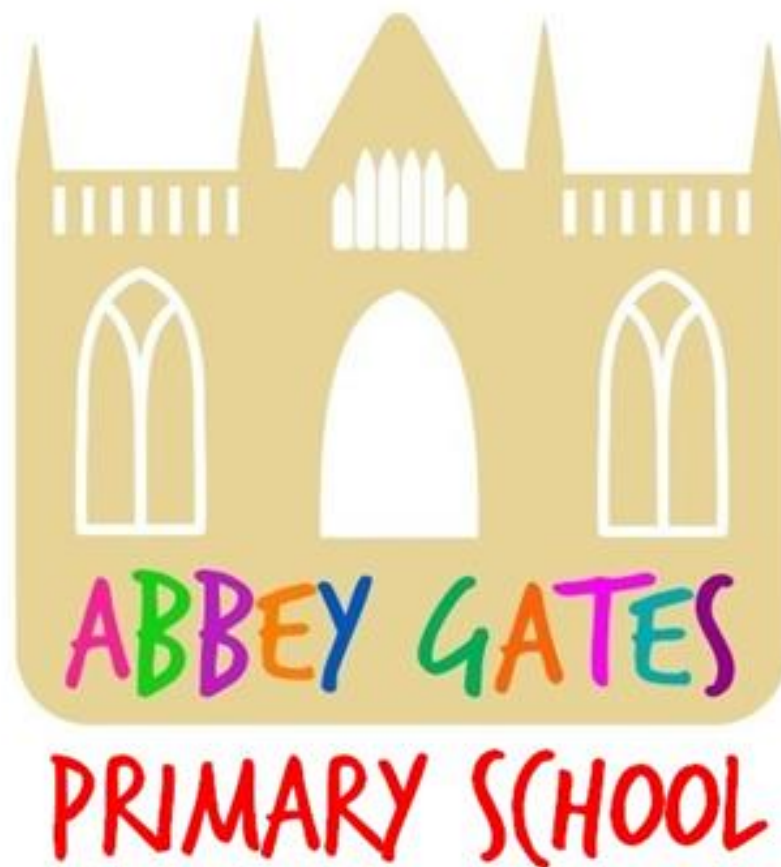


# Teaching for Mastery Calculation Policy

*Adapted from the White Rose Primary Maths Calculation Policy (September 2024)*



Primary maths

# Calculation policy

Updated September 2024

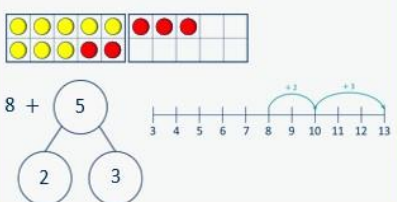
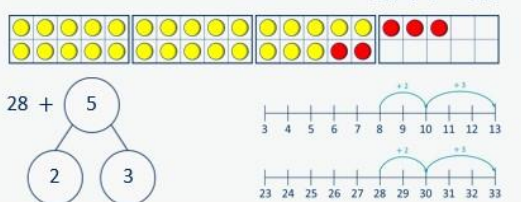
# Guidance for teachers

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.

<p><b>Add across a 10</b></p> <p>Partition the number you are adding to make a full ten.</p>	<p>... can be partitioned into ... and ...</p>  <p><math>8 + 5</math></p>	<p>I add ... to get to ... then I add ...</p> <p><math>8 + 5 = 13</math> <math>28 + 5 = 33</math></p>  <p><math>28 + 5</math></p>
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# Progression of skills - Addition

Year group	Skill
Nursery	<ul style="list-style-type: none"><li>• Subitise to 3</li><li>• Count how many</li><li>• Make numbers to 5</li><li>• Add 1 more (through songs and rhymes)</li></ul>
Reception	<ul style="list-style-type: none"><li>• Conceptually subitise to 5</li><li>• 1 more</li><li>• Notice the composition of numbers within 10</li><li>• Combine 2 groups</li><li>• Add more</li></ul>
Year 1	<ul style="list-style-type: none"><li>• Add together</li><li>• Add more</li><li>• Bonds within 10</li><li>• Related facts within 20</li><li>• Missing numbers</li></ul>




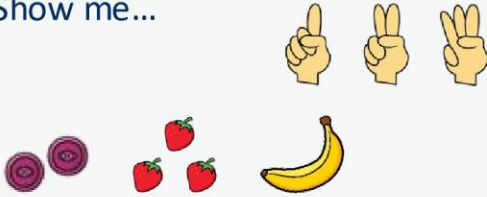


# Progression of skills - Addition

Year group	Skill
Year 2	<ul style="list-style-type: none"><li>• Add 1s to any number (related facts)</li><li>• Add three 1-digit numbers</li><li>• Add across a 10</li><li>• Add multiples of 10</li><li>• Add 10s to any number</li><li>• Add two 2-digit numbers (not across a ten)</li><li>• Add two 2-digit numbers (across a ten)</li><li>• Missing numbers</li></ul>
Year 3	<ul style="list-style-type: none"><li>• Add 1s, 10s and 100s to a 3-digit number</li><li>• Add two numbers (no exchange)</li><li>• Add two numbers across a 10 or 100</li><li>• Complements to 100</li><li>• Add fractions with the same denominator within 1 whole</li><li>• Calculate the duration of events</li></ul>


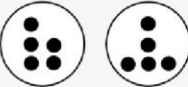


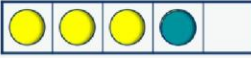
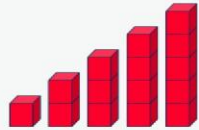
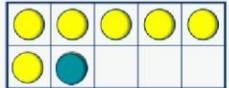

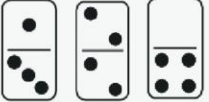





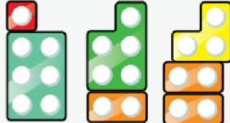
# Progression of skills - Addition

Year group	Skill
Year 4	<ul style="list-style-type: none"><li>• Add 1s, 10s and 100s to a 4-digit number</li><li>• Add up to two 4-digit numbers</li><li>• Add decimal numbers in the context of money</li><li>• Add fractions and mixed numbers with the same denominator beyond 1 whole</li></ul>
Year 5	<ul style="list-style-type: none"><li>• Add using mental strategies</li><li>• Add whole numbers with more than 4 digits</li><li>• Add decimals with up to 2 decimal places</li><li>• Complements to 1</li><li>• Add fractions with denominators that are a multiple of one another</li></ul>
Year 6	<ul style="list-style-type: none"><li>• Add integers up to 10 million</li><li>• Add decimals with up to 3 decimal places</li><li>• Order of operations</li><li>• Negative numbers</li><li>• Add fractions</li></ul>


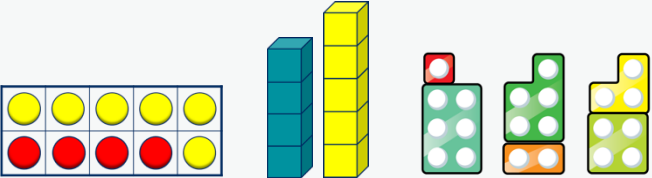
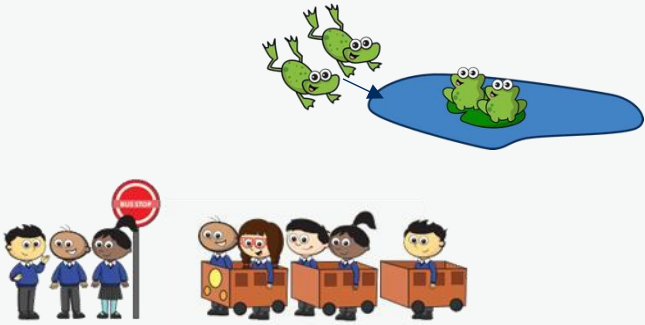

# Addition

<p><b>Nursery</b></p>	<ul style="list-style-type: none"> <li>• Begin to have an understanding of numbers to 5</li> <li>• We recommend focusing on noticing and representing small quantities, perceptual subitising and counting.</li> </ul>	
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>	
<p><b>Subitise to 3</b></p> <p>Instantly see how many.</p>	<p>How many do you see?</p> 	
<p><b>Count how many</b></p> <p>Begin to count objects using 1-1 correspondence.</p>	<p>How many are there?</p> <p>1 2 3 4 5</p> 	<p>Count out ... from a larger group. E.g. Collect 3 beanbags for a game.</p> 
<p><b>Make numbers to 5</b></p> <p>Start by showing 1, 2 and 3 using fingers.</p>	<p>Show me...</p> 	<p>Begin to link numerals to quantities.</p> 
<p><b>Add 1 more</b></p> <p>Through stories, songs and rhymes.</p>	<p>How many do I have now?</p> 	

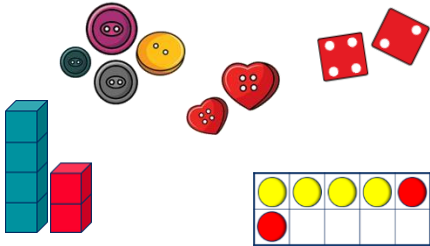
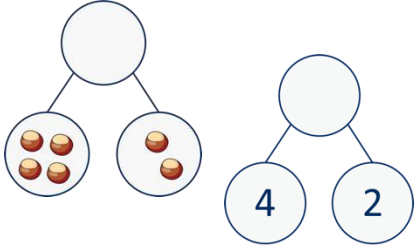
# Addition

<p><b>Reception</b></p>	<ul style="list-style-type: none"> <li>• Have a deep understanding of numbers to 10, including the composition of each number.</li> <li>• Subitise (recognise quantities without counting) up to 5</li> <li>• Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10, including double facts.</li> </ul>	
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>	
<p><b>Conceptually subitise to 5</b></p> <p>Notice the parts that make up the whole.</p>	<p>What do you see? How do you see it?</p>     	
<p><b>1 more</b></p> <p>Continue to link to stories, songs and rhymes.</p>	<p>1 more than ... is ...</p>   	
<p><b>Notice the composition of numbers within 10</b></p> <p>Link to stories, songs and rhymes.</p>	<p>How many...? How many...? How many altogether?</p>    	<p>How many ways can you make...?</p>   

# Addition

Progression of skills	Key representations	
<p><b>Combine 2 groups</b></p> <p>2 groups are combined to find the total.</p>	<p>There are .... There are .... There are .... altogether.</p> 	<p>.... and .... make ....</p> 
<p><b>Add more</b></p> <p>A quantity is increased.</p>	<p>First... Then.... Now....</p> 	<p>I have .... I add .... more. Now I have....</p> 

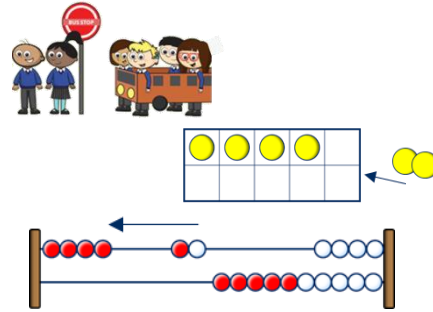
# Addition

<p><b>Year 1</b></p>	<ul style="list-style-type: none"> <li>• Read, write and interpret mathematical statements involving addition (+) and equals (=) signs.</li> <li>• Represent and use number bonds within 20</li> <li>• Add 1-digit and 2-digit numbers to 20, including zero.</li> <li>• Solve one-step problems that involve addition, using concrete objects and pictorial representations, and missing number problems such as <math>7 = \square + 2</math></li> </ul>		
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>		
<p><b>Add together</b> (aggregation)</p> <p>2 quantities are combined to find the total.</p>	<p>There are ... There are ... There are ... altogether.</p> 	<p>... is a part. ... is a part. ... is the whole.</p> 	<p>... plus ... is equal to ... ... is equal to ... + ...</p> $4 + 2 = 6$ $2 + 4 = 6$ $6 = 4 + 2$ $6 = 2 + 4$

**Add more**  
(augmentation)

A quantity is increased.

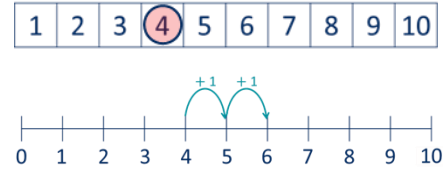
First... Then... Now...



I start at ...

I jump on ...

I land on ...



... plus ... is equal to  
... is equal to ... + ...

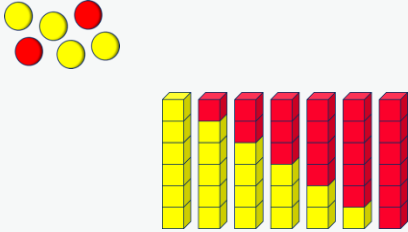
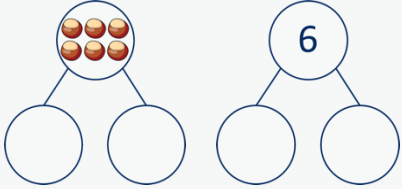
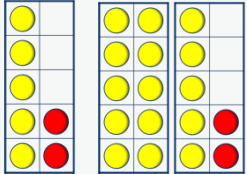
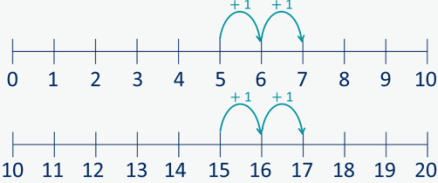
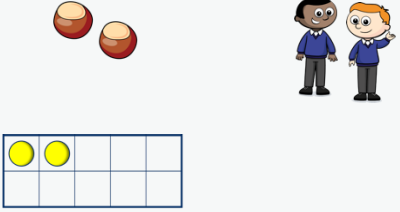
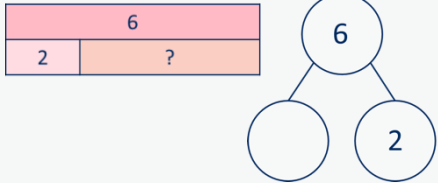

$$4 + 2 = 6$$

$$2 + 4 = 6$$

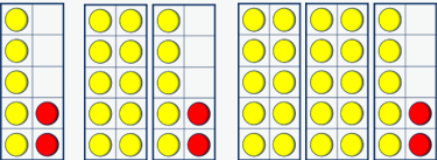
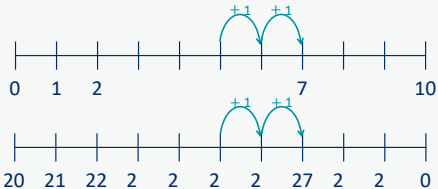
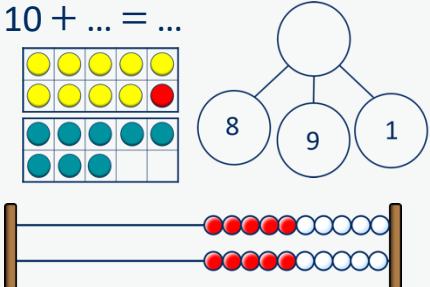
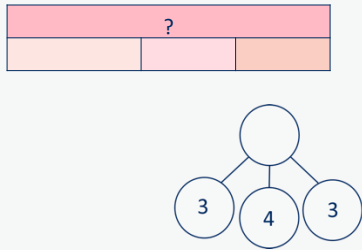
$$6 = 4 + 2$$

$$6 = 2 + 4$$


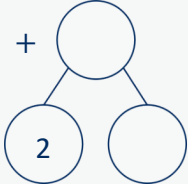

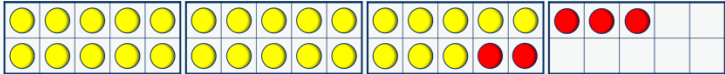
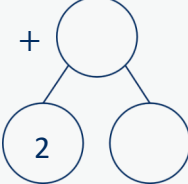


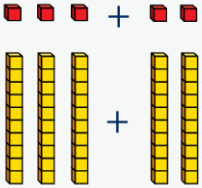
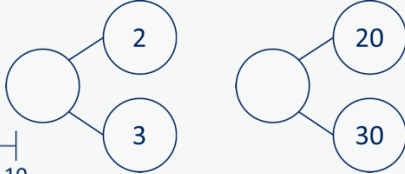
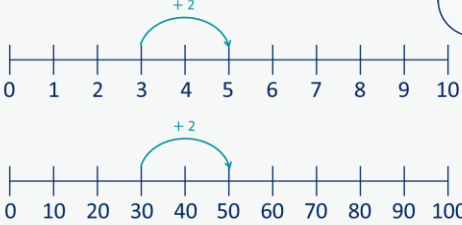
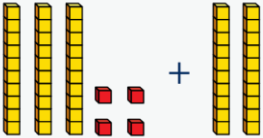
# Addition

Progression of skills	Key representations		
<p><b>Bonds within 10</b></p> <p>Include bonds for each number within 10</p> <p>Encourage children to notice patterns.</p>	<p>... is made of ... and ... ... and ... make ...</p> 	<p>... can be partitioned into ... and ...</p> 	<p>... plus ... is equal to ...</p> $6 + 0 = 6$ $5 + 1 = 6$ $4 + 2 = 6$ $3 + 3 = 6$ $2 + 4 = 6$ $1 + 5 = 6$ $0 + 6 = 6$
<p><b>Related facts within 20</b></p> <p>Make links to known facts.</p>	<p>I know that ... and ... = ... so ... and ... = ...</p> 	<p>... more than ... is ... so ... more than ... is ...</p> 	<p>What patterns do you notice?</p> $5 + 2 = 7$ $15 + 2 = 17$ $7 = 5 + 2$ $17 = 15 + 2$
<p><b>Missing numbers</b></p> <p>Make links to known facts.</p>	<p>How many more do you need to make ...?</p> 	<p>If ... is the whole and ... is a part, the other part must be...</p> 	<p>... plus ... is equal to ...</p> $2 + \square = 6$ $6 = 2 + \square$ 


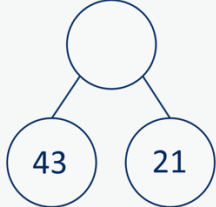
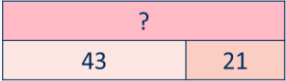
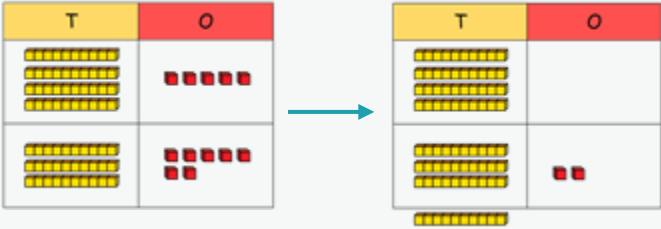
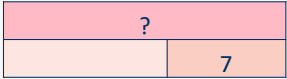
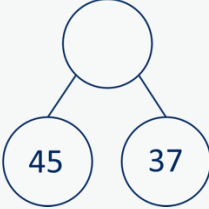
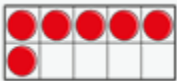
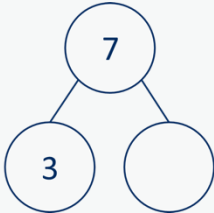
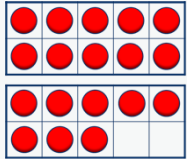
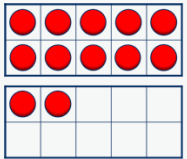
# Addition

<p><b>Year 2</b></p>	<ul style="list-style-type: none"> <li>Recall and use addition facts to 20 fluently, and derive and use related facts up to 100</li> <li>Add numbers using concrete objects, pictorial representations, and mentally, including:             <ul style="list-style-type: none"> <li>a two-digit number and 1s</li> <li>a two-digit number and 10s</li> <li>2 two-digit numbers</li> <li>adding 3 one-digit numbers</li> </ul> </li> <li>Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.</li> </ul>		
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>		
<p><b>Add ones to any number</b> (related facts)</p> <p>Make links to known facts.</p>	<p>I know that ... and ... = ... so ... and ... = ...</p> 	<p>... more than ... is ... so ... more than ... is ...</p> 	<p>What do you notice? Can you continue the pattern?</p> $5 + 2 = 7$ $15 + 2 = 17$ $25 + 2 = 27...$
<p><b>Add three 1-digit numbers</b></p> <p>Prompt children to understand that addition can be done in any order and to make links to known facts.</p>	<p>... and ... are a bond to 10 <math>10 + ... = ...</math></p> 	<p>Double ... + ... = ...</p> 	<p>What do you notice? Which addition is the easiest to calculate?</p> $8 + 9 + 1 =$ $8 + 1 + 9 =$ $9 + 1 + 8 =$

# Addition

Progression of skills	Key representations																																																													
<p><b>Add across a 10</b></p> <p>Partition the number being added to make a full ten.</p>	<p>... can be partitioned into ... and ...</p>   	<p>I add ... to get to ... then I add ...</p> $8 + 5 = 13$ $28 + 5 = 33$    																																																												
<p><b>Add multiples of 10</b></p> <p>Make links to known facts within ten.</p>	<p>... ones + ... ones = ... ones so ... tens + ... tens = ... tens</p>  $3 + 2 = 5$ $30 + 20 = 50$	<p>What is the same? What is different?</p>   <table border="1" data-bbox="1638 886 1856 993"> <tr><td>?</td></tr> <tr><td>2</td><td>3</td></tr> <tr><td>?</td></tr> <tr><td>20</td><td>30</td></tr> </table>	?	2	3	?	20	30																																																						
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<p><b>Add 10s to any number</b></p> <p>Make links to known facts.</p>	<p>... tens + ... tens = ... tens ... tens and ... ones = ...</p> 	<p>To add ... I need to add 10 ... times.</p> <table border="1" data-bbox="1114 1136 1442 1322"> <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> </table> <p>I know that ... and ... = ... so ... and ... = ...</p> $30 + 20 = 50$ $34 + 20 = 54$	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	42	43	44	45	46	47	48	49	50	51	52	53	54	55	56	57	58	59	60
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41	42	43	44	45	46	47	48	49	50																																																					
51	52	53	54	55	56	57	58	59	60																																																					

# Addition

Progression of skills	Key representations		
<p><b>Add 2-digit numbers</b> (not across a ten)</p> <p>Lining up ones and tens in columns will support with later written methods.</p>	<p>... ones + ... ones = ... ones ... tens + ... tens = ... tens</p>		<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;">  </div> <div style="margin-right: 20px;"> <p>3 ones + 1 one = 4 ones 4 tens + 2 tens = 6 tens 6 tens + 4 ones = 64</p> </div> <div>  </div> </div>
<p><b>Add 2-digit numbers</b> (across a ten)</p> <p>Begin to exchange 10 ones for 1 ten.</p>	<p>There are ... ones, so I do/do not need to make an exchange.</p> <p>... ones = ... ten and ... ones</p>		<div style="display: flex; align-items: center;"> <div style="margin-right: 20px;">  </div> <div>  </div> </div> <p>5 ones + 7 ones = 12 ones 12 ones = 1 ten and 2 ones 4 tens + 3 tens + 1 ten = 8 tens 8 tens and 2 ones = 82</p>
<p><b>Missing numbers</b></p> <p>Solve missing number problems and use the inverse to check.</p>	<p>How many more do you need to make ...?</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 10px;"> <math>6 + \square = 10</math>  <math>10 - \square = 6</math> </div> </div>	<p>If ... is a whole and ... is a part, then ... is the other part.</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 10px;"> <math>\square + 3 = 7</math>  <math>7 - 3 = \square</math> </div>  </div>	<p>... can be partitioned into ... and ...</p> <p><math>10 + 8 = 12 + \square</math></p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;">  </div> </div>




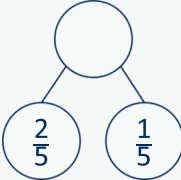



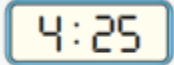
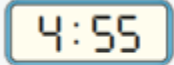
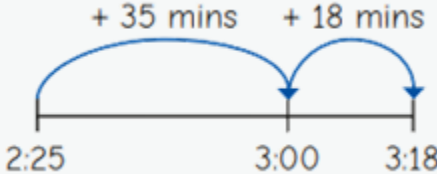
# Addition

