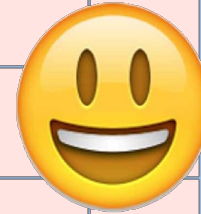
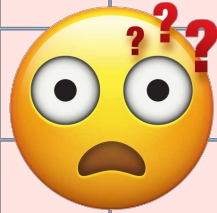
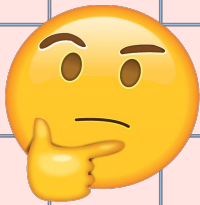


# Long Division



# Short division or long division?

Short division is used when dividing numbers by a 1 digit number

e.g.  $95 \div 5$   
 $132 \div 4$

$$\begin{array}{r} 151 \\ 5 \overline{) 7255} \end{array}$$

Long division is used when dividing numbers by a larger number e.g. a 2 or 3 digit number

e.g.  $395 \div 25$   
 $732 \div 47$

It is called long division because the calculation is extended down.

$$\begin{array}{r} 019.6 \\ 14 \overline{) 275.0} \\ \underline{14} \phantom{0} \\ 135 \\ \underline{126} \phantom{0} \\ 090 \\ \underline{84} \phantom{0} \\ 06 \phantom{0} \end{array}$$

# How to teach long division

## Long division success criteria

$$275 \div 14 \quad 14 \overline{) 275}$$

$$\begin{array}{r} 0 \\ 14 \overline{) 275} \\ \underline{0} \phantom{00} \\ 275 \phantom{0} \end{array}$$

We cannot share 2 into 14 groups, so we put a 0 above the 2.

$$\begin{array}{r} 0 \ 1 \\ 14 \overline{) 275} \\ \underline{14} \phantom{00} \\ 135 \phantom{0} \end{array}$$

Now share 27 into 14 groups. There would be 1 in each group so place a 1 above the 27. Underneath the 27 write the number that was shared into a group. ( $1 \times 14 = 14$ ).

$$\begin{array}{r} 0 \ 1 \\ 14 \overline{) 275} \\ \underline{14} \phantom{00} \\ 135 \phantom{0} \\ \underline{14} \phantom{00} \\ 215 \phantom{0} \end{array}$$

To work out how many were remaining and therefore carried over, subtract 14 from 27. This is 13 so write it underneath the 14 as you would in column subtraction. Bring down the 5 ones.

$$\begin{array}{r} 0 \ 1 \ 9 \\ 14 \overline{) 275} \\ \underline{14} \phantom{00} \\ 135 \phantom{0} \\ \underline{126} \phantom{00} \\ 9 \phantom{0} \end{array}$$

Next share 135 into 14 groups. There would be 9 in each group because  $9 \times 14 = 126$ . Write 126 underneath 135 and subtract it to work out how many are carried over, which is 9.

$$\begin{array}{r} 0 \ 1 \ 9 \\ 14 \overline{) 275} \\ \underline{14} \phantom{00} \\ 135 \phantom{0} \\ \underline{126} \phantom{00} \\ 9 \phantom{0} \end{array}$$

1. List the multiples of the divisor!

In this case it is 14.

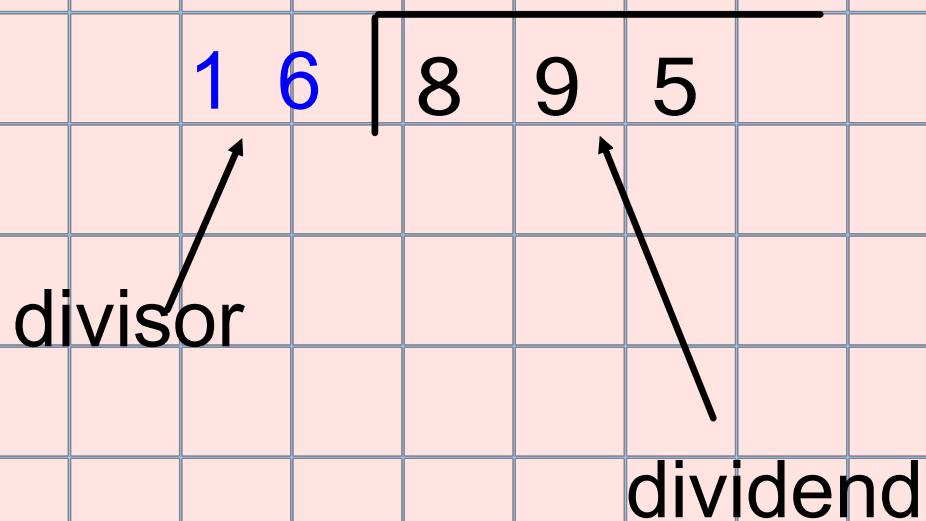
$$\begin{array}{r} 0 \ 1 \ 9 \ .6 \\ 14 \overline{) 275.0} \\ \underline{14} \phantom{00} \\ 135 \phantom{0} \\ \underline{126} \phantom{00} \\ 90 \phantom{0} \\ \underline{84} \phantom{00} \\ 6 \phantom{0} \end{array}$$

