

## Stages in Division

### Division – Early stages (EYFS)

Children will engage in a wide variety of songs and rhymes, games and activities. In practical activities and through discussion they will begin to solve problems involving halving and sharing.



Share the apples between two people.

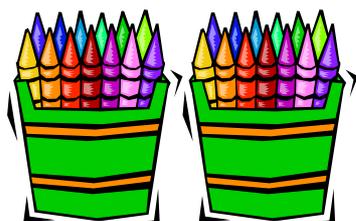
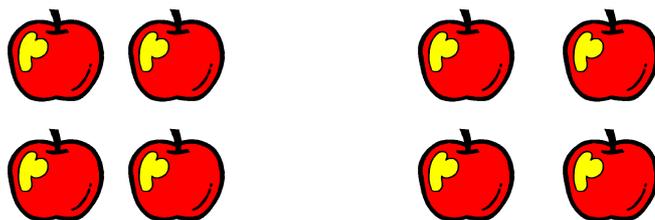
'Half of the apples for you and half of the apples for me.'

### Division - Year One

- **Solve one-step problems involving division by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher**
- **Count in multiples of twos, fives and tens (to the 10<sup>th</sup> multiple)**

Children will start with practical **sharing** using a variety of resources. They will share objects into **equal groups** in a variety of situations. They will begin to use the vocabulary associated with division in practical contexts.

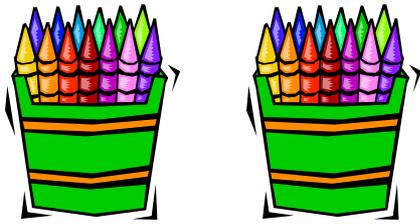
'Share these eight apples equally between two children. How many apples will each child have?'



'Share 20 crayons between 2 pots.'

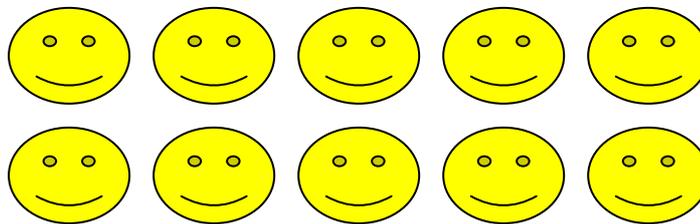
'How many crayons are in each pot?'

Children will move from **sharing** to **grouping** in a practical way

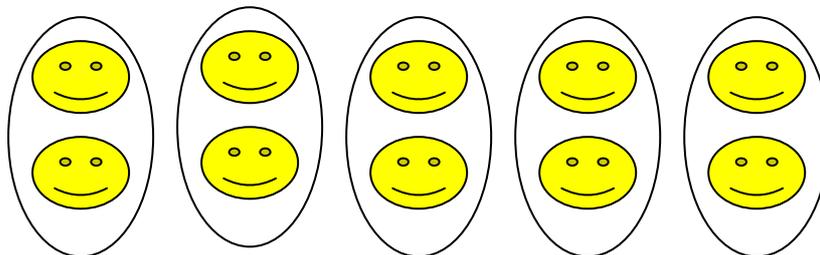


'Put 20 crayons into groups of 10. How many pots do we need?'

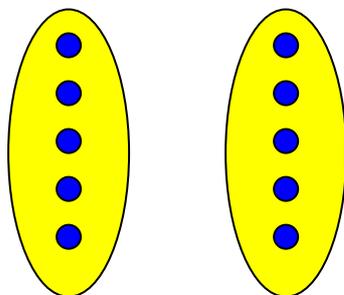
Use **arrays** to support early division



'How many faces altogether? How many groups of two?'



'Five groups of two'



'How many groups of 5?'  
'10 shared equally between 2 people'  
'Half of ten is five'

Continue to solve problems in **practical contexts** throughout Y1, and develop the language of early division, with appropriate resources.

## Division - Year Two

- Recall and use multiplication and division facts for the 2, 5 and 10 multiplication tables
- Calculate mathematical statements for division within the multiplication tables they know and write them using the division ( $\div$ ) and equals (=) signs
- Solve problems involving division, using materials, arrays, repeated subtraction, mental methods, and multiplication and division facts, including problems in contexts

**NB** Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

Children will use a range of vocabulary to describe division and use practical resources, pictures, diagrams and the  $\div$ -sign to record, using multiples that they know.

