

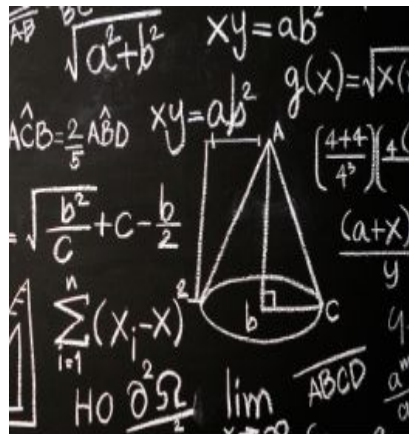
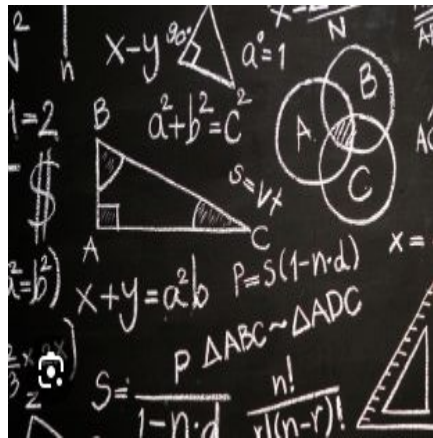


White Rose
MATHS

Primary maths

Calculation policy

Updated September 2024



Elmhurst Junior School has adopted the White Rose calculation policy to support pupils progression in mathematics across the Year groups.

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

Progression of skills - Multiplication

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




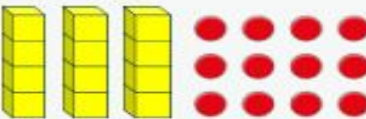


Progression of skills - Multiplication

Year group	Skill
Year 5	<ul style="list-style-type: none">• Multiples and factors• Square and cube numbers• Multiply numbers up to 4 digits by a 1-digit number• Multiply numbers up to 4 digits by a 2-digit number• Multiply by 10, 100 and 1,000• Mental strategies• Multiply fractions by a whole number• Multiply mixed numbers by a whole number• Find the whole

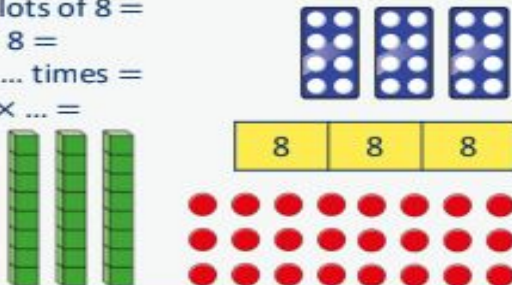

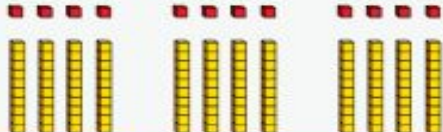

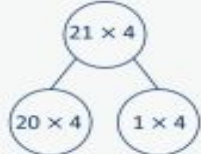
Progression of skills - Multiplication

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





























Multiplication

Year 3	<ul style="list-style-type: none">Recall and use multiplication facts for the 3, 4 and 8 multiplication tables.Write and calculate mathematical statements for multiplication using the multiplication tables that they know, including for two-digit numbers times one-digit numbers, using mental and progressing to formal written methods.Solve problems, including missing number problems, involving multiplication, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.																															
Progression of skills	Key representations																															
The 3 times-table Encourage daily counting in multiples both forwards and back.	<p>... groups of 3 = ... $\times 3$ = 3, ... times = $3 \times \dots$ =</p>  	<p>... times 3 is equal to ...</p> <table border="1" data-bbox="1263 516 1727 621"><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>$4 \times 3 = 12$ $12 = 4 \times 3$</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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The 4 times-table Encourage daily counting in multiples both forwards and back. Encourage children to notice links between the 2 and 4 times-tables.	<p>... groups of 4 = ... $\times 4$ = 4, ... times = $4 \times \dots$ =</p>  	<p>... times 4 is equal to ...</p> <table border="1" data-bbox="1263 785 1727 888"><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>$3 \times 4 = 12$ $12 = 3 \times 4$</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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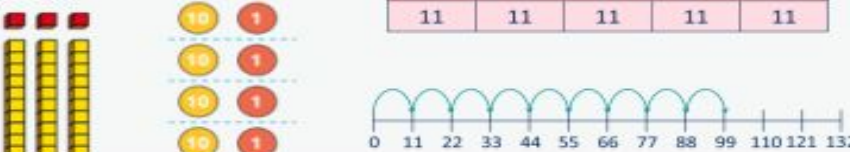
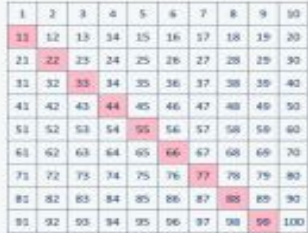