Insert a decimal point and placeholder in the tenths column. Bring the 0 down to make 90 (ignore the place value of decimals at this stage.) Share 90 equally into 14 groups.  $14 \times 6 = 84$  so put 6 in the tenths column and place 84 below 90 to begin subtraction.

$$\begin{array}{r} 0 \ 1 \ 9 \ .6 \ 4 \\ 14 \overline{) 275.00} \\ \underline{14} \phantom{00} \\ 135 \phantom{0} \\ \underline{126} \phantom{00} \\ 90 \phantom{0} \\ \underline{84} \phantom{00} \\ 60 \phantom{0} \\ \underline{56} \phantom{00} \\ 4 \phantom{0} \end{array}$$

Bring a second 0 down from the hundredths place to make 60. Share 60 into 14 groups.  $14 \times 4 = 56$  so put 4 in the tenths column of the answer. We only need to calculate 2 decimal places even though we have a remainder of 6.

**Step 1:** - List key multiplication facts for the divisor before you start



$$2 \times 16 = 32$$

$$3 \times 16 = 48$$

$$4 \times 16 = 64$$

$$5 \times 16 = 80$$

$$6 \times 16 = 96$$

# Step 2 - Divide the first digit of the dividend by the divisor

$$\begin{array}{r} 0 \\ 16 \overline{) 895} \end{array}$$

$2 \times 16 = 32$

$3 \times 16 = 48$

$4 \times 16 = 64$

$5 \times 16 = 80$

$6 \times 16 = 96$

**Long division success criteria**

1. List the multiples of the divisor!  
In this case it is 14.

275 ÷ 14 = 19.6

14 | 2 7 5

0

14 | 2 7 5

1 4

1 3 5

1 4

1 3 5

1 4

1 2 6

0 0 9

We cannot share 2 into 14 groups, so we put a 0 above the 2.

Now share 27 into 14 groups. There would be 1 in each group so place a 1 above the 27. Underneath the 27 write the number that was shared into a group. (1 x 14 = 14).

To work out how many were remaining and therefore carried over, subtract 14 from 27. This is 13 so write it underneath the 14 as you would in column subtraction. Bring down the 5 ones.

Next share 135 into 14 groups. There would be 9 in each group because 9 x 14 = 126. Write 126 underneath 135 and subtract it to work out how many are carried over, which is 9.

Insert a decimal point and placeholder in the tenths column. Bring the 0 down to make 90 (ignore the place value of decimals at this stage.) Share 90 equally into 14 groups. 14 x 6 = 84 so put 6 in the tenths column and place 84 below 90 to begin subtraction.

Bring a second 0 down from the hundredths place to make 60. Share 60 into 14 groups. 14 x 4 = 56 so put 4 in the tenths column of the answer. We only need to calculate 2 decimal places even though we have a remainder of 6.

# Step 3 - Divide the first 2 digits by the divisor

$$\begin{array}{r}
 05 \\
 16 \overline{) 895} \\
 \underline{80} \phantom{0} \\
 80
 \end{array}$$

$2 \times 16 = 32$

$3 \times 16 = 48$

$4 \times 16 = 64$

$5 \times 16 = 80$

$6 \times 16 = 96$

**Long division success criteria**

$275 \div 14$

$$\begin{array}{r}
 0 \\
 14 \overline{) 275} \\
 \underline{0} \phantom{0} \\
 27
 \end{array}$$

We cannot share 2 into 14 groups, so we put a 0 above the 2.

$$\begin{array}{r}
 01 \\
 14 \overline{) 275} \\
 \underline{14} \phantom{0} \\
 13
 \end{array}$$

Now share 27 into 14 groups. There would be 1 in each group so place a 1 above the 27. Underneath the 27 write the number that was shared into a group. (1 x 14 = 14).

$$\begin{array}{r}
 019 \\
 14 \overline{) 275} \\
 \underline{14} \phantom{0} \\
 135
 \end{array}$$

To work out how many were remaining and therefore carried over, subtract 14 from 27. This is 13 so write it underneath the 14 as you would in column subtraction. Bring down the 5 ones.

$$\begin{array}{r}
 019 \\
 14 \overline{) 275} \\
 \underline{14} \phantom{0} \\
 135 \\
 \underline{126} \\
 9
 \end{array}$$

Next share 135 into 14 groups. There would be 9 in each group because 9 x 14 = 126. Write 126 underneath 135 and subtract it to work out how many are carried over, which is 9.