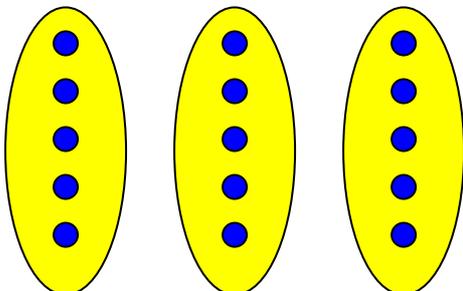
### Sharing and grouping:



'30 crayons shared equally between three pots.' (Sharing)  
'We have 30 crayons and put ten crayons in each pot.  
How many pots do we need?' (Grouping)

'30 divided by 10 = 3'  
'30 divided by 3 = 10'

$$30 \div 10 = 3$$
$$30 \div 3 = 10$$



'How many groups of 5?'  
'15 shared equally between 3 people  
is...?'

'15 divided by 3 equals 5'  
'15 divided by 5 equals 3'

$$15 \div 5 = 3$$
$$15 \div 3 = 5$$

## Using arrays to support division

$$15 \div 5 = 3$$

$$15 \div 3 = 5$$



How many groups of 3?

How many groups of 5?

15 shared between 3 people is...?

15 shared between 5 people is...?

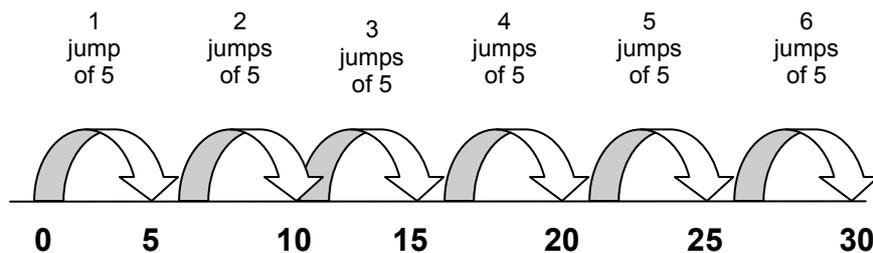
15 divided by 5 = 3

15 divided by 3 = 5

When children are ready, use an empty number line to count forwards:

$$30 \div 5 = 6$$

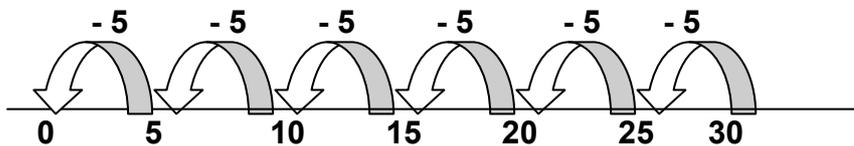
'How many jumps of five make thirty?'



Also jump back to make the link with repeated subtraction:

$$30 \div 5 = 6$$

'How many groups of five?'



**NB** If, at any time, children are making significant errors, return to the previous stage in calculation.

## Year Three – Division

- **Recall and use multiplication and division facts for the 3, 4 and 8 multiplication tables** (continue to practise the 2, 5 and 10 multiplication tables)
- **Write and calculate mathematical statements for division using the multiplication tables that they know, including for two-digit numbers divided by one-digit numbers, using mental and progressing to a formal written method**

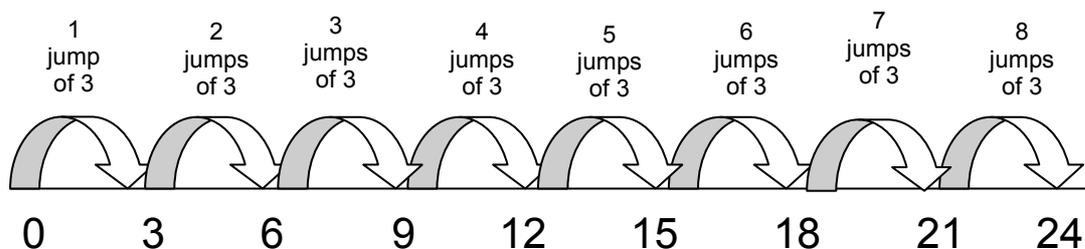
**NB** Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

Continue to use practical resources, pictures, diagrams, number lines, arrays and the  $\div$  sign to record, using multiples that they know, as appropriate (see Y2 guidance).

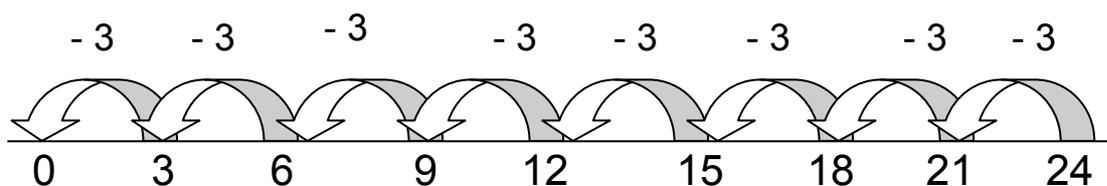
**Using an empty number line to count forwards...**

$$24 \div 3 = 8$$

'How many threes in 24?'



