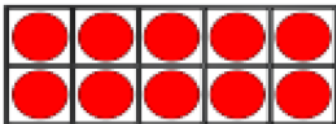
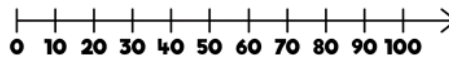
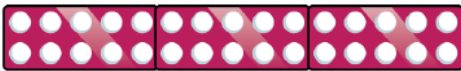


Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

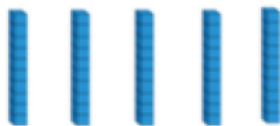
Look for patterns in the five times table, using concrete manipulatives to support. Notice the pattern in the ones as well as highlighting the odd, even, odd, even pattern.

### Skill: 10 times table

Year: 2



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

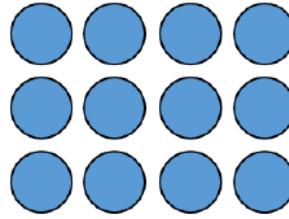
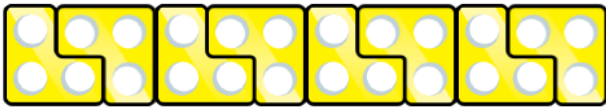


Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

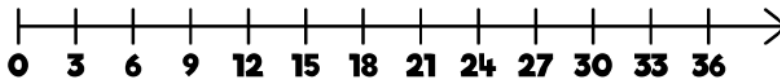
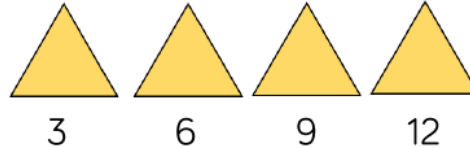
Look for patterns in the ten times table, using concrete manipulatives to support. Notice the pattern in the digits- the ones are always 0, and the tens increase by 1 ten each time.

### Skill: 3 times table

Year: 3



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

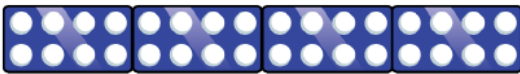


Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

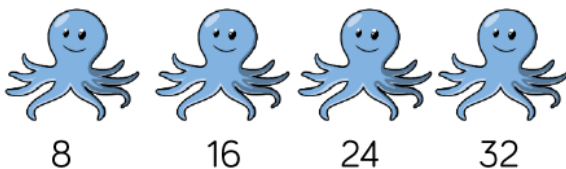
Look for patterns in the three times table, using concrete manipulatives to support. Notice the odd, even, odd, even pattern using number shapes to support. Highlight the pattern in the ones using a hundred square.

### Skill: 8 times table

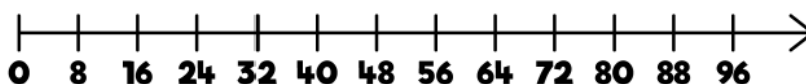
Year: 3



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



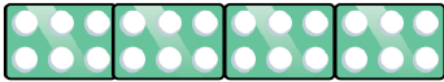
8	16	24	32	40
48	56	64	72	80



Encourage daily counting in multiples, supported by a number line or a hundred square. Look for patterns in the eight times table, using manipulatives to support. Make links to the 4 times table, seeing how each multiple is double the fours. Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support.

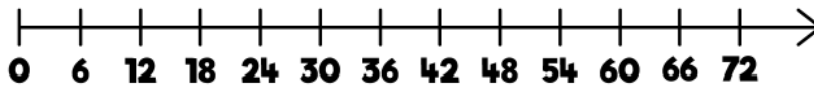
### Skill: 6 times table

Year: 4



6	12	18	24	30
36	42	48	54	60
66	72	78	84	90

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



Encourage daily counting in multiples, supported by a number line or a hundred square. Look for patterns in the six times table, using manipulatives to support. Make links to the 3 times table, seeing how each multiple is double the threes. Notice the pattern in the ones within each group of five multiples. Highlight that all the multiples are even using number shapes to support.

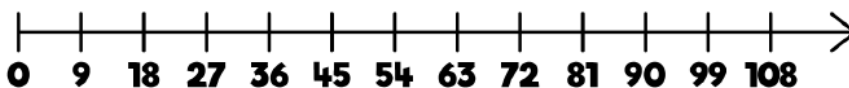
### Skill: 9 times table

Year: 4



9	18	27	36	45
54	63	72	81	90

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



Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square. Look for patterns in the nine times table, using concrete manipulatives to support. Notice the pattern in the tens and ones using the hundred square to support as well as noting the odd, even pattern within the multiples.



