

# Maths At Battle Primary

The national curriculum for mathematics aims to ensure that all pupils:

- become fluent in the fundamentals of mathematics, including through varied and frequent practice with increasingly complex problems over time, so that pupils develop conceptual understanding and the ability to recall and apply knowledge rapidly and accurately
- reason mathematically by following a line of enquiry, conjecturing relationships and generalisations, and developing an argument, justification or proof using mathematical language
- can solve problems by applying their mathematics to a variety of routine and non-routine problems with increasing sophistication, including breaking down problems into a series of simpler steps and persevering in seeking solutions

At Battle we follow a Mastery approach to help us to achieve these aims.

# The key features of a mastery approach:

## The class work together on the same topic

The emphasis is on keeping the class together until specific concepts or skills are mastered and then moving on together. This does **not** mean that some children will be left behind or others not challenged. Differentiation is now achieved through and deeper understanding, as explained below.

## Speedy teacher intervention to prevent gaps

Those children that have not met the expected outcomes or have gaps in their understanding, will be helped by receiving short, immediate extra time on maths, during the lesson or later in the day. This is a positive opportunity to consolidate their understanding.

## Challenge is provided by going deeper not accelerating

For those children that have mastered the skill, concept or procedure they will be presented with higher order thinking activities, rather than accelerating through the curriculum.

## Focused, rigorous and thorough teaching

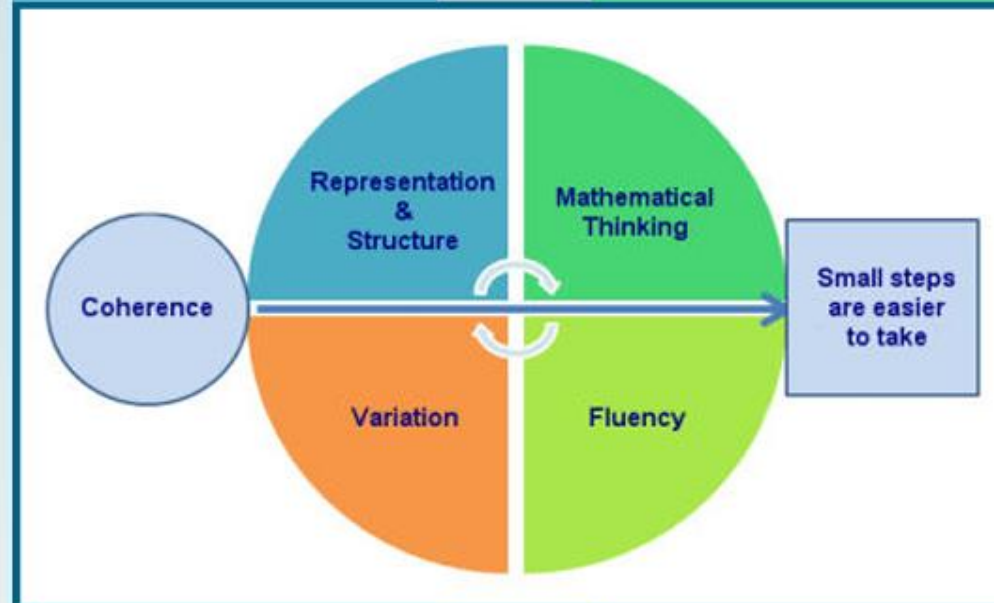
Within Mastery, the idea is to focus on one small step at a time in a lesson, with an emphasis on the mathematical structures involved and the best way to represent these through models and images. Each small step is important as it builds towards deep understanding of a concept.

## More time on teaching topics – depth and practice

The same topic is likely to have the same focus until the class has mastered the concept, skill or procedure being taught. This is particularly the case for number and calculations. Focus areas are being taught over a longer time with smaller steps of progress and time is for practice and depth, making the learning effective.

**Representation and Structure**  
Representations such as objects and pictures are used in lessons expose the mathematical concepts being taught.

**Mathematical Thinking**  
If taught ideas are to be understood deeply, they must not merely be passively received but must be thought about, reasoned with and discussed with others.



**Variation**  
Varying the way a concept is initially presented to students, by giving examples that display a concept as well as those that don't display it. Also, carefully varying practice questions so that mechanical repetition is avoided, and thinking is encouraged.

**Fluency**  
Quick and efficient recall of facts and procedures and the flexibility to move between different contexts and representations of mathematics.

**Coherence**  
Connecting new ideas to concepts that have already been understood, and ensuring that, once understood and mastered, new ideas are used again in next steps of learning, all steps being small steps.

You will see in our daily maths lessons:

Fluency, reasoning and problem solving.

In EYFS, KS1 and Year 4 and 5 the children are using the Mastering Number Program.

Learners are supported and challenged in lessons through questioning, resources and being challenged to think creatively about a problem.

Concrete manipulatives and pictorial representations are used to support conceptual understanding and to make links across topics.

Websites you can use to help your children at home:

<https://www.bbc.co.uk/bitesize>

<https://www.primaryhomeworkhelp.co.uk/maths/index.html>

<https://www.cgpbbooks.co.uk/resources/cgp-s-free-online-10-minute-tests>

<https://www.educationquizzes.com/in/primary/>

<https://mathsbot.com/>

<https://www.ncetm.org.uk/classroom-resources/ey-numberblocks-at-home/>

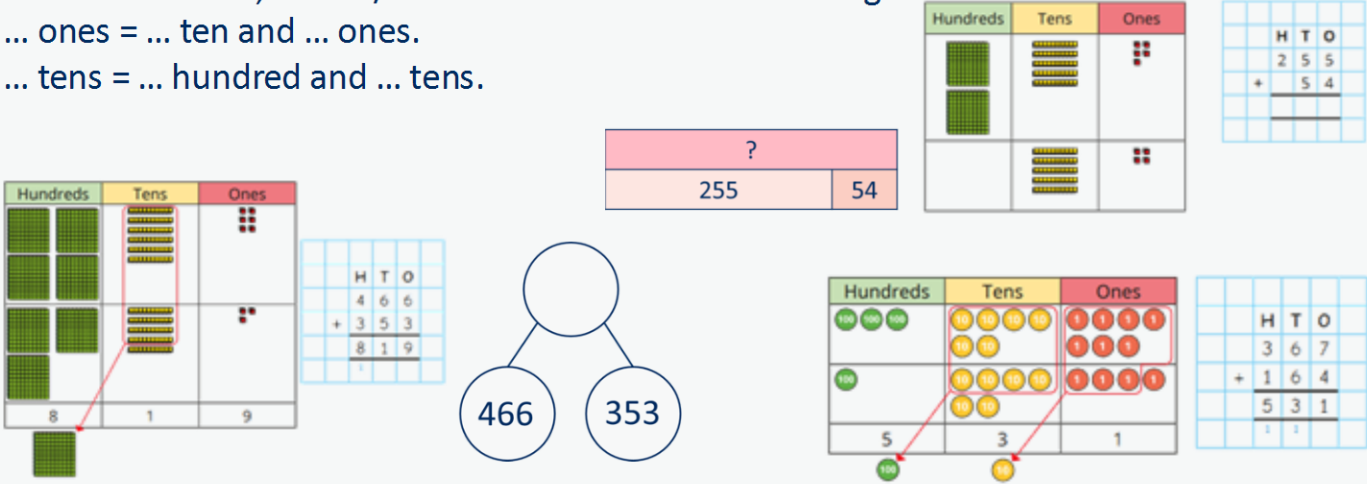
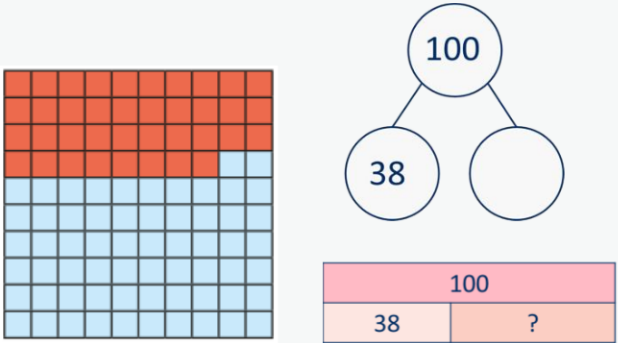
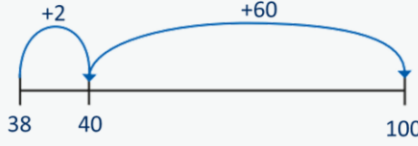
<https://www.topmarks.co.uk/maths-games/5-7-years/counting>

