

Year 3

Calculation policy

Updated September 2024

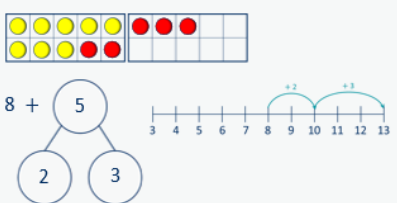
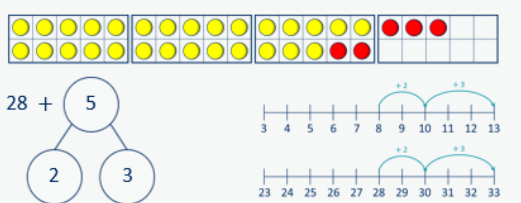
Guidance for teachers

The calculation policy is divided into four sections: addition, subtraction, multiplication and division. At the start of each section, you will find an overview of the progression of skills. Calculations involving decimal numbers and fractions are included.

The calculation policy follows the same concrete, pictorial, abstract approach as our main schemes of learning. Where appropriate, sentence stems and key questions are included alongside the key representations.

Where skills are divided into more than one section across the page, there is a progression in the level of difficulty from left to right.

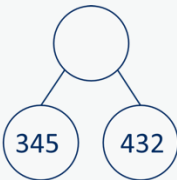
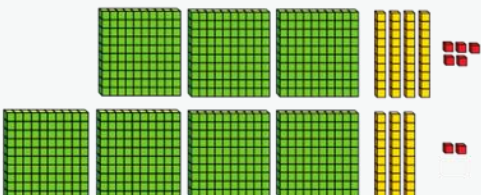
For example, when adding across a 10, children need to be able to add across 10 itself, before making links with related facts.

Add across a 10 Partition the number you are adding to make a full ten.	... can be partitioned into ... and ...  $8 + 5$	I add ... to get to ... then I add ... $8 + 5 = 13$ $28 + 5 = 33$  $28 + 5$
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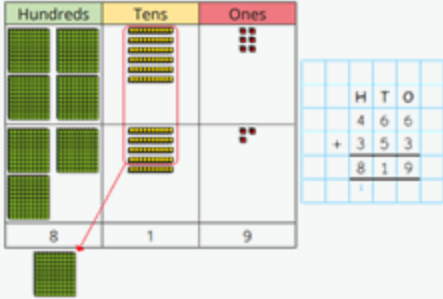
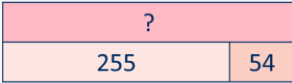
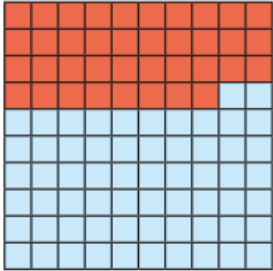
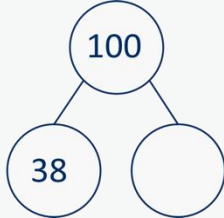
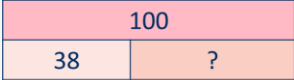
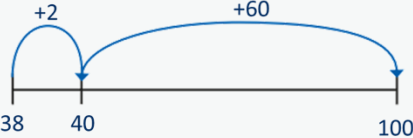
Progression of skills – Addition

Year 2	Year 3	Year 4
• Add 1s to any number (related facts) • Add three 1-digit numbers • Add across a 10 • Add multiples of 10 • Add 10s to any number • Add two 2-digit numbers (not across a ten) • Add two 2-digit numbers (across a ten) • Missing numbers	• Add 1s, 10s and 100s to a 3-digit number • Add two numbers (no exchange) • Add two numbers across a 10 or 100 • Complements to 100 • Add fractions with the same denominator within 1 whole • Calculate the duration of events	• Add 1s, 10s and 100s to a 4-digit number • Add up to two 4-digit numbers • Add decimal numbers in the context of money • Add fractions and mixed numbers with the same denominator beyond 1 whole