<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>																																
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>																																
<p><b>Add 1s, 10s or 100s to a 3-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 column will increase by ...</p> <table border="1" data-bbox="576 615 1013 815"> <thead> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p> <math>444 + 5 =</math>  <math>444 + 50 =</math>  <math>444 + 500 =</math> </p> <table border="1" data-bbox="1052 615 1313 815"> <thead> <tr> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p> <math>777 + 2 =</math>  <math>777 + 20 =</math>  <math>777 + 200 =</math> </p>	Hundreds	Tens	Ones				H	T	O				<p>What patterns do you notice?</p> <p> <math>235 + 3 =</math>  <math>235 + 30 =</math>  <math>235 + 300 =</math> </p> <p> <math>111 + \square = 118</math>  <math>111 + \square = 181</math>  <math>111 + \square = 811</math> </p> <p> <math>604 + 20 =</math>  <math>604 + 50 =</math>  <math>604 + 90 =</math> </p>																			
Hundreds	Tens	Ones																															
H	T	O																															
<p><b>Add two numbers (no exchange)</b></p> <p>Mental strategies and introduction of formal written method.</p>	<p>... ones + ... ones = ... ones          ... tens + ... tens = ... tens          ... hundreds + ... hundreds = ... hundreds</p> <p></p> <p></p> <table border="1" data-bbox="1529 989 1918 1068"> <tr> <td colspan="2">?</td> </tr> <tr> <td>345</td> <td>432</td> </tr> </table> <table border="1" data-bbox="1259 1100 1682 1300"> <thead> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> <table border="1" data-bbox="1701 1100 1918 1319"> <thead> <tr> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td>3</td> <td>4</td> <td>5</td> </tr> <tr> <td colspan="3"><hr/></td> </tr> <tr> <td>+</td> <td>4</td> <td>3</td> </tr> <tr> <td colspan="3"><hr/></td> </tr> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>		?		345	432	Hundreds	Tens	Ones							H	T	O	3	4	5	<hr/>			+	4	3	<hr/>					
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# Addition

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>



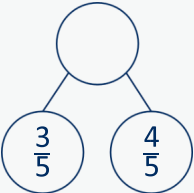
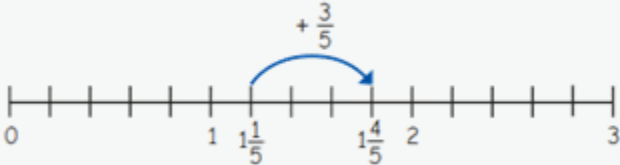

# Addition

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; justify-content: space-around;"> <div style="text-align: center;">  <math>\frac{1}{5} + \frac{1}{5}</math> </div> <div style="text-align: center;">  <math>\frac{1}{5} + \frac{2}{5}</math> </div> <div style="text-align: center;">  <math>\frac{1}{5} + \frac{3}{5}</math> </div> </div> <div style="text-align: right; margin-top: 20px;">  </div> <div style="text-align: right; 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 style="text-align: center;">  </div> </div>

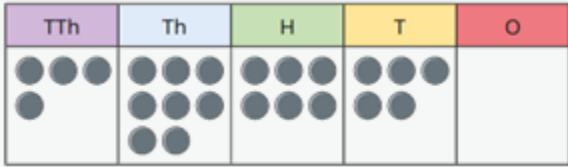
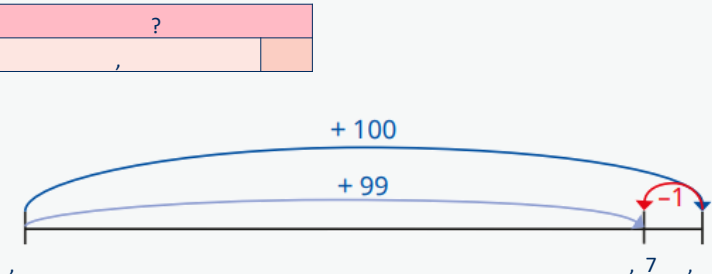
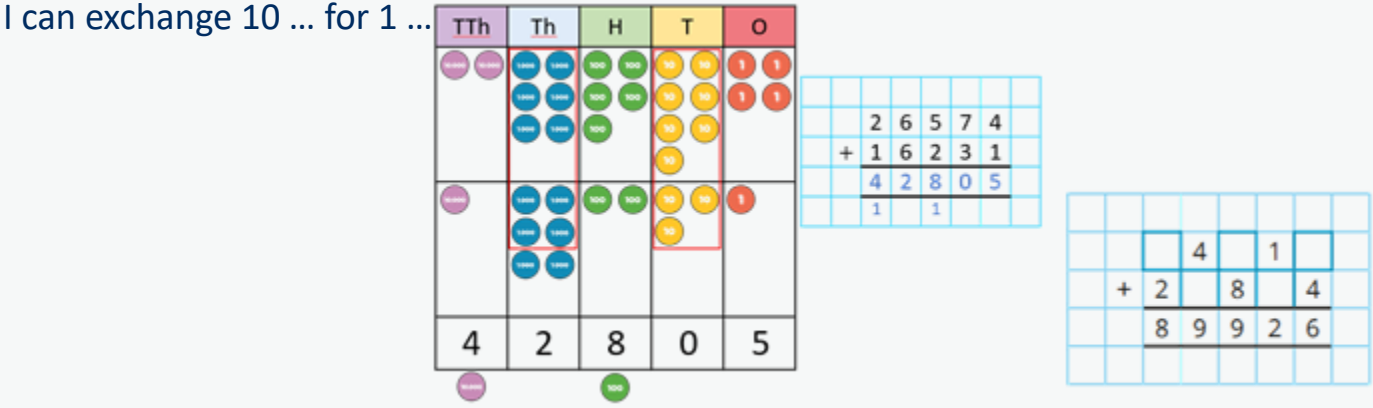
# Addition

<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 4digit 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>  	

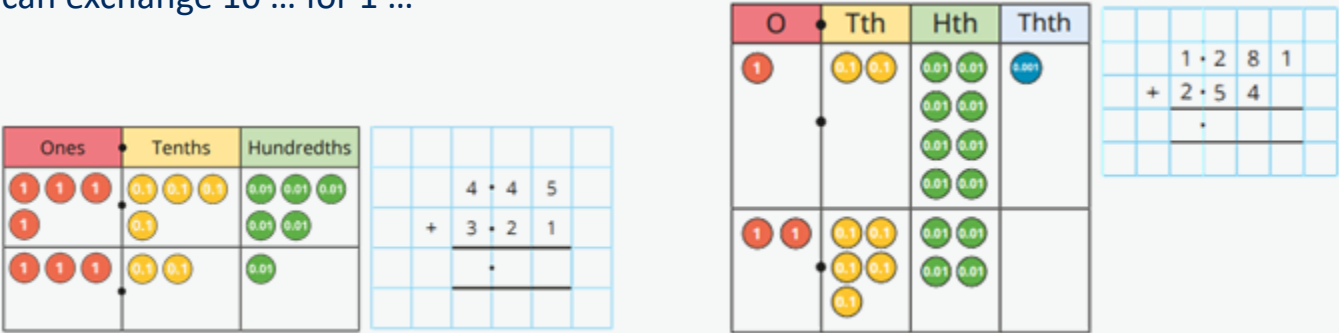
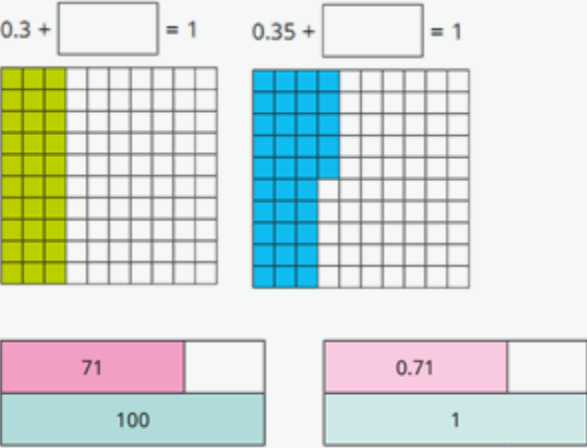
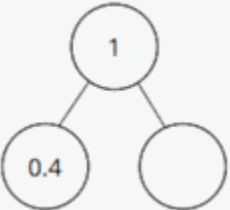


# Addition

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>  <p>45p + 25p = 70p            £2 + £3 = £5            £5 + 70p = £5.70</p>	<p>£3.25 can be partitioned into £3 + 20p + 5p</p> 
<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>  <p><math>\frac{3}{5} + \frac{4}{5} = \frac{7}{5} = 1\frac{2}{5}</math></p>  	

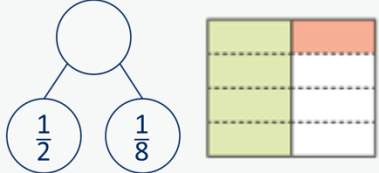
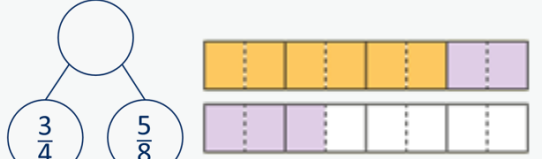
# Addition

<p><b>Year 5</b></p>	<ul style="list-style-type: none"> <li>• Add whole numbers with more than 4 digits, including using formal written methods.</li> <li>• Add numbers mentally with increasingly large numbers.</li> <li>• Add decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1</li> <li>• Add fractions with the same denominator, and denominators that are multiples of the same number.</li> </ul>	
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>	
<p><b>Add using mental strategies</b></p> <p>Add 1s, 10s, 100s, etc. to any number. Use number bonds and related facts.</p>	 <p>48,650 + 300 = 48,650 + 30,000 = 48,650 + 30 =</p>	<p>To add ..., I can add ... then subtract ...</p> 
<p><b>Add whole numbers with more than 4 digits</b></p> <p>Encourage children to estimate and use inverse operations to check answers to calculations.</p>	<p>I can exchange 10 ... for 1 ...</p> 	

# Addition

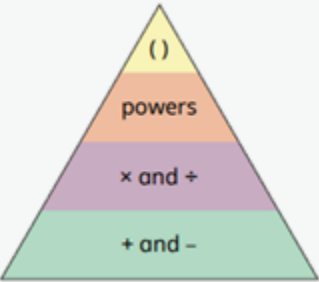



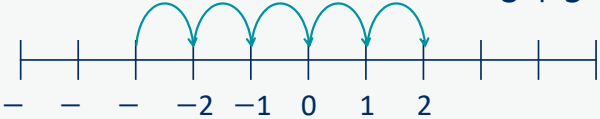
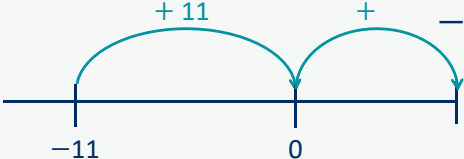
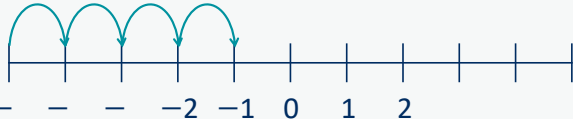
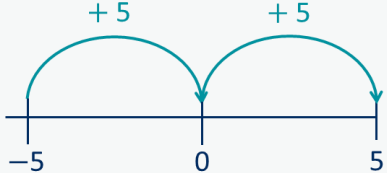
Progression of skills	Key representations
<p><b>Add decimals with up to 2 decimal places</b></p> <p>Progress from the same number of decimal places to a different number of decimal places, and from no exchange to exchange.</p>	<p>I do/do not need to make an exchange because ... I can exchange 10 ... for 1 ...</p> 
<p><b>Complements to 1</b></p> <p>Pairs of numbers with up to 3 decimal places which total 1</p> <p>Encourage children to make links with bonds to 10 and complements to 100 and 1,000</p>	 <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <p><math>0.3 + \square = 1</math></p>  <p><math>4 + 6 = 10</math></p> <p><math>44 + 56 = 100</math></p> <p><math>444 + 556 = 1,000</math></p> </div> <div style="text-align: center;"> <p><math>0.35 + \square = 1</math></p>  <p><math>0.4 + 0.6 = 1</math></p> <p><math>0.44 + 0.56 = 1</math></p> </div> <div style="text-align: center;">  <p><math>0.444 + 0.556 = 1</math></p> </div> </div>

# Addition

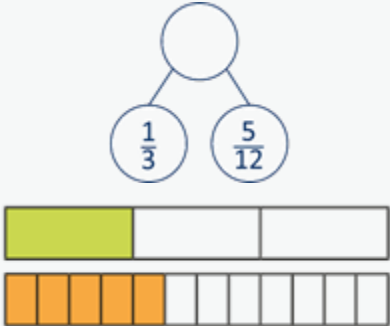
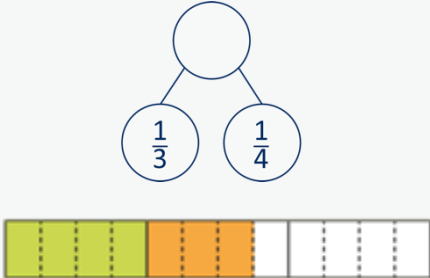
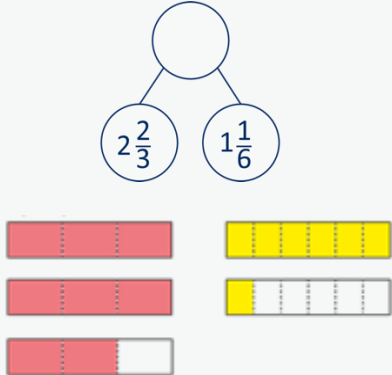
Progression of skills	Key representations
<p><b>Add fractions with denominators that are a multiple of one another</b></p> <p>Encourage children to convert fractions to the same denominator before adding.</p> <p>Progress from adding fractions within 1 whole to adding fractions beyond 1 whole.</p>	<p>The denominator has been multiplied by ..., so the numerator needs to be multiplied by... for the fractions to be equivalent.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <math display="block">\frac{1}{2} + \frac{1}{8} = \frac{4}{8} + \frac{1}{8} = \frac{5}{8}</math> </div> <div style="text-align: center;">  <math display="block">\frac{3}{4} + \frac{5}{8} = \frac{6}{8} + \frac{5}{8} = \frac{11}{8} = 1\frac{3}{8}</math> </div> </div>



# Addition

Progression of skills	Key representations	
<p><b>Order of operations</b></p> <p>Calculations in brackets should be done first. Multiplication and division should be performed before addition and subtraction. *When no brackets are shown and the operations have the same priority, work left to right.</p>	<p>... has greater priority than ..., so the first part of the calculation I need to do is ...</p> 	 <p><math>(3 + 4) \times 2 = 14</math></p>  <p><math>3 + 4 \times 2 = 11</math></p>  <p><math>3 \times 4 + 2 = 14</math></p>
<p><b>Negative numbers</b></p> <p>Children add to negative numbers and carry out calculations which cross 0</p>	<p>... plus ... is equal to ...</p> <p><math>-3 + 5 = 2</math></p>  <p><math>-11 + 16 = 5</math></p> 	 <p>The difference between <math>-5</math> and <math>-1</math> is 4</p>  <p>The difference between <math>-5</math> and 5 is 10</p>

# Addition

Progression of skills	Key representations		
<p><b>Add fractions</b></p> <p>Convert fractions to the same denominator before adding. Progress from fractions where one denominator is a multiple of the other, to any fractions and then to mixed numbers.</p>	<p>The denominator has been multiplied by ..., so the numerator needs to be multiplied by ...</p> 	<p>The lowest common multiple of ... and ... is ...</p>  $\frac{1}{3} + \frac{1}{4} = \frac{4}{12} + \frac{3}{12} = \frac{7}{12}$	<p>...is made up of ... wholes and ...</p> 

# Progression of skills - Subtraction

Year group	Skill
Nursery	<ul style="list-style-type: none"><li>• Subitise to 3</li><li>• Count how many</li><li>• Make numbers to 5</li><li>• Take 1 away (through songs and rhymes)</li></ul>
Reception	<ul style="list-style-type: none"><li>• Conceptually subitise to 5</li><li>• 1 less</li><li>• Notice the composition of numbers within 10</li><li>• Partition</li><li>• Take away</li></ul>
Year 1	<ul style="list-style-type: none"><li>• Find a part</li><li>• Take away</li><li>• Bonds within 10</li><li>• Related facts within 20</li><li>• Missing numbers</li></ul>




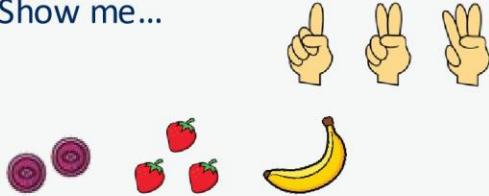


# Progression of skills - Subtraction

Year group	Skill
Year 2	<ul style="list-style-type: none"><li>• Subtract 1s from any number (related facts)</li><li>• Subtract across a 10</li><li>• Subtract multiples of 10</li><li>• Subtract 10s from any number</li><li>• Subtract two 2-digit numbers (not across a ten)</li><li>• Subtract two 2-digit numbers (across a ten)</li><li>• Missing numbers</li></ul>
Year 3	<ul style="list-style-type: none"><li>• Subtract 1s, 10s and 100s from a 3-digit number</li><li>• Subtract two numbers (no exchange)</li><li>• Subtract two numbers across a 10 or 100</li><li>• Complements to 100</li><li>• Subtract fractions with the same denominator within 1 whole</li></ul>

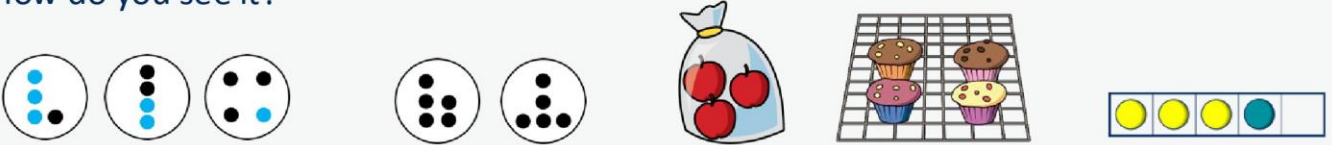
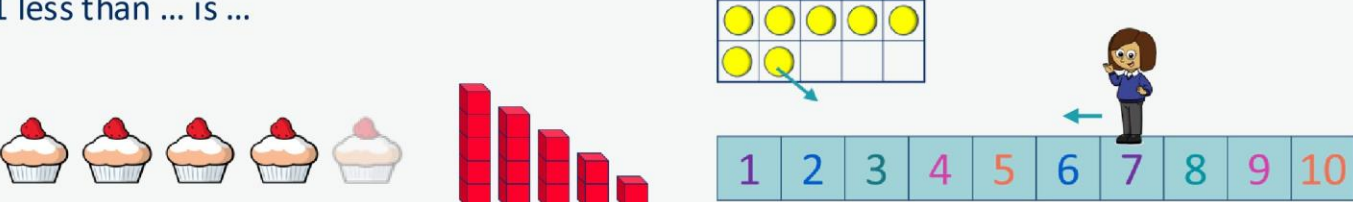

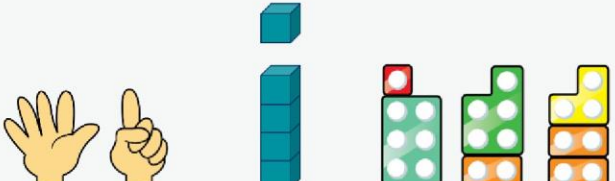
# Progression of skills - Subtraction

Year group	Skill
Year 4	<ul style="list-style-type: none"><li>• Subtract 1s, 10s, 100s and 1,000s from a 4-digit number</li><li>• Subtract up to two 4-digit numbers</li><li>• Subtract decimal numbers in the context of money</li><li>• Subtract fractions and mixed numbers with the same denominator</li></ul>
Year 5	<ul style="list-style-type: none"><li>• Subtract whole numbers with more than 4 digits</li><li>• Subtract using mental strategies</li><li>• Subtract decimals with up to 2 decimal places</li><li>• Complements to 1</li><li>• Subtract fractions with denominators that are a multiple of one another</li></ul>
Year 6	<ul style="list-style-type: none"><li>• Subtract integers up to 10 million</li><li>• Subtract decimals with up to 3 decimal places</li><li>• Order of operations</li><li>• Negative numbers</li><li>• Subtract fractions</li></ul>


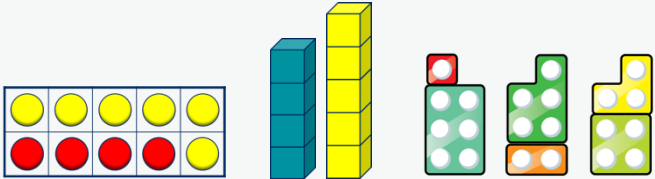
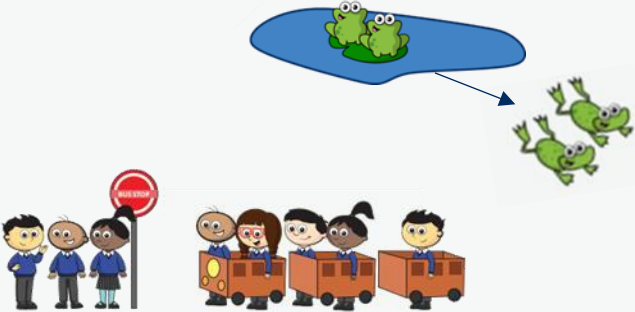
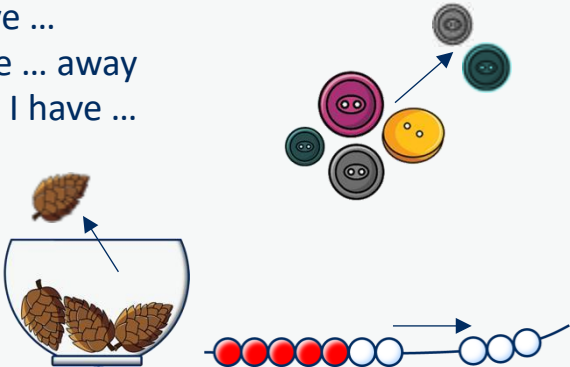
# Subtraction

<p><b>Nursery</b></p>	<ul style="list-style-type: none"> <li>• Begin to have an understanding of numbers to 5</li> <li>• We recommend focusing on noticing and representing small quantities, perceptual subitising and counting.</li> </ul>	
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>	
<p><b>Subitise to 3</b></p> <p>Instantly see how many.</p>	<p>How many do you see?</p> 	
<p><b>Count how many</b></p> <p>Begin to count objects using 1-1 correspondence.</p>	<p>How many are there?</p> <p>1 2 3 4 5</p> 	<p>Count out ... from a larger group. E.g. Collect a cup for everyone at the table.</p> 
<p><b>Make numbers to 5</b></p> <p>Start by showing 1, 2 and 3 using fingers.</p>	<p>Show me...</p> 	<p>Begin to link numerals to quantities.</p> 
<p><b>Take 1 away</b></p> <p>Through stories, songs and rhymes.</p>	<p>How many do we have now?</p> 	

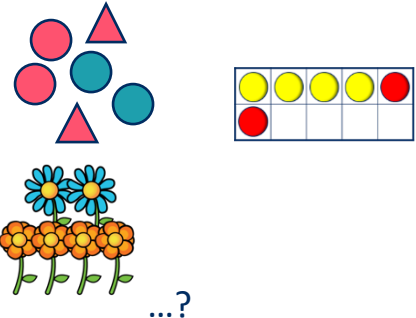
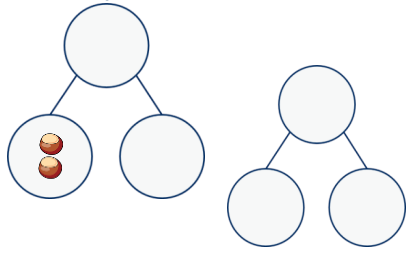
# Subtraction

<p><b>Reception</b></p>	<ul style="list-style-type: none"> <li>Have a deep understanding of number to 10, including the composition of each number.</li> <li>Subitise (recognise quantities without counting) up to 5</li> <li>Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 (and some subtraction facts) and some number bonds to 10, including double facts.</li> </ul>	
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>	
<p><b>Conceptually subitise to 5</b></p> <p>Notice the parts that make up the whole.</p>	<p>What do you see? How do you see it?</p> 	
<p><b>1 less</b></p> <p>Continue to link to stories, songs and rhymes.</p>	<p>1 less than ... is ...</p> 	
<p><b>Notice the composition of numbers within 10</b></p> <p>Link to stories, songs and rhymes.</p>	<p>How many...? How many...? How many altogether?</p> 	<p>How many ways can you make...?</p> 

# Subtraction

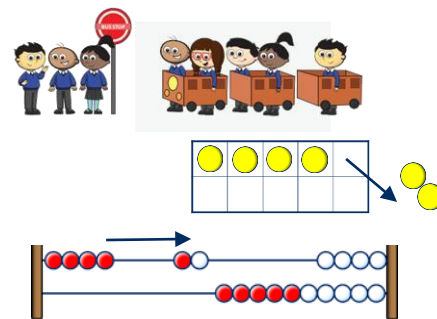
Progression of skills	Key representations	
<p><b>Partition</b></p> <p>Using objects, explore different ways to partition a number into 2 or more parts.</p>	<p>There are ... altogether. I can see ... here and ... there.</p> 	<p>... and ... make ...</p> 
<p><b>Take away</b></p> <p>A quantity is reduced.</p>	<p>First... Then... Now...</p> 	<p>I have ... I take ... away Now I have ...</p> 

# Subtraction

<p><b>Year 1</b></p>	<ul style="list-style-type: none"> <li>• Read, write and interpret mathematical statements involving subtraction (−) and equals (=) signs.</li> <li>• Represent and use number bonds and related subtraction facts within 20</li> <li>• Subtract one-digit and two-digit numbers to 20, including zero.</li> <li>• Solve one-step problems that involve subtraction, using concrete objects and pictorial representations, and missing number problems such as <math>7 = \square - 9</math></li> </ul>		
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>		
<p><b>Find a part</b></p> <p>Link to number bonds and known facts. E.g. <math>2 + 4 = 6</math> so if 6 is the whole and 4 is a part, the other part must be 2</p>	<p>There are ... in total. ... are ... How many are <b>not</b></p> 	<p>... is the whole. ... is a part. ... is a part.</p> 	<p>... subtract ... is equal to ... ... is equal to ... − ...</p> $6 - 2 = 4$ $6 - 4 = 2$ $4 = 6 - 2$ $2 = 6 - 4$

## Take away

A quantity is decreased.

