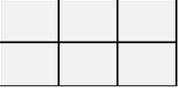
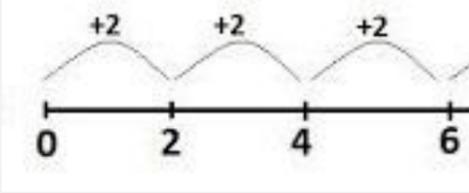
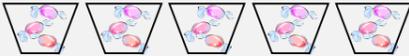
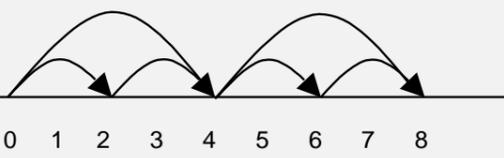
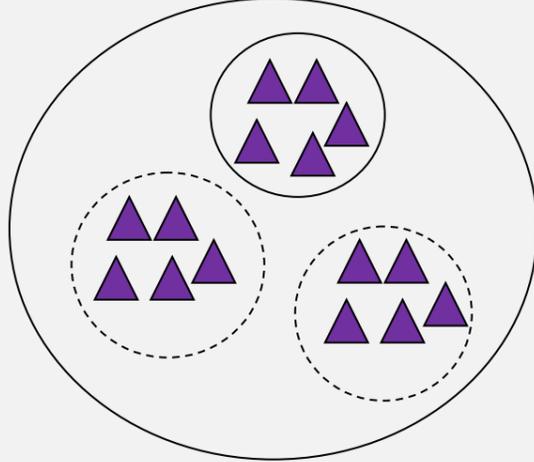


Multiplication and Division

Strand	Multiples and Times tables (factors, squares, cubes, odds/evens, primes, $\times/\div 10/100/1000$ )	Written & Mental Methods for Calculations	Order of Calculation	Problem Solving	Representations and Symbols												
<b>Foundation Stage</b>	*solve problems involving doubling																
	Recognising two/ five/ ten objects as one <b>group</b> of an amount using concrete objects during play.																
<b>Year One</b> Fluent: Counting in 2s, 5s and 10s  halves and quarters to recognise, find and name	*solve one-step problems involving multiplication and division, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.																
Use concrete objects, Cuisenaire rods, numicon and pictorial representations to illustrate division and multiplication as repeated addition.   <table border="1" data-bbox="617 1010 795 1094"> <tr> <td>2</td> <td>2</td> <td>2</td> </tr> <tr> <td colspan="3">6</td> </tr> </table> for division <table border="1" data-bbox="617 1163 795 1234"> <tr> <td colspan="3">6</td> </tr> <tr> <td>2</td> <td>2</td> <td>2</td> </tr> </table>  <u>Counting using a variety of practical resources</u> Counting in 2s e.g. counting socks, shoes, animal's legs... Counting in 5s e.g. counting fingers, fingers in gloves, toes... Counting in 10s e.g. fingers, toes...  There are 3 sweets in one bag. How many sweets are there in 5 bags?  						2	2	2	6			6			2	2	2
2	2	2															
6																	
6																	
2	2	2															

