

# Division

## Early Years

In Early Years there is a big emphasis on the children applying practical materials to everyday problems.

Through role play, toys, food, counters and cubes the children practise making equal groups and sharing out items.



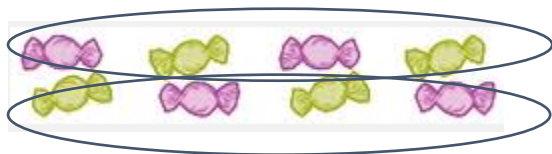
## Year 1

They solve one-step problems involving division, by calculating the answer using real life objects, pictorial representations and arrays with the support of the teacher.

### Practical apparatus

As in Early Years, they practise making equal groups and sharing out items.

E.g. Share 8 sweets between 2 people. How many sweets do they get each?



They get 4 sweets each.

### Link between dividing and multiplying

They begin to make connections between multiplication and division.

E.g.

$$6 \div 2 = 3$$

$$2 \times 3 = 6$$

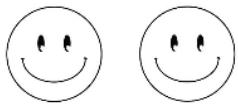
## Year 2

### Dividing

Initially with apparatus then using the smiley face method.



$$6 \div 2 = 3$$



X      X

X      X

X      X

This method is also used to find fractions of amounts. Links are made between finding a half and dividing by 2.

### Link between dividing and multiplying

They calculate mathematical statements for division using their knowledge of multiplication facts and write them using division ( $\div$ ) and equals (=) signs. (e.g.  $8 \div 2 = 4$  because  $2 \times 4 = 8$ )

There are 3 lots of 5 in 15

$$\text{So } 15 \div 5 = 3$$

Arrays are used to demonstrate this concept.



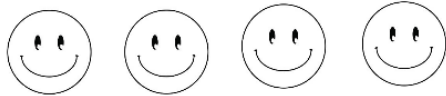
Children recall and use division facts for the 2s, 3s, 5s and 10s.

## Year 3

### Dividing

Using the smiley face method.

$$8 \div 4 =$$



X      X      X      X  
X      X      X      X

### Making links between division and multiplication

They will write and calculate mathematical statements for division using their knowledge of multiplication tables. They will make links between them.

$$4 \times 3 = 12$$

$$12 \div 3 = 4$$

$$3 \times 4 = 12$$

$$12 \div 4 = 3$$

### Missing numbers

They will also solve missing number problems, involving both multiplication and division.

$$\blacksquare \times 3 = 12$$

$$\blacksquare \div 3 = 4$$

$$3 \times \blacksquare = 12$$

$$\blacksquare \div 4 = 3$$

By the end of Year 3 most children will be able to recall and use division facts for the 3, 4, 6, 8 and 9 multiplication tables.

## Year 4

### Making links between division and multiplication

They will write and calculate mathematical statements for division using their knowledge of multiplication tables. They will make links between them.

$$5 \times 7 = 35$$

$$7 \times 5 = 35$$

$$35 \div 5 = 7$$

$$35 \div 7 = 5$$

### Rounding up and down remainders

They will solve real life problems involving division e.g. how many 50 seat coaches needed to take 208 children on a trip? Answer = 5 coaches. (Rounding up and down remainders)

### Formal method

#### **Short division**

98 ÷ 7 becomes

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

Answer: 14

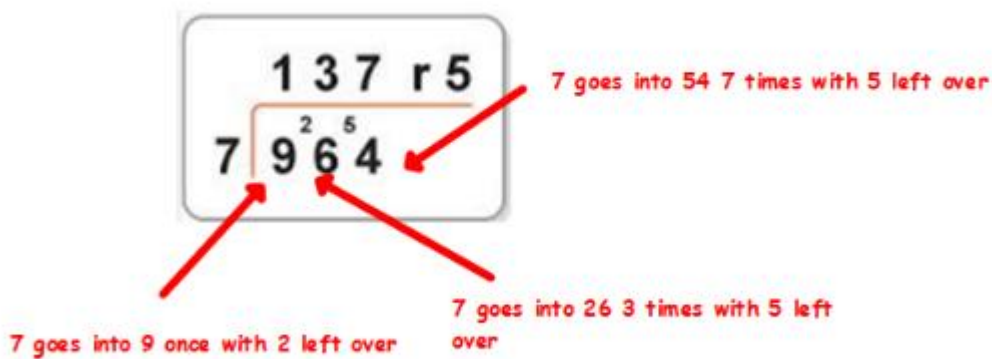
By the end of Year 4 **all** children will be able to recall division facts up  
 $144 \div 12 = 12$

## Year 5

### Formal method of short 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.

E.g. There were 964 football fans and they were sat on chairs in rows of 7. How many rows of chairs would be needed?