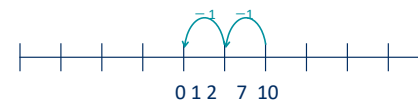


First... Then... Now...

I start at ...

I jump back ...

I land on ...



... minus ... is equal to ...

... is equal to ... - ...

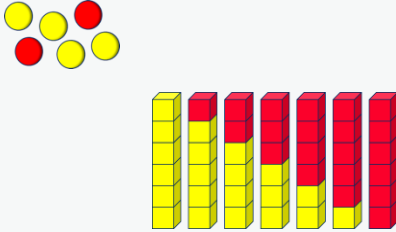
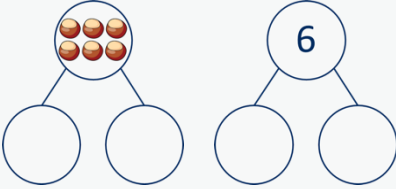
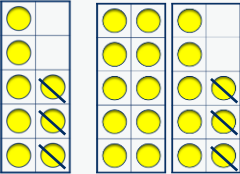
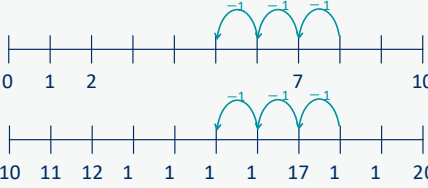
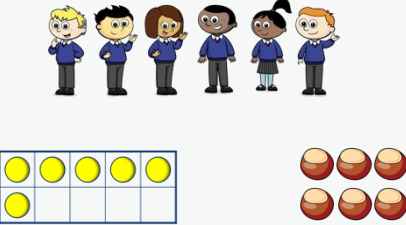
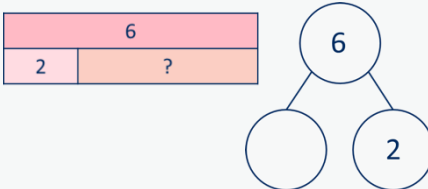

$$6 - 2 = 4$$

$$6 - 4 = 2$$

$$4 = 6 - 2$$

$$2 = 6 - 4$$

# Subtraction

Progression of skills	Key representations		
<p><b>Bonds within 10</b></p> <p>Focus on subtraction facts.</p> <p>Encourage children to notice patterns.</p>	<p>... is made of ... and ... ... and ... make ...</p> 	<p>... can be partitioned into ... and ...</p> 	<p>... minus ... is equal to ...</p> $6 - 0 = 6$ $6 - 1 = 5$ $6 - 2 = 4$ $6 - 3 = 3$ $6 - 4 = 2$ $6 - 5 = 1$ $6 - 6 = 0$
<p><b>Related facts within 20</b></p> <p>Make links to known facts.</p>	<p>I know that ... minus ... = ... so ... minus ... = ...</p> 	<p>... less than ... is ... so ... less than ... is ...</p> 	<p>What patterns do you notice?</p> $8 - 3 = 5$ $18 - 3 = 15$ $5 = 8 - 3$ $15 = 18 - 3$
<p><b>Missing numbers</b></p> <p>Make links to known facts.</p>	<p>How many do you need to subtract to make ...?</p> 	<p>If ... is the whole and ... is a part, the other part must be...</p> 	<p>... minus ... is equal to ...</p> $6 - \square = 2$ $2 = 6 - \square$ 

# Subtraction

- Recall and use subtraction facts to 20 fluently, and derive and use related facts up to 100
- Subtract numbers using concrete objects, pictorial representations, and mentally, including:
  - a two-digit number and 1s
  - a two-digit number and 10s
  - 2 two-digit numbers
- Recognise and use the inverse relationship between addition and subtraction and use this to check calculations and solve missing number problems.

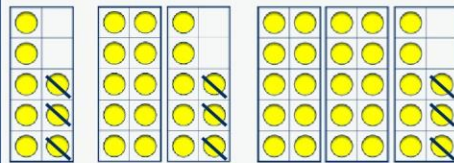
## Progression of skills

## Key representations

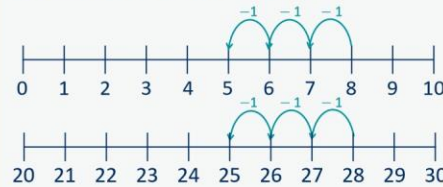
**Subtract ones from any number**  
(related facts)

Make links to known facts.

I know that ... minus ... = ...  
so ... minus ... = ...



... less than ... is ...  
so ... less than ... is ...



What do you notice?  
Can you continue the pattern?

$$8 - 3 = 5$$

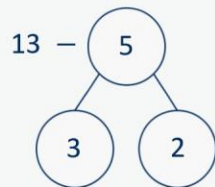
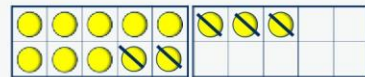
$$18 - 3 = 15$$

$$28 - 3 = 25...$$

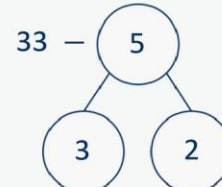
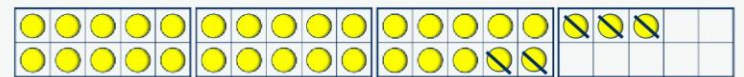
**Subtract across a 10**

Partition the number being subtracted to bridge through a ten.

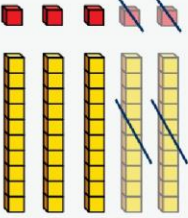
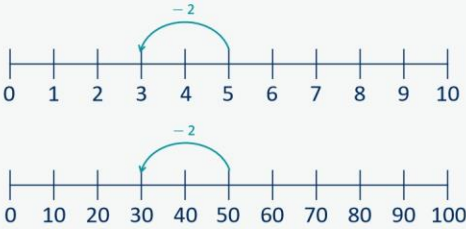
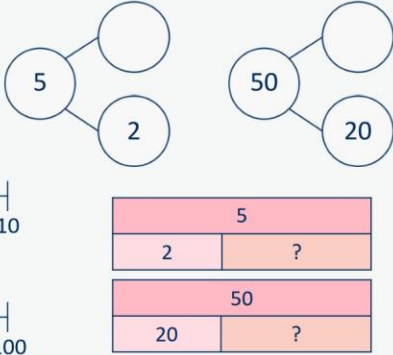
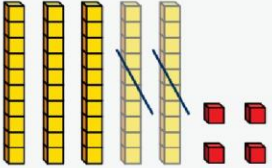
... can be partitioned into ... and ...



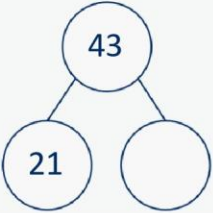
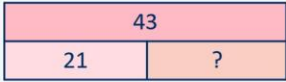
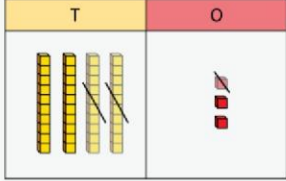
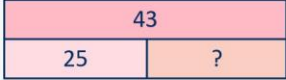
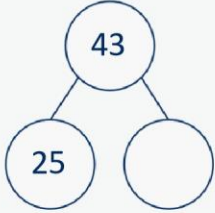
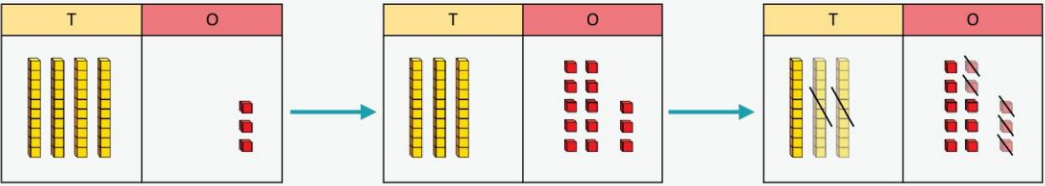
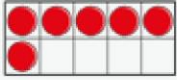
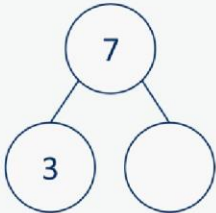
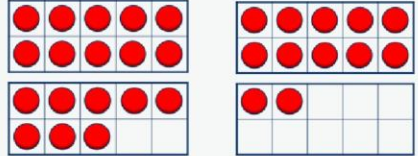
Make links with related facts.



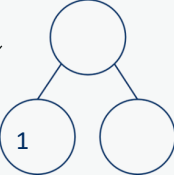
# Subtraction

Progression of skills	Key representations																																																														
<p><b>Subtract multiples of 10</b></p> <p>Make links to known facts within ten.</p>	<p>... ones – ... ones = ... ones so ... tens – ... tens = ... tens</p>  <p><math>5 - 2 = 3</math> <math>50 - 20 = 30</math></p>	<p>What is the same? What is different?</p> 	 <table border="1" data-bbox="1632 491 1893 648"> <tr> <td colspan="2">5</td> </tr> <tr> <td>2</td> <td>?</td> </tr> <tr> <td colspan="2">50</td> </tr> <tr> <td>20</td> <td>?</td> </tr> </table>	5		2	?	50		20	?																																																				
5																																																															
2	?																																																														
50																																																															
20	?																																																														
<p><b>Subtract 10s from any number</b></p> <p>Make links to known facts.</p>	<p>... tens – ... tens = ... tens ... tens and ... ones = ...</p> 	<p>To subtract ... I need to subtract 10 ... times.</p> <table border="1" data-bbox="1079 842 1477 1068"> <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> </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	<p>I know that ... minus ... = ... so ... minus ... = ...</p> <p><math>50 - 20 = 30</math> <math>54 - 20 = 34</math></p>
1	2	3	4	5	6	7	8	9	10																																																						
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# Subtraction


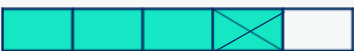

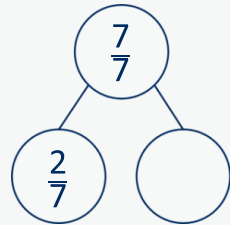

Progression of skills	Key representations		
<p><b>Subtract two 2-digit numbers</b> (not across a ten)</p>	<p>... ones – ... ones = ... ones ... tens – ... tens = ... tens</p>  	 <p>3 ones – 1 one = 2 ones 4 tens – 2 tens = 2 tens 2 tens and 2 ones = 22</p>	
<p><b>Subtract two 2-digit numbers</b> (across a ten)</p> <p>Begin to exchange 1 ten for 10 ones.</p>	<p>I need to make an exchange because I do not have enough ones to subtract ... ones.</p>  	 <p>3 ones – 5 ones (I need to exchange 1 ten for 10 ones)</p> <p>13 ones – 5 ones = 8 ones 3 tens – 2 tens = 1 ten 1 ten and 8 ones = 18</p>	
<p><b>Missing numbers</b></p> <p>Solve missing number problems and use the inverse to check.</p>	<p>How many do you need to subtract to make ...?</p>  <p><math>10 - \square = 6</math> <math>6 + \square = 10</math></p>	<p>If ... is a whole and ... is a part, then ... is the other part.</p> <p><math>7 - 3 = \square</math> <math>\square + 3 = 7</math></p> 	<p>... can be partitioned into ... and ...</p> <p><math>18 - \square = 12 + 2</math></p> 

# 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>																														
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>																														
<p><b>Subtract 1s, 10s and 100s from a 3-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 column will decrease by ...</p> <table border="1" data-bbox="576 525 1011 725"> <thead> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> <table border="1" data-bbox="1052 525 1313 725"> <thead> <tr> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> <p> <math>444 - 2 =</math>                      <math>777 - 4 =</math>  <math>444 - 20 =</math>                     <math>777 - 40 =</math>  <math>444 - 200 =</math>                    <math>777 - 400 =</math> </p>	Hundreds	Tens	Ones				H	T	O				<p>What patterns do you notice?</p> <p> <math>235 - 3 =</math>  <math>235 - 30 =</math>  <math>235 - 300 =</math> </p> <p> <math>118 - \square = 111</math>  <math>181 - \square = 111</math>  <math>811 - \square = 111</math> </p>																	
Hundreds	Tens	Ones																													
H	T	O																													
<p><b>Subtract two numbers (no exchange)</b></p> <p>Mental strategies and introduction of formal written method.</p>	<p>... ones – ... ones = ... ones          ... tens – ... tens = ... tens          ... hundreds – ... hundreds = ... hundreds</p> <table border="1" data-bbox="576 1053 1025 1178"> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table>  <table border="1" data-bbox="1632 911 1929 996"> <tbody> <tr> <td></td> <td>7</td> </tr> <tr> <td>17</td> <td>?</td> </tr> </tbody> </table> <table border="1" data-bbox="1348 1029 1694 1149"> <thead> <tr> <th>Hundreds</th> <th>Tens</th> <th>Ones</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> </tr> </tbody> </table> <table border="1" data-bbox="1750 1029 1929 1206"> <thead> <tr> <th></th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td>7</td> <td>6</td> <td>9</td> </tr> <tr> <td>-</td> <td>1</td> <td>4</td> <td>7</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> </tr> </tbody> </table>						7	17	?	Hundreds	Tens	Ones					H	T	O		7	6	9	-	1	4	7				
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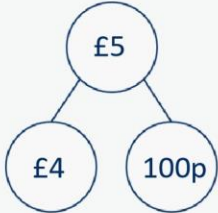
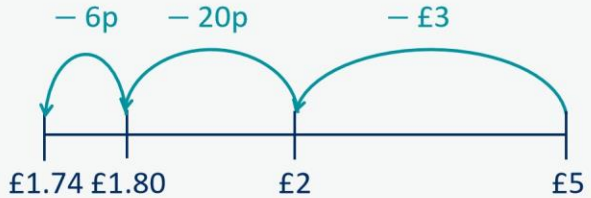
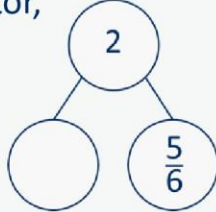
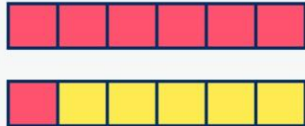
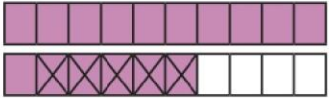
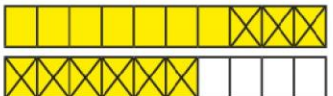
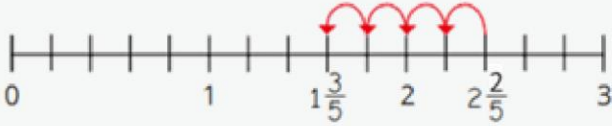
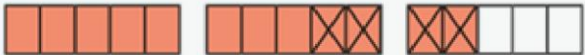


# Subtraction

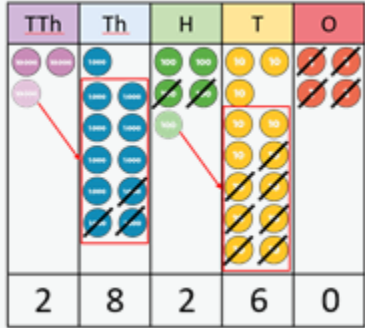
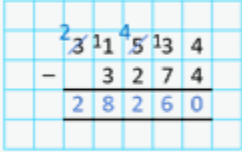
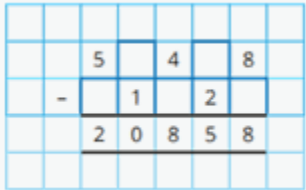
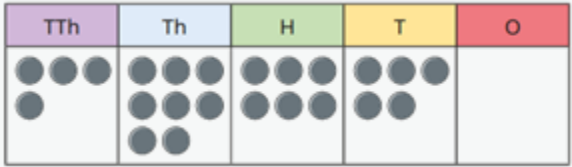
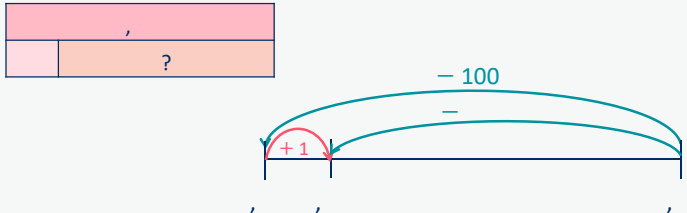
Progression of skills	Key representations
<p data-bbox="105 282 551 405"><b>Subtract fractions with the same denominator within 1 whole</b></p> <p data-bbox="105 461 468 536">Make links with known facts.</p>	<p data-bbox="576 282 1929 319">When subtracting fractions with the same denominator, I only subtract the numerator.</p> <p data-bbox="576 325 1006 362">... fifths – ... fifths = ... fifths</p> <div data-bbox="576 376 1048 434"><math data-bbox="961 376 1048 434" style="display: inline-block; vertical-align: middle;">\frac{5}{5} - \frac{1}{5}</math></div> <div data-bbox="576 476 1048 534"><math data-bbox="961 476 1048 534" style="display: inline-block; vertical-align: middle;">\frac{4}{5} - \frac{1}{5}</math></div> <div data-bbox="576 576 1048 634"><math data-bbox="961 576 1048 634" style="display: inline-block; vertical-align: middle;">\frac{3}{5} - \frac{1}{5}</math></div> <div data-bbox="1508 334 1736 556"></div> <div data-bbox="1355 576 1887 634"></div>



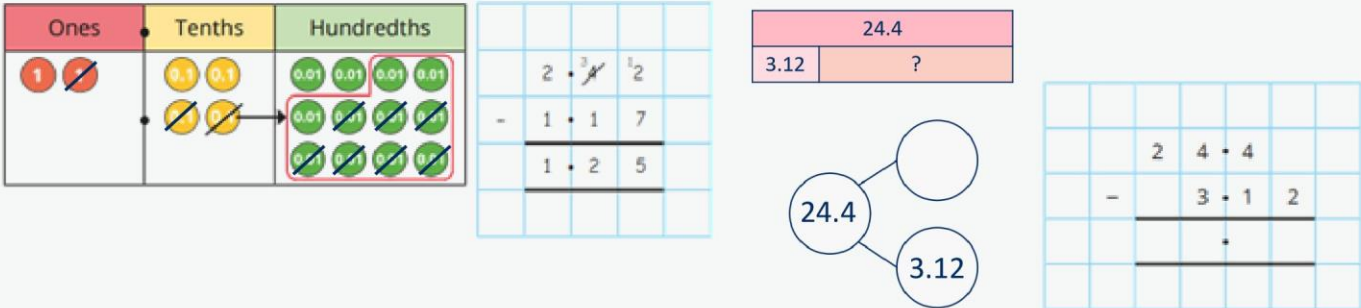
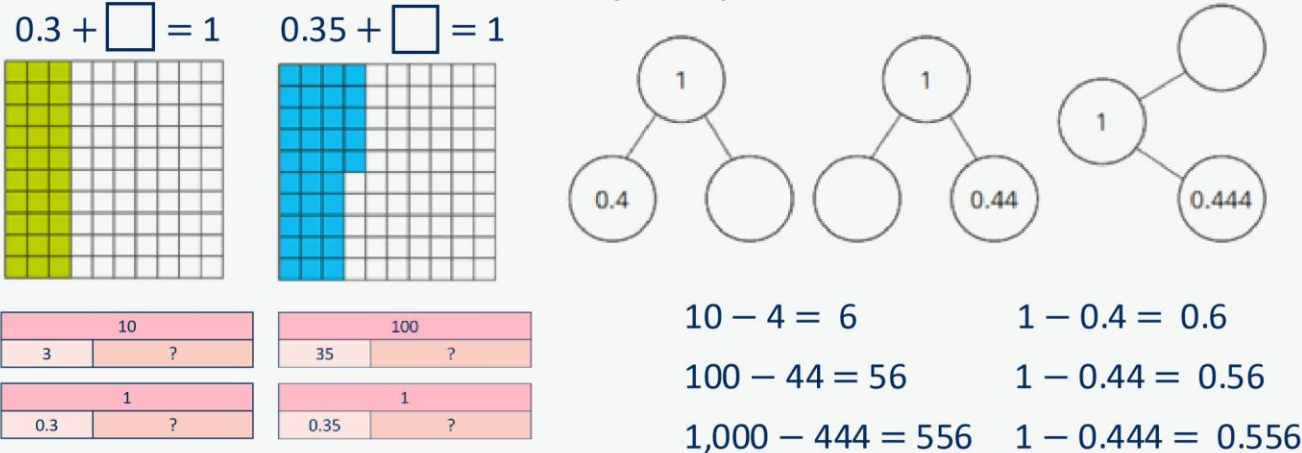
# Subtraction

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> <p><math>£... - £... = £...</math>  <math>100p - ...p = ...p</math></p> <p><b>£5 - £3.26</b>  <math>£4 - £3 = £1</math>  <math>100p - 26p = 74p</math>  <math>£5 - £3.26 = £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> <p>... tenths - ... tenths = ... tenths</p>    $\frac{16}{10} - \frac{5}{10}$  $\frac{16}{10} - \frac{9}{10}$  	

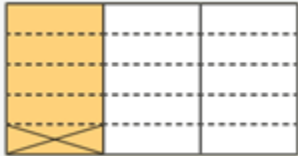

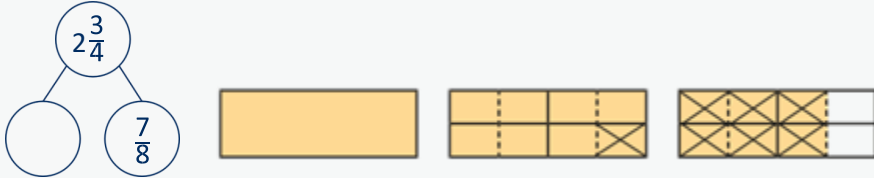
# Subtraction

<p><b>Year 5</b></p>	<ul style="list-style-type: none"> <li>Subtract whole numbers with more than 4 digits.</li> <li>Subtract numbers mentally with increasingly large numbers.</li> <li>Subtract decimals, including a mix of whole numbers and decimals, decimals with different numbers of decimal places, and complements of 1</li> <li>Subtract fractions with the same denominator, and denominators that are multiples of the same number.</li> </ul>	
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>	
<p><b>Subtract whole numbers with more than 4 digits</b></p> <p>Encourage children to estimate and use inverse operations to check answers to calculations.</p>	<p>I can exchange 1 ... for 10 ...</p>   	
<p><b>Subtract using mental strategies</b></p> <p>Subtract 1s, 10s, 100s etc from any number. Use number bonds and related facts.</p>	 <p> <math>48,650 - 300 =</math>  <math>48,650 - 30,000 =</math>  <math>48,650 - 30 =</math> </p>	<p>To subtract ..., I can subtract ... then add ...</p> 

