

National Curriculum Programme of Study;

- recall and use multiplication and division 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 and division, including positive integer scaling problems and correspondence problems in which n objects are connected to m objects.



BY THE END OF YEAR 3...

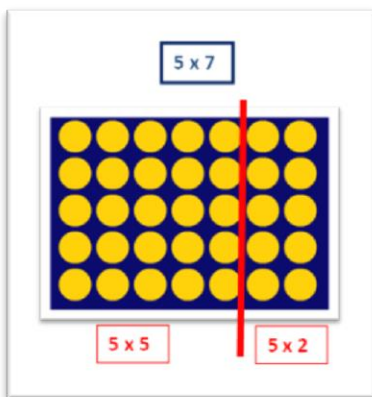
$$\begin{array}{r}
 36 \\
 \times 7 \\
 \hline
 42 \\
 \hline
 210 \\
 \hline
 252
 \end{array}$$

Expanded column written method, progressing to the compact column written method

$$\begin{array}{r}
 36 \\
 \times 7 \\
 \hline
 252 \\
 \hline
 4
 \end{array}$$

Following on from year 2...

Using arrays and known facts for multiplication of two single digit numbers

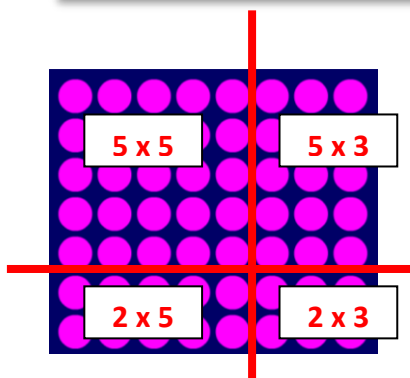


Children should be encouraged to use known multiplication facts to calculate others that are unknown to them.

Multiply two single-digit numbers together by splitting into two parts

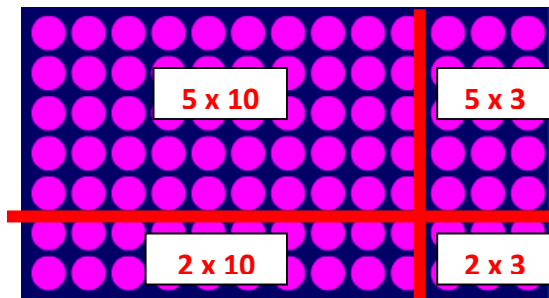
Ask the children to describe the array as *5 rows of 7 circles* or *7 columns with 5 circles in each column*. Draw a line to split the array into two smaller ones, each matching known facts for multiplication. The example here shows 5×7 being split into 5×5 and 5×2 .

Multiply two single-digit numbers together by splitting into more than two parts



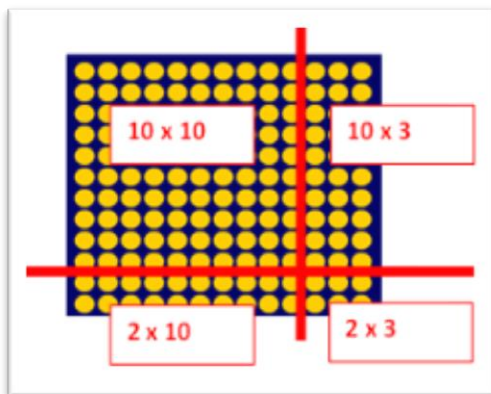
$$\begin{aligned}
 7 \times 8 &= (5 \times 5) + (5 \times 3) + (5 \times 2) + (2 \times 3) \\
 &= 25 + 15 + 10 + 6 \\
 &= 56
 \end{aligned}$$

Using arrays and known facts for multiplying a two-digit by a single-digit number

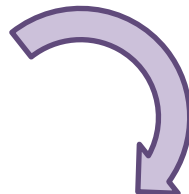


$$\begin{aligned} \text{E.g. } 7 \times 13 &= (5 \times 10) + (5 \times 3) + (2 \times 10) + (2 \times 3) \\ &= 50 + 15 + 20 + 6 \\ &= 91 \end{aligned}$$

Using arrays for multiplying two two-digit numbers



$$\begin{aligned} \text{E.g. } 12 \times 13 &= (10 \times 10) + (10 \times 3) + (2 \times 10) + (2 \times 3) \\ &= 100 + 30 + 20 + 6 \\ &= 156 \end{aligned}$$



x	10	3
6	60	18

x	10	3
10	100	30
2	20	6

The use of the array develops the required understanding for the grid method. Initially the grid should be introduced alongside the array, enabling the children to discuss what is the same and what is different.

Expanded column method for multiplication (TU x U)

$\begin{array}{r} 36 \\ \times 7 \\ \hline 42 \\ 210 \\ \hline 252 \end{array}$	<p>The expanded column method for multiplication should only be introduced once children are secure with the grid method shown above. They should be able to explain the structure of the grid and how it helps to find the answer to the multiplication calculation.</p>
$\begin{array}{r} 210 \\ 252 \\ \hline 252 \end{array}$	<p>The column notation should be shown alongside the same example represented as a grid (and even an array), enabling the children to see the similarities. Model the expanded column method, paying particular attention to the value of the digits involved, and showing where the same part appears in the grid method.</p>