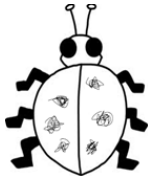
Progression in Written Division

Stage 1

Children are encouraged to develop a mental image of the number system in their heads to use for calculation. They should experience practical calculation opportunities involving **equal** groups and **equal** sharing.

They may develop ways of recording calculations using pictures.

A child's jotting showing halving six spots between two sides of a ladybird.



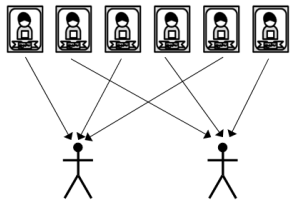
A child's jotting showing how they shared the apples at snack time between two groups.

Stage 2

Children explore practical contexts where they share equally and group equally. 6 ÷ 2 = ?

Equal sharing (6 shared equally between 2)

6 football stickers are shared equally between 2 people, how many do they each get? Children may solve this by using a 'one for you, one for me' strategy until all of the stickers have been given out.



Equal grouping (How many groups of 2 are there in 6?)

There are 6 football stickers, how many people can have 2 stickers each?

Stage 3

Children continue to use practical equipment to represent division calculations as grouping (repeated subtraction) and use jottings to support their calculation.

12 ÷ 3 = ? Children begin to read this calculation as, 'How many groups of 3 are there in 12?'

At this stage, children will also be introduced to division calculations that result in remainders.

13 ÷ 4 = 3 remainder 1

Stage 4

43 ÷ 8

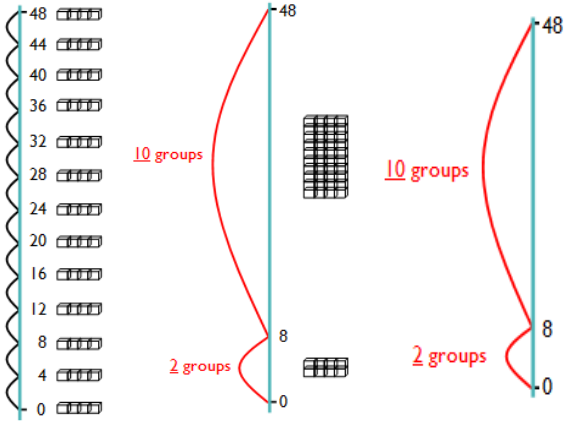
43 ÷ 8 = 5 remainder 3

At this stage, children also learn if the remainder should be rounded up or down e.g. 62 ÷ 8 = 7 remainder 6

I have 62p. Sweets are 8p each. How many can I buy?
Answer: 7 (the remaining 6p is not enough for another sweet)
Apples are packed into boxes of 8. There are 62 apples. How many boxes do I need?
Answer: 8 (the remaining 6 apples still need to be placed into a box)

Stage 5

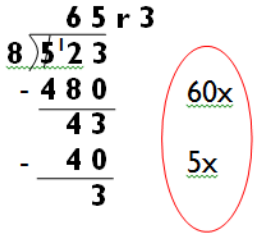
The previous method of repeated subtraction on a number line is continued, but using a vertical number line alongside practical equipment.
The repeated subtraction is made more efficient by subtracting 'chunks' of the divisor.



Stage 6

This is the final stage, in which children use the 'chunking' method.

523 ÷ 8



Progression in Written Division

Stage 6 continued

$$\begin{array}{r} 0\ 3\ 5\ 1\ \text{r}\ 1 \\ 7\overline{)2\,{}^{2}4\,{}^{3}5\ 8} \end{array}$$

$$\begin{array}{r} 0\ 7\ 2.\dot{4} \\ 5\overline{)3\,{}^{3}6\,{}^{1}2.{}^{2}0} \end{array}$$

$$\begin{array}{r} 0\ 9\ 0.7\ 5 \\ 4\overline{)3\,{}^{3}6\ 3.{}^{3}0\,{}^{2}0} \end{array}$$

6367 ÷ 28

$$\begin{array}{rl} & 227\text{r}11 \\ 28\overline{)6367} & \\ -\ 5600 & 200x \\ \hline 767 & \\ -\ 560 & 20x \\ \hline 207 & \\ -\ 140 & 5x \\ \hline 67 & \\ -\ 56 & 2x \\ \hline 11 & \end{array}$$

Stage 6 continued

362 ÷ 17

$$\begin{array}{rl} & 21.29 \\ 17\overline{)362} & \\ -\ 340 & 20x \\ \hline 22 & \\ -\ 17 & 1x \\ \hline 5.0 & \\ -\ 3.4 & 0.2x \\ \hline 1.60 & \\ -\ 1.53 & 0.09x \\ \hline 0.07 & \end{array}$$

To enable children to continue the calculation, they need to understand that 5 is the same as 5.0

When recalling and deriving multiplication and division facts, children should also identify decimal equivalents of times tables,
e.g. if 2 x 17 = 34, I know that
0.2 x 17 = 3.4
if 9 x 17 = 153, 0.9 x 17 = 15.3
so 0.09 x 17 = 1.53

3574 ÷ 8

$$\begin{array}{rl} 8\overline{)3574} & \\ -\ 3200 & 400x \\ \hline 374 & \\ -\ 320 & 40x \\ \hline 54 & \\ -\ 48 & 6x \\ \hline 6 & \end{array}$$

$\frac{6}{8}$ ← remainder / divisor

So 3574 ÷ 8 is $446\frac{6}{8}$
(when the remainder is shown as a fraction)

Children should not be made to go onto the next stage if:

1) **they are not ready.**
2) **they are not confident.**

Children should be encouraged to consider if a mental calculation would be appropriate before using written methods.