

MULTIPLICATION

Stage 1 -

Pictures and symbols

There are 3 sweets in one bag.
How many sweets are there in 5 bags?

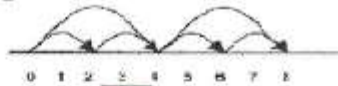


Stage 2 -

Arrays and repeated addition

$\begin{array}{cccc} \bullet & \bullet & \bullet & \bullet \\ \bullet & \bullet & \bullet & \bullet \end{array}$ 4×2 or $4 + 4$
 2×4

$2 + 2 + 2 + 2$



Stage 3 -

Number lines

E.g. 6×3



Partitioning

E.g. $15 \times 2 = 70$

$$\begin{array}{r} \times \quad 10 \quad 5 \\ 2 \quad 20 \quad 10 \quad = 30 \end{array}$$



Stage 4 -

Grid method

E.g. $35 \times 2 = 70$

$$\begin{array}{r|l|l} \times & 30 & 5 \\ 2 & 60 & 10 \end{array} = 70$$

E.g. $123 \times 3 = 369$

$$\begin{array}{r|l|l|l} \times & 100 & 20 & 3 \\ 3 & 300 & 60 & 9 \end{array} = 369$$



Stage 5 -

Grid method

72×38

$$\begin{array}{r|l|l} \times & 70 & 2 \\ 30 & 2100 & 60 \\ 8 & 560 & 16 \end{array} = \begin{array}{r} 2160 \\ + 576 \\ \hline 2736 \end{array}$$

Progressing to using the grid method for decimals.



Stage 6 -

Compact method

2 digits \times 1 digit leading to 2 digits \times 2 digits

$$\begin{array}{r} 23 \\ \times 7 \\ \hline 21 \quad (7 \times 3) \\ +140 \quad (7 \times 20) \\ \hline 161 \end{array} \Rightarrow \begin{array}{r} 23 \\ \times 7 \\ \hline 161 \\ \\ \hline \end{array} \Rightarrow \begin{array}{r} 23 \\ \times 17 \\ \hline 161 \\ + 230 \\ \hline 391 \end{array}$$