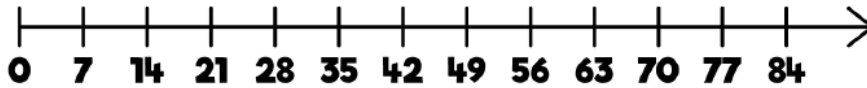
### Skill: 7 times table

Year: 4



7	14	21	28	35
42	49	56	63	70

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



Encourage daily counting in multiples both forwards and backwards, supported by a number line or a hundred square. The seven times table can be trickier to learn due to the lack of obvious pattern in the numbers, however they already know several facts due to commutativity. Children can still see the odd, even pattern in the multiples using number shapes to support.

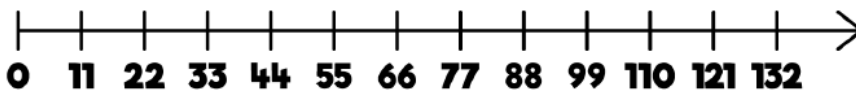
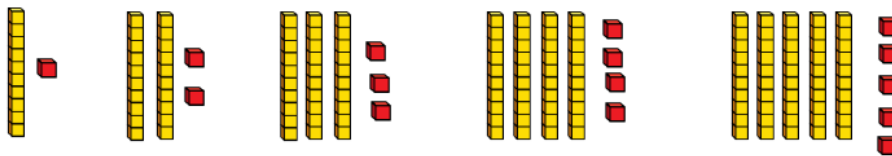
### Skill: 11 times table

Year: 4

11	22	33	44	55	66
77	88	99	110	121	132



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

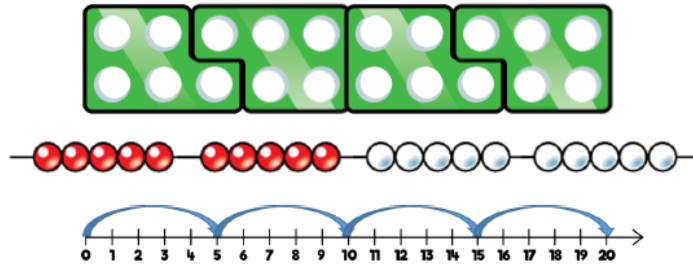
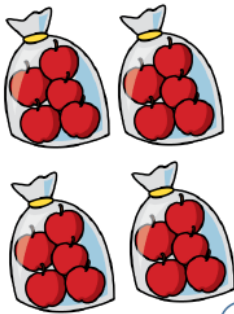


Encourage daily counting in multiples both forwards and backwards. This can be supported using a number line or a hundred square.

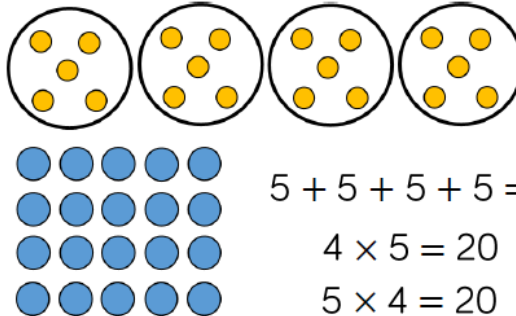
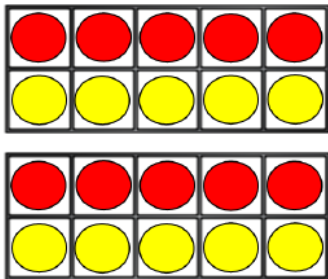
Look for patterns in the eleven times table, using concrete manipulatives to support. Notice the pattern in the tens and ones using the hundred square to support. Also consider the pattern after crossing 100

**Skill: Solve 1-step problems using multiplication**

**Year: 1/2**



One bag holds 5 apples.  
How many apples do 4 bags hold?