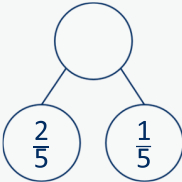
Addition

Year 3	- Add numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds. - Add numbers with up to three digits, using formal written methods of columnar addition. - Add fractions with the same denominator within 1 whole. - Calculate the time taken by particular events or tasks.																										
Progression of skills	Key representations																										
Add 1s, 10s or 100s to a 3-digit number Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	The ones/tens/hundreds column will increase by ... <table><tr><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td><td></td></tr></table> $444 + 5 =$ $444 + 50 =$ $444 + 500 =$ <table><tr><th>H</th><th>T</th><th>O</th></tr><tr><td></td><td></td><td></td></tr></table> $777 + 2 =$ $777 + 20 =$ $777 + 200 =$	Hundreds	Tens	Ones				H	T	O				What patterns do you notice? $235 + 3 =$ $235 + 30 =$ $235 + 300 =$ $111 + \square = 118$ $111 + \square = 181$ $111 + \square = 811$ $604 + 20 =$ $604 + 50 =$ $604 + 90 =$													
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Add two numbers (no exchange) Mental strategies and introduction of formal written method.	... ones + ... ones = ... ones ... tens + ... tens = ... tens ... hundreds + ... hundreds = ... hundreds  <table><tr><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table> <table><tr><th>H</th><th>T</th><th>O</th></tr><tr><td>3</td><td>4</td><td>5</td></tr><tr><td>+</td><td>4</td><td>3</td></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>			Hundreds	Tens	Ones							H	T	O	3	4	5	+	4	3						
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Addition

Progression of skills	Key representations	
Add two numbers across a 10 or 100 Formal written method involving up to 2 exchanges including 3-digit plus 2-digit numbers.	There are ... ones, so I do/do not need to make an exchange. There are ... tens, so I do/do not need to make an exchange. ... ones = ... ten and ... ones. ... tens = ... hundred and ... tens. 	 
Complements to 100 Pairs of numbers which total 100	... plus ... is equal to 100   	I add ... to get to the next 10, then ... to get to 100  $38 + 62 = 100$ $62 + 38 = 100$ $100 = 38 + 62$ $100 = 62 + 38$

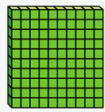
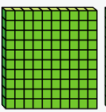
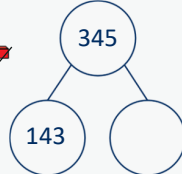
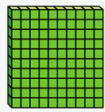
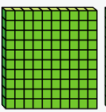
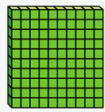
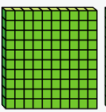
Addition

Progression of skills	Key representations
Add fractions with the same denominator within 1 whole Make links with known facts.	When adding fractions with the same denominator, I only add the numerator. ... fifths + ... fifths = ... fifths  $\frac{1}{5} + \frac{1}{5}$  $\frac{1}{5} + \frac{2}{5}$  $\frac{1}{5} + \frac{3}{5}$  

Progression of skills - Subtraction

Year 2	Year 3	Year 4
• Subtract 1s from any number (related facts) • Subtract across a 10 • Subtract multiples of 10 • Subtract 10s from any number • Subtract two 2-digit numbers (not across a ten) • Subtract two 2-digit numbers (across a ten) • Missing numbers	• Subtract 1s, 10s and 100s from a 3-digit number • Subtract two numbers (no exchange) • Subtract two numbers across a 10 or 100 • Complements to 100 • Subtract fractions with the same denominator within 1 whole	• Subtract 1s, 10s, 100s and 1,000s from a 4-digit number • Subtract up to two 4-digit numbers • Subtract decimal numbers in the context of money • Subtract fractions and mixed numbers with the same denominator

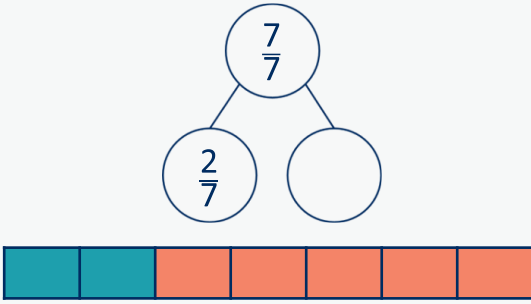
Subtraction

Year 3	- Subtract numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds. - Subtract numbers with up to three digits, using formal written methods. - Subtract fractions with the same denominator within 1 whole.																																		
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Subtract 1s, 10s and 100s from a 3-digit number Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.	The ones/tens/hundreds column will decrease by ... <table><tr><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td><td></td></tr></table> $444 - 2 =$ $444 - 20 =$ $444 - 200 =$	Hundreds	Tens	Ones				<table><tr><th>H</th><th>T</th><th>O</th></tr><tr><td></td><td></td><td></td></tr></table> $777 - 4 =$ $777 - 40 =$ $777 - 400 =$	H	T	O				What patterns do you notice? $235 - 3 =$ $235 - 30 =$ $235 - 300 =$ $118 - \square = 111$ $181 - \square = 111$ $811 - \square = 111$																				
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Subtraction