**Multiplication and Division**

<p><b>Year Two</b></p> <p><b>Fluent: Odd and Even</b>  <b>Recall of 2, 5 and 10 times tables</b></p> <p>recognise, find, name and write halves and quarters and equivalence for half</p>	<p>*recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables, including recognising odd and even numbers</p>	<p>* calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (<math>\times</math>), division (<math>\div</math>) and equals (=) signs</p>	<p>* show that multiplication of two numbers can be done in any order (commutative) and division of one number by another cannot</p>	<p>*solve problems involving multiplication and division, using materials, arrays, repeated addition, mental methods, and multiplication and division facts, including problems in contexts.</p>	<p>* calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (<math>\times</math>), division (<math>\div</math>) and equals (=) signs</p>
<p>Use concrete objects, Cuisenaire rods, numicon and pictorial representations to illustrate Use arrays and bar models to solve and create problems in the 2, 5, and 10 times tables. Share examples with tables beyond these for the 3, 4 and 8 times tables.</p> <p>    <math>4 \times 2</math> or <math>4 + 4</math> </p> <p>    <math>2 \times 4</math> or <math>2 + 2 + 2 + 2</math> </p> <p>Children need to be secure with partitioning numbers into 10s and 1s and partitioning in different ways: <math>6 = 5 + 1</math> so  e.g. Double 6 is the same as double five add double one.</p> <p>    AND double 15   <math display="block">\begin{array}{r} 10 \\ + \quad 5 \\ \hline 15 \end{array}</math>   <math display="block">\begin{array}{r} 20 \\ + \quad 10 \\ \hline 30 \end{array}</math> </p> <p>OR</p> <p> <math display="block">\begin{array}{r rr} \times &amp; 10 &amp; 5 \\ \hline 2 &amp; 20 &amp; 10 \\ \hline &amp; 20 &amp; 10 \\ &amp; \hline &amp; 30 \end{array}</math> </p> <p>Derive doubles quickly:</p> <ul style="list-style-type: none"> <li>• doubles of numbers 1 to 15</li> <li>• doubles of multiples of 5 to 50</li> </ul>			<p>Use concrete/ pictorial materials to solve <b>grouping</b> problems:</p> <p>How many 5's in 15?</p> <p>The size of the subset is given as four and the problem is finding how many subsets there are.</p> <p>  </p> <p>Oral and written practise is used to establish division as the inverse of multiplication.</p> <p>Derive halves quickly:</p> <ul style="list-style-type: none"> <li>• halves of even numbers to 20</li> <li>• halves of multiples of 10 up to 100</li> </ul>		

Multiplication and Division

<p><b>Year Three</b></p> <p><b>Fluent: Recall of 3, 4, and 8 times tables</b></p> <p>recognise and use fractions as numbers including non-unit fractions.</p> <p>To count in tenths and dividing by 10 (multiplying by 10) decimal tenths</p>	<p>*recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables</p> <p>*write and calculate mathematical statements for multiplication and 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</p>	<p>* write and calculate mathematical statements for multiplication and 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</p>		<p>*solve problems, including missing number problems, involving multiplication and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.</p>															
			<p>Derive quarters quickly by halving and halving.</p> <p>(Supported by Cuisenaire rods) initially counting in single steps,</p> <p><math>30 \div 5 =</math></p> <table border="1" data-bbox="1706 814 2300 951"> <tr><td colspan="6">30</td></tr> <tr><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td><td>5</td></tr> </table> <p><math>30 \div 5 = 6</math></p> <p>moving on to using known facts:</p> <p><math>18 \div 3 =</math></p> <table border="1" data-bbox="1706 1255 2300 1392"> <tr><td colspan="2">18</td></tr> <tr><td><math>5 \times 3 = 15</math></td><td>3</td></tr> </table>	30						5	5	5	5	5	5	18		$5 \times 3 = 15$	3
30																			
5	5	5	5	5	5														
18																			
$5 \times 3 = 15$	3																		

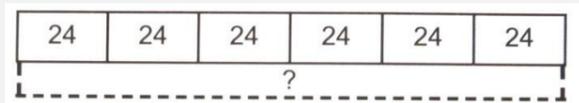
x	20	4
6	120	24

$$\begin{array}{r} 24 \\ \times 6 \\ \hline 24 \\ 120 \\ \hline \end{array}$$

$$\begin{array}{r} 24 \\ \times 6 \\ \hline 24 \\ 120 \\ \hline 144 \end{array}$$