Multiplication

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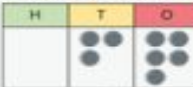
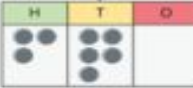
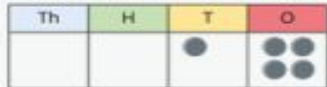
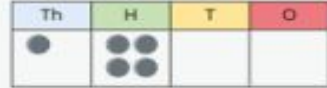
Multiplication

Progression of skills	Key representations								
<p>Correspondence problems (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 ... \times ... possibilities altogether.</p> <div></div> <table><thead><tr><th>hats</th><th>scarves</th></tr></thead><tbody><tr><td>blue </td><td> </td></tr><tr><td>orange </td><td> </td></tr><tr><td>purple </td><td> </td></tr></tbody></table> <p>For every hat, there are two possible scarves. $3 \times 2 = 6$</p> <p>There are 6 possibilities altogether.</p>	hats	scarves	blue 	 	orange 	 	purple 	 
hats	scarves								
blue 	 								
orange 	 								
purple 	 								










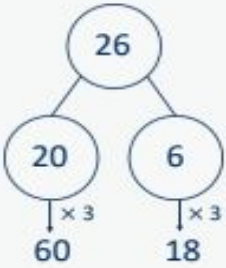
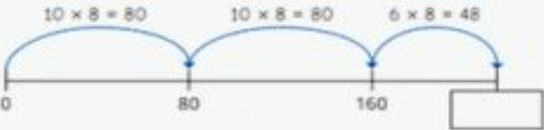












Multiplication

<p>Year 4</p>	<ul style="list-style-type: none"> Recall multiplication facts for multiplication tables up to 12×12 Use place value, known and derived facts to multiply mentally, including: multiplying by 0 and 1; multiplying together three numbers. Recognise and use factor pairs and commutativity in mental calculations. Multiply two-digit and three-digit numbers by a one-digit number using formal written layout. 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. 										
<p>Progression of skills</p>	<p>Key representations</p>										
<p>Times-table facts to 12×12</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>... \times ... =</p>  										
<p>Multiply by 1 and 0</p>	<table border="1"> <tr> <td data-bbox="537 816 1168 1013"> <p>Any number multiplied by 1 is equal to ...</p> <p>Any number multiplied by 0 is equal to ...</p>  </td><td data-bbox="1178 816 1794 1013"> <p>... \times ... = ...</p> <table> <tr> <td>$1 \times 1 = 1$</td><td>$1 \times 0 = 0$</td></tr> <tr> <td>$2 \times 1 = 2$</td><td>$2 \times 0 = 0$</td></tr> <tr> <td>$3 \times 1 = 3$</td><td>$3 \times 0 = 0$</td></tr> <tr> <td>$4 \times 1 = 4$</td><td>$4 \times 0 = 0$</td></tr> </table> </td></tr> </table>	<p>Any number multiplied by 1 is equal to ...</p> <p>Any number multiplied by 0 is equal to ...</p> 	<p>... \times ... = ...</p> <table> <tr> <td>$1 \times 1 = 1$</td><td>$1 \times 0 = 0$</td></tr> <tr> <td>$2 \times 1 = 2$</td><td>$2 \times 0 = 0$</td></tr> <tr> <td>$3 \times 1 = 3$</td><td>$3 \times 0 = 0$</td></tr> <tr> <td>$4 \times 1 = 4$</td><td>$4 \times 0 = 0$</td></tr> </table>	$1 \times 1 = 1$	$1 \times 0 = 0$	$2 \times 1 = 2$	$2 \times 0 = 0$	$3 \times 1 = 3$	$3 \times 0 = 0$	$4 \times 1 = 4$	$4 \times 0 = 0$
<p>Any number multiplied by 1 is equal to ...</p> <p>Any number multiplied by 0 is equal to ...</p> 	<p>... \times ... = ...</p> <table> <tr> <td>$1 \times 1 = 1$</td><td>$1 \times 0 = 0$</td></tr> <tr> <td>$2 \times 1 = 2$</td><td>$2 \times 0 = 0$</td></tr> <tr> <td>$3 \times 1 = 3$</td><td>$3 \times 0 = 0$</td></tr> <tr> <td>$4 \times 1 = 4$</td><td>$4 \times 0 = 0$</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	
Multiply 3 numbers Children use their understanding of commutativity to multiply more efficiently.	To work out $\dots \times \dots \times \dots$, I can first calculate $\dots \times \dots$ and then multiply the answer by ...  $4 \times 2 \times 3 = 8 \times 3 = 24$ $2 \times 3 \times 4 = 6 \times 4 = 24$ $3 \times 4 \times 2 = 12 \times 2 = 24$	
Factor pairs Children explore equivalent calculations using different factors pairs.	 $8 \times 6 = 8 \times 3 \times 2$ $8 \times 6 = 24 \times 2$	 $6 \times 8 = 6 \times 4 \times 2$ $6 \times 8 = 24 \times 2$
Multiply by 10 and 100 Some children may over-generalise that multiplying by 10 or 100 always results in adding zeros. This will cause issues later when multiplying decimals.	When I multiply by 10, the digits move ... place value column to the left. ... is 10 times the size of ...   $35 \times 10 = 350$	When I multiply by 100, the digits move ... place value columns to the left. ... is 100 times the size of ...   $14 \times 100 = 1,400$