**YEAR 3 and  
YEAR 4**




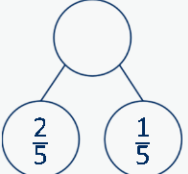
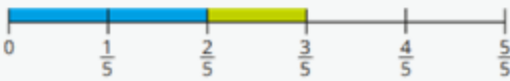


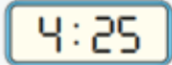
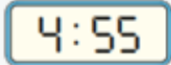
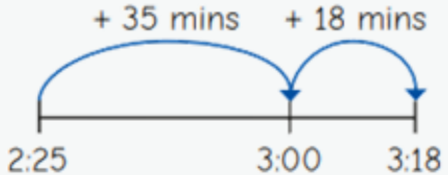
# Addition

<p><b>Year 3</b></p>	<ul style="list-style-type: none"> <li>Add numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds.</li> <li>Add numbers with up to three digits, using formal written methods of columnar addition.</li> <li>Add fractions with the same denominator within 1 whole.</li> <li>Calculate the time taken by particular events or tasks.</li> </ul>																																			
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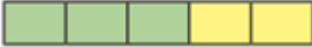
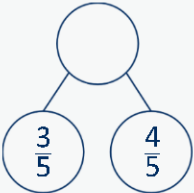
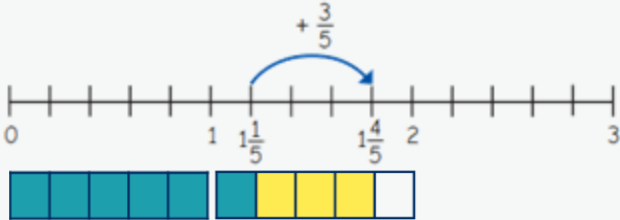
Progression of skills	Key representations	
<p><b>Add two numbers across a 10 or 100</b></p> <p>Formal written method involving up to 2 exchanges including 3-digit plus 2-digit numbers.</p>	<p>There are ... ones, so I do/do not need to make an exchange. There are ... tens, so I do/do not need to make an exchange. ... ones = ... ten and ... ones. ... tens = ... hundred and ... tens.</p> 	
<p><b>Complements to 100</b></p> <p>Pairs of numbers which total 100</p>	<p>... plus ... is equal to 100</p> 	<p>I add ... to get to the next 10, then ... to get to 100</p>  <p> <math>38 + 62 = 100</math>  <math>62 + 38 = 100</math>  <math>100 = 38 + 62</math>  <math>100 = 62 + 38</math> </p>

# Addition

Progression of skills	Key representations
<p><b>Add fractions with the same denominator within 1 whole</b></p> <p>Make links with known facts.</p>	<p>When adding fractions with the same denominator, I only add the numerator.            ... fifths + ... fifths = ... fifths</p> <div style="display: flex; align-items: center;">  <math>\frac{1}{5} + \frac{1}{5}</math> </div> <div style="display: flex; align-items: center; margin-top: 10px;">  <math>\frac{1}{5} + \frac{2}{5}</math> </div> <div style="display: flex; align-items: center; margin-top: 10px;">  <math>\frac{1}{5} + \frac{3}{5}</math> </div> <div style="text-align: right; margin-top: 20px;">  </div> <div style="text-align: center; margin-top: 20px;">  </div>
<p><b>Calculate the duration of events</b></p> <p>Find durations of time between a given start and end point. Children will need to calculate complements to 60</p>	<p>From ... to ... o'clock is ... minutes.            From ... o'clock to ... is ... minutes.            The total time taken is ... minutes.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p>start</p> </div> <div style="text-align: center;">  <p>finish</p> </div> <div style="text-align: center;">  <p>start</p> </div> <div style="text-align: center;">  <p>finish</p> </div> </div> <div style="text-align: right; margin-top: 20px;">  </div>

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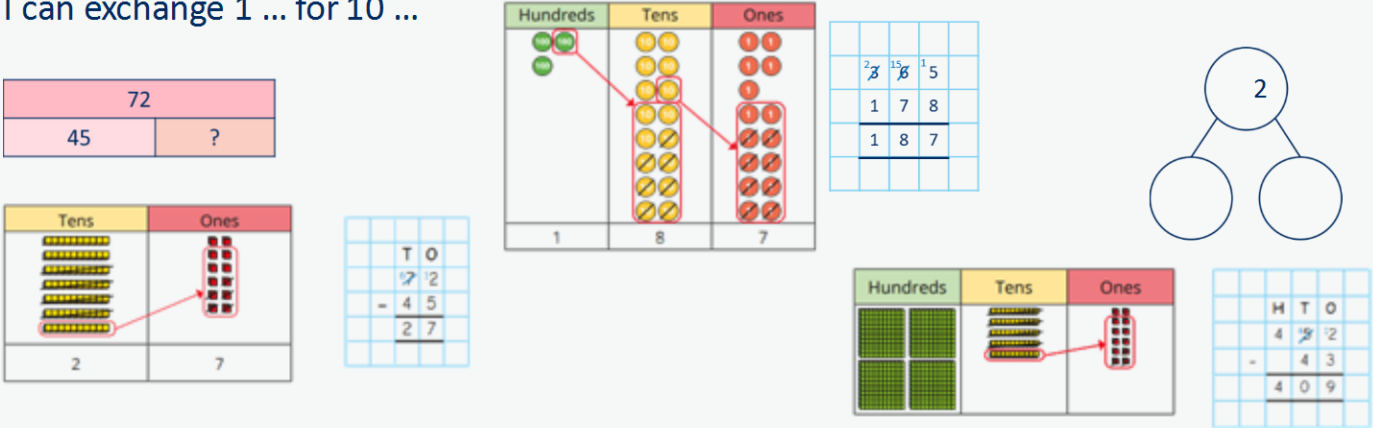
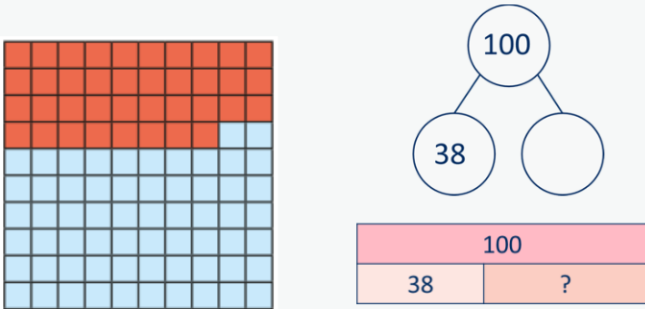
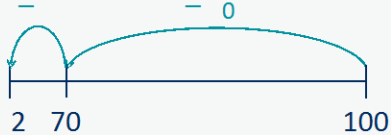
<p><b>Year 4</b></p>	<ul style="list-style-type: none"> <li>Add numbers with up to 4 digits using a formal written method.</li> <li>Solve simple measure and money problems involving fractions and decimals to 2 decimal places.</li> <li>Add fractions with the same denominator.</li> </ul>	
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>	
<p><b>Add 1s, 10s and 100s to a 4-digit number</b></p> <p>Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.</p>	<p>The ones/tens/hundreds/thousands column will increase by ...</p>  <p> <math>3,425 + 3 =</math>                      <math>3,425 + 300 =</math>  <math>3,425 + 30 =</math>                    <math>3,425 + 3,000 =</math> </p>	<p>What patterns do you notice?</p> <p> <math>2,350 + 3 =</math>  <math>2,350 + 30 =</math>  <math>2,350 + 300 =</math>  <math>2,350 + 3,000 =</math> </p> <p> <math>6,040 + 200 =</math>                    <math>2,211 + \square = 2,251</math>  <math>6,040 + 500 =</math>                    <math>2,211 + \square = 2,215</math>  <math>6,040 + 900 =</math>                    <math>2,211 + \square = 2,511</math> </p>
<p><b>Add up to two 4-digit numbers</b></p> <p>Formal written method with up to 3 exchanges. Encourage children to estimate and use inverse operations to check answers to calculations.</p>	<p>There are ... ones/tens/hundreds so I do/do not need to make an exchange.</p> <p>I can exchange 10 ... for 1 ...</p>  	