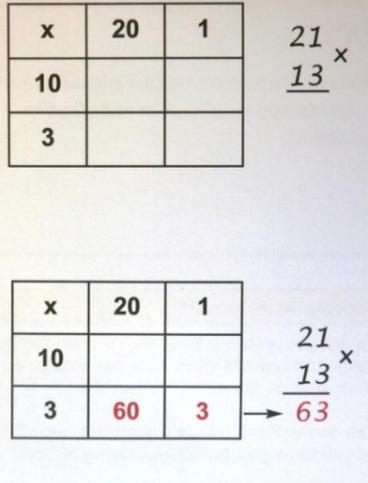
Solve missing number problems using arrays and bar models

$7 \times 2 = \square$	$\square = 2 \times 7$
$7 \times \square = 14$	$14 = \square \times 7$
$\square \times 2 = 14$	$14 = 2 \times \square$
$\square \times \nabla = 14$	$14 = \square \times \nabla$



Multiplication and Division

<p><b>Year Four</b>  <b>Fluent: Recall of 6, 7, 9, 11 and 12 times tables</b>          To count in hundredths and dividing by 100 (multiplying by 100)          decimal hundredths          money problems – decimals to 2 places</p>	<p>*recall multiplication and division facts for multiplication tables up to <math>12 \times 12</math>          *use place value, known and derived facts to multiply and divide mentally, including:          multiplying by 0 and 1; dividing by 1;          multiplying together three numbers          *recognise and use factor pairs and commutativity in mental calculations</p>	<p>* multiply two-digit and three-digit numbers by a one-digit number using formal written layout</p>	<p>* recognise and use factor pairs and commutativity in mental calculations          * 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>	<p>*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>																				
<div style="display: flex; align-items: flex-start;"> <div style="margin-right: 20px;"> <math display="block">\begin{array}{r} 37 \\ 4 \times \\ \hline 148 \\ 2 \end{array}</math> <p><math>\approx 40 \times 4</math></p> </div> <table border="1" style="border-collapse: collapse; text-align: center;"> <tr> <td style="width: 25px;">37</td> <td style="width: 25px;">37</td> <td style="width: 25px;">37</td> <td style="width: 25px;">37</td> </tr> <tr> <td colspan="4" style="border: none;">?</td> </tr> </table> </div>		37	37	37	37	?				<p>Using known number facts</p> $64 \div 4 =$ <table border="1" style="border-collapse: collapse; margin: 5px auto; width: 80%;"> <tr> <td colspan="2" style="text-align: center;">64</td> </tr> <tr> <td style="text-align: center;"><math>10 \times 4 = 40</math></td> <td style="text-align: center;"><math>6 \times 4 = 24</math></td> </tr> </table> $64 \div 4 = 16$ <p>Moving on to using remainders,</p> $65 \div 7 =$ <table border="1" style="border-collapse: collapse; margin: 5px auto; width: 80%;"> <tr> <td colspan="2" style="text-align: center;">65</td> </tr> <tr> <td style="text-align: center;">7</td> <td style="border: 1px dashed black;"></td> </tr> </table> $9 \times 7 = 63$ <table border="1" style="border-collapse: collapse; margin: 5px auto; width: 80%;"> <tr> <td colspan="2" style="text-align: center;">65</td> </tr> <tr> <td style="text-align: center;">63</td> <td style="text-align: center;">+2</td> </tr> </table> $65 \div 7 = 9 \text{ r } 2$			64		$10 \times 4 = 40$	$6 \times 4 = 24$	65		7		65		63	+2
37	37	37	37																					
?																								
64																								
$10 \times 4 = 40$	$6 \times 4 = 24$																							
65																								
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65																								
63	+2																							