Progression of skills	Key representations																																																																						
Subtract two numbers across a 10 or 100 Formal written method involving up to 2 exchanges including 3-digit subtract 2-digit numbers.	I need to subtract ... ones. I do/do not need to make an exchange. I need to subtract ... tens. I do/do not need to make an exchange. I can exchange 1 ... for 10 ... <table><tr><td colspan="2">72</td></tr><tr><td>45</td><td>?</td></tr></table> <table><tr><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td></tr><tr><td>2</td><td>7</td></tr></table> <table><tr><td></td><td>T</td><td>O</td></tr><tr><td></td><td>7</td><td>2</td></tr><tr><td>-</td><td>4</td><td>5</td></tr><tr><td></td><td>2</td><td>7</td></tr></table> <table><tr><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td><td></td></tr><tr><td>1</td><td>8</td><td>7</td></tr></table> <table><tr><td>2</td><td>1</td><td>5</td></tr><tr><td>1</td><td>7</td><td>8</td></tr><tr><td>1</td><td>8</td><td>7</td></tr></table> <table><tr><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table> <table><tr><td></td><td>H</td><td>T</td><td>O</td></tr><tr><td></td><td>4</td><td>5</td><td>2</td></tr><tr><td>-</td><td></td><td>4</td><td>3</td></tr><tr><td></td><td>4</td><td>0</td><td>9</td></tr></table> <table><tr><td colspan="2">452</td></tr><tr><td>43</td><td></td></tr></table>		72		45	?	Tens	Ones			2	7		T	O		7	2	-	4	5		2	7	Hundreds	Tens	Ones				1	8	7	2	1	5	1	7	8	1	8	7	Hundreds	Tens	Ones								H	T	O		4	5	2	-		4	3		4	0	9	452		43	
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Complements to 100 Focus on subtraction facts. Encourage children to notice patterns.	100 minus ... is equal to ... <table><tr><td colspan="2">100</td></tr><tr><td>38</td><td>?</td></tr></table> <table><tr><th>Hundreds</th><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td></tr></table>	100		38	?	Hundreds	Tens	Ones							I subtract ... tens, then I subtract ... ones. $100 - 38 = 62$$100 - 62 = 38$$62 = 100 - 38$$38 = 100 - 62$ 																																																								
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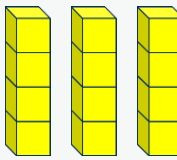
Subtraction

Progression of skills	Key representations
Subtract fractions with the same denominator within 1 whole Make links with known facts.	When subtracting fractions with the same denominator, I only subtract the numerator. ... fifths – ... fifths = ... fifths  $\frac{5}{5} - \frac{1}{5}$  $\frac{4}{5} - \frac{1}{5}$  $\frac{3}{5} - \frac{1}{5}$ 

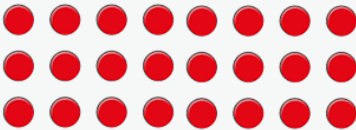
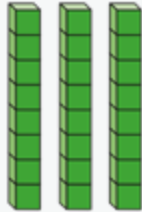
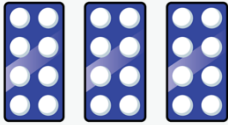
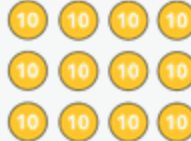
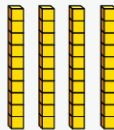
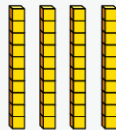
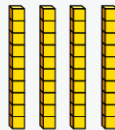
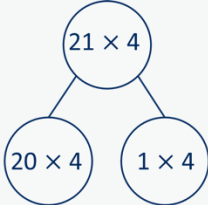
Progression of skills – Multiplication

Year 2	Year 3	Year 4
• Link repeated addition and multiplication • Use arrays • Double • The 2 times-table • The 10 times-table • The 5 times-table • Missing numbers	• The 3 times-table • The 4 times-table • The 8 times-table • Related facts • Multiply a 2-digit number by a 1-digit number - no exchange • Multiply a 2-digit number by a 1-digit number - with exchange • Scaling • Correspondence problems	• Times-table facts to 12×12 • Multiply by 1 and 0 • Multiply 3 numbers • Factor pairs • Multiply by 10 and 100 • Related facts • Mental strategies • Multiply a 2 or 3-digit number by a 1-digit number • Scaling • Correspondence problems

