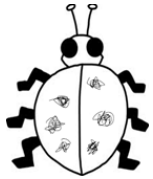
# Progression in Written Division

## 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.



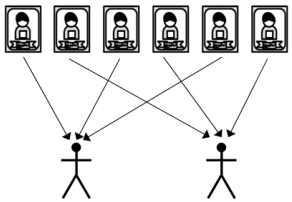
A child's jotting showing how they shared the apples at snack time between two groups.

## 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?'

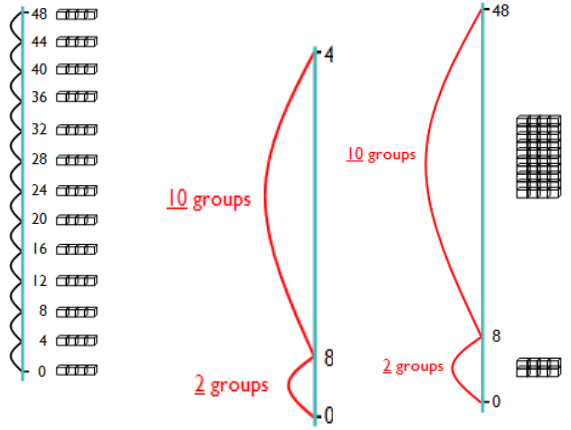
At this stage, children will also be introduced to division calculations that result in remainders.

13 ÷ 4 = 3 remainder 1

## Stage 4

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 'groups' of the divisor.




## Stage 5

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 6

Children will initially use base 10 equipment to practically complete division calculations. Teachers should select numbers carefully to ensure that children do not need to exchange.

When children are confident; they will represent this in their books as jottings.

e.g
69 ÷ 3 =

Children can then represent this as a formal short division method.

$$3\overline{)69}\quad 23$$

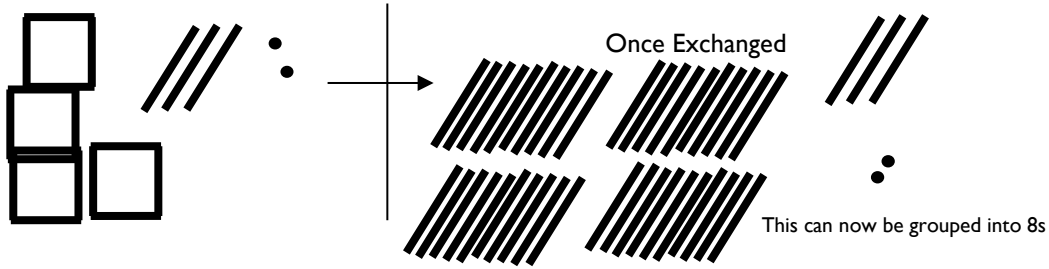
# Progression in Written Division

## Stage 7

Teachers should introduce children to numbers which will require an exchange.
e.g,

$$8 \overline{)432} \quad 054$$

From using the base 10 equipment, children will see that by having 4 hundreds, we cannot group this into groups of 8. Therefore the 4 hundreds will need to be exchanged for 40 tens. This will then leave us with 43 tens which can be grouped into 8s. (Through the use of a fact box, children may know that there are 50 groups of 8 in 400 with a remainder of 3 tens.) The three tens can then be exchanged into ones and again grouped into 8s.




As in the previous stage, children should be encouraged to use practical equipment then move onto jottings before recording this as a formal written method.

**Short division**

98 ÷ 7 becomes

$$7 \overline{)98} \quad 14$$

Answer: 14

432 ÷ 5 becomes

$$5 \overline{)432} \quad 86 \text{ r } 2$$

Answer: 86 remainder 2

496 ÷ 11 becomes

$$11 \overline{)496} \quad 45 \text{ r } 1$$

Answer: $45\frac{1}{11}$

## Stage 8

Long division should be introduced however children may find short division more favourable.

432 ÷ 15 becomes

$$15 \overline{)432.0} \quad 28.8$$

$$\begin{array}{r} 30 \\ \hline 132 \\ 120 \\ \hline 120 \\ 120 \\ \hline 0 \end{array}$$

Answer: 28·8

Fact Box
1 x 15= 15
2 x 15= 30
5 x 15 = 75
10 x 15 = 150

For this stage, children would understand from previous stages that 400 cannot be represented into 15 groups when still in the hundred format. They would then move to see how many groups of 15 are in 43 tens. With the use of a fact box they would know 2 x 15 = 30 therefore 20 x 15 = 300, a 2 would be represented in the tens column.

This will them leave them with a remainder of 13 tens and the 2 units , which is part of the dividend. This can be brought down so it is clear how many groups of 15 the children still need to find. Using the fact box they would know there are 8 groups of 15 in 132 which leaves 12 units. This cannot be grouped into 15s so we must exchange for 120 tenths. This leaves us with 8 groups which is represented as 8 tenths in the quotient.

**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.**