Progression of skills	Key representations	
<p><b>Add decimal numbers in the context of money</b></p> <p>Emphasis on partitioning and use of number lines rather than formal written calculations.</p>	<p>... pence + ... pence = ... pence ... pounds + ... pounds = ... pounds</p> <div style="text-align: center;">  </div> <p>45p + 25p = 70p £2 + £3 = £5 £5 + 70p = £5.70</p>	<p>£3.25 can be partitioned into £3 + 20p + 5p</p> <div style="text-align: center;">  </div>
<p><b>Add fractions and mixed numbers with the same denominator beyond 1 whole</b></p>	<p>When adding fractions with the same denominator, I only add the numerator. ... fifths + ... fifths = ... fifths</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;"> <math display="block">\frac{3}{5} + \frac{4}{5} = \frac{7}{5} = 1\frac{2}{5}</math>  </div> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div>	




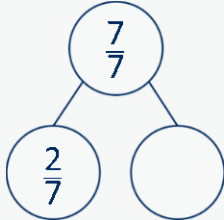

# Subtraction

<p><b>Year 3</b></p>	<ul style="list-style-type: none"> <li>Subtract numbers mentally, including: a three-digit number and ones, a three-digit number and tens, a three-digit number and hundreds.</li> <li>Subtract numbers with up to three digits, using formal written methods.</li> <li>Subtract fractions with the same denominator within 1 whole.</li> </ul>																														
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# Subtraction

Progression of skills	Key representations	
<p><b>Subtract two numbers across a 10 or 100</b></p> <p>Formal written method involving up to 2 exchanges including 3-digit subtract 2-digit numbers.</p>	<p>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 ...</p> 	
<p><b>Complements to 100</b></p> <p>Focus on subtraction facts.</p> <p>Encourage children to notice patterns.</p>	<p>100 minus ... is equal to ...</p> 	<p>I subtract ... tens, then I subtract ... ones.</p> $100 - 38 = 62$ $100 - 62 = 38$ $62 = 100 - 38$ $38 = 100 - 62$ 

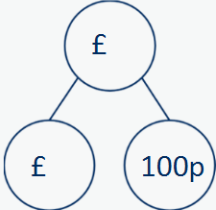
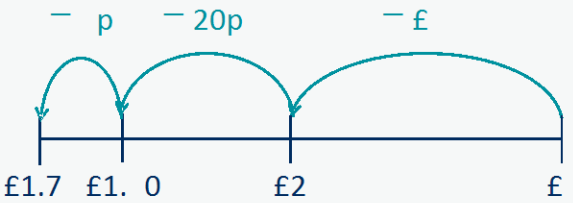
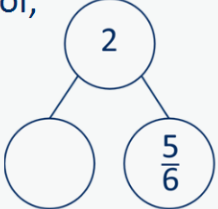
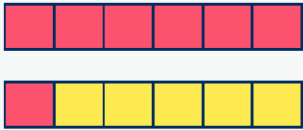
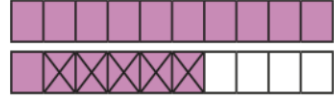
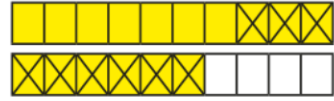
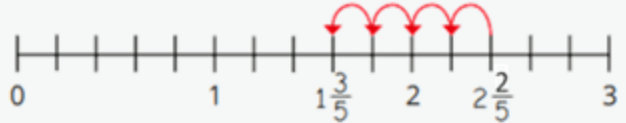