$$5 + 5 + 5 + 5 = 20$$

$$4 \times 5 = 20$$

$$5 \times 4 = 20$$

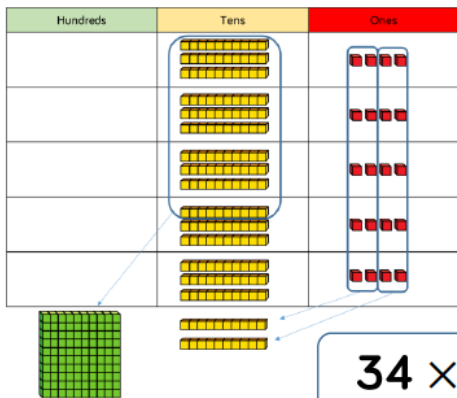
Children represent multiplication as repeated addition in many different ways.

In Year 1, children use concrete and pictorial representations to solve problems. They are not expected to record multiplication formally.

In Year 2, children are introduced to the multiplication symbol.

**Skill: Multiply 2-digit numbers by 1-digit numbers**

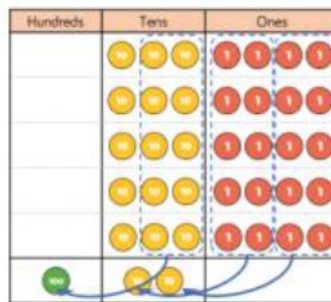
**Year: 3/4**



	H	T	O	
		3	4	
x			5	
		2	0	(5 x 4)
+	1	5	0	(5 x 30)
	1	7	0	

**$34 \times 5 = 170$**

	H	T	O
		3	4
x			5
	1	7	0
	1	2	



Teachers may decide to first look at the expanded column method before moving on to the short multiplication method.

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.

### Skill: Multiply 3-digit numbers by 1-digit numbers

Year: 3/4

	H	T	O
	2	4	5
x			4
	9	8	0
	1	2	

**$245 \times 4 = 980$**

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.

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

### Skill: Multiply 4-digit numbers by 1-digit numbers

Year: 5

Thousands	Hundreds	Tens	Ones
1000	100 100 100 100	10 10	1 1 1
1000	100 100 100 100	10 10	1 1 1
1000	100 100 100 100	10 10	1 1 1
1000	100 100	10	1 1 1
1000	100 100		1 1 1

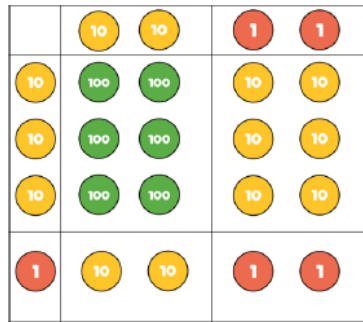
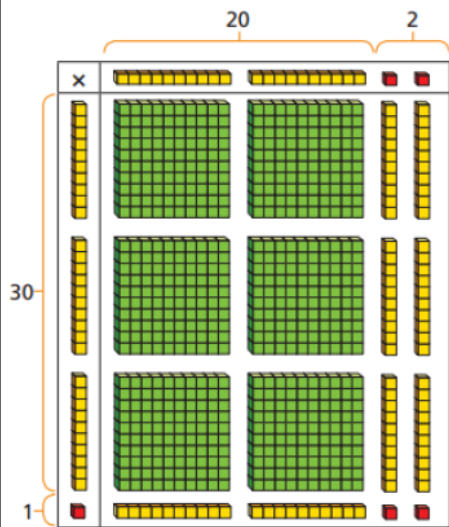
**$1,826 \times 3 = 5,478$**

	Th	H	T	O
	1	8	2	6
x				3
	5	4	7	8
	2		1	

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.

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

Year: 5



×	20	2
30	600	60
1	20	2

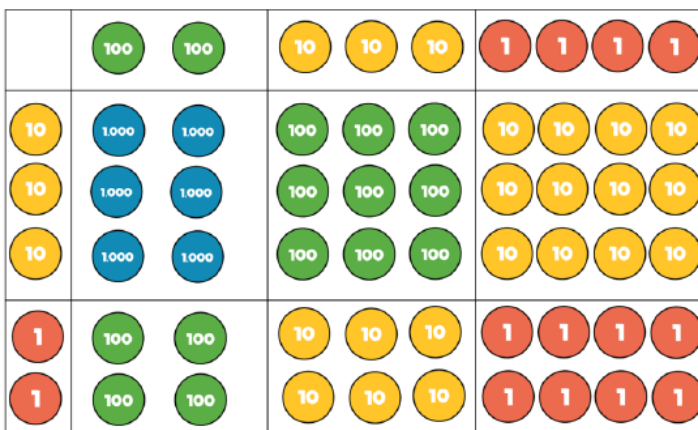
	H	T	O
		2	2
×		3	1
		2	2
	6	6	0
	6	8	2

$$22 \times 31 = 682$$

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.