# Subtraction

Progression of skills	Key representations
<p><b>Subtract decimals with up to 2 decimal places</b></p> <p>Progress from the same number of decimal places to a different number of decimal places and from no exchange to exchange.</p>	 <p>Ones: 1 (crossed out)</p> <p>Tenths: 0.1, 0.1 (crossed out)</p> <p>Hundredths: 0.01, 0.01, 0.01, 0.01 (crossed out)</p> <p>Grid showing subtraction: <math>24.4 - 3.12 = 21.28</math></p> <p>Number bond: <math>24.4 = 3.12 + ?</math></p> <p>Grid showing subtraction: <math>24.4 - 3.12 = 21.28</math></p>
<p><b>Complements to 1</b></p> <p>Encourage children to make links with bonds to 10 and complements to 100 and 1,000 when finding a missing part or subtracting from 1</p>	 <p><math>0.3 + \square = 1</math></p> <p><math>0.35 + \square = 1</math></p> <p>Number bonds for 1:</p> <ul style="list-style-type: none"> <li><math>1 = 0.4 + \square</math></li> <li><math>1 = \square + 0.44</math></li> <li><math>1 = \square + 0.444</math></li> </ul> <p>Subtraction problems:</p> <ul style="list-style-type: none"> <li><math>10 - 4 = 6</math></li> <li><math>100 - 44 = 56</math></li> <li><math>1,000 - 444 = 556</math></li> </ul>

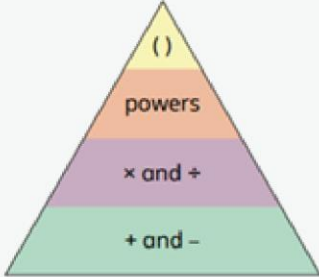
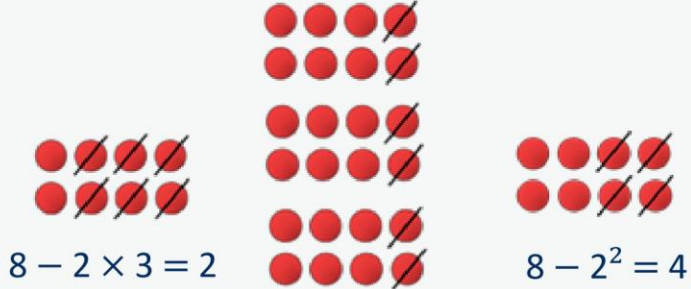

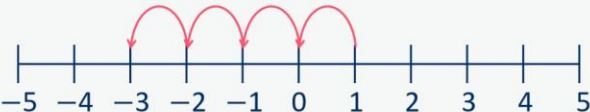
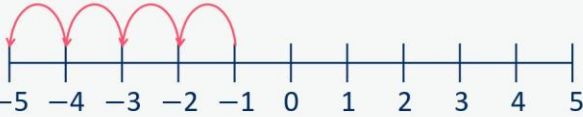
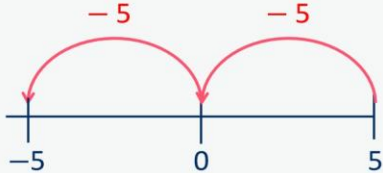
# Subtraction

Progression of skills	Key representations
<p><b>Subtract fractions with denominators that are a multiple of one another</b></p> <p>Convert fractions to the same denominator before subtracting. Progress from subtracting fractions within 1 whole to subtracting from a mixed number.</p>	<p>The denominator has been multiplied by ..., so the numerator needs to be multiplied by... for the fractions to be equivalent.</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;">  </div> <div style="margin-right: 20px;"> <math display="block">\frac{1}{3} - \frac{1}{15} = \frac{5}{15} - \frac{1}{15} = \frac{4}{15}</math> </div> <div style="margin-right: 20px;">  </div> <div style="margin-right: 20px;"> <math display="block">\frac{2}{3} - \frac{2}{9} = \frac{6}{9} - \frac{2}{9} = \frac{4}{9}</math> </div> </div> <div style="margin-top: 20px;">  </div>

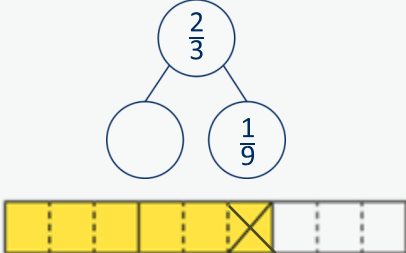
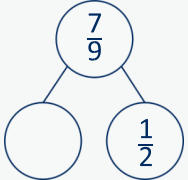
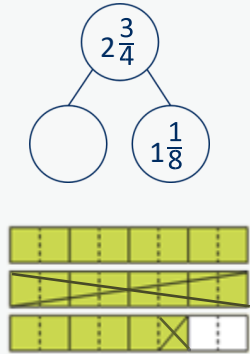
# Subtraction

<p><b>Year 6</b></p>	<ul style="list-style-type: none"> <li>Subtract larger numbers, using the formal written methods of columnar subtraction.</li> <li>Use their knowledge of the order of operations to carry out calculations involving the 4 operations.</li> <li>Calculate intervals across zero.</li> <li>Subtract fractions with different denominators and mixed numbers, using the concept of equivalent fractions.</li> </ul>																																																																																						
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>																																																																																						
<p><b>Subtract integers up to 10 million</b></p> <p>Encourage children to estimate and use inverse operations to check answers to calculations.</p>	<div style="display: flex; justify-content: space-around; align-items: flex-start;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td><del>2</del>3</td><td><sup>1</sup>4</td><td><del>5</del>6</td><td><sup>1</sup>2</td><td>2</td><td>1</td><td></td><td></td></tr> <tr><td></td><td></td><td>-</td><td>1</td><td>8</td><td>4</td><td>3</td><td>2</td><td>1</td><td></td></tr> <tr><td></td><td></td><td></td><td>1</td><td>6</td><td>1</td><td>9</td><td>0</td><td>0</td><td></td></tr> </table> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td colspan="3" style="background-color: #f8d7da;">4,604</td></tr> <tr><td style="background-color: #f8d7da;">2,354</td><td style="background-color: #f8d7da;">750</td><td style="background-color: #f8d7da;">?</td></tr> </table> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td>8</td><td></td><td>4</td><td>8</td><td>5</td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td>-</td><td>3</td><td>6</td><td></td><td></td><td></td><td></td><td>4</td></tr> <tr><td></td><td></td><td></td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td><td></td><td></td></tr> </table> </div>													<del>2</del> 3	<sup>1</sup> 4	<del>5</del> 6	<sup>1</sup> 2	2	1					-	1	8	4	3	2	1					1	6	1	9	0	0		4,604			2,354	750	?													8		4	8	5						-	3	6					4				5	5	5	5	5		
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<p><b>Subtract decimals with up to 3 decimal places</b></p> <p>Progress from the same number of decimal and whole number places to a different number of decimal and whole number places.</p>	<p>I do/do not need to make an exchange because ...</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td>6</td><td><del>7</del></td><td><sup>1</sup>3</td></tr> <tr><td></td><td></td><td>-</td><td>1</td><td>3</td><td>4</td></tr> <tr><td></td><td></td><td></td><td>5</td><td>3</td><td>9</td></tr> </table> <div style="text-align: center;"> <table border="1" style="border-collapse: collapse;"> <tr><td style="background-color: #f8d7da;">0</td><td style="background-color: #fff3cd;">Tth</td><td style="background-color: #d4edda;">Hth</td><td style="background-color: #d1ecf1;">Thth</td></tr> <tr><td style="text-align: center;">●</td><td style="text-align: center;">●</td><td style="text-align: center;">●</td><td style="text-align: center;">●</td></tr> <tr><td style="text-align: center;">0</td><td style="text-align: center;">9</td><td style="text-align: center;">7</td><td style="text-align: center;">5</td></tr> </table> <p>Diagram showing base ten blocks for 0.975. A red arrow points from a 0.1 block to a 0.01 block. A red box highlights the 0.09 and 0.07 blocks, and a green box highlights the 0.01 and 0.01 blocks.</p> </div> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr><td></td><td></td><td></td><td></td><td></td></tr> <tr><td></td><td></td><td><sup>0</sup>1</td><td><del>15</del></td><td><sup>1</sup>5</td></tr> <tr><td></td><td></td><td>-</td><td>0</td><td>6</td><td>4</td></tr> <tr><td></td><td></td><td></td><td>0</td><td>9</td><td>7</td><td>5</td></tr> </table> </div>								6	<del>7</del>	<sup>1</sup> 3			-	1	3	4				5	3	9	0	Tth	Hth	Thth	●	●	●	●	0	9	7	5								<sup>0</sup> 1	<del>15</del>	<sup>1</sup> 5			-	0	6	4				0	9	7	5																													
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# Subtraction

Progression of skills	Key representations	
<p><b>Order of operations</b></p> <p>Children learn the order of priority for operations in a calculation. Calculations in brackets should be done first. Multiplication and division should be performed before addition and subtraction.</p>	<p>... has greater priority than ... , so the first part of the calculation I need to do is ...</p> 	 <p><math>8 - 2 \times 3 = 2</math></p> <p><math>(8 - 2) \times 3 = 18</math></p> <p><math>8 - 2^2 = 4</math></p>
<p><b>Negative numbers</b></p> <p>Children subtract from positive and negative numbers and calculate intervals across 0</p>	<p>... minus ... is equal to ...</p> <p><math>-1 - 4 = -5</math></p>  <p><math>1 - 4 = -3</math></p> 	 <p>The difference between <math>-5</math> and <math>-1</math> is 4</p>  <p>The difference between 5 and <math>-5</math> is 10</p>

# Subtraction

Progression of skills	Key representations		
<p><b>Subtract fractions</b></p> <p>Convert fractions to the same denominator before subtracting. Progress from fractions where one denominator is a multiple of the other, to any fractions and then subtracting from a mixed number.</p>	<p>The denominator has been multiplied by ..., so the numerator needs to be multiplied by...</p>  $\frac{2}{3} - \frac{1}{9} = \frac{6}{9} - \frac{1}{9} = \frac{5}{9}$	<p>The lowest common multiple of ... and ... is ...</p>  $\frac{7}{9} - \frac{1}{2} = \frac{14}{18} - \frac{9}{18} = \frac{5}{18}$	<p>... is made up of ... wholes and ...</p>  $2\frac{3}{4} - 1\frac{1}{8} = 1\frac{5}{8}$

# Progression of skills - Multiplication

Year group	Skill
Nursery	<ul style="list-style-type: none"><li>• Continue with counting and subitising skills as a foundation for later work on equal groups. (see addition and subtraction sections)</li></ul>
Reception	<ul style="list-style-type: none"><li>• Double to 10</li><li>• Make equal groups</li></ul>
Year 1	<ul style="list-style-type: none"><li>• Count in 2s, 5s and 10s</li><li>• Add equal groups</li><li>• Make arrays</li><li>• Make doubles</li></ul>

# Progression of skills - Multiplication

Year group	Skill
Year 2	<ul style="list-style-type: none"><li>• Link repeated addition and multiplication</li><li>• Use arrays</li><li>• Double</li><li>• The 2 times-table</li><li>• The 10 times-table</li><li>• The 5 times-table</li><li>• Missing numbers</li></ul>
Year 3	<ul style="list-style-type: none"><li>• The 3 times-table</li><li>• The 4 times-table</li><li>• The 8 times-table</li><li>• Related facts</li><li>• Multiply a 2-digit number by a 1-digit number - no exchange</li><li>• Multiply a 2-digit number by a 1-digit number - with exchange</li><li>• Scaling</li><li>• Correspondence problems</li></ul>

# Progression of skills - Multiplication

Year group	Skill
Year 4	<ul style="list-style-type: none"><li>• Times-table facts to <math>12 \times 12</math></li><li>• Multiply by 1 and 0</li><li>• Multiply 3 numbers</li><li>• Factor pairs</li><li>• Multiply by 10 and 100</li><li>• Related facts</li><li>• Mental strategies</li><li>• Multiply a 2 or 3-digit number by a 1-digit number</li><li>• Scaling</li><li>• Correspondence problems</li></ul>

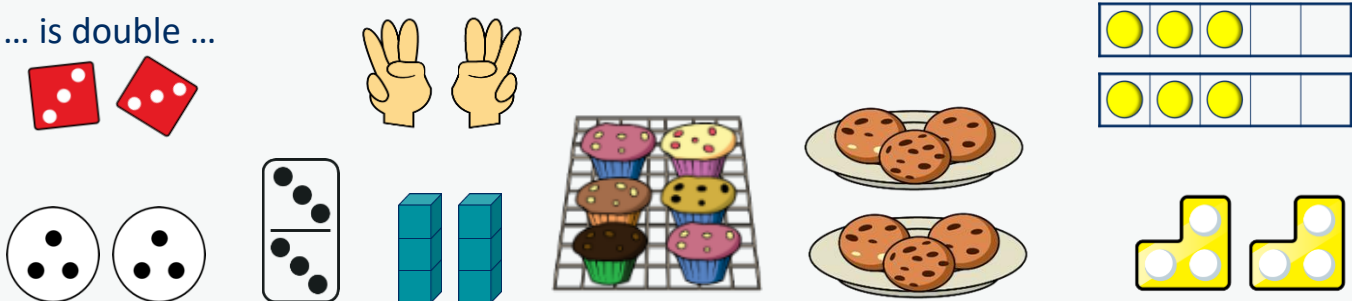
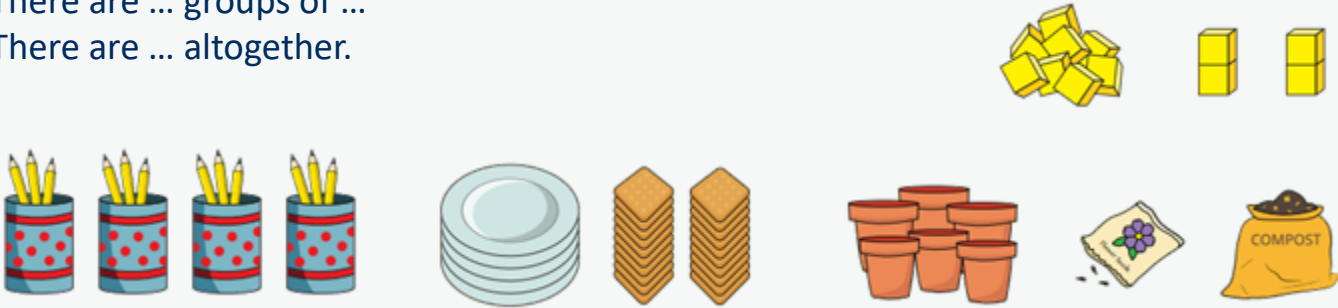
# Progression of skills - Multiplication

Year group	Skill
Year 5	<ul style="list-style-type: none"><li data-bbox="513 294 940 329">• Multiples and factors</li><li data-bbox="513 379 1027 415">• Square and cube numbers</li><li data-bbox="513 465 1462 501">• Multiply numbers up to 4 digits by a 1-digit number</li><li data-bbox="513 551 1462 586">• Multiply numbers up to 4 digits by a 2-digit number</li><li data-bbox="513 636 1085 672">• Multiply by 10, 100 and 1,000</li><li data-bbox="513 722 878 758">• Mental strategies</li><li data-bbox="513 808 1224 843">• Multiply fractions by a whole number</li><li data-bbox="513 893 1338 929">• Multiply mixed numbers by a whole number</li><li data-bbox="513 979 830 1015">• Find the whole</li></ul>

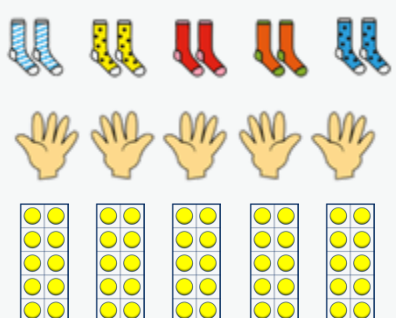


# Progression of skills - Multiplication

Year group	Skill
Year 6	<ul style="list-style-type: none"><li>• Multiply numbers up to 4 digits by a 2-digit number</li><li>• Multiply by 10, 100 and 1,000</li><li>• Order of operations</li><li>• Multiply decimals by integers</li><li>• Multiply fractions by fractions</li><li>• Find the whole</li><li>• Calculations involving ratio</li></ul>


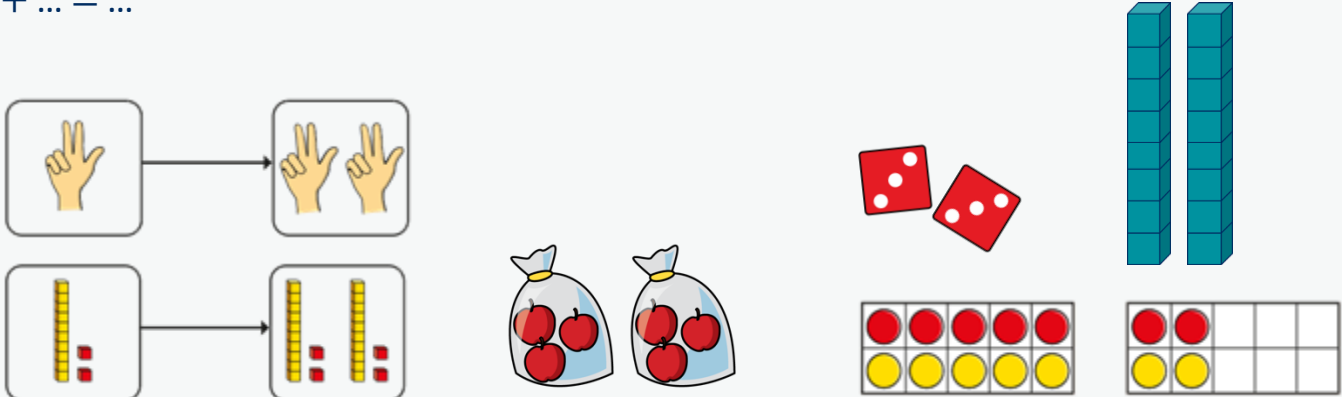
# Multiplication

<p><b>Reception</b></p>	<ul style="list-style-type: none"> <li>• Have a deep understanding of number to 10, including the composition of each number.</li> <li>• Subitise (recognise quantities without counting) up to 5</li> <li>• Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10, including double facts.</li> <li>• Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.</li> </ul>
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>
<p><b>Double to 10</b></p> <p>Prompt children to notice that double means twice as many and to notice that there are two equal groups.</p>	<p>Double ... is ... ... is double ...</p> 
<p><b>Make equal groups</b></p> <p>Provide opportunities to make equal groups when tidying up or during snack time. Encourage children to check that each group has the same amount.</p>	<p>There are ... groups of ... There are ... altogether.</p> 


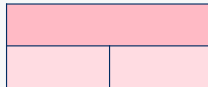






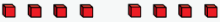
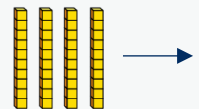
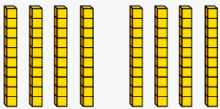
# Multiplication

<p><b>Year 1</b></p>	<ul style="list-style-type: none"> <li>Count in multiples of twos, fives and tens.</li> <li>Solve one-step problems involving multiplication, using concrete objects, pictorial representations and arrays with the support of the teacher.</li> </ul>																																																												
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>																																																												
<p><b>Count in 2s, 5s and 10s</b></p> <p>Begin by counting objects that naturally come in 2s, 5s and 10s, for example pairs of socks or fingers.</p>	<p>There are ... equal groups of ... There are ... altogether.</p> 	<p>Continue to colour in ...s What do you notice?</p> <table border="1" data-bbox="1098 671 1471 856"> <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>	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>Complete the number track/number line by counting in ...s.</p> <table border="1" data-bbox="1512 685 1947 742"> <tr> <td>5</td> <td>10</td> <td>15</td> <td>20</td> <td></td> <td></td> <td></td> <td></td> </tr> </table> 	5	10	15	20				
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<p><b>Add equal groups</b> (repeated addition)</p> <p>Children should be able to write a repeated addition to represent equal groups and to draw pictures or use objects to represent a repeated addition.</p>	<p>There are ... groups of ... There are ... altogether.</p>  <p><math>10 + 10 + 10 = 30</math></p> <p><math>5 + 5 + 5 + 5 = 20</math></p>		<p>What is the same? What is different?</p> <p><math>2 + 2 + 2 =</math></p> <p><math>5 + 5 + 5 =</math></p> <p><math>10 + 10 + 10 =</math></p> <p>Use objects or a drawing to represent the equal groups and find how many in total.</p>																																																										

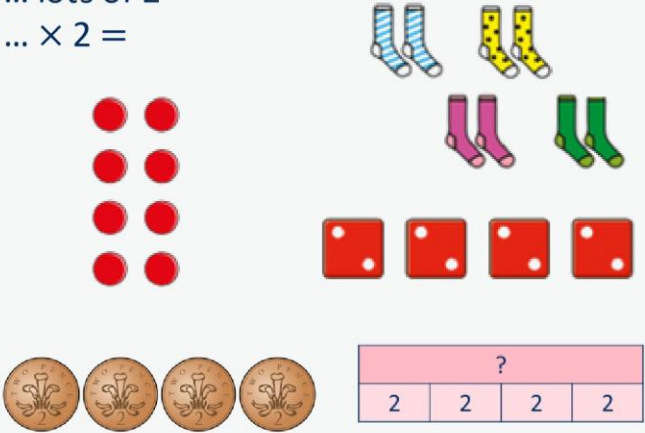

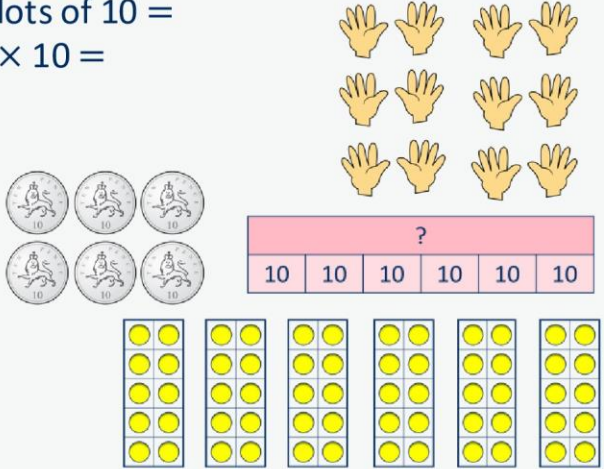
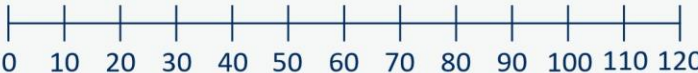
# Multiplication

Progression of skills	Key representations
<p><b>Make arrays</b></p> <p>Children use their knowledge of adding equal groups to arrange objects in columns and rows.</p>	<p>There are ... rows of ... There are ... altogether. There are ... columns of ... There are ... altogether.</p> 
<p><b>Make doubles</b></p> <p>Children understand that doubles are two equal groups. Children may begin to explore doubles beyond 20 using base 10</p>	<p>Double ... is ... ... + ... = ...</p> 




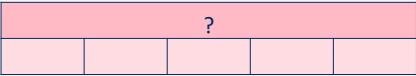


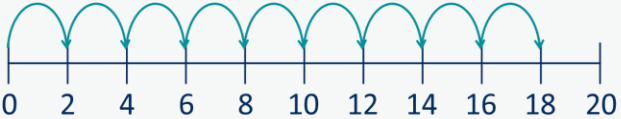
# Multiplication

<p><b>Year 2</b></p>	<ul style="list-style-type: none"> <li>Recall and use multiplication facts for the 2, 5 and 10 multiplication tables.</li> <li>Calculate mathematical statements for multiplication within the multiplication tables and write them using the multiplication (×) and equals (=) signs.</li> <li>Show that multiplication of two numbers can be done in any order (commutative).</li> </ul>	
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>	
<p><b>Link repeated addition and multiplication</b></p> <p>Encourage children to make the link between repeated addition and multiplication.</p>	<p>There are ... equal groups with ... in each group. There are ... altogether.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: left;"> <p><math>3 + 3 = 6</math> <math>2 \times 3 = 6</math></p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> <div style="text-align: left;"> <p><math>5 + 5 + 5 + 5 = 20</math> <math>4 \times 5 = 20</math></p> </div> </div>	
<p><b>Use arrays</b></p> <p>Encourage children to see that multiplication is commutative.</p>	<p>There are ... rows with ... in each row. There are ... columns with ... in each column.</p> <div style="display: flex; justify-content: space-between;"> <div style="text-align: center;">  </div> <div style="text-align: left;"> <p>3 lots of 5 = 15 <math>5 + 5 + 5 = 15</math></p> <p>5 lots of 3 = 15 <math>3 + 3 + 3 + 3 + 3 = 15</math></p> </div> </div>	<p>I can see ... × ... and ... × ...</p> <p style="text-align: center;"><math>3 \times 5 = 15</math> <math>5 \times 3 = 15</math> <math>3 \times 5 = 5 \times 3</math></p>
<p><b>Double</b></p> <p>Encourage children to make links with related facts.</p>	<p>Double ... is ...</p> <div style="display: flex; align-items: center;">  <span style="margin: 0 10px;">→</span>  </div> <p style="margin-left: 150px;">Double 4 = 4 + 4 Double 4 is 8</p>	<p>Double ... is ... so double ... is ...</p> <div style="display: flex; align-items: center;">  <span style="margin: 0 10px;">→</span>  </div> <p style="margin-left: 150px;">Double 4 is 8</p> <div style="display: flex; align-items: center;">  <span style="margin: 0 10px;">→</span>  </div> <p style="margin-left: 150px;">Double 40 is 80</p>