# Subtraction

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

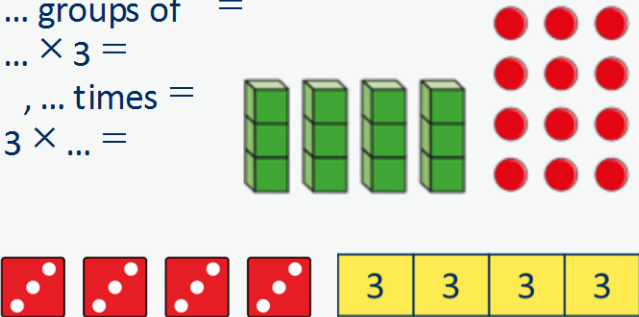

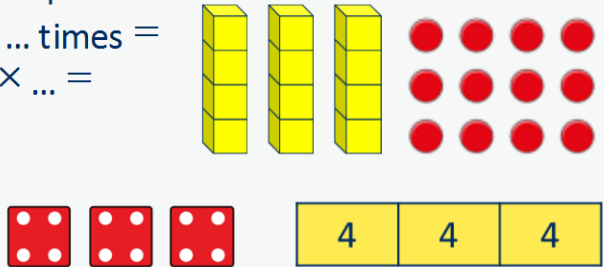

# Subtraction

<p><b>Year 4</b></p>	<ul style="list-style-type: none"> <li>Subtract numbers with up to 4 digits using a formal written method.</li> <li>Solve simple measure and money problems involving fractions and decimals to 2 decimal places.</li> <li>Subtract fractions with the same denominator.</li> </ul>																																																																					
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>																																																																					
<p><b>Subtract 1s, 10s, 100s and 1,000s from a 4-digit number</b></p> <p>Emphasis on mental strategies including number bonds and related facts. Prompt children to notice which digit changes.</p>	<p>The ones/tens/hundreds/thousands column will decrease by ...</p> <table border="1" data-bbox="576 564 1038 749"> <thead> <tr> <th>Thousands</th> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td>1,000 1,000 1,000</td> <td>100 100 100 100</td> <td>10 10</td> <td>1 1 1 1 1</td> </tr> </tbody> </table> <p> <math>3,425 - 2 =</math>      <math>3,425 - 200 =</math>  <math>3,425 - 20 =</math>    <math>3,425 - 2,000 =</math> </p>	Thousands	Hundreds	Tens	Ones	1,000 1,000 1,000	100 100 100 100	10 10	1 1 1 1 1	<p>What patterns do you notice?</p> <p> <math>4,356 - 3 =</math>  <math>4,356 - 30 =</math>  <math>4,356 - 300 =</math>  <math>4,356 - 3,000 =</math> </p> <p> <math>4,433 - \square = 4,430</math>  <math>4,433 - \square = 4,033</math>  <math>4,433 - \square = 4,403</math> </p>																																																												
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<p><b>Subtract up to two 4-digit numbers</b></p> <p>Formal written method with up to 3 exchanges. Encourage children to estimate and use inverse operations to check answers to calculations.</p>	<p>I need to subtract... ones/tens/hundreds. I do/do not need to make an exchange.</p> <p>I can exchange 1... for 10...</p> <table border="1" data-bbox="1073 992 1570 1316"> <thead> <tr> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>1,000 1,000 1,000</td> <td>100</td> <td>10 10 10</td> <td>1 1 1</td> </tr> <tr> <td></td> <td></td> <td>10 10 10</td> <td>1 1 1</td> </tr> <tr> <td></td> <td></td> <td>10 10 10</td> <td>1 1 1</td> </tr> <tr> <td></td> <td></td> <td>10 10 10</td> <td>1 1 1</td> </tr> <tr> <td></td> <td></td> <td>10 10 10</td> <td>1 1 1</td> </tr> <tr> <td></td> <td></td> <td>10 10 10</td> <td>1 1 1</td> </tr> <tr> <td></td> <td></td> <td>10 10 10</td> <td>1 1 1</td> </tr> <tr> <td></td> <td></td> <td>10 10 10</td> <td>1 1 1</td> </tr> <tr> <td></td> <td></td> <td>10 10 10</td> <td>1 1 1</td> </tr> <tr> <td></td> <td></td> <td>10 10 10</td> <td>1 1 1</td> </tr> <tr> <td></td> <td></td> <td>10 10 10</td> <td>1 1 1</td> </tr> </tbody> </table> <table border="1" data-bbox="1605 1031 1895 1282"> <thead> <tr> <th></th> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td>3</td> <td>2</td> <td>4</td> <td>8</td> </tr> <tr> <td>-</td> <td>2</td> <td>1</td> <td>4</td> <td>8</td> </tr> <tr> <td></td> <td>1</td> <td>0</td> <td>5</td> <td>8</td> </tr> </tbody> </table>		Th	H	T	O	1,000 1,000 1,000	100	10 10 10	1 1 1			10 10 10	1 1 1			10 10 10	1 1 1			10 10 10	1 1 1			10 10 10	1 1 1			10 10 10	1 1 1			10 10 10	1 1 1			10 10 10	1 1 1			10 10 10	1 1 1			10 10 10	1 1 1			10 10 10	1 1 1		Th	H	T	O		3	2	4	8	-	2	1	4	8		1	0	5	8
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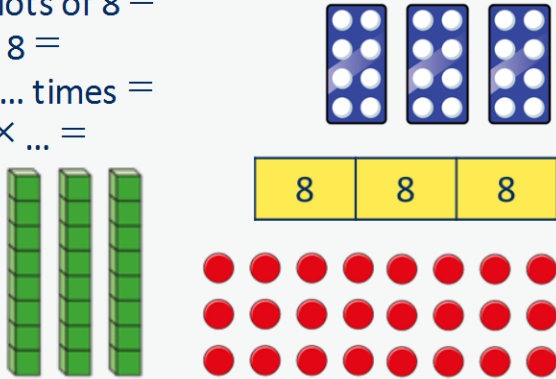

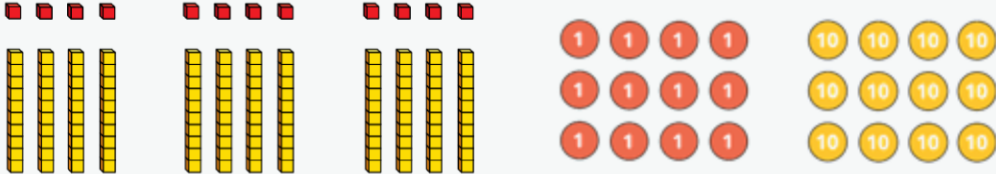
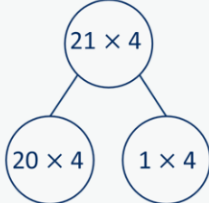
# Subtraction

Progression of skills	Key representations	
<p><b>Subtract decimal numbers in the context of money</b></p> <p>Emphasis here is on partitioning and use of number lines rather than formal written calculations.</p>	<p>I can partition £... into £... and 100p</p> $\text{£}... - \text{£}... = \text{£}...$ $100\text{p} - \dots\text{p} = \dots\text{p}$ <p><b>£5 - £3.26</b>  <math>\text{£}4 - \text{£}3 = \text{£}1</math>  <math>100\text{p} - 26\text{p} = 74\text{p}</math>  <math>\text{£}5 - \text{£}3.26 = \text{£}1.74</math></p> 	<p>£3.26 can be partitioned into £3 + 20p + 6p</p> 
<p><b>Subtract fractions and mixed numbers with the same denominator</b></p> <p>Include subtracting fractions from wholes.</p>	<p>When subtracting fractions with the same denominator, I only subtract the numerator.</p> $\dots \text{ tenths} - \dots \text{ tenths} = \dots \text{ tenths}$    $\frac{16}{10} - \frac{5}{10}$  $\frac{16}{10} - \frac{9}{10}$  	


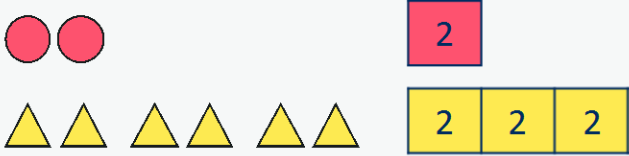


# Multiplication

<p><b>Year 3</b></p>	<ul style="list-style-type: none"> <li>Recall and use multiplication facts for the 3, 4 and 8 multiplication tables.</li> <li>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.</li> <li>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.</li> </ul>																															
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>																															
<p><b>The 3 times-table</b></p> <p>Encourage daily counting in multiples both forwards and back.</p>	<p>... groups of =  <math>\dots \times 3 =</math>              , ... times =  <math>3 \times \dots =</math></p> 	<p>... times is equal to ...</p> <table border="1" data-bbox="1346 664 1833 806"> <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> <p><math>4 \times 3 = 12</math>   <math>12 = 4 \times 3</math></p> 	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
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<p><b>The 4 times-table</b></p> <p>Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2 and 4 times-tables.</p>	<p>... groups of =  <math>\dots \times 4 =</math>              , ... times =  <math>4 \times \dots =</math></p> 	<p>... times is equal to ...</p> <table border="1" data-bbox="1346 1028 1833 1170"> <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> <p><math>3 \times 4 = 12</math>   <math>12 = 3 \times 4</math></p> 	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
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# Multiplication