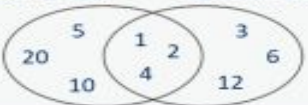






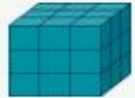
Multiplication

Progression of skills	Key representations								
Related facts Use knowledge of multiplying by 10 and 100 to scale times-table facts.	<p>... \times ... ones is equal to ... ones so ... \times ... tens is equal to ... tens and ... \times ... hundreds is equal to ... hundreds.</p> <div style="display: flex; align-items: center;"> <div style="display: flex; gap: 10px;">    </div> <div style="margin-left: 20px;"> $3 \times 7 = 21$ $3 \times 70 = 210$ $3 \times 700 = 2,100$ </div> <div style="margin-left: 40px;"> $7 \times 3 = 21$ $7 \times 30 = 210$ $7 \times 300 = 2,100$ </div> </div>								
Mental strategies Partition 2 or 3-digit numbers to multiply using informal methods.	<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> <table border="1" style="border-collapse: collapse; text-align: center;"> <thead> <tr> <th style="background-color: #fff9c4;">Tens</th><th style="background-color: #ffe0b2;">Ones</th></tr> </thead> <tbody> <tr> <td></td><td></td></tr> <tr> <td></td><td></td></tr> <tr> <td></td><td></td></tr> </tbody> </table> </div> <div style="margin-right: 20px;">  </div> <div>  </div> </div> <p>$3 \times 26 = 60 + 18 = 78$</p> <p>$26 \times 8 = 80 + 80 + 48 = 208$</p>	Tens	Ones						
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Multiplication

Progression of skills	Key representations																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																																		
<p>Multiply a 2 or 3-digit number by a 1-digit number</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> 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Multiplication

Year 5	<ul style="list-style-type: none">Identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbersRecognise and use square numbers and cube numbers, and the notation for squared (²) and cubed (³)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.Multiply numbers mentally drawing upon known facts.Multiply whole numbers and those involving decimals by 10, 100 and 1000Multiply proper fractions and mixed numbers by whole numbers, supported by materials and diagrams.																																
Progression of skills	Key representations																																
Multiples and factors Encourage children to notice patterns and make links with known facts.	<p>... is a multiple of ... because ... × ... = ...</p>  <table border="1" data-bbox="537 687 946 782"><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>  1×8  2×4 <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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11	12	13	14	15	16	17	18	19	20																								
21	22	23	24	25	26	27	28	29	30																								
Square and cube numbers	<p>... squared means ... × ...</p>  1×1 $1^2 = 1$  2×2 $2^2 = 4$  3×3 $3^2 = 9$  4×4 $4^2 = 16$		<p>... cubed means ... × ... × ...</p>  $1 \times 1 \times 1$ $1^3 = 1$  $2 \times 2 \times 2$ $2^3 = 8$  $3 \times 3 \times 3$ $3^3 = 27$																														

