

# ROUTEWAY THROUGH WRITTEN CALCULATION - MULTIPLICATION

Multiplication – grid/expanded method e.g.  $24 \times 3$



$24 \times 3$

x	20	4
	10 10	1 1 1 1

x	20	4

Make the number using the place value counters.

$$\begin{array}{r} 24 \\ \times 3 \\ \hline \\ \hline \end{array}$$

$24 \times 3$

x	20	4
3	10 10 10 10 10 10	1 1 1 1 1 1 1 1 1 1 1 1

x	20	4
3	$20 \times 3$	$4 \times 3$

Use the place value counters to make the right number of groups.  
**Always start with the least significant digit.**

$$\begin{array}{r} 24 \\ \times 3 \\ \hline \\ \hline \end{array}$$

$24 \times 3$

x	20	4
3	10 10 10 10 10 10	1 1 1 1 1 1 1 1 1 1 1 1

x	20	4
3	60	12

Calculate the total of the '10' counters and of the '1' counters.

$$\begin{array}{r} 24 \\ \times 3 \\ \hline 12 \\ 60 \\ \hline \end{array}$$

$24 \times 3$

x	20	4
3	10 10 10 10 10 10	1 1 1 1 1 1 1 1 1 1 1 1

x	20	4
3	60	12

Combine the totals.

$$\begin{array}{r} 24 \\ \times 3 \\ \hline 12 \\ 60 \\ \hline 72 \end{array}$$

Multiplication – grid/expanded method e.g. 243 x 4



243 x 4

x	200	40	3
	100 100	10 10 10 10	1 1 1

x	200	40	3
4			

Make the number using the place value counters.

$$\begin{array}{r} 243 \\ \times 4 \\ \hline \\ \hline \end{array}$$

243 x 4

x	200	40	3
4	100 100 100 100 100 100 100 100	10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10	1 1 1 1 1 1 1 1 1 1 1 1

x	200	40	3
4	200 x 4	40 x 4	3 x 4

Use the place value counters to make the right number of groups.  
**Always start with the least significant digit.**

$$\begin{array}{r} 243 \\ \times 4 \\ \hline \\ \hline \end{array}$$

243 x 4

x	200	40	3
4	100 100 100 100 100 100 100 100	10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10	1 1 1 1 1 1 1 1 1 1 1 1

x	200	40	3
4	800	160	12

Calculate the total of the '100' counters, of the '10' counters and the '1' counters.

$$\begin{array}{r} 243 \\ \times 4 \\ \hline 12 \\ 160 \\ \hline 800 \\ \hline \end{array}$$

243 x 4

x	200	40	3
4	100 100 100 100 100 100 100 100	10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10	1 1 1 1 1 1 1 1 1 1 1 1

x	200	40	3
4	800	160	12

= 972

Combine the totals.

$$\begin{array}{r} 240 \\ \times 3 \\ \hline 12 \\ 160 \\ \hline 800 \\ \hline 972 \end{array}$$

Multiplication – compact method e.g. 243 x 4



243 x 4

x	200	40	3
	100 100	10 10 10 10	1 1 1

Make the number using the place value counters.

$$\begin{array}{r} 243 \\ \times 4 \\ \hline \hline \hline \end{array}$$

243 x 4

x	200	40	3
4	100 100	10 10 10 10	1 1 1 1 1 1 1 1 1 1 1 1

Push down ten 1s and regroup as a 10. Record the matching stage of the calculation.

243 x 4

x	200	40	3
4			1 1

10

$$\begin{array}{r} 243 \\ \times 4 \\ \hline 2 \\ \hline 1 \end{array}$$

243 x 4

x	200	40	3
4	100 100	10 10 10 10 10 10 10 10 10 10 10 10 10 10 10 10	1 1

Use the place value counters to make the next least significant digit.

Push 10s counters down to regroup as a 100. Record the matching stage of the calculation.

243 x 4

x	200	40	3
4	100 100	10 10 10 10 10 10 10	1 1

100

$$\begin{array}{r} 243 \\ \times 4 \\ \hline 72 \\ \hline 1 \ 1 \end{array}$$

243 x 4

x	200	40	3
4	100 100 100 100 100 100 100 100	10 10 10 10 10 10 10	1 1

Use the place value counters to make the next least significant digit.

Record the matching stage of the calculation.

$$\begin{array}{r} 243 \\ \times 4 \\ \hline 972 \\ \hline 1 \ 1 \end{array}$$