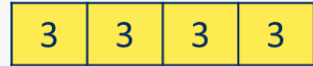


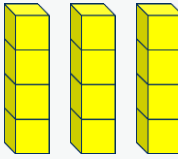



# Multiplication

Progression of skills	Key representations																																									
<p><b>The 2 times-table</b></p> <p>Encourage daily counting in multiples both forwards and back. Notice that all multiples of 2 are even numbers.</p>	<p>... lots of 2 = ... <math>\times 2 =</math></p> 	<p>... times 2 is equal to ...</p> <table border="1" data-bbox="1384 344 1798 462"> <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>1 \times 2 = 2</math>    <math>2 = 1 \times 2</math>  <math>2 \times 2 = 4</math>    <math>4 = 2 \times 2</math>  <math>3 \times 2 = 6</math>    <math>6 = 3 \times 2</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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21	22	23	24	25	26	27	28	29	30																																	
<p><b>The 10 times-table</b></p> <p>Encourage daily counting in multiples both forwards and back. Notice the pattern in the numbers.</p>	<p>... lots of 10 = ... <math>\times 10 =</math></p> 	<p>... times 10 is equal to ...</p> <table border="1" data-bbox="1384 825 1798 982"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> <tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr> </table> <p> <math>1 \times 10 = 10</math>    <math>10 = 1 \times 10</math>  <math>2 \times 10 = 20</math>    <math>20 = 2 \times 10</math>  <math>3 \times 10 = 30</math>    <math>30 = 3 \times 10</math> </p> 	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40
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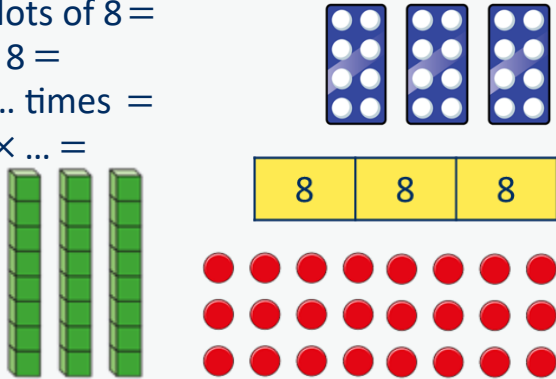

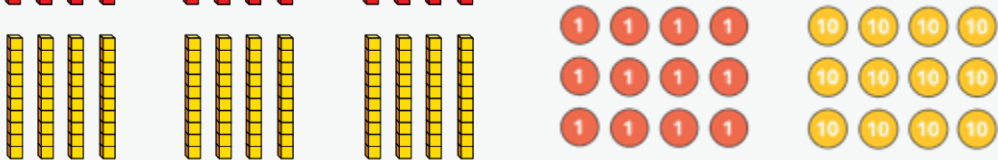
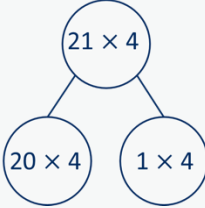
# Multiplication

Progression of skills	Key representations																																									
<p><b>The 5 times-table</b></p> <p>Encourage daily counting in multiples both forwards and back. Notice the pattern in the numbers.</p>	<p>... lots of = </p> <p>... <math>\times 5 =</math></p> <p></p> <p></p> <p></p>	<p>... times is equal to ...</p> <table border="1" data-bbox="1384 337 1810 499"> <tr><td>1</td><td>2</td><td>3</td><td>4</td><td>5</td><td>6</td><td>7</td><td>8</td><td>9</td><td>10</td></tr> <tr><td>11</td><td>12</td><td>13</td><td>14</td><td>15</td><td>16</td><td>17</td><td>18</td><td>19</td><td>20</td></tr> <tr><td>21</td><td>22</td><td>23</td><td>24</td><td>25</td><td>26</td><td>27</td><td>28</td><td>29</td><td>30</td></tr> <tr><td>31</td><td>32</td><td>33</td><td>34</td><td>35</td><td>36</td><td>37</td><td>38</td><td>39</td><td>40</td></tr> </table> <p><math>1 \times 5 = 5</math>      <math>5 = 1 \times 5</math>  <math>2 \times 5 = 10</math>    <math>10 = 2 \times 5</math>  <math>3 \times 5 = 15</math>    <math>15 = 3 \times 5</math></p> <p></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
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<p><b>Missing numbers</b></p> <p>Make links to known facts.</p>	<p>... is equal to ... groups of ...</p> <p>18 socks, how many pairs? </p> <p></p>	<p>... times ... is equal to ...</p> <p><math>\square \times 2 = 18</math></p> <p><math>18 = 2 \times \square</math></p>																																								

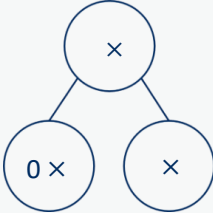


# Multiplication

<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 onedigit 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 = </p> <p>... <math>\times 3 =</math> </p> <p>, ... times = </p> <p><math>3 \times \dots =</math> </p>	<p>... times is equal to ...</p> <table border="1" data-bbox="1336 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 = </p> <p>... <math>\times 4 =</math> </p> <p>, ... times = </p> <p><math>4 \times \dots =</math> </p>	<p>... times is equal to ...</p> <table border="1" data-bbox="1336 1021 1833 1163"> <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 timestables.</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 334 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 1079 913 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>  <table border="1" data-bbox="1566 1079 1914 1310"> <thead> <tr><th>Tens</th><th>Ones</th></tr> </thead> <tbody> <tr><td>60</td><td>0</td></tr> <tr><td>0</td><td>2</td></tr> <tr><td>0</td><td>2</td></tr> <tr><td>0</td><td>0</td></tr> <tr><td>0</td><td>0</td></tr> </tbody> </table>		Tens	Ones	30	0	20	0	10	0	0	2	0	2	Tens	Ones	60	0	0	2	0	2	0	0	0	0						
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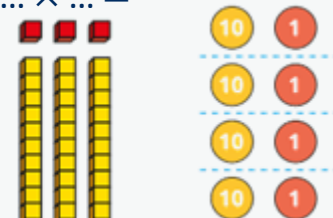
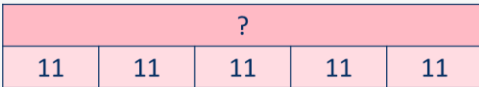
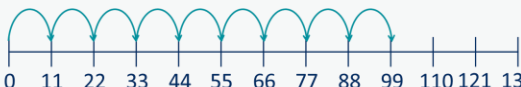


# Multiplication

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> </tbody> </table> <p> <math>20 \times 4 = 80</math>  <math>4 \times 4 = 16</math>  <math>24 \times 4 = 96</math> </p>	Tens	Ones											 <table border="1" data-bbox="1520 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> <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>																						


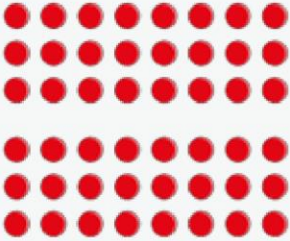
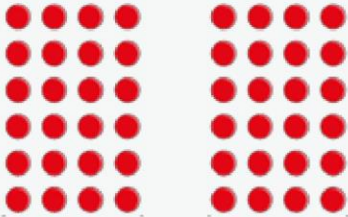
# Multiplication

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="590 506 969 706"></div> <table border="1" data-bbox="996 364 1290 714"><thead><tr><th data-bbox="996 364 1141 401">hats</th><th data-bbox="1145 364 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 709">purple </td><td data-bbox="1145 609 1290 709"> </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 	 								
purple 	 								

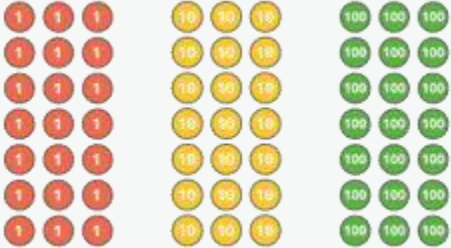
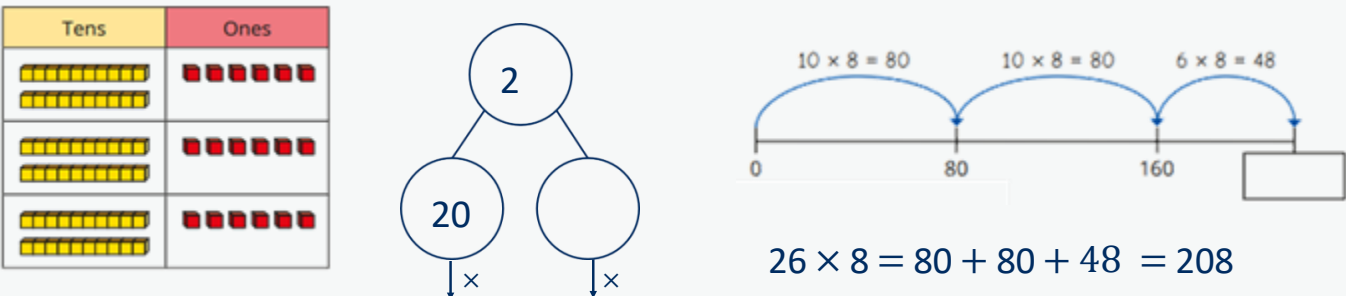
# Multiplication

<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 ... =</p> <p>... times ... is equal to ...</p> <p>... <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 ...</p> <p>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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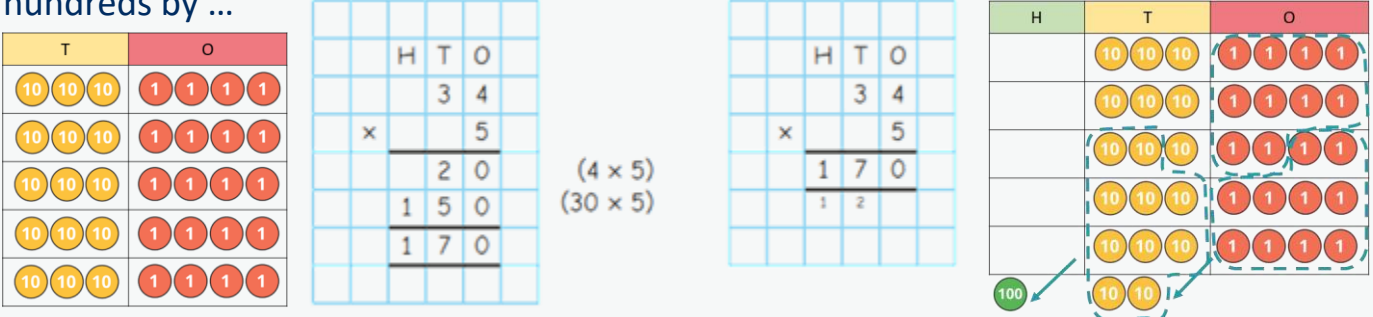
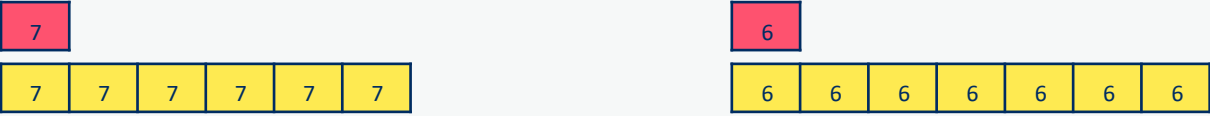
# Multiplication

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> 12 = ... <math>\times</math> ... <math>\times</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;"> <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;"> <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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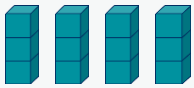


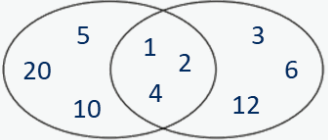






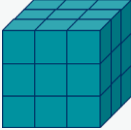
# Multiplication

Progression of skills	Key representations
<p><b>Related facts</b></p> <p>Use knowledge of multiplying by 10 and 100 to scale timestable facts.</p>	<p>... × ... ones is equal to ... ones            so ... × ... tens is equal to ... tens            and ... × ... 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>  <p> <math>3 \times 26 = 60 + 18 = 78</math> </p> <p> <math>26 \times 8 = 80 + 80 + 48 = 208</math> </p>

# 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 diagrams illustrate the multiplication process. On the left, a place value grid shows 34 multiplied by 5, resulting in 170. This is shown in expanded form as <math>(4 \times 5) = 20</math> and <math>(30 \times 5) = 150</math>, which are then added to get 170. On the right, a similar grid shows 345 multiplied by 5, resulting in 1725. This is shown in expanded form as <math>(5 \times 5) = 25</math>, <math>(40 \times 5) = 200</math>, and <math>(300 \times 5) = 1500</math>, which are then added to get 1725. A third diagram shows a place value grid with columns for Hundreds (H), Tens (T), and Ones (O). It shows 345 multiplied by 5, with the result 1725. The grid is filled with circles representing the value of each digit: 3 hundreds (300), 4 tens (40), and 5 ones (5) are multiplied by 5 to get 15 hundreds (1500), 20 tens (200), and 25 ones (25), which are then carried over to get the final result of 1725.</p>																								
<p><b>Scaling</b></p> <p>Children focus on multiplication as scaling ( ... times the size).</p>	<p>... is ... times the size of ...</p>  <p>A computer mouse costs £7            A keyboard costs 6 times as much.</p> <p>A red ribbon is 6 cm.            A yellow ribbon is 7 times as long.</p>																								
<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 1061 1943 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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# Multiplication

<p><b>Year 5</b></p>	<ul style="list-style-type: none"> <li>Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers</li> <li>Recognise and use square numbers and cube numbers, and the notation for squared (<math>^2</math>) and cubed (<math>^3</math>)</li> <li>Multiply numbers up to 4 digits by a one or two-digit number using a formal written method, including long multiplication for two-digit numbers.</li> <li>Multiply numbers mentally drawing upon known facts.</li> <li>Multiply whole numbers and those involving decimals by 10, 100 and 1000</li> <li>Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.</li> </ul>																																
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>																																
<p><b>Multiples and factors</b></p> <p>Encourage children to notice patterns and make links with known facts.</p>	<p>... is a multiple of ... because</p> <p><math>\dots \times \dots = \dots</math></p>  <table border="1" data-bbox="576 901 1006 1029"> <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>	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	<p>... is a factor of ... because</p> <p><math>\dots \times \dots = \dots</math></p>  $1 \times 8$  $2 \times 4$ <p>1, 2, 4 and 8 are factors of 8</p>	<p>The common factors of ... and ... are ...</p> <p>Factors of 20      Factors of 12</p> 
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<p><b>Square and cube numbers</b></p>	<p>... squared means <math>\dots \times \dots</math></p>  $1 \times 1$ $1^2 = 1$  $2 \times 2$ $2^2 = 4$  $3 \times 3$ $3^2 = 9$  $4 \times 4$ $4^2 = 16$		<p>... cubed means <math>\dots \times \dots \times \dots</math></p>  $1 \times 1 \times 1$ $1^3 = 1$  $2 \times 2 \times 2$ $2^3 = 8$  $3 \times 3 \times 3$ $3^3 = 27$																														

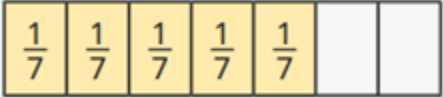
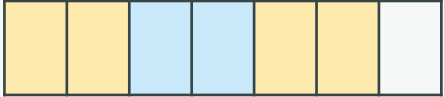
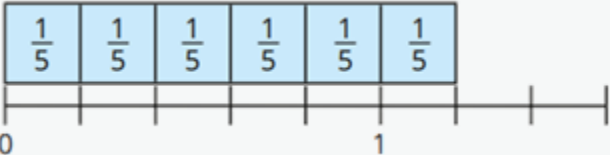
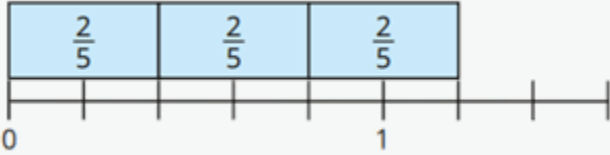
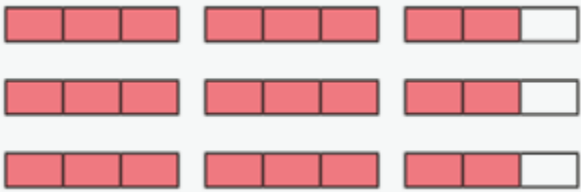
# Multiplication

Progression of skills	Key representations																																																																															
<p><b>Multiply numbers up to 4 digits by a 1-digit number</b></p> <p>This builds on the short multiplication method introduced in Y4</p>	<p>To multiply a 4-digit number by ... , I multiply the ones by ... , the tens by ... , the hundreds by ... and the thousands by ...</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="width: 20px;">Th</th> <th style="width: 20px;">H</th> <th style="width: 20px;">T</th> <th style="width: 20px;">O</th> </tr> </thead> <tbody> <tr> <td>1000</td> <td>100</td> <td>10 10 10 10 10</td> <td>1 1</td> </tr> <tr> <td>1000</td> <td>100</td> <td>10 10 10 10 10</td> <td>1 1</td> </tr> <tr> <td>1000</td> <td>100</td> <td>10 10 10 10 10</td> <td>1 1</td> </tr> </tbody> </table> <div style="border: 1px solid black; padding: 5px; margin-left: 20px;"> <table style="border-collapse: collapse; text-align: center;"> <tr><td style="width: 20px;"> </td><td style="width: 20px;"> </td><td style="width: 20px;"> </td><td style="width: 20px;"> </td><td style="width: 20px;"> </td></tr> <tr><td> </td><td>1</td><td>1</td><td>5</td><td>2</td></tr> <tr><td>×</td><td> </td><td> </td><td> </td><td>3</td></tr> <tr><td colspan="5" style="border-top: 1px solid black;"> </td></tr> <tr><td colspan="5" style="border-top: 1px solid black;"> </td></tr> </table> </div> </div>		Th	H	T	O	1000	100	10 10 10 10 10	1 1	1000	100	10 10 10 10 10	1 1	1000	100	10 10 10 10 10	1 1							1	1	5	2	×				3																																															
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<p><b>Multiply numbers up to 4 digits by a 2-digit number</b></p> <p>Numbers are first partitioned using an area model then long multiplication is introduced for the first time.</p>	<p>I can partition ... into ... and ...</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20px;">×</td> <td style="width: 20px;">●●●●</td> <td style="width: 20px;">●●●●</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> <tr> <td>●</td> <td>●●●●</td> <td>●●●●</td> </tr> </table> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20px;">×</td> <td style="width: 20px;">40</td> <td style="width: 20px;">4</td> </tr> <tr> <td>30</td> <td>1,200</td> <td>120</td> </tr> <tr> <td>2</td> <td>80</td> <td>8</td> </tr> </table> </div> <p><math>32 \times 44 = 1,200 + 80 + 120 + 8</math>  <math>32 \times 44 = 1,408</math></p>	×	●●●●	●●●●	●	●●●●	●●●●	●	●●●●	●●●●	●	●●●●	●●●●	●	●●●●	●●●●	×	40	4	30	1,200	120	2	80	8	<p>First, I multiply by the ... Then I multiply by the ..</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="width: 20px;">×</td> <td style="width: 20px;">10</td> <td style="width: 20px;">3</td> </tr> <tr> <td>30</td> <td>300</td> <td>90</td> </tr> <tr> <td>2</td> <td>20</td> <td>6</td> </tr> </table> <div style="border: 1px solid black; padding: 5px; margin-left: 20px;"> <math>300 + 90 + 20 + 6 = 416</math> </div> <div style="border: 1px solid black; padding: 5px; margin-left: 20px;"> <table style="border-collapse: collapse; text-align: center;"> <tr><td style="width: 20px;"> </td><td style="width: 20px;"> </td><td style="width: 20px;"> </td><td style="width: 20px;"> </td><td style="width: 20px;"> </td></tr> <tr><td> </td><td> </td><td>3</td><td>2</td><td> </td></tr> <tr><td>×</td><td> </td><td>1</td><td>3</td><td> </td></tr> <tr><td colspan="5" style="border-top: 1px solid black;"> </td></tr> <tr><td> </td><td> </td><td>9</td><td>6</td><td> </td></tr> <tr><td> </td><td>3</td><td>2</td><td>0</td><td> </td></tr> <tr><td colspan="5" style="border-top: 1px solid black;"> </td></tr> <tr><td> </td><td>4</td><td>1</td><td>6</td><td> </td></tr> <tr><td> </td><td> </td><td> </td><td> </td><td> </td></tr> </table> <div style="margin-left: 10px;"> <p><math>(32 \times 3)</math>  <math>(32 \times 10)</math></p> </div> </div> </div>	×	10	3	30	300	90	2	20	6								3	2		×		1	3									9	6			3	2	0								4	1	6						
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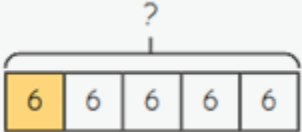
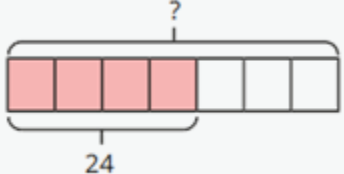
# Multiplication

Progression of skills	Key representations																										
<p><b>Multiply by 10, 100 and 1,000</b></p> <p>Some children may over-generalise that multiplying by a power of 10 always results in adding zeros. This will cause issues later when multiplying decimals.</p>	<p>To multiply by 10/100/1,000, I move all the digits ... places to the left. ... is 10/100/1,000 times the size of ...</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;"> <table border="1" style="border-collapse: collapse; width: 150px; height: 40px;"> <tr> <td style="background-color: #d3d3d3;">M</td> <td style="background-color: #d2b48c;">HTh</td> <td style="background-color: #d8bfd8;">TTh</td> <td style="background-color: #add8e6;">Th</td> <td style="background-color: #90ee90;">H</td> <td style="background-color: #ffff00;">T</td> <td style="background-color: #ff0000;">O</td> </tr> <tr> <td></td> <td></td> <td></td> <td></td> <td>● ●</td> <td>● ● ●</td> <td>● ● ● ●</td> </tr> </table> <p><math>234 \times 10 = 2,340</math>  <math>234 \times 100 = 23,400</math>  <math>234 \times 1,000 = 234,000</math></p> </div> <div style="text-align: center;"> <table border="1" style="border-collapse: collapse; width: 150px; height: 40px;"> <tr> <td style="background-color: #add8e6;">Th</td> <td style="background-color: #90ee90;">H</td> <td style="background-color: #ffff00;">T</td> <td style="background-color: #ff0000;">O</td> <td style="border-left: 1px dashed black; background-color: #d8bfd8;">Tth</td> <td style="background-color: #90ee90;">Hth</td> </tr> <tr> <td></td> <td></td> <td></td> <td>● ● ● ●</td> <td style="border-left: 1px dashed black;">● ● ● ●</td> <td>● ● ● ●</td> </tr> </table> <p><math>2.34 \times 10 = 23.4</math>  <math>2.34 \times 100 = 234</math>  <math>2.34 \times 1,000 = 2,340</math></p> </div> </div>	M	HTh	TTh	Th	H	T	O					● ●	● ● ●	● ● ● ●	Th	H	T	O	Tth	Hth				● ● ● ●	● ● ● ●	● ● ● ●
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<p><b>Mental strategies</b></p> <p>Children continue to use efficient mental strategies such as partitioning and knowledge of factor pairs and related facts to multiply.</p>	<p>The most efficient strategy to calculate ... <math>\times</math> ... is ...          To calculate ... <math>\times</math> 12, I can do ... <math>\times</math> ... <math>\times</math> ...</p> <p>For example: <math>121 \times 12</math>          I could calculate <math>100 \times 12</math> plus <math>20 \times 12</math> plus <math>1 \times 12</math>          I could calculate <math>121 \times 10</math> plus <math>121 \times 2</math>          I could calculate <math>121 \times 6 \times 2</math>          I could calculate <math>121 \times 4 \times 3</math></p>																										