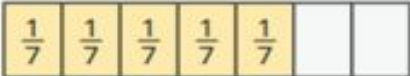

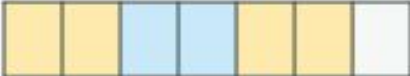
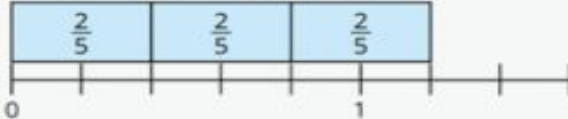
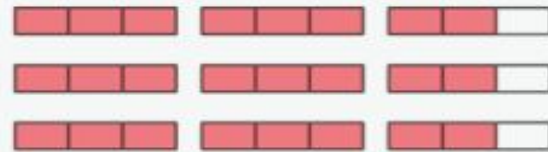
Multiplication

Progression of skills	Key representations																																																							
Multiply numbers up to 4 digits by a 1-digit number This builds on the short multiplication method introduced in Y4	To multiply a 4-digit number by ... , I multiply the ones by ... , the tens by ... , the hundreds by ... and the thousands by ... <table><tr><th>Th</th><th>H</th><th>T</th><th>O</th></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td></td></tr></table> <table><tr><td></td><td></td><td>1</td><td>1</td><td>5</td><td>2</td></tr><tr><td>x</td><td></td><td></td><td></td><td></td><td>3</td></tr><tr><td colspan="6"><hr/></td></tr><tr><td colspan="6"><hr/></td></tr></table>		Th	H	T	O															1	1	5	2	x					3	<hr/>						<hr/>																			
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Multiply numbers up to 4 digits by a 2-digit number Numbers are first partitioned using an area model then long multiplication is introduced for the first time.	I can partition ... into ... and ... <table><tr><td>x</td><td></td><td></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> $32 \times 44 = 1,200 + 80 + 120 + 8$ $32 \times 44 = 1,408$	x			30	1,200	120	2	80	8	First, I multiply by the ... Then I multiply by the ... <table><tr><td>x</td><td>10</td><td>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> <table><tr><td></td><td></td><td>3</td><td>2</td></tr><tr><td>x</td><td></td><td>1</td><td>3</td></tr><tr><td colspan="4"><hr/></td></tr><tr><td></td><td>9</td><td>6</td><td></td></tr><tr><td colspan="4"><hr/></td></tr><tr><td></td><td>3</td><td>2</td><td>0</td></tr><tr><td colspan="4"><hr/></td></tr><tr><td></td><td>4</td><td>1</td><td>6</td></tr><tr><td colspan="4"><hr/></td></tr></table> (32×3) (32×10) $300 + 90 + 20 + 6 = 416$	x	10	3	30	300	90	2	20	6			3	2	x		1	3	<hr/>					9	6		<hr/>					3	2	0	<hr/>					4	1	6	<hr/>			
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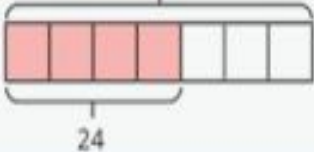
Multiplication

Progression of skills	Key representations																										
<p>Multiply by 10, 100 and 1,000</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><table><tr><th>M</th><th>HTh</th><th>TTh</th><th>Th</th><th>H</th><th>T</th><th>O</th></tr><tr><td></td><td></td><td></td><td></td><td>●●</td><td>●●</td><td>●●</td></tr></table><table><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></div> <div><div>$234 \times 10 = 2,340$ $234 \times 100 = 23,400$ $234 \times 1,000 = 234,000$</div><div>$2.34 \times 10 = 23.4$ $2.34 \times 100 = 234$ $2.34 \times 1,000 = 2,340$</div></div>	M	HTh	TTh	Th	H	T	O					●●	●●	●●	Th	H	T	O	Tth	Hth				●●	●●	●●
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<p>Mental strategies</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 ... \times ... is ... To calculate ... \times 12, I can do ... \times ... \times ...</p> <p>For example: 121×12 I could calculate 100×12 plus 20×12 plus 1×12 I could calculate 121×10 plus 121×2 I could calculate $121 \times 6 \times 2$ I could calculate $121 \times 4 \times 3$</p>																										