Children can use inverse to check.  $137 \times 7 + 5 = 964$

### Long division with brackets

$432 \div 15$  becomes

$$\begin{array}{r} 28 \\ 15 \overline{) 432} \\ \underline{300} \quad (15 \times 20) \\ 132 \\ \underline{120} \quad (15 \times 8) \\ 12 \end{array}$$

Answer is 28 r 12

## Year 6

### Division

Children will divide numbers up to 4 digits by a two-digit whole number using chunking method of long division or 'bus stop' method. They will interpret remainders as whole number remainders, fractions, or by rounding, as appropriate for the context.

### Chunking Method

$$\begin{array}{r} 139 \\ 27 \overline{) 3753} \\ \underline{-2700} \quad (100 \times 27) \\ 1053 \\ \underline{-270} \quad (10 \times 27) \\ 783 \\ \underline{-270} \quad (10 \times 27) \\ 513 \\ \underline{-270} \quad (10 \times 27) \\ 243 \\ \underline{-243} \quad (9 \times 27) \\ 0 \end{array}$$

### Long division

$$\begin{array}{r} 3753 \div 27 \\ \hline 27 \overline{) 3753} \\ \underline{27} \phantom{0} \phantom{0} \phantom{0} \\ 105 \phantom{0} \\ \underline{81} \phantom{0} \\ 243 \\ \underline{243} \\ 0 \end{array}$$

The arrows show the number being brought down from the number being divided.

Children are encouraged to use the inverse to check their answer.

$$\begin{array}{r} 27 \\ \times 9 \\ \hline 243 \\ 6 \end{array}$$
$$\begin{array}{r} 27 \\ \times 5 \\ \hline 135 \\ 3 \end{array}$$
$$\begin{array}{r} 27 \\ \times 3 \\ \hline 81 \\ 2 \end{array}$$

## Long Division with decimals

This example shows how the number is extended to give a decimal answer rather than a remainder.

9	6	3	÷	8					
			1	2	0	.	3	7	5
		8		9	<sup>1</sup> 6	3	<sup>3</sup> 0	<sup>6</sup> 0	<sup>4</sup> 0



$$\begin{array}{r}
 964 \div 8 \\
 \hline
 120.5 \\
 8 \overline{) 964.0}
 \end{array}$$

### Converting a simple fraction into a decimal

Explore and make conjectures about converting a simple fraction to a decimal fraction (for example,  $3 \div 8 = 0.375$ ) using short division.

$$\begin{array}{r}
 0.375 \\
 8 \overline{) 3.000}
 \end{array}$$

### Short Division with decimal places

Use short division methods in cases where the answer has up to two decimal places.

**Example 2:** in a café, the bill comes to £37.24. This amount is shared equally between 7 people. How much will each person have to pay?

$$37.24 \div 7$$

To divide a number that includes a decimal fraction:

- put a decimal point on the answer line at the end of the units column
- carry out the division in the usual way

$$\begin{array}{r}
 7 \overline{) 37.24} \quad 7 \overline{) 37.24} \quad \begin{array}{r} 5.32 \end{array}
 \end{array}$$

The answer is  $37.24 \div 7 = 5.32$

The same applies to 'long division':

**Example 3:**  $275.1 \div 14$

$$\begin{array}{r}
 14 \overline{) 275.1} \quad 14 \overline{) 275.10} \\
 \underline{14} \phantom{0} \\
 135 \\
 \underline{126} \\
 91 \\
 \underline{84} \\
 70 \\
 \underline{70} \\
 00
 \end{array}$$

The first zero is a place holder, to make sure that all the answer digits are in the correct columns.

The final zero is needed to finish the calculation

$$275 \div 14 = 19.65$$

estimate and check your answer.  $280 \div 14 = 20$ , so it's about the right size.

By the end of Year 6 all children should be able to recall division facts up  $144 \div 12 = 12$ , identify common factors, common multiples and prime numbers.

