


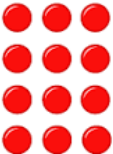

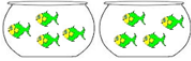
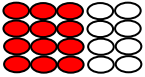
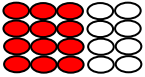

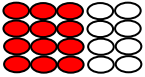


Multiplication and Division

Learning Objectives	Written Calculations	Models or images	Mental Calculations	Known Facts
<p>Year 1 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.</p>	<p><u>Multiplication Number Sentences</u></p> <p>$3 \times 5 = 15$</p> <p>$2 \times 4 = 8$</p>	<p><u>Using picture prompts</u></p> <p>$3 \times 5 = 15$</p>  <p>Numicon Practise showing the difference between an addition sentence and a multiplication sentence</p>  <p>$3 + 2 = 5$ $3 \times 2 = 6$</p> 		<p>Count in multiples of 2s, 5s and 10s</p>
<p>Year 2 Calculate mathematical statements for multiplication and division within the multiplication tables and write them using the multiplication (\times), division (\div) and equals (=) signs. Show that multiplication of two numbers can be done in any order (commutative) and</p>	<p><u>Multiplication and Division Number Sentences</u></p> <p>$3 \times 4 = 12$</p> <p>$4 \times 5 = 20$</p> <p>$8 \div 4 = 2$</p>	<p><u>Arrays</u> These show commutative properties ie 1 array shows $3 \times 4 = 4 \times 3$</p>  <p><u>Sharing</u> 8 sweets shared between 4 children</p> 	<p>- Use counting up in 3s, 5s and 10s (using fingers to keep track of groups) to start to derive multiplication facts, phrased as 'what is 4 times 3' or 'how many in four groups of 3'</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>Doubles of numbers to 10</p>

<p>division of one number by another cannot. Solve problems involving multiplication and division, using materials, arrays, repeated addition</p>		<p>Grouping 4 fish can live in 1 bowl. How many bowls do 8 fish need?</p> 												
<p>Year 3 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>Grid method Multiply a 2 digit number by 2, 3, 4 5 & 8- use PV counters to model</p> <table border="1"> <tr> <td>x</td> <td>30</td> <td>2</td> <td></td> </tr> <tr> <td>4</td> <td>30 x 4 = 120</td> <td>2 x 4 = 8</td> <td></td> </tr> </table> <p>Extend grid method to 2 digit by 2 digit - dotty paper useful to model this.</p> <p>Formal written method for division</p> $2 \overline{)84}$	x	30	2		4	30 x 4 = 120	2 x 4 = 8		<p>'Rows of chairs in hall' (array) as visual representation of grid method</p>  <table border="1"> <tr> <td>10 x 6 = 60</td> <td>4 x 6 = 24</td> </tr> </table>	10 x 6 = 60	4 x 6 = 24	<ul style="list-style-type: none"> - Multiply a number by doubling and doubling again - Multiply a 2 digit whole number by 10 	<p>Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables. Times tables & place value calculations such as 70 x 3</p>
x	30	2												
4	30 x 4 = 120	2 x 4 = 8												
10 x 6 = 60	4 x 6 = 24													
<p>Year 4 Multiply two-digit and three-digit numbers by a one-digit number using formal written layout.</p>	<p>Short multiplication for single digit multiplication - Use efficient methods of short multiplication</p> $\begin{array}{r} 239 \\ \times 4 \\ \hline 956 \\ 13 \end{array}$	<p>Introduce short multiplication linked to grid for 2/3 digit by 1 digit</p> <p>Extend to expanded method of multiplication</p>	<ul style="list-style-type: none"> - Use place value to multiply a whole number by 10 or 100 - Multiply two multiples of 10 together, 	<p>Recall multiplication and division facts for multiplication tables up to 12 x 12. Quickly derive corresponding division facts.</p>										

Solve problems involving multiplying and adding, including using the distributive law to multiply two digit numbers by one digit.

Grid method

Use grid method to use with 2 digit by 2 digit

$38 \times 62 =$

X	60	2
30		
8		

X	60	2
30	1800	60
8	480	16

$38 \times 62 = 1800 + 60 + 480 + 16$

$38 \times 62 = 2356$

$$\begin{array}{r} 263 \\ \times 4 \\ \hline 12 \\ \hline 240 \\ \hline 800 \\ \hline 1052 \end{array}$$

Use PV counters/Dienes to introduce short division

$248 \div 2 =$

$$\begin{array}{r} 124 \\ 2 \overline{) 248} \end{array}$$

e.g. 40×30

Partitioning

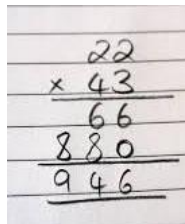
Multiply teens numbers by single digit by visualised partitioning

$$\begin{array}{l} 14 \times 6 \\ / \quad \backslash \\ 60 + 24 \end{array} = 84$$

Times tables & PV calculations with decimals such as 0.7×3

Year 5. 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. Divide numbers up to 4 digits by a one-

Long multiplication or grid method to multiply up to 4 digits by a one or two digit number



- Multiply decimals and whole number by 10, 100 and 1000
- Multiply a two digit number by a single digit

Times tables & place value calculations such as 40×3
Times tables & PV calculations with decimals such as 0.7×0.3
Identify multiples and factors, including finding all factor pairs of a number, and

digit number using the formal written method of short division and interpret remainders appropriately for the context. understanding the meaning of the equals sign.

$$352 \times 59 = 20,768$$

X	300	50	2
50	15,000 +	2,500 +	100 +
9	2,700 +	450 +	18

15000
2500
100
2700
450
+ 18
20768
11

Short method of division to divide up to 4 digits by a one digit number (Bus stop method)

$$362 \div 7 =$$

$$\begin{array}{r}
 51 \text{ r}5 \\
 7 \overline{) 362}
 \end{array}$$

$$362 \div 7 = 51 \text{ r}5$$

common factors of two numbers. Know and use the vocabulary of prime numbers, prime factors and composite (non-prime) numbers.

Year 6
To multiply multi-digit numbers of up to 4 digits by a 2 digit number using the formal written method of long multiplication.
To divide 4 digit

Long multiplication of up to 4 digits by 2 digits.

$$\begin{array}{r}
 469 \\
 \times 32 \\
 \hline
 938 \\
 14070 \\
 \hline
 15008
 \end{array}$$

-

numbers by a 2 digit whole number using the formal written method of long division and interpret remainders as whole number remainders, fractions or by rounding.
 To divide 4 digit numbers by 2 digit numbers using the formal written method of short division.

Long division to divide 4 digits by 2 digit numbers.

$$\begin{array}{r}
 0245r3 \\
 21 \overline{) 5148} \\
 \underline{-42} \\
 94 \\
 \underline{-84} \\
 108 \\
 \underline{-105} \\
 3
 \end{array}$$

Short division to divide 4 digits by 2 digit numbers.

$$\begin{array}{r}
 0245r3 \\
 21 \overline{) 5148}
 \end{array}$$