

Multiplication

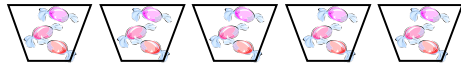
Stage 1

Pictures and symbols and repeated addition

There are 3 sweets in one bag.

How many sweets are there in 5 bags?

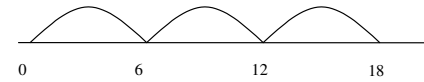
$$3 + 3 + 3 + 3 + 3 = 15$$



Stage 2

Represent as number lines

$$6 \times 3$$



and arrays

$$\begin{array}{c} \bullet \bullet \bullet \bullet \\ \bullet \bullet \bullet \bullet \end{array} \quad 4 \times 2 \text{ or } 4 + 4$$

$$2 \times 4$$

Stage 3

Represent as arrays and grid method

$$15 \times 2 = 30$$

$$\begin{array}{r|l|l} \times & 10 & 5 \\ 2 & 20 & 10 \end{array}$$

$$\begin{array}{c} \bullet \bullet \bullet \bullet \bullet \\ \bullet \bullet \bullet \bullet \bullet \\ \bullet \bullet \bullet \bullet \bullet \end{array} \quad 5 \times 3$$

$$3 \times 5$$

Stage 4

Grid method e.g. $35 \times 2 = 70$

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

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

Expanded and then compact method

$$\begin{array}{r} 4 \times 67 \\ \times 4 \\ \hline 240 \\ 268 \end{array} \quad \rightarrow \quad \begin{array}{r} 67 \\ \times 4 \\ \hline 268 \\ 2 \end{array}$$

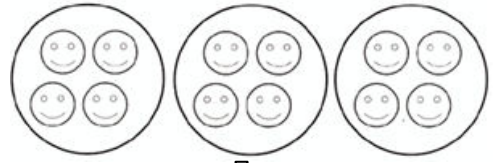
Place the 'carry' digit below the line

Division

Stage 1

Pictures / marks

Children will understand how to share items in play and problem solving.



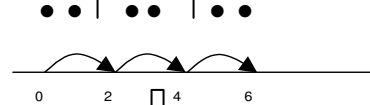
Stage 2

Sharing - 6 sweets are shared between 2 people. How many do they have each?



Grouping

There are 6 sweets. How many people can have 2 sweets each? (How many 2's make 6?)

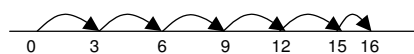


Stage 3

Division with remainders

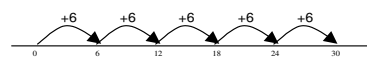
$$16 \div 3 = 5 \text{ r}1$$

Grouping - How many 3's make 16, how many left over? e.g.

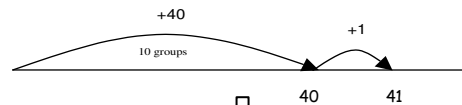


Stage 4

$30 \div 6$ can be modelled as: grouping - counting on in 6's until you reach the number you are dividing E.g.



$$41 \div 4 = 10 \text{ r}1$$



Stage 5

Using chunking for division $256 \div 7 = 36 \text{ r}4$

$$\begin{array}{r} 256 \\ - 140 \quad (20 \text{ groups}) \text{ or } (20 \times 7) \\ \hline 116 \\ - 70 \quad (10 \text{ groups}) \text{ or } (10 \times 7) \\ \hline 46 \\ - 42 \quad (6 \text{ groups}) \text{ or } (6 \times 7) \\ \hline 4 \end{array}$$

Total all the 'chunks' of 7 to find the answer.

$$36 \text{ groups}) \text{ or } (36)$$

Answer: 36 remainder 4