Multiplication

Year 3	- Recall and use multiplication facts for the 3, 4 and 8 multiplication tables. - Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. - Solve problems, including missing number problems, involving multiplication, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.																															
Progression of skills	Key representations																															
The 3 times-table Encourage daily counting in multiples both forwards and back.	... groups of 3 = ... $\times 3$ = 3, ... times = $3 \times \dots$ =   	... times 3 is equal to ... <table border="1" data-bbox="1332 662 1831 805"><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></table> $4 \times 3 = 12$ $12 = 4 \times 3$ 	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
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11	12	13	14	15	16	17	18	19	20																							
21	22	23	24	25	26	27	28	29	30																							
The 4 times-table Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2 and 4 times-tables.	... groups of 4 = ... $\times 4$ = 4, ... times = $4 \times \dots$ =   	... times 4 is equal to ... <table border="1" data-bbox="1332 1018 1831 1160"><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></table> $3 \times 4 = 12$ $12 = 3 \times 4$ 	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
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Multiplication

Progression of skills	Key representations																															
The 8 times-table Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2, 4 and 8 times-tables.	... lots of 8 = $\times 8 =$ 8, ... times = $8 \times \dots =$ 	... times 8 is equal to ... <table border="1"><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></table> $3 \times 8 = 24$ $24 = 3 \times 8$ 	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
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Related facts Use knowledge of multiplying by 10 to scale times-table facts.	... $\times$... ones is equal to ... ones so ... $\times$... tens is equal to ... tens. 	$3 \times 4 = 12$ $3 \times 40 = 120$																														
Multiply a 2-digit number by a 1-digit number - no exchange Children apply their understanding of partitioning to represent and solve calculations using the expanded method.	... tens multiplied by ... is equal to ... tens. ...ones multiplied by ... is equal to ... ones. <table border="1"><thead><tr><th>Tens</th><th>Ones</th></tr></thead><tbody><tr><td></td><td></td></tr><tr><td></td><td></td></tr></tbody></table> $30 \times 2 = 60$ $2 \times 2 = 4$ $32 \times 2 = 64$	Tens	Ones					<table border="1"><thead><tr><th>Tens</th><th>Ones</th></tr></thead><tbody><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></tbody></table>	Tens	Ones																						
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Multiplication

Progression of skills	Key representations																					
Multiply a 2-digit number by a 1-digit number - with exchange Children apply their understanding of partitioning to represent and solve calculations using the expanded method.	... tens multiplied by ... is equal to ... tens. ... ones multiplied by ... is equal to ... ones. <table><tr><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table> $20 \times 4 = 80$ $4 \times 4 = 16$ $24 \times 4 = 96$	Tens	Ones											45 × 3 40 × 3 5 × 3 <table><tr><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>	Tens	Ones						
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Scaling Children focus on multiplication as scaling (... times the size) as opposed to repeated addition.	There are times as many ... as ... 2 2 2 There are 3 times as many triangles as circles.	... is ... times the size of is ... times the length/height of ... 4 cm 16 cm Miss Smith is twice the height of Jo.																				

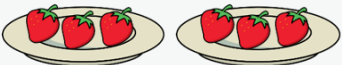
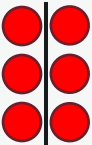
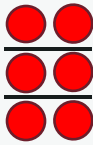
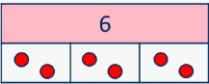
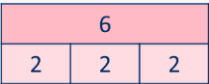
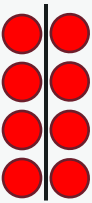
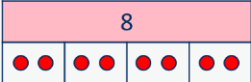
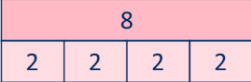
Multiplication

Progression of skills	Key representations												
Correspondence problems (How many ways?) Encourage children to work systematically to find all the different possible combinations.	For every ... , there are ... possible ... There are ... × ... possibilities altogether. <table data-bbox="994 362 1288 709"><thead><tr><th></th><th>hats</th><th>scarves</th></tr></thead><tbody><tr><td>blue</td><td></td><td> </td></tr><tr><td>orange</td><td></td><td> </td></tr><tr><td>purple</td><td></td><td> </td></tr></tbody></table> For every hat, there are two possible scarves. $3 \times 2 = 6$ There are 6 possibilities altogether.		hats	scarves	blue		 	orange		 	purple		 
	hats	scarves											
blue		 											
orange		 											
purple		 											

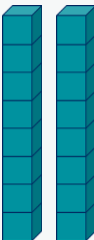
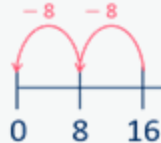
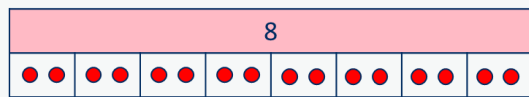
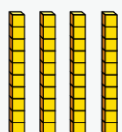
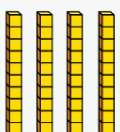
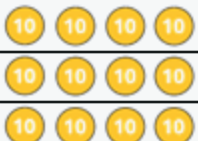
Progression of skills – Division