Multiplication

Progression of skills	Key representations
<p>Multiply fractions by a whole number</p> <p>Make links with repeated addition.</p> <p>E.g. $\frac{1}{5} \times 4 = \frac{1}{5} + \frac{1}{5} + \frac{1}{5} + \frac{1}{5}$</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; align-items: flex-start;"> <div style="text-align: center;">  $\frac{1}{7} \times 5 = \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} + \frac{1}{7} = \frac{5}{7}$  $\frac{1}{5} \times 6 = \frac{6}{5} = 1 \frac{1}{5}$ </div> <div style="text-align: center;">  $\frac{2}{7} \times 3 = \frac{2}{7} + \frac{2}{7} + \frac{2}{7} = \frac{6}{7}$  $\frac{2}{5} \times 3 = \frac{6}{5} = 1 \frac{1}{5}$ </div> </div>
<p>Multiply mixed numbers by a whole number</p>	<p>I can partition $\frac{2}{3}$ into $\frac{2}{3}$ and $\frac{2}{3}$</p> <div style="display: flex; align-items: center;"> <div style="margin-right: 20px;">  </div> <div> $2 \frac{2}{3} \times 3$ $2 \times 3 = 6 \quad \frac{2}{3} \times 3 = \frac{6}{3} = 2$ $2 \frac{2}{3} \times 3 = 6 + 2 = 8$ </div> </div>







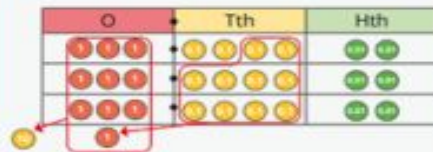
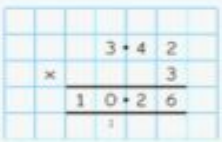
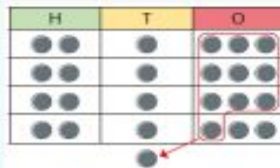
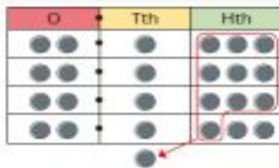
Multiplication

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

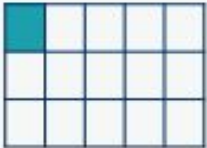


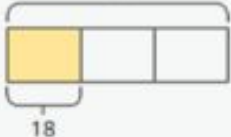
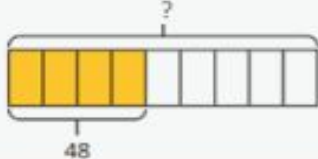
Multiplication

Year 6	<ul style="list-style-type: none">Identify common factors and common multiples.Multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication.Multiply numbers by 10, 100 and 1,000Multiply one-digit numbers with up to two decimal places by whole numbers.Use their knowledge of the order of operations to carry out calculations involving the 4 operations.Multiply simple pairs of proper fractions, writing the answer in its simplest form.Solve problems involving the relative sizes of two quantities where missing values can be found by using integer multiplication and division facts.Solve problems involving the calculation of percentages.																																																																						
Progression of skills	Key representations																																																																						
Multiply numbers up to 4 digits by a 2-digit number	<p>To multiply by a 2-digit number, first multiply by the ones, then multiply by the tens and then find the total.</p> <div><table><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></td><td>1</td><td>2</td><td>0</td><td>7</td><td></td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>×</td><td></td><td></td><td>3</td><td>6</td><td></td><td></td></tr><tr><td></td><td></td><td></td><td>+</td><td>7</td><td>2</td><td>4</td><td>2</td><td></td><td>(1,207 × 6)</td></tr><tr><td></td><td></td><td></td><td></td><td>3</td><td>6</td><td>2</td><td>1</td><td>0</td><td>(1,207 × 30)</td></tr><tr><td></td><td></td><td></td><td></td><td>4</td><td>3</td><td>4</td><td>5</td><td>2</td><td></td></tr><tr><td></td><td></td><td></td><td></td><td>1</td><td></td><td></td><td></td><td></td><td></td></tr></table></div>														1	2	0	7							×			3	6						+	7	2	4	2		(1,207 × 6)					3	6	2	1	0	(1,207 × 30)					4	3	4	5	2						1					
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Multiply by 10, 100 and 1,000 Some children may over-generalise that multiplying by a power of 10 always results in adding zeros.	<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><table><tr><td>M</td><td>HTh</td><td>TTh</td><td>Th</td><td>H</td><td>T</td><td>O</td><td></td><td>Th</td><td>H</td><td>T</td><td>O</td><td>Tth</td><td>Hth</td><td>Thth</td></tr><tr><td></td><td></td><td></td><td></td><td>● ●</td><td>● ●</td><td>● ●</td><td></td><td></td><td></td><td></td><td></td><td>● ●</td><td>● ●</td><td>● ●</td></tr></table><p>234 × 10 = 2,340 234 × 100 = 23,400 234 × 1,000 = 234,000</p></div> <div><table><tr><td>Th</td><td>H</td><td>T</td><td>O</td><td></td><td>Tth</td><td>Hth</td><td>Thth</td></tr><tr><td></td><td></td><td></td><td></td><td>● ●</td><td>● ●</td><td>● ●</td><td>● ●</td></tr></table><p>0.234 × 10 = 2.34 0.234 × 100 = 23.4 0.234 × 1,000 = 234</p></div>	M	HTh	TTh	Th	H	T	O		Th	H	T	O	Tth	Hth	Thth					● ●	● ●	● ●						● ●	● ●	● ●	Th	H	T	O		Tth	Hth	Thth					● ●	● ●	● ●	● ●																								
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