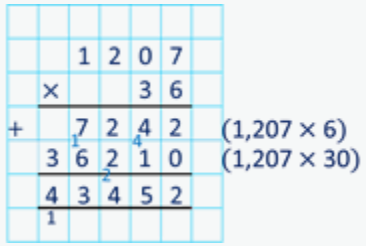
# Multiplication

Progression of skills	Key representations
<p><b>Multiply fractions by a whole number</b></p> <p>Make links with repeated addition.            E.g. <math>\frac{1}{7} \times 4 = \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7}</math></p>	<p>To multiply a fraction by an integer, I multiply the numerator by the integer and the denominator remains the same.</p> <div style="display: flex; justify-content: space-around;"> <div style="text-align: center;">  <math display="block">\frac{1}{7} \times 5 = \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} = \frac{5}{7}</math> </div> <div style="text-align: center;">  <math display="block">\frac{2}{7} \times 3 = \frac{2}{7} + \frac{2}{7} + \frac{2}{7} = \frac{6}{7}</math> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 20px;"> <div style="text-align: center;">  <math display="block">\frac{1}{5} \times 6 = 1\frac{1}{5}</math> </div> <div style="text-align: center;">  <math display="block">\frac{2}{5} \times 3 = 1\frac{2}{5}</math> </div> </div>
<p><b>Multiply mixed numbers by a whole number</b></p>	<p>I can partition <math>\frac{2}{5}</math> into <math>\frac{1}{5}</math> and <math>\frac{1}{5}</math></p> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div style="text-align: center;">  <math display="block">2\frac{2}{5} \times 3</math> <math display="block">2 \times 3 = 6 \quad \frac{2}{5} \times 3 = \frac{6}{5} = 1\frac{1}{5}</math> <math display="block">2\frac{2}{5} \times 3 = 6 + 2 = 8</math> </div> </div>

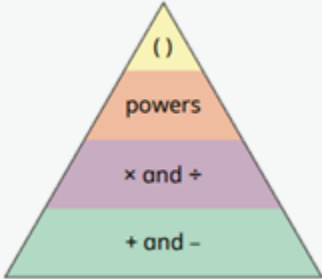

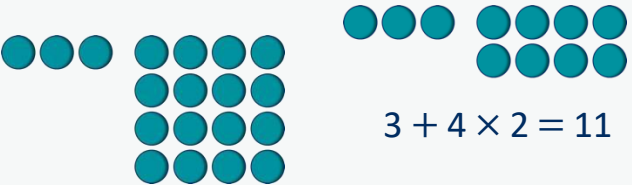
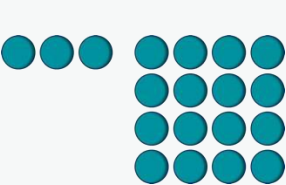


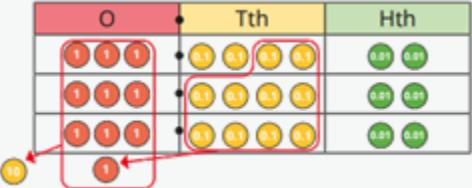
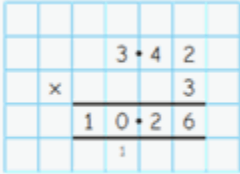
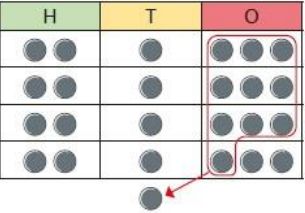
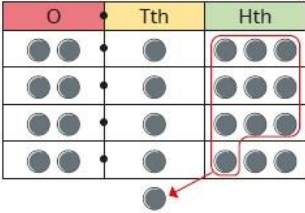
# Multiplication

Progression of skills	Key representations	
<p><b>Find the whole</b></p> <p>Children multiply to find the whole from a given part.</p>	<p>If <math>\frac{1}{\square}</math> is ... , then the whole is ...<math>\times</math> ...</p> <p><math>\frac{1}{\square}</math> of ___ = 6</p>  <p><math>5 \times 6 = 30</math></p> <p><math>\frac{1}{\square}</math> of <b>30</b> = 6</p>	<p>If <math>\frac{\square}{\square}</math> is ... , then <math>\frac{1}{\square}</math> is ... and the whole is ...<math>\times</math> ...</p> <p><math>\frac{1}{7}</math> of ___ = 24</p>  <p><math>\frac{1}{7} = 24 \div 4 = 6</math></p> <p><math>7 \times 6 = 42</math></p> <p><math>\frac{1}{7}</math> of <b>42</b> = 24</p>

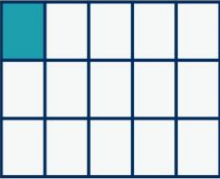
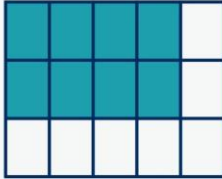

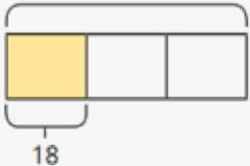
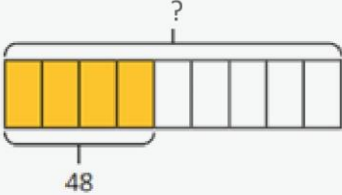
# Multiplication

<p><b>Year 6</b></p>	<ul style="list-style-type: none"> <li>Identify common factors and common multiples.</li> <li>Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.</li> <li>Multiply numbers by 10, 100 and 1,000</li> <li>Multiply one-digit numbers with up to two decimal places by whole numbers.</li> <li>Use their knowledge of the order of operations to carry out calculations involving the 4 operations.</li> <li>Multiply simple pairs of proper fractions, writing the answer in its simplest form.</li> <li>Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.</li> <li>Solve problems involving the calculation of percentages.</li> </ul>																												
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>																												
<p><b>Multiply numbers up to 4 digits by a 2-digit number</b></p>	<p>To multiply by a 2-digit number, first multiply by the ones, then multiply by the tens and then find the total.</p> 																												
<p><b>Multiply by 10, 100 and 1,000</b></p> <p>Some children may over generalise that multiplying by a power of 10 always results in adding zeros.</p>	<p>To multiply by 10/100/1,000, I move all the digits ... places to the left. ... is 10/100/1,000 times the size of ...</p> <table border="1" data-bbox="576 1099 1218 1220"> <thead> <tr> <th>M</th> <th>HTh</th> <th>TTh</th> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td>● ●</td> <td>● ●</td> <td>● ●</td> </tr> </tbody> </table> <p><math>234 \times 10 = 2,340</math>  <math>234 \times 100 = 23,400</math>  <math>234 \times 1,000 = 234,000</math></p> <table border="1" data-bbox="1243 1099 1885 1220"> <thead> <tr> <th>Th</th> <th>H</th> <th>T</th> <th>O</th> <th>Tth</th> <th>Hth</th> <th>Thth</th> </tr> </thead> <tbody> <tr> <td></td> <td></td> <td></td> <td></td> <td>● ●</td> <td>● ●</td> <td>● ●</td> </tr> </tbody> </table> <p><math>0.234 \times 10 = 2.34</math>  <math>0.234 \times 100 = 23.4</math>  <math>0.234 \times 1,000 = 234</math></p>	M	HTh	TTh	Th	H	T	O					● ●	● ●	● ●	Th	H	T	O	Tth	Hth	Thth					● ●	● ●	● ●
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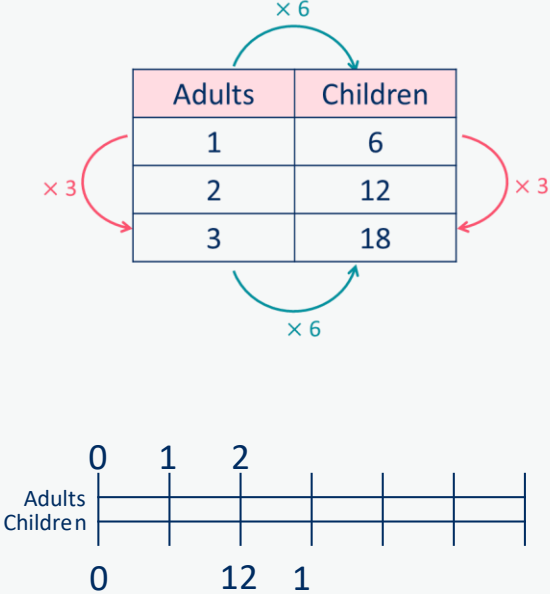
# Multiplication

Progression of skills	Key representations	
<p><b>Order of operations</b></p> <p>Calculations in brackets should be done first. Multiplication and division should be performed before addition and subtraction.</p>	<p>... has greater priority than ..., so the first part of the calculation I need to do is ...</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  <p><math>(3 + 4) \times 2 = 14</math></p> </div> <div style="text-align: center;">  <p><math>3 + 4 \times 2 = 11</math></p> </div> </div> <div style="text-align: center; margin-top: 20px;">  <p><math>3 + 4^2 = 19</math></p> </div>	
<p><b>Multiply decimals by integers</b></p> <p>This is the first time children multiply decimals by numbers other than 10, 100 or 1,000. Encourage them to make links with known facts and whole number multiplication.</p>	<p>I know that ... <math>\times</math> ... = ..., so I also know that ... <math>\times</math> ... = ...</p> <div style="display: flex; justify-content: center; align-items: center; margin-top: 20px;"> <div style="text-align: center;">  <p><math>6 \times 2 = 12</math></p> </div> <div style="text-align: center; margin-left: 20px;">  <p><math>6 \times 0.2 = 1.2</math></p> </div> </div>	<p>I need to exchange 10 ... for 1 ...</p> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 20px;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div> <div style="display: flex; justify-content: space-around; align-items: center; margin-top: 20px;"> <div style="text-align: center;">  <p><math>213 \times 4 = 852</math></p> </div> <div style="text-align: center;">  <p><math>2.13 \times 4 = 8.52</math></p> </div> </div>

# Multiplication

Progression of skills	Key representations	
<p><b>Multiply fractions by fractions</b></p> <p>Encourage children to give answers in their simplest form.</p>	<p>When multiplying a pair of fractions, I need to multiply the numerator and multiply the denominator.</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <math display="block">\frac{1}{3} \times \frac{1}{5} = \frac{1}{15}</math> </div> <div style="text-align: center;">  <math display="block">\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}</math> </div> <div style="text-align: center;">  <math display="block">\frac{2}{3} \times \frac{3}{5} = \frac{6}{15} = \frac{2}{5}</math> </div> </div>	
<p><b>Find the whole</b></p> <p>Children multiply to find the whole from a given part.</p>	<p>If <math>\frac{1}{\square}</math> is ... , then the whole is ... <math>\times</math> ...</p> <p><math>\frac{1}{3}</math> of ___ = 18</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <math>18 \times 3 = 54</math>  <math>\frac{1}{3}</math> of <b>54</b> = 18         </div> </div>	<p>If <math>\frac{\square}{\square}</math> is ... , then <math>\frac{1}{\square}</math> is ... and the whole is ... <math>\times</math> ...</p> <p><math>\frac{4}{9}</math> of ___ = 48</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> <math>\frac{1}{9} = 48 \div 4 = 12</math>  <math>9 \times 12 = 108</math>  <math>\frac{4}{9}</math> of <b>108</b> = 48         </div> </div>

# Multiplication

Progression of skills	Key representations																																	
<p><b>Calculate percentages</b></p> <p>Children first learn how to find 1%, 10%, 20%, 25% and 50% before using multiples of these amounts to find any percentage.</p>	<p>There are ... lots of ... % in 100%</p> <p>To find ... %, I need to divide by ...</p> <table border="1" data-bbox="576 368 1085 482"> <tr><td colspan="4">100%</td></tr> <tr><td colspan="2">50%</td><td colspan="2">50%</td></tr> <tr><td>25%</td><td>25%</td><td>25%</td><td>25%</td></tr> </table> <p>0% of ... = ... ÷ 2</p> <p>2 % of ... = ... ÷ 4</p>	100%				50%		50%		25%	25%	25%	25%	<p>... % is made up of ... %, and ... %</p> <table border="1" data-bbox="1147 354 1910 445"> <tr><td colspan="10">100%</td></tr> <tr><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td></tr> </table> <p>To find 30%, I can find 10% and then multiply it by 3</p> <p>To find 23%, I can use 10% × 2 and 1% × 3</p> <p>To find 99%, I can find 1%, then subtract from 100%</p>	100%										10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
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<p><b>Calculations involving ratio</b></p> <p>Encourage children to see the multiplicative relationship between ratios. They will need to multiply or divide each value by the same number to keep the ratio equivalent. Double number lines and ratio tables help children to see both horizontal and vertical multiplicative relationships.</p>	<p>For every ... , there are ...</p> <p>For every 1 adult on a school trip, there are 6 children.</p> <p>adults </p> <p>children </p> <table border="1" data-bbox="1500 768 1825 962"> <thead> <tr><th>Adults</th><th>Children</th></tr> </thead> <tbody> <tr><td>1</td><td>6</td></tr> <tr><td>2</td><td>12</td></tr> <tr><td>3</td><td>18</td></tr> </tbody> </table> <p>The ratio of adults to children is 1 : 6</p> 		Adults	Children	1	6	2	12	3	18																								
Adults	Children																																	
1	6																																	
2	12																																	
3	18																																	

# Progression of skills - Division

Year group	Skill
Nursery	<ul style="list-style-type: none"><li>• Continue with counting and subitising skills as a foundation for later work on equal groups. (see addition and subtraction sections)</li></ul>
Reception	<ul style="list-style-type: none"><li>• Sharing</li><li>• Grouping</li></ul>
Year 1	<ul style="list-style-type: none"><li>• Make equal groups – grouping</li><li>• Make equal groups – sharing</li><li>• Find a half</li><li>• Find a quarter</li></ul>

# Progression of skills - Division

Year group	Skill
Year 2	<ul style="list-style-type: none"><li>• Divide by 2</li><li>• Divide by 10</li><li>• Divide by 5</li><li>• Missing numbers</li><li>• Unit fractions</li><li>• Non-unit fractions</li></ul>
Year 3	<ul style="list-style-type: none"><li>• Divide by 3</li><li>• Divide by 4</li><li>• Divide by 8</li><li>• Related facts</li><li>• Divide a 2-digit number by a 1-digit number - no exchange</li><li>• Divide a 2-digit number by a 1-digit number - with remainders</li><li>• Unit fractions of a set of objects</li><li>• Non-unit fractions of a set of objects</li></ul>



# Progression of skills - Division

Year group	Skill
Year 4	<ul style="list-style-type: none"><li>• Division facts to <math>12 \times 12</math></li><li>• Divide a number by 1 and itself</li><li>• Related facts</li><li>• Divide a 2 or 3-digit number by a 1-digit number</li><li>• Divide by 10 and 100</li></ul>
Year 5	<ul style="list-style-type: none"><li>• Mental strategies</li><li>• Divide numbers up to 4 digits by a 1-digit number</li><li>• Divide by 10, 100 and 1,000</li><li>• Fraction of an amount</li></ul>




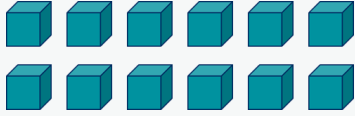




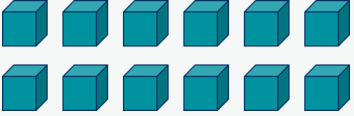
# Progression of skills - Division

Year group	Skill
Year 6	<ul style="list-style-type: none"><li>• Short division</li><li>• Mental strategies</li><li>• Long division</li><li>• Order of operations</li><li>• Divide by 10, 100 and 1,000</li><li>• Divide decimals by integers</li><li>• Decimal and fraction equivalents</li><li>• Divide a fraction by an integer</li><li>• Fraction of an amount</li><li>• Calculate percentages</li><li>• Calculations involving ratio</li></ul>

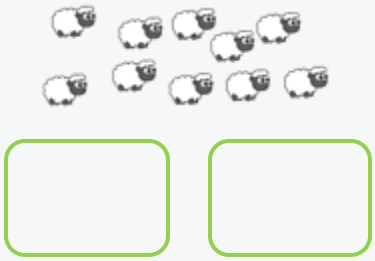
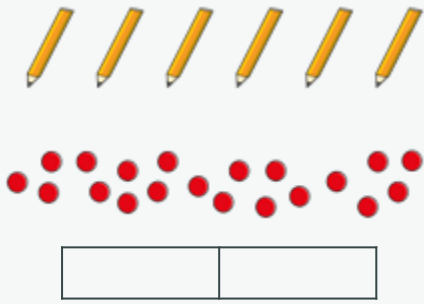
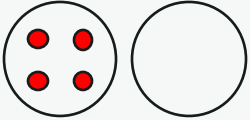
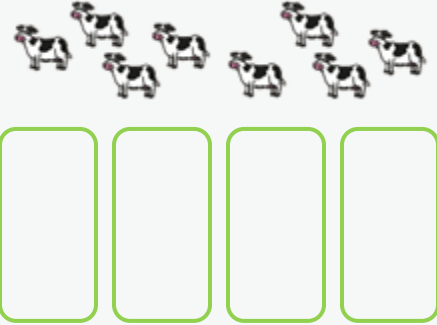
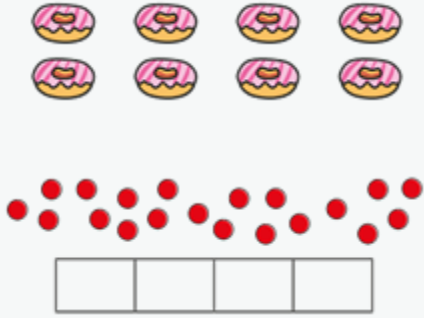
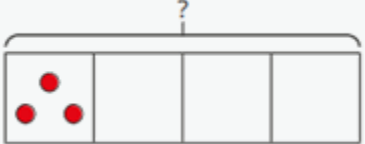
# Division

<b>Reception</b>	<ul style="list-style-type: none"><li>• Have a deep understanding of number to 10, including the composition of each number.</li><li>• Subitise (recognise quantities without counting) up to 5</li><li>• Automatically recall (without reference to rhymes, counting or other aids) number bonds up to 5 and some number bonds to 10, including double facts.</li><li>• Explore and represent patterns within numbers up to 10, including evens and odds, double facts and how quantities can be distributed equally.</li></ul>
<b>Progression of skills</b>	<b>Key representations</b>
<b>Sharing</b>  Provide practical activities such as sharing items during snack time. Encourage children to check whether items have been shared fairly (equally).	There are ... altogether. They are shared equally between ... groups.  
<b>Grouping</b>  Provide opportunities to make equal groups when tidying up or during snack time. Encourage children to check that each group has the same amount.	There are ... groups of ... There are ... altogether.  

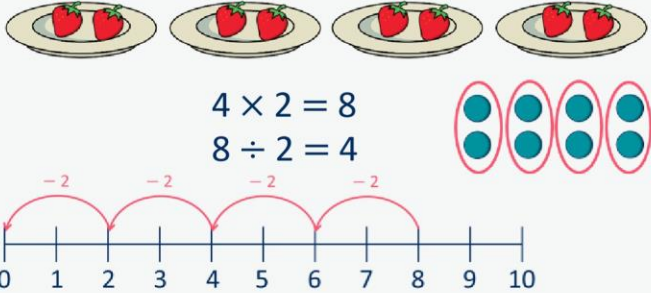
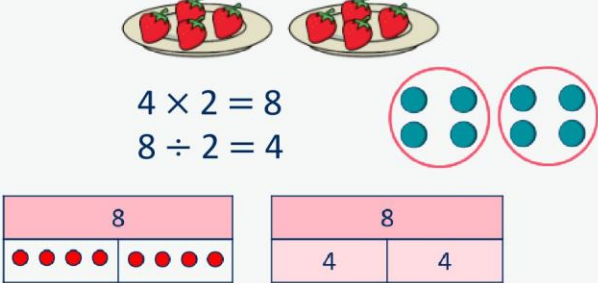
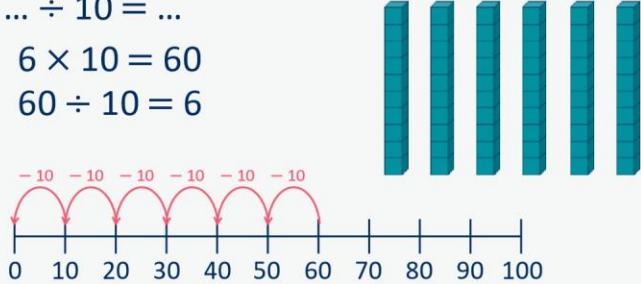
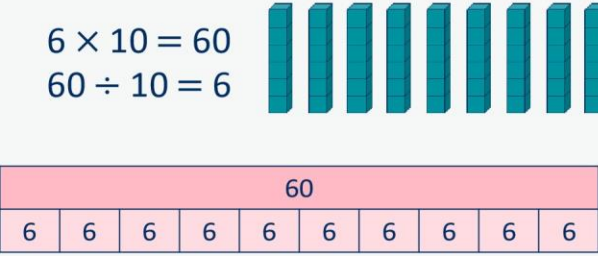
# Division

<p><b>Year 1</b></p>	<ul style="list-style-type: none"> <li>Solve simple onestep problems involving division, using concrete objects, pictorial representations and arrays with the support of the teacher.</li> <li>Recognise, find and name a half as one of two equal parts of a quantity.</li> <li>Recognise, find and name a quarter as one of four equal parts of an object, shape or quantity.</li> </ul>		
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>		
<p><b>Make equal groups–grouping</b></p> <p>Encourage children to physically move objects into equal groups. They can also circle equal groups when using pictures.</p>	<p>There are ... altogether. How many groups of ... can you make?</p>  	<p>Circle groups of 2 There are ... groups of 2</p> 	<p>Take ... cubes. Make equal groups.</p>  <p>There are ... groups of ...</p>
<p><b>Make equal groups–sharing</b></p> <p>Encourage children to check that the objects have been shared fairly and each group is the same.</p>	<p>... have been shared equally between... There are ... on/in each ...</p>    		<p>Take ... cubes. Share them between ...</p>  <p>12 shared between ... is ...</p>

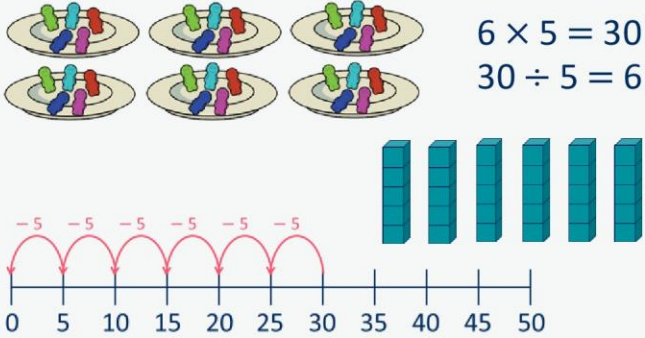
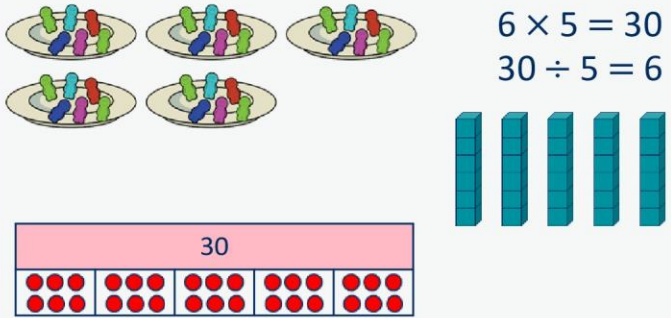
# Division