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

Year: 5



Th	H	T	O
	2	3	4
×		3	2
	4	6	8
17	10	2	0
7	4	8	8

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

$$234 \times 32 = 7,488$$

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.

Skill: Multiply 4-digit numbers by 2-digit numbers

Year: 5/6

TTh	Th	H	T	O
	2	7	3	9
×			2	8
2	1	9	1	2
<sub>2</sub>	<sub>5</sub>	<sub>3</sub>	<sub>7</sub>	
5	4	7	8	0
<sub>1</sub>		<sub>1</sub>		
7	6	6	9	2

1


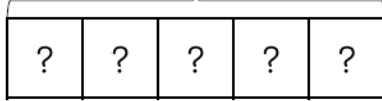
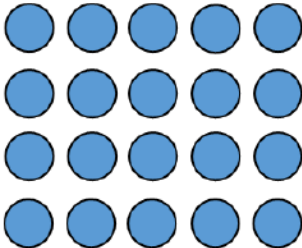

$$2,739 \times 28 = 76,692$$

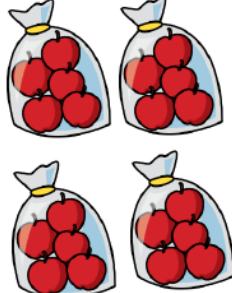
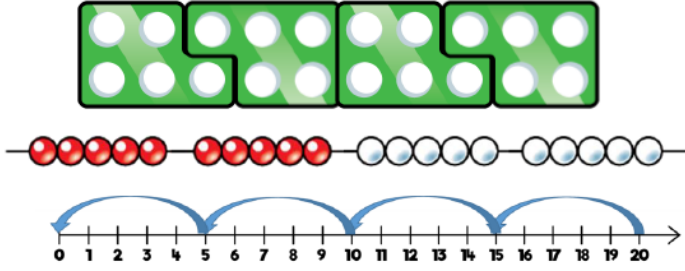
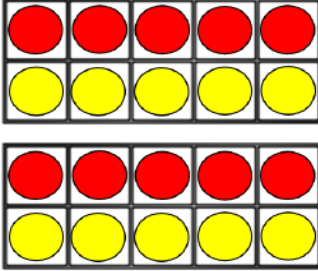
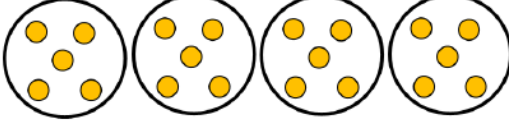
When multiplying 4-digits by 2-digits, children should be confident in the written method.

If they are still struggling with times tables, provide multiplication grids to support when they are focusing on the use of the method.

Consider where exchanged digits are placed and make sure this is consistent.

## Division

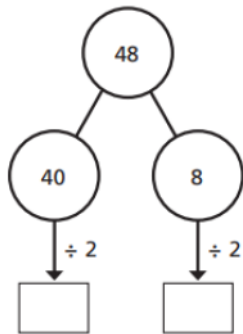
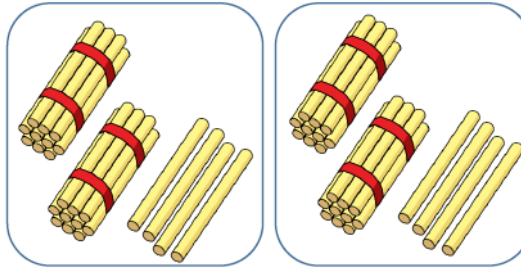
Skill: Solve 1-step problems using multiplication (sharing)	Year: 1/2
<div style="display: flex; justify-content: space-around; align-items: center;">  <div style="text-align: center;"> <math>20</math>   </div> </div> <div style="text-align: center; margin: 10px 0;"> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; display: inline-block;"> <p>There are 20 apples altogether. They are shared equally between 5 bags. How many apples are in each bag?</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <div style="text-align: center; margin-top: 10px;"> <math>20 \div 5 = 4</math> </div>	<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
<div style="display: flex; justify-content: space-around; align-items: center;">  <div style="text-align: center;">  </div> </div> <div style="text-align: center; margin: 10px 0;"> <div style="border: 1px solid black; border-radius: 15px; padding: 10px; display: inline-block;"> <p>There are 20 apples altogether. They are put in bags of 5. How many bags are there?</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: center;">   </div> <div style="text-align: center; margin-top: 10px;"> <math>20 \div 5 = 4</math> </div>	<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>