**...also jump back from 24 to make the link with repeated subtraction.**



'How many groups of three in 24?'

**Introduce the formal layout using multiplication/division facts that the children know:**

$$24 \div 3 = 8$$

This can also be recorded as...

$$\begin{array}{r} 8 \\ \hline 3 \overline{) 24} \end{array}$$

'Twenty four divided by three equals eight.'

'How many threes are there in twenty four?'

**NB** If, at any time, children are making significant errors, return to the previous stage in calculation.

## Year Four- Division

- Recall multiplication and division facts for multiplication tables up to  $12 \times 12$
- Use place value, known and derived facts to divide mentally
- Divide two-digit and three-digit numbers by a one-digit number using formal written layout (not explicitly stated in the programmes of study but implied in the non-statutory guidance)

**NB** Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

Continue to write and calculate mathematical statements for division using the multiplication tables that the children know e.g.

$$32 \div 8 = 4$$

Continue using the **formal written layout** for division using multiplication tables that they know:

$$\begin{array}{r} 4 \\ \hline 8 \overline{) 32} \end{array}$$

'How many eights are there in thirty two?'

Continue using the formal written layout, introducing remainders:

$$25 \div 3 = 8 \text{ r } 1$$

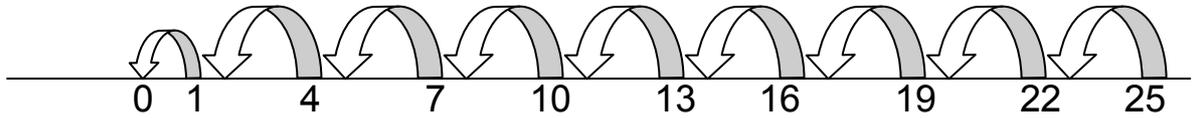
$$\begin{array}{r} 8 \text{ r } 1 \\ \hline 3 \overline{) 25} \end{array}$$

**NB** Remainders are not specifically referred to until Y5 in the National Curriculum. However, this may be an appropriate point to introduce them using familiar multiplication facts.

This could be modelled using an empty number line, if necessary:

'Eight jumps of three and one left over.'

$$25 \div 3 = 8 \text{ r}1$$



Alternatively you could jump forwards in multiples of three from zero to twenty four ('and one more makes 25')

**Division using partitioning** (two digits divided by one digit):

$$65 \div 5 = 13$$

$$65 = 50 + 15 \quad \text{Partition 65 into 50 and 15}$$

$$50 \div 5 = 10$$

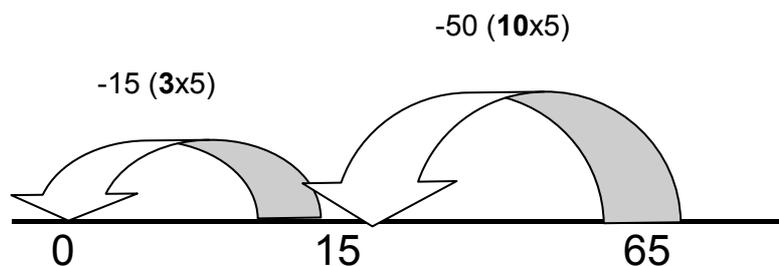
$$15 \div 5 = 3$$

$$10 + 3 = 13$$

**NB** Children will need to practise partitioning in a variety of ways.

Continue to use **empty number lines**, as appropriate, using multiples of the divisor:

$$65 \div 5 = 13$$



$$98 \div 7 = 14$$

$$98 = 70 + 28 \quad \text{Partition 98 into 70 and 28}$$

$$70 \div 7 = 10$$

$$28 \div 7 = 4$$

$$10 + 4 = 14$$

This could be modelled on an empty number line to further develop understanding.

**NB** Children will need to practise partitioning in a variety of ways.

$$98 \div 7 = 14$$

'We have partitioned 98 into 70 and 28 (90 = 70 + 28).

Seven 'goes into' 70 ten times and seven 'goes into' 28 four times.  
Ten add four equals 14'

$$\begin{array}{r} 10 + 4 = 14 \\ 7 \overline{) 70 + 28} \end{array}$$

This will lead into the formal written method of short division:

$$98 \div 7 = 14$$

$$\begin{array}{r} 14 \\ 7 \overline{) 98} \end{array}$$

Use the vocabulary of place value to ensure understanding and make the link to partitioning.

Continue to practise the formal method of short division throughout Y4.