Progression of skills	Key representations		
<p><b>Find a half</b></p> <p>Start with practical opportunities to share a quantity into 2 groups. Progress to circling half of the objects in a picture and then to finding the whole from a given half.</p>	<p>To find half, I need to share into 2 equal groups.</p>  <p>There are ... in each group.</p>	<p>Half of ... is ...</p> 	<p>If ... is half, what is the whole?</p>  <p>is half of ...</p>
<p><b>Find a quarter</b></p> <p>Start with practical opportunities to share a quantity into 4 groups. Progress to using pictures or bar models to find a quarter and then to finding the whole from a given quarter.</p>	<p>To find a quarter, I need to share into 4 equal groups.</p>  <p>There are ... in each group.</p>	<p>A quarter of ... is ...</p> 	<p>If ... is one quarter, what is the whole?</p>  <p>is one quarter of ...</p>

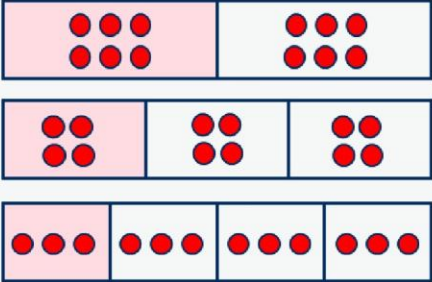

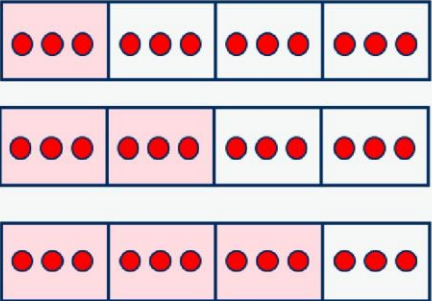
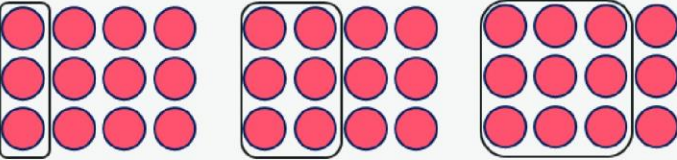
# Division

<p><b>Year 2</b></p>	<ul style="list-style-type: none"> <li>Recall and use division facts for the 2, 5 and 10 multiplication tables.</li> <li>Calculate mathematical statements for division within the multiplication tables and write them using the division (<math>\div</math>) and equals (<math>=</math>) signs.</li> <li>Recognise, find, name and write fractions <math>\frac{1}{3}</math>, <math>\frac{1}{4}</math>, <math>\frac{2}{4}</math> and <math>\frac{3}{4}</math> of a quantity.</li> </ul>	
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>	
<p><b>Divide by 2</b></p> <p>Encourage children to compare the grouping and sharing structures of division and to make links with times-table facts and halving.</p>	<p>There are ... equal groups of 2  <math>\dots \div 2 = \dots</math></p>  <p><math>4 \times 2 = 8</math>  <math>8 \div 2 = 4</math></p>	<p>... shared equally between 2 is ...          Half of ... is ...  <math>\dots \div 2 = \dots</math></p>  <p><math>4 \times 2 = 8</math>  <math>8 \div 2 = 4</math></p>
<p><b>Divide by 10</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 ... equal groups of 10  <math>\dots \div 10 = \dots</math></p> <p><math>6 \times 10 = 60</math>  <math>60 \div 10 = 6</math></p> 	<p>... shared equally between 10 is ...  <math>\dots \div 10 = \dots</math></p> <p><math>6 \times 10 = 60</math>  <math>60 \div 10 = 6</math></p> 

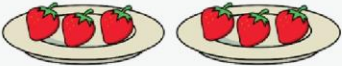
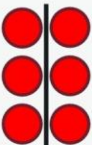
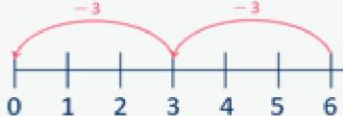


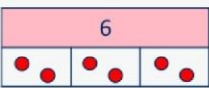
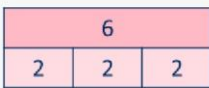

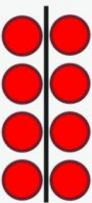


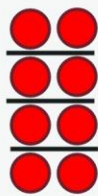
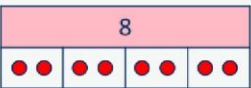
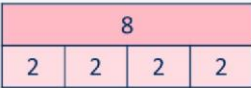
# Division

Progression of skills	Key representations																					
<p><b>Divide by 5</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 ... equal groups of 5</p> <p>... <math>\div 5 = \dots</math></p>  <p><math>6 \times 5 = 30</math> <math>30 \div 5 = 6</math></p>	<p>... shared equally between 5 is ...</p> <p>... <math>\div 5 = \dots</math></p>  <p><math>6 \times 5 = 30</math> <math>30 \div 5 = 6</math></p>																				
<p><b>Missing numbers</b></p> <p>Bar models are useful to show the link between multiplication and division.</p>	<p>... divided by 2/5/10 is equal to ...</p> <table border="1" data-bbox="576 825 762 906"> <tr><td>?</td></tr> <tr><td>10</td><td>10</td></tr> </table> $\square \div 2 = 10$ <table border="1" data-bbox="576 928 1011 1009"> <tr><td>?</td></tr> <tr><td>10</td><td>10</td><td>10</td><td>10</td><td>10</td></tr> </table> $\square \div 5 = 10$ <table border="1" data-bbox="576 1031 1350 1112"> <tr><td>?</td></tr> <tr><td>10</td><td>10</td><td>10</td><td>10</td><td>10</td><td>10</td><td>10</td><td>10</td><td>10</td><td>10</td></tr> </table> $\square \div 10 = 10$		?	10	10	?	10	10	10	10	10	?	10	10	10	10	10	10	10	10	10	10
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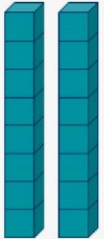
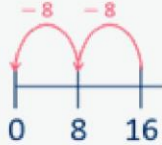
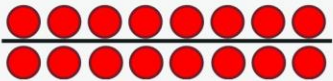

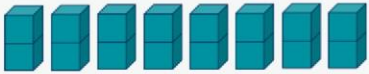
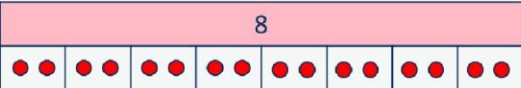

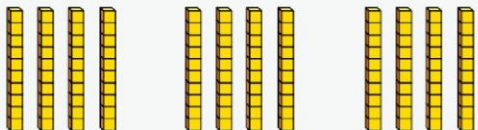
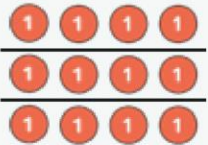

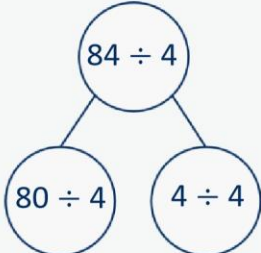
# Division

Progression of skills	Key representations	
<p><b>Unit fractions</b></p> <p>In Y2 the focus is on finding <math>\frac{1}{2}</math>, <math>\frac{1}{4}</math> and <math>\frac{1}{3}</math></p> <p>Bar models are useful to show the link between division and finding a fraction.</p>	<p>The objects have been shared fairly into ... groups.</p> <p><math>\frac{1}{\square}</math> of ... is ...</p> 	<p>There are ... equal parts.</p> <p>There is ... part circled.</p> <p><math>\frac{1}{\square}</math> is circled.</p> 
<p><b>Non-unit fractions</b></p> <p>In Y2 the focus is on finding <math>\frac{2}{4}</math> and <math>\frac{3}{4}</math></p> <p>Prompt children to notice that <math>\frac{2}{4}</math> is equivalent to <math>\frac{1}{2}</math></p>	<p>The objects have been shared fairly into ... groups.</p> <p><math>\frac{\square}{\square}</math> of ... is ...</p> 	<p>There are ... equal parts.</p> <p>There are ... parts circled.</p> <p><math>\frac{\square}{\square}</math> is circled.</p> 

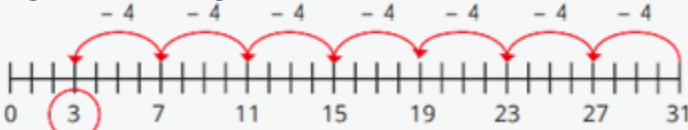

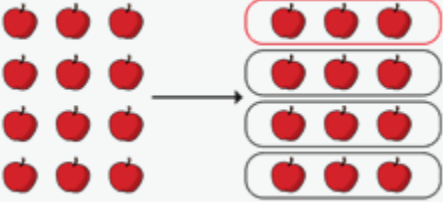
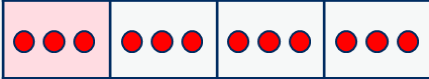

# Division

<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 3 in ...</p> <p>... <math>\div 3 =</math></p>  <p><math>2 \times 3 = 6</math> <math>6 \div 3 = 2</math></p>  	<p>... has been shared equally into 3 equal groups.</p> <p>... <math>\div 3 =</math></p>  <p><math>2 \times 3 = 6</math> <math>6 \div 3 = 2</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 4 in ...</p> <p>... <math>\div 4 =</math></p>  <p><math>2 \times 4 = 8</math> <math>8 \div 4 = 2</math></p>  	<p>... has been shared equally into 4 equal groups.</p> <p>... <math>\div 4 =</math></p>  <p><math>2 \times 4 = 8</math> <math>8 \div 4 = 2</math></p>   

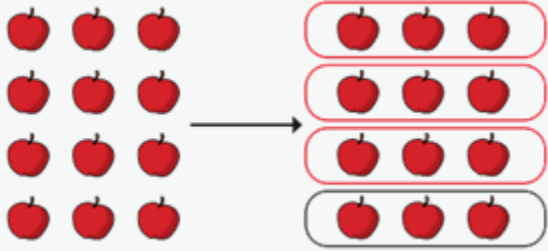
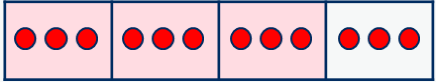

# Division

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 8 in ...</p> <p><math>\dots \div 8 =</math></p>  <p><math>2 \times 8 = 16</math> <math>16 \div 8 = 2</math></p>  	<p>... has been shared equally into 8 equal groups.</p> <p><math>\dots \div 8 =</math></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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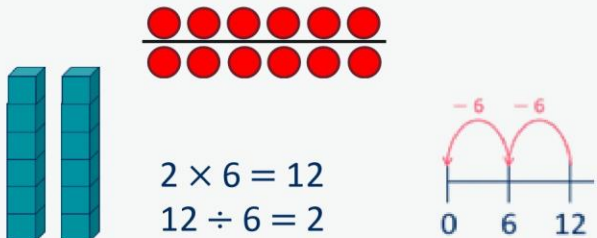
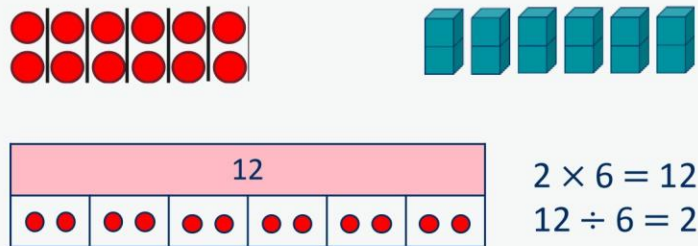




# Division

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="590 492 948 825"> <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="977 482 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>10 10</td><td></td></tr> <tr><td>10 10</td><td></td></tr> <tr><td>10 10</td><td></td></tr> <tr><td>10 10</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>10 10</td><td>1 1 1</td></tr> <tr><td>10 10</td><td>1 1 1</td></tr> <tr><td>10 10</td><td>1 1 1</td></tr> <tr><td>10 10</td><td>1 1 1</td></tr> </tbody> </table>	Tens	Ones	10 10		10 10		10 10		10 10		Tens	Ones	10 10	1 1 1	10 10	1 1 1	10 10	1 1 1	10 10	1 1 1
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<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> 																																		




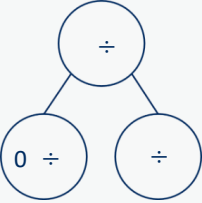
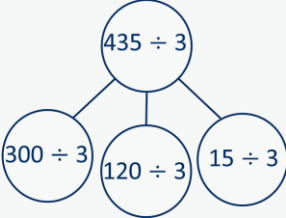
# Division

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 ...</p> <p><math>\dots \div \dots =</math></p>  <p><math>2 \times 6 = 12</math> <math>12 \div 6 = 2</math></p>	<p>... has been shared equally into ... equal groups.</p> <p><math>\dots \div \dots =</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> 

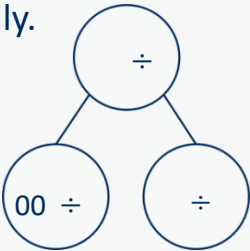
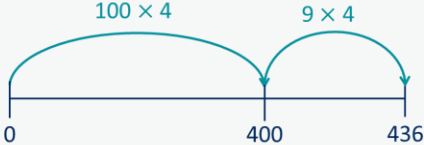
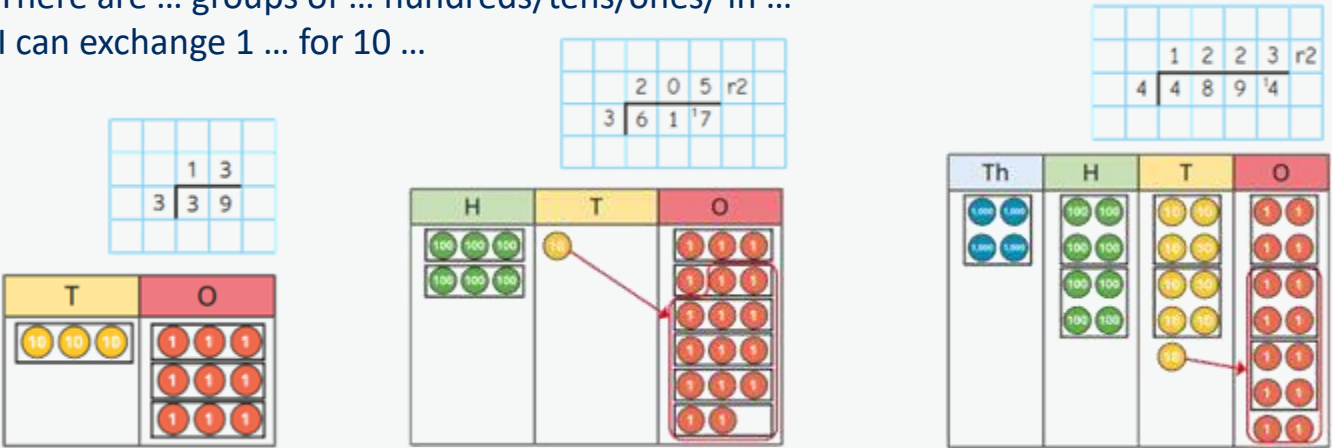
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Progression of skills	Key representations																										
<p><b>Related facts</b></p> <p>Link to known timestable facts.</p>	<p>... ÷ ... is equal to ...            so ... tens ÷ ... is equal to ... tens            and ... hundreds ÷ ... is equal to ... hundreds.</p> <div style="display: flex; justify-content: space-around; align-items: flex-start;"> <div style="text-align: center;">  <p>21 ÷ 7 = 3</p> </div> <div style="text-align: center;">  <p>210 ÷ 7 = 30</p> </div> <div style="text-align: center;">  <p>2,100 ÷ 7 = 300</p> </div> </div> <div style="display: flex; justify-content: space-around; align-items: flex-start; margin-top: 20px;"> <div style="text-align: center;"> <p>21 ÷ 3 = 7</p> <p>210 ÷ 3 = 70</p> <p>2,100 ÷ 3 = 700</p> </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; margin-bottom: 10px;">  <div style="margin-left: 20px;"> <p>80 ÷ 4 = 20</p> <p>4 ÷ 4 = 1</p> <p>84 ÷ 4 = 21</p> </div> </div> <table border="1" style="margin-left: auto; margin-right: auto;"> <thead> <tr> <th style="background-color: #fff9c4;">Tens</th> <th style="background-color: #f8bbd0;">Ones</th> </tr> </thead> <tbody> <tr><td style="text-align: center;">10 10</td><td style="text-align: center;">1</td></tr> <tr><td style="text-align: center;">10 10</td><td style="text-align: center;">1</td></tr> <tr><td style="text-align: center;">10 10</td><td style="text-align: center;">1</td></tr> <tr><td style="text-align: center;">10 10</td><td style="text-align: center;">1</td></tr> </tbody> </table>	Tens	Ones	10 10	1	10 10	1	10 10	1	10 10	1	<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; margin-bottom: 10px;">  <div style="margin-left: 20px;"> <p>300 ÷ 3 = 100</p> <p>120 ÷ 3 = 40</p> <p>15 ÷ 3 = 5</p> <p>435 ÷ 3 = 145</p> </div> </div> <table border="1" style="margin-left: auto; margin-right: auto;"> <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 style="text-align: center;">100</td><td style="text-align: center;">10 10 10 10</td><td style="text-align: center;">1 1 1 1 1</td></tr> <tr><td style="text-align: center;">100</td><td style="text-align: center;">10 10 10 10</td><td style="text-align: center;">1 1 1 1 1</td></tr> <tr><td style="text-align: center;">100</td><td style="text-align: center;">10 10 10 10</td><td style="text-align: center;">1 1 1 1 1</td></tr> <tr><td style="text-align: center;">100</td><td style="text-align: center;">10</td><td style="text-align: center;">10</td></tr> </tbody> </table>	Hundreds	Tens	Ones	100	10 10 10 10	1 1 1 1 1	100	10 10 10 10	1 1 1 1 1	100	10 10 10 10	1 1 1 1 1	100	10	10
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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 data-bbox="576 419 847 535"> </div> <div data-bbox="880 419 1239 535"> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div data-bbox="576 558 847 674"> </div> <div data-bbox="880 558 1239 674"> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div data-bbox="617 711 816 746"><math>2 \div 10 = 0.2</math></div> <div data-bbox="955 711 1174 746"><math>12 \div 10 = 1.2</math></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 data-bbox="1276 419 1547 535"> </div> <div data-bbox="1580 419 1939 535"> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div data-bbox="1276 558 1547 674"> </div> <div data-bbox="1580 558 1939 674"> </div> </div> <div style="display: flex; justify-content: space-around; margin-top: 10px;"> <div data-bbox="1303 711 1541 746"><math>2 \div 100 = 0.02</math></div> <div data-bbox="1638 711 1897 746"><math>12 \div 100 = 0.12</math></div> </div>	

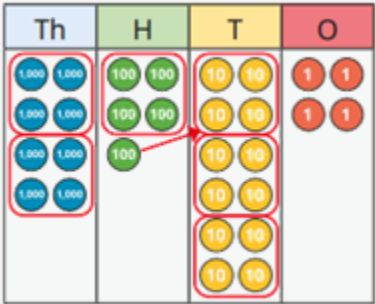
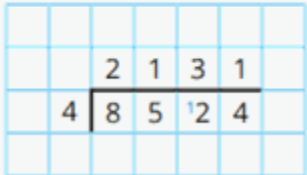
# Division

<p><b>Year 5</b></p>	<ul style="list-style-type: none"> <li>• Divide numbers mentally drawing upon known facts.</li> <li>• Divide numbers up to 4 digits by a one digit number using the formal written method of short division and interpret remainders appropriately for the context.</li> <li>• Divide whole numbers and those involving decimals by 10, 100 and 1,000</li> </ul>		
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>		
<p><b>Mental strategies</b></p>	<p>I can partition ... into ... and ... to help me to divide more easily.</p> 	<p>I can show groups of ... on a number line.</p> 	<p>To divide by ..., I can divide by ... and then divide the result by ...</p> $436 \div 4 = 436 \div 2 \div 2$ $436 \div 2 = 218$ $218 \div 2 = 109$
<p><b>Divide numbers up to 4 digits by a 1-digit number</b></p> <p>The short division method is introduced for the first time.</p>	<p>There are ... groups of ... hundreds/tens/ones/ in ... I can exchange 1 ... for 10 ...</p> 		

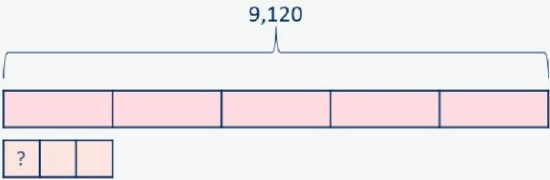
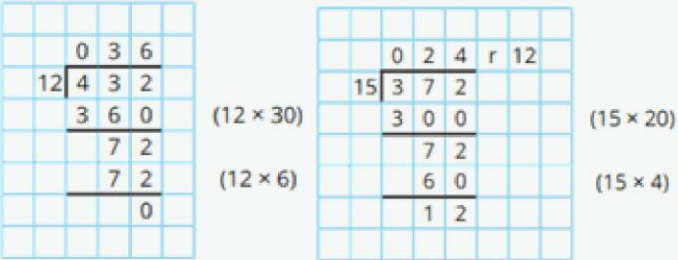
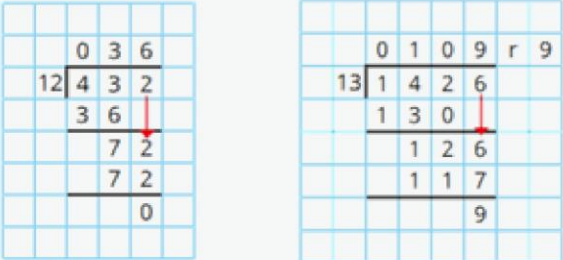
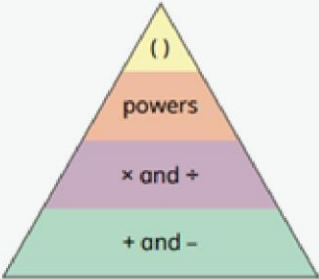


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Progression of skills	Key representations																																					
<p><b>Divide by 10, 100 and 1,000</b></p> <p>Encourage children to notice that dividing by 100 is the same as dividing by 10 twice, and that dividing by 1,000 is the same as dividing by 10 three times.</p>	<p>To divide by 10/100/1,000, I move all the digits ... places to the right. ... is one-tenth/one-hundredth/onethousandth the size of ...</p> <table border="1" data-bbox="582 376 1006 468"> <tr><th>Th</th><th>H</th><th>T</th><th>O</th><th>Tth</th><th>Hth</th></tr> <tr><td></td><td>●</td><td>●●</td><td>●</td><td></td><td></td></tr> </table> <p><math>120 \div 10 = 12</math></p> <table border="1" data-bbox="582 482 1006 574"> <tr><th>Th</th><th>H</th><th>T</th><th>O</th><th>Tth</th><th>Hth</th></tr> <tr><td></td><td></td><td>●</td><td>●●</td><td>●</td><td></td></tr> </table> <p><math>120 \div 100 = 1.2</math></p> <table border="1" data-bbox="582 588 1006 679"> <tr><th>Th</th><th>H</th><th>T</th><th>O</th><th>Tth</th><th>Hth</th></tr> <tr><td></td><td></td><td></td><td>●</td><td>●●</td><td>●</td></tr> </table> <p><math>120 \div 1,000 = 0.12</math></p>		Th	H	T	O	Tth	Hth		●	●●	●			Th	H	T	O	Tth	Hth			●	●●	●		Th	H	T	O	Tth	Hth				●	●●	●
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<p><b>Fraction of an amount</b></p> <p>Bar models support children to understand that to find a fraction of an amount, we divide by the denominator and multiply by the numerator.</p>	<p>To find <math>\frac{\square}{\square}</math> of ... , I need to divide by ... and multiply by ...</p> <table border="1" data-bbox="582 953 965 1031"> <tr><td>●●</td><td>●●</td><td>●●</td><td>●●</td><td>●●</td></tr> <tr><td>●●</td><td>●●</td><td>●●</td><td>●●</td><td>●●</td></tr> </table> <p><math>\frac{1}{1}</math> of 20 =</p> <p>— of 20 =</p>	●●	●●	●●	●●	●●	●●	●●	●●	●●	●●	<p>If <math>\frac{1}{\square}</math> is ... , then the whole is ...<math>\times</math> ...</p> <table border="1" data-bbox="1353 896 1649 1025"> <tr><td></td><td>?</td></tr> <tr><td>6</td><td>6</td><td>6</td><td>6</td><td>6</td></tr> </table> <p><math>\frac{1}{\square}</math> of ___ = 6</p> <table border="1" data-bbox="1353 1068 1690 1239"> <tr><td></td><td>?</td></tr> <tr><td>■</td><td>■</td><td>■</td><td>■</td><td>■</td><td>■</td><td>■</td></tr> <tr><td colspan="4">24</td></tr> </table> <p><math>\frac{1}{7}</math> of ___ = 24</p>		?	6	6	6	6	6		?	■	■	■	■	■	■	■	24									
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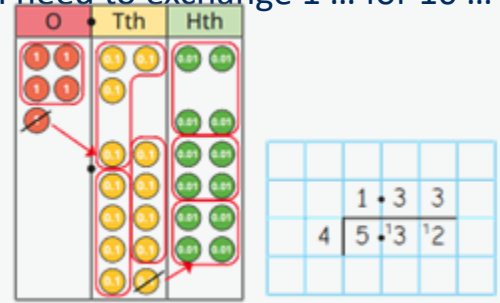
# Division