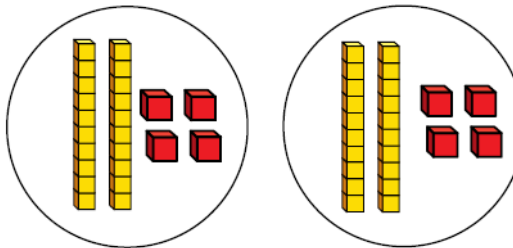
**Skill: Divide 2-digits by 1-digit (sharing with no exchange)**

**Year: 1/2**

Tens	Ones
10 10	1 1 1 1
10 10	1 1 1 1



$$48 \div 2 = 24$$



When dividing larger numbers, children can use manipulatives that allow them to partition into tens and ones.

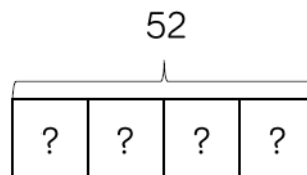
Straws, Base 10 and place value counters can all be used to share numbers into equal groups.

Part-whole models can provide children with a clear written method that matches the concrete representation.

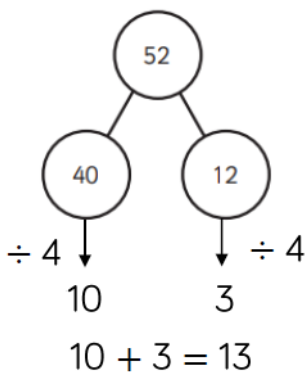
**Skill: Divide 2-digits by 1-digit (sharing with exchange)**

**Year: 3/4**

Tens	Ones
10	1 1 1 1
10	1 1 1 1
10	1 1 1 1
10	1 1 1 1



$$52 \div 4 = 13$$



Tens	Ones
10	1 1 1
10	1 1 1
10	1 1 1
10	1 1 1

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.

Flexible partitioning in a part-whole model supports this method.

### Skill: Divide 2-digits by 1-digit (sharing with remainders)

Year: 3/4

$53 \div 4 = 13 \text{ r}1$

When dividing numbers with remainders, children can use Base 10 and place value counters to exchange one ten for ten ones. 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. Flexible partitioning in a part-whole model supports this method.

### Skill: Divide 2-digits by 1-digit (grouping)

Year: 4/5

$52 \div 4 = 13$

When using the short division method, children use grouping. Starting with the largest place value, they group by the divisor.

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?'

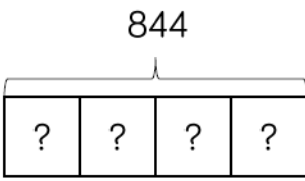
Remainders can also be seen as they are left ungrouped.



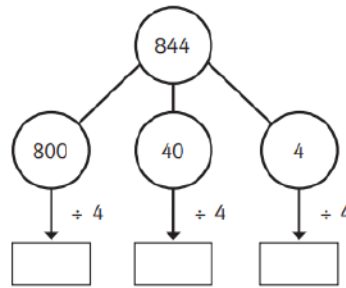
### Skill: Divide 3-digits by 1-digit (sharing)

Year: 4

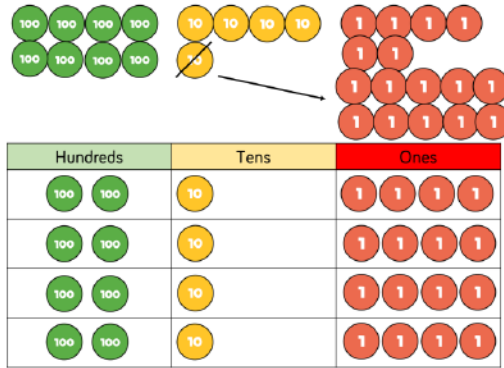
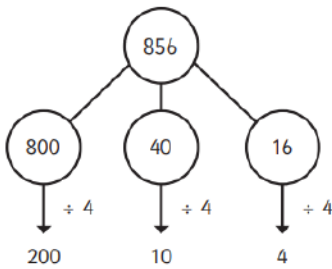
$$844 \div 4 = 211$$