Year 2	Year 3	Year 4
• Divide by 2 • Divide by 10 • Divide by 5 • Missing numbers • Unit fractions • Non-unit fractions	• Divide by 3 • Divide by 4 • Divide by 8 • Related facts • Divide a 2-digit number by a 1-digit number - no exchange • Divide a 2-digit number by a 1-digit number - with remainders • Unit fractions of a set of objects • Non-unit fractions of a set of objects	• Division facts to 12×12 • Divide a number by 1 and itself • Related facts • Divide a 2 or 3-digit number by a 1-digit number • Divide by 10 and 100

Division

Year 3	- Recall and use division facts for the 3, 4 and 8 multiplication tables. - Write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods. - Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.	
Progression of skills	Key representations	
Divide by 3 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are ... groups of 3 in ... $\dots \div 3 =$  $2 \times 3 = 6$ $6 \div 3 = 2$  	... has been shared equally into 3 equal groups. $\dots \div 3 =$  $2 \times 3 = 6$ $6 \div 3 = 2$   
Divide by 4 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are ... groups of 4 in ... $\dots \div 4 =$  $2 \times 4 = 8$ $8 \div 4 = 2$  	... has been shared equally into 4 equal groups. $\dots \div 4 =$  $2 \times 4 = 8$ $8 \div 4 = 2$   

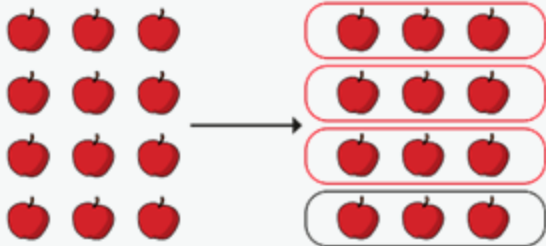
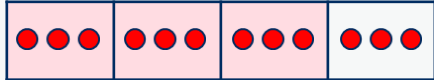
Division

Progression of skills	Key representations																					
Divide by 8 Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.	There are ... groups of 8 in ... $\dots \div 8 =$  $2 \times 8 = 16$ $16 \div 8 = 2$  	... has been shared equally into 8 equal groups. $\dots \div 8 =$    $2 \times 8 = 16$ $16 \div 8 = 2$																				
Related facts Link to known times-table facts.	... $\div$... is equal to ..., so ... tens $\div$... is equal to ... tens.         $12 \div 3 = 4$ $120 \div 3 = 40$																					
Divide a 2-digit number by a 1-digit number - no exchange Partition into tens and ones to divide and then recombine.	... tens divided by ... is equal to ... tens. ... ones divided by ... is equal to ... ones. <table><tr><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table> $60 \div 2 = 30$ $4 \div 2 = 2$ $64 \div 2 = 32$ 84 $\div$ 4 80 $\div$ 4 4 $\div$ 4 <table><tr><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>		Tens	Ones									Tens	Ones								
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Division

Progression of skills	Key representations																																											
Divide a 2-digit number by a 1-digit number - with remainders Encourage children to partition numbers flexibly to help them to divide more efficiently.	... tens divided by ... is equal to ... tens. ... ones divided by ... is equal to ... ones. <table><tr><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table> 96 ÷ 4 80 ÷ 4 16 ÷ 4 80 ÷ 4 = 20 16 ÷ 4 = 4 96 ÷ 4 = 24	Tens	Ones													There are ... groups of ... There are ... remaining. 31 ÷ 4 = 7 r3 94 ÷ 4 = 23 r2 <table><tr><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table><table><tr><th>Tens</th><th>Ones</th></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr><tr><td></td><td></td></tr></table>	Tens	Ones													Tens	Ones												
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Unit fractions of a set of objects Bar models are useful to show the link between division and fractions, for example, dividing by 3 and finding a third.	The whole is divided into ... equal parts. Each part is $\frac{1}{\square}$ of the whole. $\frac{1}{4}$ of 12 apples is 3 apples.	One ... of ... is ... $\frac{1}{4}$ of 12 is 3 $\frac{1}{3}$ of 36 is 12																																										

Division

Progression of skills	Key representations	
Non-unit fractions of a set of objects Bar models are a useful representation and show the links with division and multiplication.	The whole is divided into ... equal parts. Each part is $\frac{1}{\square}$ of the whole.  $\frac{3}{4}$ of 12 apples is 9 apples.	$\frac{1}{\square}$ of ... is ..., so $\frac{\square}{\square}$ of ... is ... $\frac{3}{4}$ of 12 is 9  $\frac{2}{3}$ of 36 is 24 