Progression of skills	Key representations																															
<p><b>The 8 times-table</b></p> <p>Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2, 4 and 8 times-tables.</p>	<p>... lots of 8 =  <math>\times 8 =</math>            , ... times =  <math>8 \times \dots =</math></p> 	<p>... times is equal to ...</p> <table border="1" data-bbox="1334 335 1866 486"> <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> <p><math>3 \times 8 = 24</math>    <math>24 = 3 \times 8</math></p> 	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30
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<p><b>Related facts</b></p> <p>Use knowledge of multiplying by 10 to scale times-table facts.</p>	<p>... <math>\times</math> ... ones is equal to ... ones            so ... <math>\times</math> ... tens is equal to ... tens.</p>  <p><math>3 \times 4 = 12</math>  <math>3 \times 40 = 120</math></p>																															
<p><b>Multiply a 2-digit number by a 1-digit number - no exchange</b></p> <p>Children apply their understanding of partitioning to represent and solve calculations using the expanded method.</p>	<p>... tens multiplied by ... is equal to ... tens.            ...ones multiplied by ... is equal to ... ones.</p> <table border="1" data-bbox="582 1078 915 1310"> <thead> <tr><th>Tens</th><th>Ones</th></tr> </thead> <tbody> <tr><td>30</td><td>0</td></tr> <tr><td>20</td><td>0</td></tr> <tr><td>10</td><td>0</td></tr> <tr><td>0</td><td>2</td></tr> <tr><td>0</td><td>2</td></tr> </tbody> </table> <p><math>30 \times 2 = 60</math>  <math>2 \times 2 = 4</math>  <math>32 \times 2 = 64</math></p>	Tens	Ones	30	0	20	0	10	0	0	2	0	2	 <table border="1" data-bbox="1564 1078 1916 1310"> <thead> <tr><th>Tens</th><th>Ones</th></tr> </thead> <tbody> <tr><td>20</td><td>0</td></tr> <tr><td>10</td><td>0</td></tr> <tr><td>10</td><td>0</td></tr> <tr><td>0</td><td>4</td></tr> <tr><td>0</td><td>4</td></tr> </tbody> </table>	Tens	Ones	20	0	10	0	10	0	0	4	0	4						
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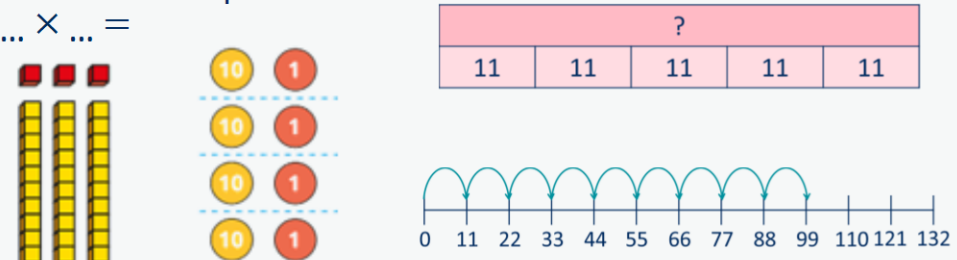

# Multiplication

Progression of skills	Key representations																							
<p><b>Multiply a 2-digit number by a 1-digit number - with exchange</b></p> <p>Children apply their understanding of partitioning to represent and solve calculations using the expanded method.</p>	<p>... tens multiplied by ... is equal to ... tens. ... ones multiplied by ... is equal to ... ones.</p> <table border="1" data-bbox="588 386 946 718"> <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> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table> <p><math>20 \times 4 = 80</math> <math>4 \times 4 = 16</math></p> <p><math>24 \times 4 = 96</math></p>	Tens	Ones													 <p>The diagram shows a tree diagram with a top circle containing 'x' and two bottom circles, each containing '0 x'. To the right is a place value chart for 24 multiplied by 4:</p> <table border="1" data-bbox="1518 496 1908 686"> <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> </tbody> </table>	Tens	Ones						
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<p><b>Scaling</b></p> <p>Children focus on multiplication as scaling ( ... times the size) as opposed to repeated addition.</p>	<p>There are ... times as many ... as ...</p>  <p>There are 3 times as many triangles as circles.</p>	<p>... is ... times the size of ... ... is ... times the length/height of ...</p>   <p>Miss Smith is twice the height of Jo.</p>																						


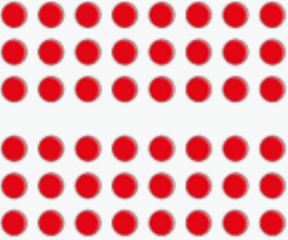

# Multiplication

Progression of skills	Key representations								
<p><b>Correspondence problems</b> (How many ways?)</p> <p>Encourage children to work systematically to find all the different possible combinations.</p>	<p>For every ... , there are ... possible ... There are ... <math>\times</math> ... possibilities altogether.</p> <div data-bbox="590 506 969 702"></div> <table border="1" data-bbox="996 365 1290 711"><thead><tr><th data-bbox="996 365 1141 401">hats</th><th data-bbox="1145 365 1290 401">scarves</th></tr></thead><tbody><tr><td data-bbox="996 404 1141 504">blue </td><td data-bbox="1145 404 1290 504"> </td></tr><tr><td data-bbox="996 506 1141 606">orange </td><td data-bbox="1145 506 1290 606"> </td></tr><tr><td data-bbox="996 609 1141 711">purple </td><td data-bbox="1145 609 1290 711"> </td></tr></tbody></table> <p>For every hat, there are two possible scarves. <math>3 \times 2 = 6</math></p> <p>There are 6 possibilities altogether.</p>	hats	scarves	blue 	 	orange 	 	purple 	 
hats	scarves								
blue 	 								
orange 	 								
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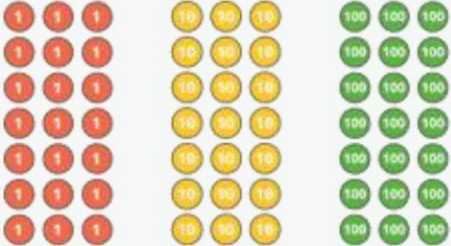
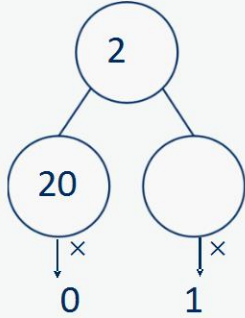
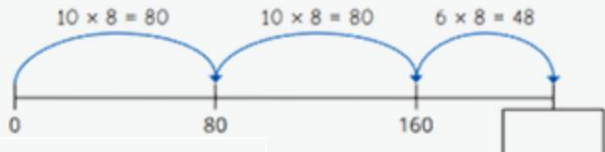
# Multiplication