Multiplication

Progression of skills	Key representations	
<p>Order of operations</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; align-items: center; justify-content: space-around;">  <div style="text-align: center;">  <p>$(3 + 4) \times 2 = 14$</p> </div> <div style="text-align: center;">  <p>$3 + 4^2 = 19$</p> </div> <div style="text-align: center;">  <p>$3 + 4 \times 2 = 11$</p> </div> </div>	
<p>Multiply decimals by integers</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 $\dots \times \dots = \dots$, so I also know that $\dots \times \dots = \dots$</p> <div style="display: flex; align-items: center; justify-content: space-around;">  <p>$6 \times 2 = 12$</p>  <p>$6 \times 0.2 = 1.2$</p> </div>	<p>I need to exchange 10 ... for 1 ...</p> <div style="display: flex; align-items: center; justify-content: space-around;"> <div style="text-align: center;">  </div> <div style="text-align: center;">  </div> </div> <div style="display: flex; align-items: center; justify-content: space-around;"> <div style="text-align: center;">  <p>$213 \times 4 = 852$</p> </div> <div style="text-align: center;">  <p>$2.13 \times 4 = 8.52$</p> </div> </div>

Multiplication

Progression of skills	Key representations	
<p>Multiply fractions by fractions</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;">  $\frac{1}{3} \times \frac{1}{5} = \frac{1}{15}$ </div> <div style="text-align: center;">  $\frac{2}{3} \times \frac{4}{5} = \frac{8}{15}$ </div> <div style="text-align: center;">  $\frac{2}{3} \times \frac{3}{5} = \frac{6}{15} = \frac{2}{5}$ </div> </div>	
<p>Find the whole</p> <p>Children multiply to find the whole from a given part.</p>	<p>If $\frac{1}{\square}$ is ..., then the whole is ... \times ...</p> <p>$\frac{1}{3}$ of ___ = 18</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> $18 \times 3 = 54$ $\frac{1}{3}$ of 54 = 18 </div> </div>	<p>If $\frac{\square}{\square}$ is ..., then $\frac{1}{\square}$ is ... and the whole is ... \times ...</p> <p>$\frac{4}{9}$ of ___ = 48</p> <div style="display: flex; align-items: center;">  <div style="margin-left: 20px;"> $\frac{1}{9} = 48 \div 4 = 12$ $9 \times 12 = 108$ $\frac{4}{9}$ of 108 = 48 </div> </div>

Multiplication

Progression of skills	Key representations																																	
Calculate percentages Children first learn how to find 1%, 10%, 20%, 25% and 50% before using multiples of these amounts to find any percentage.	<p>There are ... lots of ... % in 100% To find ... %, I need to divide by ...</p> <table border="1"><tr><th colspan="4">100%</th></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 ... = ... ÷ 2 25% of ... = ... ÷ 4</p>	100%				50%		50%		25%	25%	25%	25%	<p>... % is made up of ... %, and ... %</p> <table border="1"><tr><th colspan="10">100%</th></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% × 2 and 1% × 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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Calculations involving ratio 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>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> <p>The ratio of adults to children is 1 : 6</p>																																	