<p><b>Year 6</b></p>	<ul style="list-style-type: none"> <li>• Perform mental calculations, including with mixed operations and large numbers.</li> <li>• Divide numbers up to 4 digits by a twødigit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.</li> <li>• Divide numbers up to 4 digits by a twødigit number using the formal written method of short division where appropriate, interpreting remainders according to the context.</li> <li>• Divide numbers by 10, 100 and 1,000 giving answers up to three decimal places.</li> <li>• Use written division methods in cases where the answer has up to two decimal places.</li> <li>• Associate a fraction with division and calculate decimal fraction equivalents.</li> <li>• Divide proper fractions by whole numbers [for example <math>\frac{1}{2} \div 2 = \frac{1}{4}</math> ]</li> <li>• Solve problems involving the calculation of percentages.</li> </ul>
<p><b>Progression of skills</b></p>	<p><b>Key representations</b></p>
<p><b>Short division</b></p> <p>Encourage children to interpret remainders in context, for example knowing that “ remainder 1” could mean complete boxes with 1 left over so 5 boxes will be needed.</p>	<p>There are ... groups of ... hundreds/tens/ones/ in ... I can exchange 1 ... for 10 ...</p>  

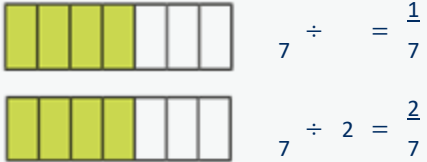


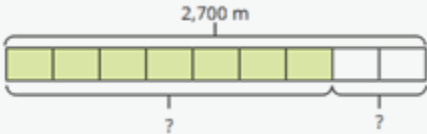

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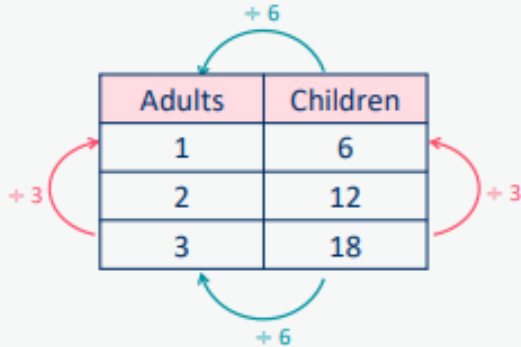
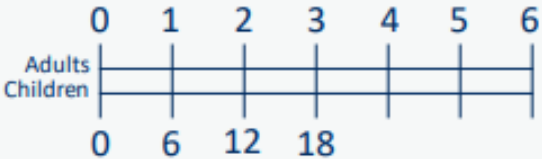
Progression of skills	Key representations	
<p><b>Mental strategies</b></p> <p>Include partitioning and number line strategies outlined in Y5 as well as division using factors.</p>	<p>To divide by ... , I can first divide by ... and then divide the answer by ...</p> <p> <math>240 \div 60 = 240 \div 10 \div 6</math>  <math>240 \rightarrow \boxed{+10} \rightarrow \square \rightarrow \boxed{+6} \rightarrow \square</math> </p> <p> <math>480 \div 24 = 480 \div 4 \div 6</math>  <math>480 \rightarrow \boxed{+4} \rightarrow \square \rightarrow \boxed{+6} \rightarrow \square</math> </p> <p> <math>9,120 \div 15 = 9,120 \div 5 \div 3</math> </p> 	
<p><b>Long division</b></p> <p>The long division method is introduced for the first time. Two alternative methods are shown.</p>	<p><b>Method 1</b></p> 	<p><b>Method 2</b></p> 
<p><b>Order of operations</b></p> <p>Calculations in brackets should be done first, then powers. Multiplication and division should be performed before addition and subtraction.</p>	<p>... has greater priority than ..., so the first part of the calculation I need to do is ...</p>  <p>  <math>(6 + 4) \div 2 = 5</math> </p> <p>  <math>6 + 4 \div 2 = 8</math> </p>	

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<p><b>Divide by 10, 100 and 1,000</b></p> <p>Encourage children to notice that dividing by 100 is the same as dividing by 10 twice, and that dividing by 1,000 is the same as dividing by 10 three times.</p>	<p>To divide by ... , I move the digits ... places to the right.</p> <div style="display: flex; align-items: center;"> <table border="1" style="margin-right: 20px;"> <tr><th>H</th><th>T</th><th>O</th><th>Tth</th><th>Hth</th><th>Thth</th></tr> <tr><td>●●</td><td>●</td><td>●●</td><td></td><td></td><td></td></tr> </table> <div style="text-align: center;"> <math>\downarrow +1,000</math> </div> <table border="1" style="margin-right: 20px;"> <tr><th>H</th><th>T</th><th>O</th><th>Tth</th><th>Hth</th><th>Thth</th></tr> <tr><td></td><td></td><td></td><td>●●</td><td>●</td><td>●●</td></tr> </table> <div style="margin-left: 20px;"> <math>312 \div 10 = 31.2</math>  <math>312 \div 100 = 3.12</math>  <math>312 \div 1,000 = 0.312</math> </div> </div> <div style="margin-left: 200px;"> <math>906 \div 10 = 90.6</math>  <math>906 \div 100 = 9.06</math>  <math>906 \div 1,000 = 0.906</math> </div>		H	T	O	Tth	Hth	Thth	●●	●	●●				H	T	O	Tth	Hth	Thth				●●	●	●●
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<p><b>Divide decimals by integers</b></p> <p>This is the first time children divide decimals by numbers other than 10, 100 or 1,000</p>	<p>I know that ... <math>\div</math> ... = ..., so I also know that ... <math>\div</math> ... = ...</p> <div style="display: flex; justify-content: space-around; align-items: center;"> <div style="text-align: center;">  <p><math>39 \div 3 = 13</math></p> </div> <div style="text-align: center;">  <p><math>3.9 \div 3 = 1.3</math></p> </div> <div style="text-align: center;">  <p><math>0.39 \div 3 = 0.13</math></p> </div> </div>	<p>I need to exchange 1 ... for 10 ...</p> 																								
<p><b>Decimal and fraction equivalents</b></p>	<p>The fraction ... is equivalent to the decimal ...</p> <div style="display: flex; justify-content: space-around;"> <table border="1" style="text-align: center;"> <tr><td colspan="2">1</td></tr> <tr><td><math>\frac{1}{2}</math></td><td><math>\frac{1}{2}</math></td></tr> <tr><td><math>\frac{1}{4}</math></td><td><math>\frac{1}{4}</math></td></tr> <tr><td><math>\frac{1}{5}</math></td><td><math>\frac{1}{5}</math></td></tr> <tr><td><math>\frac{1}{10}</math></td><td><math>\frac{1}{10}</math></td></tr> </table> <table border="1" style="text-align: center;"> <tr><td colspan="2">1</td></tr> <tr><td>0.5</td><td>0.5</td></tr> <tr><td>0.25</td><td>0.25</td></tr> <tr><td>0.2</td><td>0.2</td></tr> <tr><td>0.1</td><td>0.1</td></tr> </table> </div> <p><math>\frac{1}{5} = 0.2</math>    <math>\frac{2}{5} = 0.4</math>    <math>\frac{3}{5} = 0.6</math></p> <div style="margin-left: 200px;"> <math>\frac{3}{4}</math> is equal to <math>\frac{\square}{100}</math>  <math>\frac{3}{4} \times 25 = \frac{75}{100} = 0.75</math> </div>		1		$\frac{1}{2}$	$\frac{1}{2}$	$\frac{1}{4}$	$\frac{1}{4}$	$\frac{1}{5}$	$\frac{1}{5}$	$\frac{1}{10}$	$\frac{1}{10}$	1		0.5	0.5	0.25	0.25	0.2	0.2	0.1	0.1				
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0.5	0.5																									
0.25	0.25																									
0.2	0.2																									
0.1	0.1																									

Division

Progression of skills	Key representations		
<p><b>Divide a fraction by an integer</b></p> <p>This is the first time children divide fractions by an integer.</p>	<p>... ones divided by 2 is ... ones so ... sevenths divided by 2 is ... sevenths.</p>  <p><math>\frac{1}{7} \div 2 = \frac{1}{14}</math></p> <p><math>\frac{2}{7} \div 2 = \frac{1}{7}</math></p>	<p>I am dividing by ... , so I can split each part into ... equal parts.</p>  <p><math>\frac{1}{7} \div 2 = \frac{1}{14}</math></p>	<p>... is equivalent to ... so ... <math>\div</math> ... = ... <math>\div</math> ...</p>  <p><math>\frac{2}{7} \div 2 = \frac{1}{7}</math></p> <p>so <math>\frac{2}{7} \div 2 = \frac{1}{7}</math></p>
<p><b>Fraction of an amount</b></p> <p>Children divide and multiply to find fractions of an amount. Bar models can still be used to support understanding where needed.</p>	<p>To find <math>\frac{1}{\square}</math> I divide by ...</p> <p><math>\frac{1}{2}</math> of ... = ... <math>\div</math> 2</p> <p><math>\frac{1}{12}</math> of 36 = ... <math>\div</math> 12</p>	<p>If <math>\frac{1}{\square}</math> is equal to ..., then <math>\square</math> are equal to ...</p>  <p><math>\frac{1}{7}</math> of 2,700 = <math>\frac{1}{7}</math> of 2,700 <math>\times</math> 7</p>	<p>If <math>\square</math> is equal to ..., then the whole is equal to ...</p>  <p>48 of ... = 48</p>

Progression of skills	Key representations																																	
<p><b>Calculate percentages</b></p> <p>Children first learn how to find 1%, 10%, 20%, 25% and 50% before using multiples of these amounts to find any percentage.</p>	<p>There are ... lots of ... % in 100%</p> <p>To find ... %, I need to divide by ...</p> <table border="1" data-bbox="582 396 1094 511"> <tr><td colspan="4">100%</td></tr> <tr><td colspan="2">50%</td><td colspan="2">50%</td></tr> <tr><td>25%</td><td>25%</td><td>25%</td><td>25%</td></tr> </table> <p>50% of ... = ... <math>\div</math> 2 25% of ... = ... <math>\div</math> 4</p>	100%				50%		50%		25%	25%	25%	25%	<p>... % is made up of ... %, and ... %</p> <table border="1" data-bbox="1156 382 1929 472"> <tr><td colspan="10">100%</td></tr> <tr><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td><td>10%</td></tr> </table> <p>To find 30%, I can find 10% and then multiply it by 3 To find 23%, I can use 10% <math>\times</math> 2 and 1% <math>\times</math> 3 To find 99%, I can find 1%, then subtract from 100%</p>	100%										10%	10%	10%	10%	10%	10%	10%	10%	10%	10%
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10%	10%	10%	10%	10%	10%	10%	10%	10%	10%																									
<p><b>Calculations involving ratio</b></p> <p>Encourage children to see the multiplicative relationship between ratios. They will need to multiply or divide each value by the same number to keep the ratio equivalent. Double number lines and ratio tables help children to see both horizontal and vertical multiplicative relationships.</p>	<p>For every ... , there are ...</p> <p>For every 6 children on a school trip, there is 1 adult.</p> <p>adults </p> <p>children </p> <table border="1" data-bbox="1520 796 1852 991"> <thead> <tr><th>Adults</th><th>Children</th></tr> </thead> <tbody> <tr><td>1</td><td>6</td></tr> <tr><td>2</td><td>12</td></tr> <tr><td>3</td><td>18</td></tr> </tbody> </table> <p>The ratio of children to adults is 6 : 1</p>  		Adults	Children	1	6	2	12	3	18																								
Adults	Children																																	
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3	18																																	

# Times Table Policy

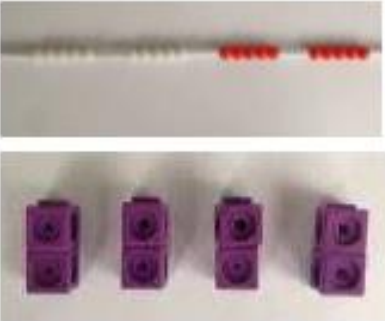
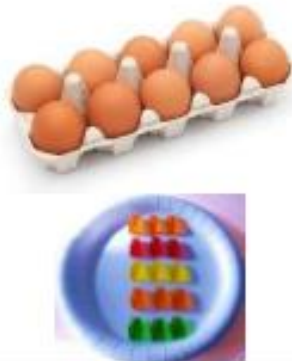
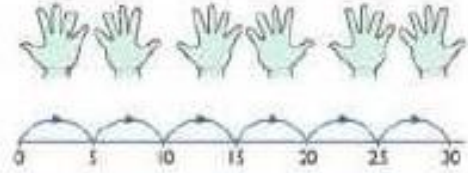

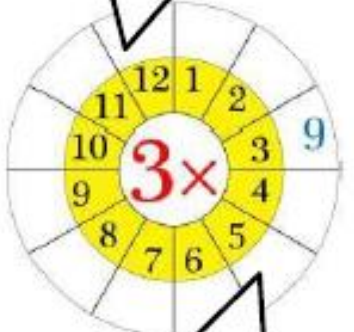
## TIMES IT!

The National Curriculum 2014 states that: *“By the end of year 4, pupils should have memorised their multiplication tables up to and including the 12 multiplication table and show precision and fluency in their work.”* The importance of times tables and their links across other mathematical concepts is clear and at Abbey Gates, we also understand the importance of reducing cognitive load to enable all children to access the learning with confidence and efficiency. Research suggests that if times tables are embedded in long term memory, the cognitive load of mathematical questions are reduced, therefore it is important that children develop their efficiency in recalling times tables facts. Once the children have learnt their times tables by heart, they are then able to work far more confidently and efficiently through a wide range of more advanced calculations. At Abbey Gates Primary School, we believe that through a variety of interactive, visual, engaging and rote learning techniques, most children can achieve the full times table knowledge by the time they leave Year 4 and enter Year 5.

Reception	Year 1	Year 2	Year 3	Year 4	Year 5 and 6
I can count in steps of 1 I can count in steps of 2 I can count in steps of 10 I can count in steps of 5	I can count in steps of 2 I can count in steps of 5 I can count in steps of 10 I know my 1 times table I know my 10 times table	I know my 2 times table I know my 5 times table I know my 10 times table I can count in steps of 3	I know my 3 times table I know my 4 times table I know my 8 times table I know my 11 times table I know related division facts	I know my 6 times table I know my 7 times table I know my 8 times table I know my 12 times table I know related division facts	Regular consolidation of all multiplication and division facts.

At Abbey Gates, we advocate Third Space learnings approach for [‘How to Learn Times Tables: Teaching Pupils For Instant Recall From KS1 To KS2’](#)

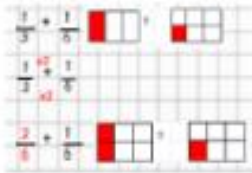
## Process of teaching times tables

<p>Children will be taught the concept of multiplication using practical resources.</p>	<p>Children will progress on to using number lines or pictures.</p>	<p>Children will count in multiple steps.</p>	<p>Children will recite times tables by rote. Links will be made with 'grouping' and division whilst times tables are being taught.</p>																								
<p style="text-align: center;"><b>Concrete</b> <b>BUILD IT! / USE IT!</b></p>	<p style="text-align: center;"><b>Pictorial</b> <b>DRAW IT!</b></p>	<p style="text-align: center;"><b>Abstract stage 1</b> <b>SOLVE IT!</b></p>	<p style="text-align: center;"><b>Abstract stage 2</b> <b>PRACTISE IT!</b></p>																								
<p>Count in multiples supported by concrete objects in equal groups.</p>  <p>Use real-life arrays or build arrays.</p>  <div style="border: 1px solid black; padding: 5px; width: fit-content; margin-top: 10px;"> <p>Identify how many in each row and refer to links with division.</p> </div>	<p>Use a number line or pictures to continue support in counting in multiples.</p>  <div style="text-align: center; margin-top: 20px;"> <math>3 \times 2 = 6</math>   </div> <div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: fit-content; margin: 10px auto;"> <p>What do you notice?</p> </div> <div style="border: 1px solid black; padding: 5px; width: fit-content; margin: 10px auto;"> <p>Link to division – how many equal groups?</p> </div> <div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: fit-content; margin: 10px auto;"> <p>Link multiplication and division facts.</p> </div>	<p>Count in multiples of a number aloud.</p> <p>Write sequences with multiples of numbers.</p> <p>2, 4, 6, 8, 10 5, 10, 15, 20, 25, 30</p> <p>Record multiplication number sentences.</p> <table style="font-family: monospace; border-collapse: collapse;"> <tr><td style="padding: 2px;"><math>1 \times 7 = 7</math></td><td style="padding: 2px;"><math>7 + 7 = 14</math></td></tr> <tr><td style="padding: 2px;"><math>2 \times 7 = 14</math></td><td style="padding: 2px;"><math>14 + 7 = 21</math></td></tr> <tr><td style="padding: 2px;"><math>3 \times 7 = 21</math></td><td style="padding: 2px;"><math>21 + 7 = 28</math></td></tr> <tr><td style="padding: 2px;"><math>4 \times 7 = 28</math></td><td style="padding: 2px;"><math>28 + 7 = 35</math></td></tr> <tr><td style="padding: 2px;"><math>5 \times 7 = 35</math></td><td style="padding: 2px;"><math>35 + 7 = 42</math></td></tr> <tr><td style="padding: 2px;"><math>6 \times 7 = 42</math></td><td style="padding: 2px;"><math>42 + 7 = 49</math></td></tr> <tr><td style="padding: 2px;"><math>7 \times 7 = 49</math></td><td style="padding: 2px;"><math>49 + 7 = 56</math></td></tr> <tr><td style="padding: 2px;"><math>8 \times 7 = 56</math></td><td style="padding: 2px;"><math>56 + 7 = 63</math></td></tr> <tr><td style="padding: 2px;"><math>9 \times 7 = 63</math></td><td style="padding: 2px;"><math>63 + 7 = 70</math></td></tr> <tr><td style="padding: 2px;"><math>10 \times 7 = 70</math></td><td style="padding: 2px;"><math>70 + 7 = 77</math></td></tr> <tr><td style="padding: 2px;"><math>11 \times 7 = 77</math></td><td style="padding: 2px;"><math>77 + 7 = 84</math></td></tr> <tr><td style="padding: 2px;"><math>12 \times 7 = 84</math></td><td style="padding: 2px;"><math>84 + 7 = 91</math></td></tr> </table>	$1 \times 7 = 7$	$7 + 7 = 14$	$2 \times 7 = 14$	$14 + 7 = 21$	$3 \times 7 = 21$	$21 + 7 = 28$	$4 \times 7 = 28$	$28 + 7 = 35$	$5 \times 7 = 35$	$35 + 7 = 42$	$6 \times 7 = 42$	$42 + 7 = 49$	$7 \times 7 = 49$	$49 + 7 = 56$	$8 \times 7 = 56$	$56 + 7 = 63$	$9 \times 7 = 63$	$63 + 7 = 70$	$10 \times 7 = 70$	$70 + 7 = 77$	$11 \times 7 = 77$	$77 + 7 = 84$	$12 \times 7 = 84$	$84 + 7 = 91$	<p>Recite times tables by rote orally.</p> <div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: fit-content; margin: 10px auto;"> <p>3 times 3 equals 9, so 9 divided by 3 equals 3. One third of 9 equals 3.</p> </div>  <div style="border: 1px solid black; border-radius: 50%; padding: 10px; width: fit-content; margin: 10px auto;"> <p>If you know 3 times 3 equals 9, what else do you know? <math>90 \div 30 = 3</math></p> </div>
$1 \times 7 = 7$	$7 + 7 = 14$																										
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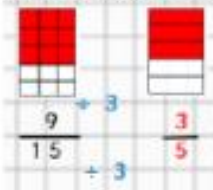


### Adding, subtracting, multiplying and dividing fractions

$$\frac{3}{4} \times \frac{2}{3} = \frac{6}{12}$$

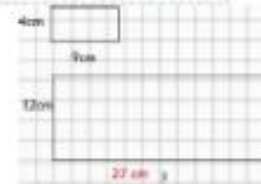


### Simplifying fractions



### Using scale factors

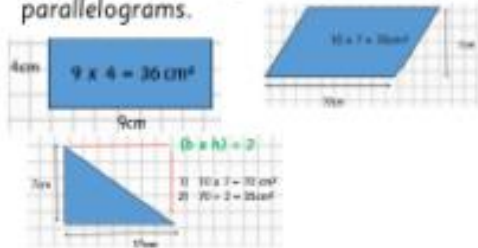
2 people	1 person	5 people
6 eggs	$6 \div 2 = 3$ eggs	$3 \times 5 = 15$ eggs
100g flour	$100 \div 2 = 50$ g	$50 \times 5 = 250$ g



### Finding a fraction or a percentage of a number

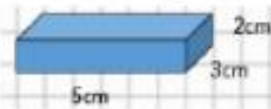


### Finding the area of rectangles, triangles and parallelograms.



Why are times tables useful?

### Calculating volume



### Calculating ratio

A prize is shared in a ratio of 3 : 4 between Jamie and Dan. If Jamie gets £21, how much will Dan get?

Jamie : Dan  
3 : 4  
21 : 28

### Using known facts

If  $3 \times 2 = 6$ , then  
 $3 \times 20 = 60$   
 $30 \times 2 = 60$   
 $30 \times 20 = 600$

### Using algebraic rules

- 1st term:  $5 \times 1 - 4 = 1$
- 2nd term:  $5 \times 2 - 4 = 6$
- 3rd term:  $5 \times 3 - 4 = 11$
- 4th term:  $5 \times 4 - 4 = 16$
- 5th term:  $5 \times 5 - 4 = 21$

### Converting between mixed and improper fractions

$$1\frac{3}{4} = \frac{7}{4}$$

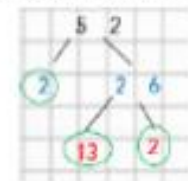
### Convert between miles and kilometres

- To convert km to miles:
- 5 miles 8km: 1) Divide by 8 (48 = 8x6)
  - 2) Multiply by 5 (6 x 5 = 30)
  - 30 miles 48km

### Short and long division

$$5 \overline{) 625}$$

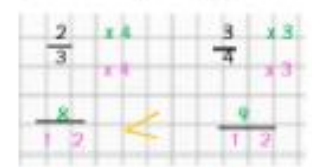
### Finding prime factors



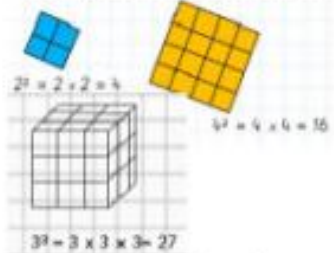
### Factors and common factors

1 x 4 = 4	1 x 3 = 3
2 x 2 = 4	2 x 1 = 2
3 x 1 = 3	3 x 1 = 3
4 x 1 = 4	4 x 1 = 4
6 x 1 = 6	6 x 1 = 6

### Ordering and comparing fractions



### Square and cube numbers



### Identifying prime and composite numbers

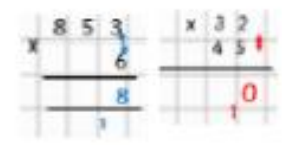
A prime number is a whole number greater than 1 with no divisors except 1 and itself.

1	2	3	4	5	6	7	8	9	10

### Multiples and common multiples

- Multiples of 3: 3, 6, 9, 12, 15, 18, 21, 24
- Multiples of 4: 4, 8, 12, 16, 20, 24, 28, 32

### Short and long multiplication



@SarahFarrellKS2