<p><b>Year 4</b></p>	<ul style="list-style-type: none"> <li>Recall multiplication facts for multiplication tables up to <math>12 \times 12</math></li> <li>Use place value, known and derived facts to multiply mentally, including: multiplying by 0 and 1; multiplying together three numbers.</li> <li>Recognise and use factor pairs and commutativity in mental calculations.</li> <li>Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.</li> <li>Solve problems involving multiplying and adding, including using the distributive law to multiply two-digit numbers by one digit, integer scaling problems and harder correspondence problems such as n objects are connected to m objects.</li> </ul>																																																																																																					
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>																																																																																																					
<p><b>Times-table facts to <math>12 \times 12</math></b></p> <p>Encourage daily counting in multiples both forwards and back. Encourage children to notice links between related times-tables.</p>	<p>... groups of ... = ... times ... is equal to ... ... <math>\times</math> ... =</p> 	<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> <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> <tr><td>51</td><td>52</td><td>53</td><td>54</td><td>55</td><td>56</td><td>57</td><td>58</td><td>59</td><td>60</td></tr> <tr><td>61</td><td>62</td><td>63</td><td>64</td><td>65</td><td>66</td><td>67</td><td>68</td><td>69</td><td>70</td></tr> <tr><td>71</td><td>72</td><td>73</td><td>74</td><td>75</td><td>76</td><td>77</td><td>78</td><td>79</td><td>80</td></tr> <tr><td>81</td><td>82</td><td>83</td><td>84</td><td>85</td><td>86</td><td>87</td><td>88</td><td>89</td><td>90</td></tr> <tr><td>91</td><td>92</td><td>93</td><td>94</td><td>95</td><td>96</td><td>97</td><td>98</td><td>99</td><td>100</td></tr> </table>	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
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<p><b>Multiply by 1 and 0</b></p>	<p>Any number multiplied by 1 is equal to ... Any number multiplied by 0 is equal to ...</p> 	<p>... <math>\times</math> ... = ...</p> <table> <tr><td><math>1 \times 1 = 1</math></td><td><math>1 \times 0 = 0</math></td></tr> <tr><td><math>2 \times 1 = 2</math></td><td><math>2 \times 0 = 0</math></td></tr> <tr><td><math>3 \times 1 = 3</math></td><td><math>3 \times 0 = 0</math></td></tr> <tr><td><math>4 \times 1 = 4</math></td><td><math>4 \times 0 = 0</math></td></tr> </table>	$1 \times 1 = 1$	$1 \times 0 = 0$	$2 \times 1 = 2$	$2 \times 0 = 0$	$3 \times 1 = 3$	$3 \times 0 = 0$	$4 \times 1 = 4$	$4 \times 0 = 0$																																																																																												
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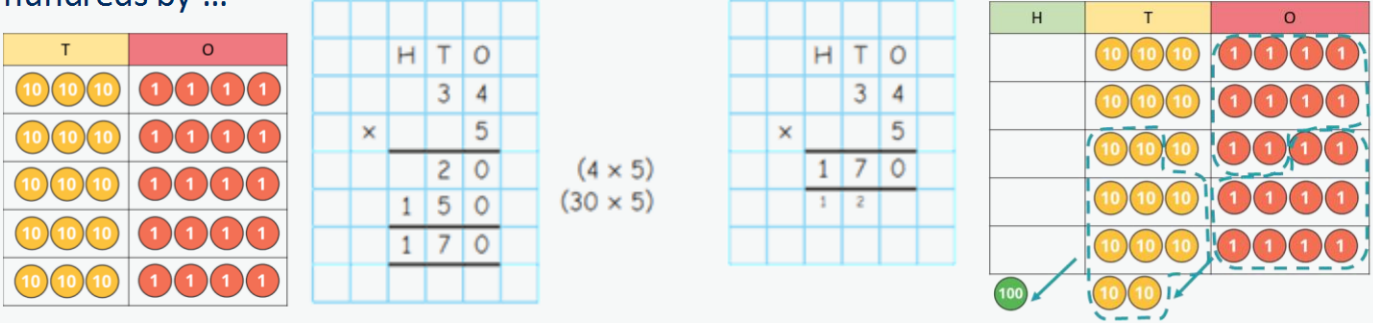
# Multiplication

Progression of skills	Key representations															
<p><b>Multiply 3 numbers</b></p> <p>Children use their understanding of commutativity to multiply more efficiently.</p>	<p>To work out ... <math>\times</math> ... <math>\times</math> ..., I can first calculate ... <math>\times</math> ... and then multiply the answer by ...</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <math>4 \times 2 \times 3 = 8 \times 3 = 24</math>  <math>2 \times 3 \times 4 = 6 \times 4 = 24</math>  <math>3 \times 4 \times 2 = 12 \times 2 = 24</math> </div> </div>															
<p><b>Factor pairs</b></p> <p>Children explore equivalent calculations using different factors pairs.</p>	<p><math>12 = \dots \times \dots</math>, so ... <math>\times</math> <math>12 = \dots \times \dots \times \dots</math></p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><math>8 \times 6 = 8 \times 3 \times 2</math> <math>8 \times 6 = 24 \times 2</math></p> </div> <div style="text-align: center;">  <p><math>6 \times 8 = 6 \times 4 \times 2</math> <math>6 \times 8 = 24 \times 2</math></p> </div> </div>															
<p><b>Multiply by 10 and 100</b></p> <p>Some children may over-generalise that multiplying by 10 or 100 always results in adding zeros. This will cause issues later when multiplying decimals.</p>	<p>When I multiply by 10, the digits move ... place value column to the left. ... is 10 times the size of ...</p> <div style="display: flex; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center; width: 100px; height: 80px;"> <tr><th style="background-color: #d9ead3;">H</th><th style="background-color: #fff2cc;">T</th><th style="background-color: #f4cccc;">O</th></tr> <tr><td></td><td>●●</td><td>●●●●</td></tr> </table> <div style="margin-left: 20px;"> <math>35 \times 10 = 350</math> </div> </div>	H	T	O		●●	●●●●	<p>When I multiply by 100, the digits move ... place value columns to the left. ... is 100 times the size of ...</p> <div style="display: flex; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center; width: 150px; height: 80px;"> <tr><th style="background-color: #d9ead3;">Th</th><th style="background-color: #d9ead3;">H</th><th style="background-color: #fff2cc;">T</th><th style="background-color: #f4cccc;">O</th></tr> <tr><td></td><td></td><td>●</td><td>●●●●</td></tr> </table> <div style="margin-left: 20px;"> <math>14 \times 100 = 1,400</math> </div> </div>	Th	H	T	O			●	●●●●
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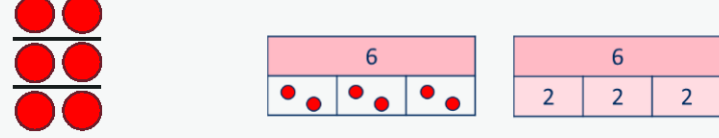



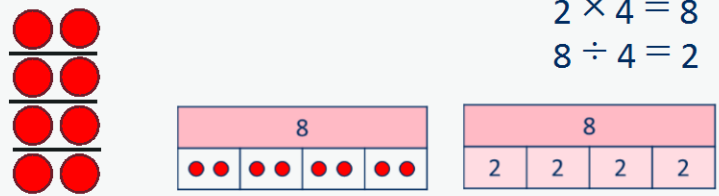
# Multiplication

Progression of skills	Key representations								
<p><b>Related facts</b></p> <p>Use knowledge of multiplying by 10 and 100 to scale times-table facts.</p>	<p>... <math>\times</math> ... ones is equal to ... ones so ... <math>\times</math> ... tens is equal to ... tens and ... <math>\times</math> ... hundreds is equal to ... hundreds.</p>  <p> <math>3 \times 7 = 21</math>                      <math>7 \times 3 = 21</math>  <math>3 \times 70 = 210</math>                <math>7 \times 30 = 210</math>  <math>3 \times 700 = 2,100</math>            <math>7 \times 300 = 2,100</math> </p>								
<p><b>Mental strategies</b></p> <p>Partition 2 or 3-digit numbers to multiply using informal methods.</p>	<p>... tens multiplied by ... is equal to ... tens. ...ones multiplied by ... is equal to ... ones.</p> <table border="1" data-bbox="576 803 903 1063"> <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> </tbody> </table>   <p> <math>3 \times 26 = 60 + 18 = 78</math>                      <math>26 \times 8 = 80 + 80 + 48 = 208</math> </p>	Tens	Ones						
Tens	Ones								