**If children are confident** develop further, by dividing three-digit numbers by a one-digit number using the formal method of short division with whole number answers (no remainders).

**NB** If, at any time, children are making significant errors, return to the previous stage in calculation.

## Year Five - Division

- Divide numbers up to 4 digits by a one-digit number using the formal written method of short division and interpret remainders appropriately for the context

**NB** Ensure that children are confident with the methods outlined in the previous year's guidance before moving on.

**Continue to practise the formal written method of short division with whole number answers...**

$$184 \div 8 = 23$$

$$\begin{array}{r} 23 \\ 8 \overline{) 184} \end{array}$$

Use the language of place value to ensure understanding.

Make the link to the partitioning method (see Y4 guidance).

...and with remainders:

$$432 \div 5 = 86 \text{ r}2$$

$$\begin{array}{r} 86 \text{ r}2 \\ 5 \overline{) 432} \end{array}$$

The remainder can also be expressed as a fraction,  $\frac{2}{5}$  (the remainder divided by the divisor):  $432 \div 5 = 86\frac{2}{5}$

Continue to practise, develop and extend the formal method of short division, with and without remainders. Interpret and express remainders according to the context.

**NB** If, at any time, children are making significant errors, return to the previous stage in calculation.

## Year Six – Division

- Divide numbers up to 4 digits by a two-digit number using the formal written method of short division where appropriate, interpreting remainders according to the context
- Divide numbers up to 4 digits by a two-digit whole number using the formal written method of long division, and interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context

**NB** Ensure that children are confident with the methods outlined in the previous year's guidance before moving on

Continue to practise the **formal method of short division**, with and without remainders, using the language of place value to ensure understanding (see Y5 guidance).

$$496 \div 11 = 45 \text{ r}1$$

$$\begin{array}{r} 45 \text{ r}1 \\ 11 \overline{) 496} \end{array}$$

The remainder can also be expressed as a fraction,  $\frac{1}{11}$  (the remainder divided by the divisor)

Dividing by a two-digit number using a **formal method of long division**:

$$\begin{array}{r} 45 \text{ r}1 \\ 11 \overline{) 496} \\ \underline{- 440} \quad (40 \times 11) \\ 56 \\ \underline{- 55} \quad (5 \times 11) \\ 1 \text{ (remainder)} \end{array}$$

Multiples of the divisor (11) have been subtracted from the dividend (496)

'40 (lots of 11) + 5 (lots of 11) = 45 (lots of 11)'

'1 is the remainder'

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

Standard short division does not help with the following calculation. However, it can be solved using **long division** (by repeated subtraction using multiples of the divisor):

$$144 \div 16 = 9$$

$  \begin{array}{r}  9 \\  \hline  16 \overline{) 144} \\  \underline{- 64} \quad (4 \times 16) \\  80 \\  \underline{- 64} \quad (4 \times 16) \\  16 \\  \underline{- 16} \quad (1 \times 16) \\  0  \end{array}  $	<p>Multiples of the divisor (16) have been subtracted from the dividend (144)</p> <p>'4 (lots of 16) + 4 (lots of 16) + 1 (lot of 16) = 9 (lots of 16)</p> <p>There is no remainder'</p>
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Children will need to select the most effective method for each calculation/problem they meet, including whether to use the standard, **formal written method of long division**:

$$432 \div 15 = 28 \text{ r}12$$

$  \begin{array}{r}  28 \text{ r}12 \\  \hline  15 \overline{) 432} \\  \underline{300} \quad (20 \times 15) \\  132 \\  \underline{120} \quad (8 \times 15) \\  12 \quad (\text{remainder})  \end{array}  $	<p>Multiples of the divisor (15) have been subtracted from the dividend (432)</p> <p>'20 (lots of 15) + 8 (lots of 15) = 28</p> <p>12 is the remainder'</p>
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The remainder can also be expressed as a fraction,  $\frac{12}{15}$  (the remainder divided by the divisor) or as a decimal, **0.8** (see next example)

The answer is:  $28 \frac{12}{15}$  or 28.8

This is an alternative way of recording formal long division:

$$432 \div 15 = 28.8$$

$$\begin{array}{r} 28.8 \\ \hline 15 \overline{) 432.0} \\ \underline{30} \phantom{0} \\ 132 \\ \underline{120} \\ 120 \\ \underline{120} \\ 0 \end{array}$$

**NB** Only teach this method when children are completely secure with the previous method.

The remainder is expressed as a decimal.

**NB** If, at any time, children are making significant errors, return to the previous stage in calculation.

Our aim is that by the end of Y6 children use **mental methods (with jottings)** when appropriate, but for calculations that they cannot do in their heads, they use an efficient **formal written method** accurately and with confidence.