<p><b>Year Five</b></p> <p><b>thousandths problems with 3dp multiply, divide by 10, 100, 1000</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>*identify multiples and factors, including finding all factor pairs of a number, and common factors of two numbers</li> <li>*establish whether a number up to 100 is prime and recall prime numbers up to 19</li> <li>*multiply and divide numbers mentally drawing upon known facts</li> <li>*multiply and divide whole numbers and those involving decimals by 10, 100 and 1000</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>*solve problems involving multiplication and division including using their knowledge of factors and multiples, squares and cubes</li> </ul>	<ul style="list-style-type: none"> <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>* 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> </ul>		<ul style="list-style-type: none"> <li>*solve problems involving addition, subtraction, multiplication and division and a combination of these, including understanding the meaning of the equals sign</li> <li>*solve problems involving multiplication and division, including scaling by simple fractions and problems involving simple rates.</li> </ul>	
		<p>Up to two digits use the bar model and mental maths and use formal, short division for 3 and above digits.</p> $\begin{array}{r} 121 \\ 8 \overline{)9168} \end{array}$ $\begin{array}{r} 038 \text{ r } 4 \\ 6 \overline{)22352} \end{array}$			

x	20	1
10	200	10
3	60	3

$$\begin{array}{r} 21 \\ 13 \\ \hline 63 \\ 210 \end{array}$$

$$\begin{array}{r} 275 \\ \underline{36x} \\ 1650 \\ \small{4 \quad 3} \\ 8250 + \\ \underline{\quad \quad} \\ 9900 \end{array}$$

≈ 250 x 40  
= 10000

$$\begin{array}{r} 2761 \\ \underline{\quad 5x} \\ 13805 \\ \small{3 \quad 3} \end{array}$$

≈ 3000 x 10 ÷ 2  
= 15000

For long division use the bar model alongside column chunking

372		
240	120	

$$\begin{array}{r} 372 \\ \underline{240 - (10x)} \\ 132 \\ \underline{120 - (5x)} \\ 12 \text{ r} \end{array}$$

1 x = 24
2 x = 48
5 x = 120
10 x = 240

15 r 12 or 15 12/24 (15½)

Multiplication and Division

<p><b>Year Six</b></p> <p><b>multiply, divide by 10, 100, 1000</b></p> <p><b>multiplying fractions</b></p> <p><b>multiply 1 digit numbers with up to 2 dp by whole numbers</b></p> <p><b>use written division with answer up to 2 dp</b></p>	<p>*identify common factors, common multiples and prime numbers</p>	<p>* multiply multi-digit numbers up to 4 digits by a two-digit whole number using the formal written method of long multiplication</p> <p>* divide numbers up to 4 digits by a two-digit 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</p> <p>* divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context</p> <p>* perform mental calculations, including with mixed operations and large numbers</p> <p>* use their knowledge of the order of operations to carry out calculations involving the four operations</p>	<p>* use their knowledge of the order of operations to carry out calculations involving the four operations</p>	<p>*solve problems involving addition, subtraction, multiplication and division</p> <p>*use <b>estimation</b> to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.</p>	
	$\begin{array}{r} 4792 \\ \times 78 \\ \hline 38336 \\ \phantom{38336} 671 \\ \hline 335440 \end{array} +$ $\begin{array}{r} 335440 \\ \phantom{335440} 671 \\ \hline 373776 \end{array}$ <p><math>\approx 5000 \times 80</math></p> <p><math>= 400000</math></p>	<p>Formal short:</p> $\begin{array}{r} 038 \text{ r } 3 \\ 6 \overline{)2351} \end{array}$ <p><math>232 \div 6 = 38 \text{ r } 3</math> or <math>38 \frac{3}{6}</math></p> <p><math>= 38 \frac{1}{2}</math></p> $\begin{array}{r} 38.5 \\ 6 \overline{)2351.30} \end{array}$ $\begin{array}{r} 56.25 \\ 4 \overline{)237.1020} \end{array}$			

$$\begin{array}{r}
 6.35 \\
 \hline
 4x \\
 \hline
 25.40 \\
 \hline
 1 \quad 2
 \end{array}$$

Formal long:

$$\begin{array}{r}
 \underline{15.5} \\
 24 \overline{) 372.0} \\
 \underline{24} \downarrow \\
 132 \\
 \underline{120} \downarrow \\
 120 \\
 \underline{120} \\
 0
 \end{array}$$

15 r 12 or 15  $\frac{12}{24}$  or 15  $\frac{1}{2}$  or 15.5