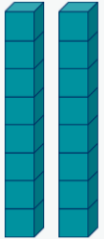




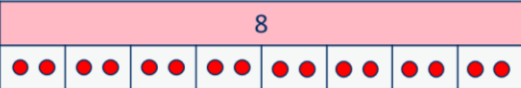


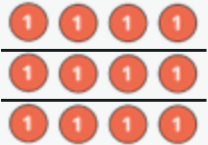

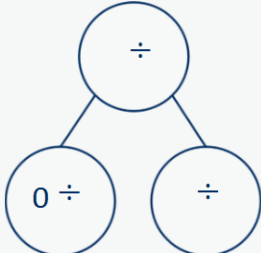
# Multiplication

Progression of skills	Key representations																								
<p><b>Multiply a 2 or 3-digit number by a 1-digit number</b></p> <p>The short multiplication method is introduced for the first time, initially in an expanded form.</p>	<p>To multiply a 2-digit number by ... , I multiply the ones by ... and the tens by ... To multiply a 3-digit number by ... , I multiply the ones by ... , the tens by ... and the hundreds by ...</p>  <p>The first representation shows base ten blocks for <math>34 \times 5</math> and <math>305 \times 5</math>. The second shows a grid with the same calculations. The third shows a short multiplication method with place value labels (H, T, O) and a carry of 1 from the tens column to the hundreds column.</p>																								
<p><b>Scaling</b></p> <p>Children focus on multiplication as scaling (... times the size).</p>	<p>... is ... times the size of ...</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;"> <p><b>7</b></p> <p>7 7 7 7 7 7</p> <p>A computer mouse costs £7 A keyboard costs 6 times as much.</p> </div> <div style="text-align: center;"> <p><b>6</b></p> <p>6 6 6 6 6 6 6</p> <p>A red ribbon is 6 cm. A yellow ribbon is 7 times as long.</p> </div> </div>																								
<p><b>Correspondence problems</b></p> <p>Encourage children to use tables to show all the different possible combinations.</p>	<p>For every ... , there are ... possibilities. There are ... <math>\times</math> ... possibilities altogether.</p> <p>A pizza company offers a choice of 5 toppings and 3 bases.</p> <p><math>5 \times 3 = 15</math></p> <table border="1" data-bbox="1197 1062 1939 1310"> <thead> <tr> <th></th> <th>Deep pan</th> <th>Italian</th> <th>Thin</th> </tr> </thead> <tbody> <tr> <th>Cheese</th> <td>C DP</td> <td>C I</td> <td>C Th</td> </tr> <tr> <th>Mushroom</th> <td>M DP</td> <td>M I</td> <td>M Th</td> </tr> <tr> <th>Vegetable</th> <td>V DP</td> <td>V I</td> <td>V Th</td> </tr> <tr> <th>Chicken</th> <td>C DP</td> <td>C I</td> <td>C Th</td> </tr> <tr> <th>Tuna</th> <td>T DP</td> <td>T I</td> <td>T Th</td> </tr> </tbody> </table>		Deep pan	Italian	Thin	Cheese	C DP	C I	C Th	Mushroom	M DP	M I	M Th	Vegetable	V DP	V I	V Th	Chicken	C DP	C I	C Th	Tuna	T DP	T I	T Th
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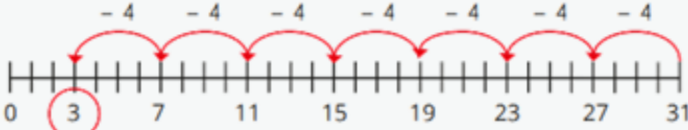

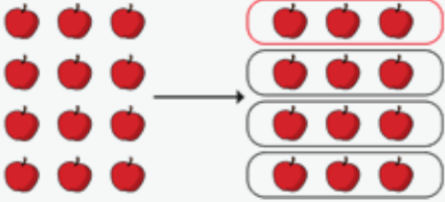
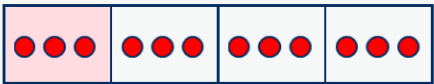

# Division

<p><b>Year 3</b></p>	<ul style="list-style-type: none"> <li>Recall and use division facts for the 3, 4 and 8 multiplication tables.</li> <li>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.</li> <li>Recognise, find and write fractions of a discrete set of objects: unit fractions and non-unit fractions with small denominators.</li> </ul>	
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>	
<p><b>Divide by 3</b></p> <p>Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.</p>	<p>There are ... groups of in ...</p> <p><math>\dots \div 3 =</math></p>  	<p>... has been shared equally into equal groups.</p> <p><math>\dots \div 3 =</math></p>  
<p><b>Divide by 4</b></p> <p>Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.</p>	<p>There are ... groups of in ...</p> <p><math>\dots \div 4 =</math></p>  	<p>... has been shared equally into equal groups.</p> <p><math>\dots \div 4 =</math></p>  

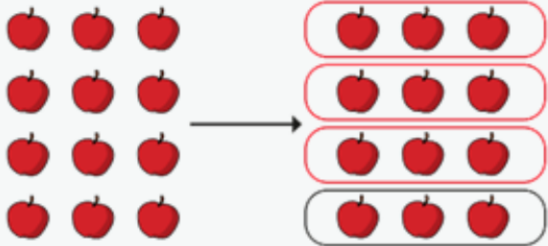
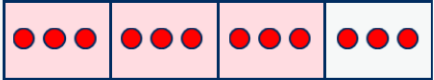

# Division

Progression of skills	Key representations																	
<p><b>Divide by 8</b></p> <p>Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.</p>	<p>There are ... groups of ... in ... ... <math>\div</math> 8 =</p>  <p><math>2 \times 8 = 16</math> <math>16 \div 8 = 2</math></p>  	<p>... has been shared equally into ... equal groups. ... <math>\div</math> 8 =</p>    <p><math>2 \times 8 = 16</math> <math>16 \div 8 = 2</math></p>																
<p><b>Related facts</b></p> <p>Link to known times-table facts.</p>	<p>... <math>\div</math> ... is equal to ..., so ... tens <math>\div</math> ... is equal to ... tens.</p>     <p><math>12 \div 3 = 4</math> <math>120 \div 3 = 40</math></p>																	
<p><b>Divide a 2-digit number by a 1-digit number - no exchange</b></p> <p>Partition into tens and ones to divide and then recombine.</p>	<p>... tens divided by ... is equal to ... tens. ... ones divided by ... is equal to ... ones.</p> <table border="1" data-bbox="582 1079 913 1308"> <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> <p><math>60 \div 2 = 30</math> <math>4 \div 2 = 2</math> <math>64 \div 2 = 32</math></p>  <table border="1" data-bbox="1566 1079 1918 1308"> <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					Tens	Ones								
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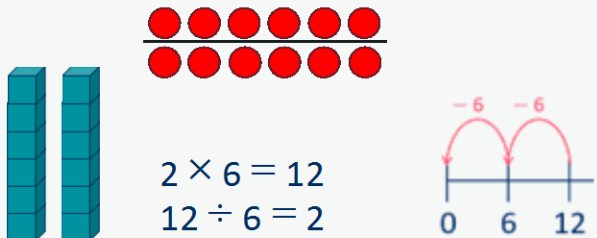
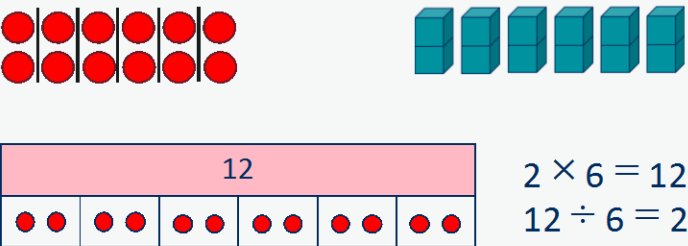