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



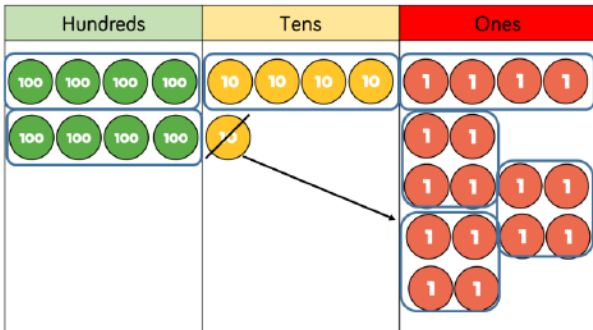
$$844 \div 4 = 211$$



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.

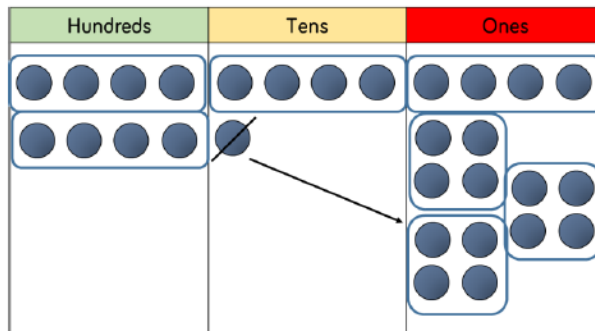
### Skill: Divide 3-digits by 1-digit (grouping)

Year: 5



		2	1	4
	4	8	5	16

$$856 \div 4 = 214$$

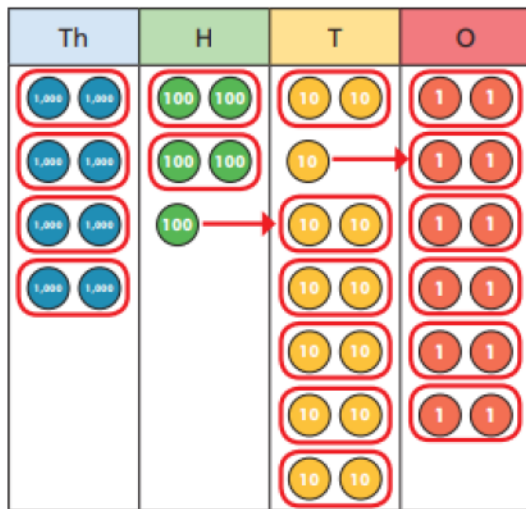


Children can continue to use grouping to support their understanding of short division when dividing a 3-digit number by a 1-digit number.

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



	4	2	6	6
2	8	5	13	12

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.

Children should be encouraged to move away from the concrete and pictorial when dividing numbers with multiple exchanges.

$$8,532 \div 2 = 4,266$$

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

Year: 6

		0	3	6
	12	4	43	72

$$432 \div 12 = 36$$

$$7,335 \div 15 = 489$$

	0	4	8	9
15	7	73	133	135

15	30	45	60	75	90	105	120	135	150
----	----	----	----	----	----	-----	-----	-----	-----

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.

**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)  $12 \times 1 = 12$
- $12 \times 2 = 24$
- $12 \times 3 = 36$
- $12 \times 4 = 48$
- $12 \times 5 = 60$
- (x6)  $12 \times 6 = 72$
- $12 \times 7 = 84$
- $12 \times 8 = 96$
- $12 \times 7 = 108$
- $12 \times 10 = 120$

$$432 \div 12 = 36$$

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.

$$7,335 \div 15 = 489$$

		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)  $1 \times 15 = 15$
- $2 \times 15 = 30$
- $3 \times 15 = 45$
- (x80)  $4 \times 15 = 60$
- $5 \times 15 = 75$
- (x9)  $10 \times 15 = 150$

**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	

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