# Division

Progression of skills	Key representations																																			
<p><b>Divide a 2-digit number by a 1-digit number - with remainders</b></p> <p>Encourage children to partition numbers flexibly to help them to divide more efficiently.</p>	<p>... tens divided by ... is equal to ... tens. ... ones divided by ... is equal to ... ones.</p> <table border="1" data-bbox="588 492 946 825"> <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> <tr> <td></td> <td></td> </tr> <tr> <td></td> <td></td> </tr> </tbody> </table> <div data-bbox="975 482 1183 682"> </div> <p> <math>80 \div 4 = 20</math>  <math>16 \div 4 = 4</math>  <math>96 \div 4 = 24</math> </p>	Tens	Ones													<p>There are ... groups of ... There are ... remaining.</p> <p><math>31 \div 4 = 7 \text{ r}3</math></p>  <p><math>94 \div 4 = 23 \text{ r}2</math></p> <table border="1" data-bbox="1253 645 1466 835"> <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>  <table border="1" data-bbox="1674 645 1887 835"> <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									Tens	Ones								
Tens	Ones																																			
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Tens	Ones																																			
<p><b>Unit fractions of a set of objects</b></p> <p>Bar models are useful to show the link between division and fractions, for example, dividing by 3 and finding a third.</p>	<p>The whole is divided into ... equal parts. Each part is <math>\frac{1}{\square}</math> of the whole.</p>  <p><math>\frac{1}{3}</math> of 12 apples is 3 apples.</p>	<p>ne ... of ... is ...</p> <p><math>\frac{1}{3}</math> of 12 is 3</p>  <p><math>\frac{1}{3}</math> of 36 is 12</p> 																																		




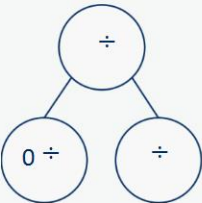
















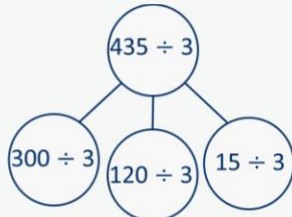















































# Division

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

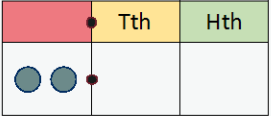
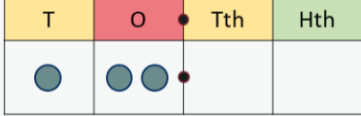
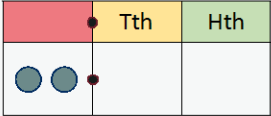
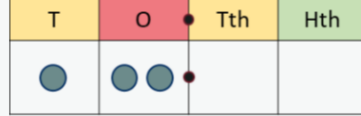
# Division

<p><b>Year 4</b></p>	<ul style="list-style-type: none"> <li>Recall division facts for multiplication tables up to <math>12 \times 12</math></li> <li>Use place value, known and derived facts to divide mentally, including: dividing by 1</li> <li>Find the effect of dividing a one- or two-digit number by 10 and 100, identifying the value of the digits in the answer as ones, tenths and hundredths.</li> </ul>	
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>	
<p><b>Division facts to <math>12 \times 12</math></b></p> <p>Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts.</p>	<p>There are ... groups of ... in ... ... <math>\div</math> ... =</p>  <p><math>2 \times 6 = 12</math> <math>12 \div 6 = 2</math></p>	<p>... has been shared equally into ... equal groups. ... <math>\div</math> ... =</p>  <p><math>2 \times 6 = 12</math> <math>12 \div 6 = 2</math></p>
<p><b>Divide a number by 1 and itself</b></p> <p>Children may try to divide a number by zero and it should be highlighted that this is not possible.</p>	<p>When I divide a number by 1, the number remains the same.</p> <p>5 shared between 1 is 5 </p> <p>There are 5 groups of 1 in 5</p> 	<p>When I divide a number by itself, the answer is 1</p> <p>5 shared between 5 is 1</p>  <p>There is 1 group of 5 in 5</p> 

# Division

Progression of skills	Key representations																										
<p><b>Related facts</b></p> <p>Link to known times-table facts.</p>	<p>... <math>\div</math> ... is equal to ...            so ... tens <math>\div</math> ... is equal to ... tens            and ... hundreds <math>\div</math> ... is equal to ... hundreds.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>21 <math>\div</math> 7 = 3</p> <p>210 <math>\div</math> 7 = 30</p> <p>2,100 <math>\div</math> 7 = 300</p> </div> <div style="text-align: center;">  <p>21 <math>\div</math> 3 = 7</p> <p>210 <math>\div</math> 3 = 70</p> <p>2,100 <math>\div</math> 3 = 700</p> </div> <div style="text-align: center;">  </div> </div>																										
<p><b>Divide a 2 or 3-digit number by a 1-digit number</b></p> <p>Progress from divisions with no exchange, to divisions with exchange and then divisions with remainders.</p>	<p>I can partition ... into ... tens and ... ones.</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center;">  </div> <div style="margin-left: 20px;"> <p>80 <math>\div</math> 4 = 20</p> <p>4 <math>\div</math> 4 = 1</p> <p>84 <math>\div</math> 4 = 21</p> </div> </div> <table border="1" style="margin-top: 10px; width: 100%; text-align: center;"> <thead> <tr> <th style="background-color: #fff9c4;">Tens</th> <th style="background-color: #f8bbd0;">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									<p>I cannot share the hundreds/tens equally, so I need to exchange 1 ... for 10 ...</p> <div style="display: flex; align-items: center; justify-content: center;"> <div style="text-align: center;">  </div> <div style="margin-left: 20px;"> <p>300 <math>\div</math> 3 = 100</p> <p>120 <math>\div</math> 3 = 40</p> <p>15 <math>\div</math> 3 = 5</p> <p>435 <math>\div</math> 3 = 145</p> </div> </div> <table border="1" style="margin-top: 10px; width: 100%; text-align: center;"> <thead> <tr> <th style="background-color: #c8e6c9;">Hundreds</th> <th style="background-color: #fff9c4;">Tens</th> <th style="background-color: #f8bbd0;">Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td> </td> <td></td> </tr> </tbody> </table>	Hundreds	Tens	Ones											 	
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# Division

Progression of skills	Key representations			
<p><b>Divide by 10 and 100</b></p> <p>Encourage children to notice that dividing by 100 is the same as dividing by 10 twice.</p>	<p>When I divide by 10, the digits move 1 place value column to the right. ... is one-tenth the size of ...</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p><math>2 \div 10 = 0.2</math></p> </div> <div style="text-align: center;">  <p><math>12 \div 10 = 1.2</math></p> </div> </div>		<p>When I divide by 100, the digits move 2 place value columns to the right. ... is one-hundredth the size of ...</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <p><math>2 \div 100 = 0.02</math></p> </div> <div style="text-align: center;">  <p><math>12 \div 100 = 0.12</math></p> </div> </div>	

# Glossary

**Addend** - A number to be added to another.

**Aggregation** - combining two or more quantities or measures to find a total.

**Augmentation** - increasing a quantity or measure by another quantity.

**Commutative** – numbers can be added in any order.

**Complement** – in addition, a number and its complement make a total e.g. 300 is the complement to 700 to make 1,000

**Difference** – the numerical difference between two numbers is found by comparing the quantity in each group.

**Exchange** – Change a number or expression for another of an equal value.

**Minuend** – A quantity or number from which another is subtracted.

**Partitioning** – Splitting a number into its component parts.

**Reduction** – Subtraction as take away.

**Subitise** – Instantly recognise the number of objects in a small group without needing to count.

**Subtrahend** - A number to be subtracted from another.

**Sum** - The result of an addition.

**Total** – The aggregate or the sum found by addition.

# Glossary

**Array** – An ordered collection of counters, cubes or other item in rows and columns.

**Commutative** – Numbers can be multiplied in any order.

**Dividend** – In division, the number that is divided.

**Divisor** – In division, the number by which another is divided.

**Exchange** – Change a number or expression for another of an equal value.

**Factor** – A number that multiplies with another to make a product.

**Multiplicand** – In multiplication, a number to be multiplied by another.

**Partitioning** – Splitting a number into its component parts.

**Product** – The result of multiplying one number by another.

**Quotient** – The result of a division

**Remainder** – The amount left over after a division when the divisor is not a factor of the dividend.

**Scaling** – Enlarging or reducing a number by a given amount, called the scale factor