**1. List the multiples of the divisor!**

In this case it is 14.

$$\begin{array}{r}
 019.6 \\
 14 \overline{) 275.0} \\
 \underline{14} \phantom{0} \\
 135 \\
 \underline{126} \\
 90 \\
 \underline{84} \\
 6
 \end{array}$$

Insert a decimal point and placeholder in the tenths column. Bring the 0 down to make 90 (ignore the place value of decimals at this stage.) Share 90 equally into 14 groups. 14 x 6 = 84 so put 6 in the tenths column and place 84 below 90 to begin subtraction.

$$\begin{array}{r}
 019.64 \\
 14 \overline{) 275.00} \\
 \underline{14} \phantom{0} \\
 135 \\
 \underline{126} \\
 90 \\
 \underline{84} \\
 60 \\
 \underline{56} \\
 4
 \end{array}$$

Bring a second 0 down from the hundredths place to make 60. Share 60 into 14 groups. 14 x 4 = 56 so put 4 in the tenths column of the answer. We only need to calculate 2 decimal places even though we have a remainder of 6.

# Step 3 - work out what we have remaining

$$\begin{array}{r}
 16 \overline{) 895} \\
 \underline{- 80} \\
 09
 \end{array}$$

$2 \times 16 = 32$

$3 \times 16 = 48$

$4 \times 16 = 64$

$5 \times 16 = 80$

$6 \times 16 = 96$

**Long division success criteria**

275 ÷ 14

1. List the multiples of the divisor!  
In this case it is 14.

We cannot share 2 into 14 groups, so we put a 0 above the 2.

Now share 27 into 14 groups. There would be 1 in each group so place a 1 above the 27. Underneath the 27 write the number that was shared into a group. (1 x 14 = 14).

To work out how many were remaining and therefore carried over, subtract 14 from 27. This is 13 so write it underneath the 14 as you would in column subtraction. Bring down the 5 ones.

Next share 135 into 14 groups. There would be 9 in each group because 9 x 14 = 126. Write 126 underneath 135 and subtract it to work out how many are carried over, which is 9.

Insert a decimal point and placeholder in the tenths column. Bring the 0 down to make 90 (ignore the place value of decimals at this stage.) Share 90 equally into 14 groups. 14 x 6 = 84 so put 6 in the tenths column and place 84 below 90 to begin subtraction.

Bring a second 0 down from the hundredths place to make 60. Share 60 into 14 groups. 14 x 4 = 56 so put 4 in the tenths column of the answer. We only need to calculate 2 decimal places even though we have a remainder of 6.

# Step 4 - bring down the next digit of the dividend

$$\begin{array}{r}
 05 \\
 16 \overline{) 895} \\
 \underline{80} \phantom{0} \\
 95
 \end{array}$$

$2 \times 16 = 32$

$3 \times 16 = 48$

$4 \times 16 = 64$

$5 \times 16 = 80$

$6 \times 16 = 96$

**Long division success criteria**

1. List the multiples of the divisor!  
In this case it is 14.

275 ÷ 14    14 | 2 7 5

0

$$\begin{array}{r}
 0 \\
 14 \overline{) 275} \\
 \underline{28} \phantom{0} \\
 15
 \end{array}$$

We cannot share 2 into 14 groups, so we put a 0 above the 2.

0 1

$$\begin{array}{r}
 01 \\
 14 \overline{) 275} \\
 \underline{14} \phantom{0} \\
 135
 \end{array}$$

Now share 27 into 14 groups. There would be 1 in each group so place a 1 above the 27. Underneath the 27 write the number that was shared into a group. (1 x 14 = 14).

0 1

$$\begin{array}{r}
 01 \\
 14 \overline{) 275} \\
 \underline{14} \phantom{0} \\
 135
 \end{array}$$

To work out how many were remaining and therefore carried over, subtract 14 from 27. This is 13 so write it underneath the 14 as you would in column subtraction. Bring down the 5 ones.

0 1 9

$$\begin{array}{r}
 019 \\
 14 \overline{) 275} \\
 \underline{14} \phantom{0} \\
 135 \\
 \underline{126} \\
 9
 \end{array}$$

Next share 135 into 14 groups. There would be 9 in each group because 9 x 14 = 126. Write 126 underneath 135 and subtract it to work out how many are carried over, which is 9.

0 1 9 . 6

$$\begin{array}{r}
 019.6 \\
 14 \overline{) 275.0} \\
 \underline{14} \phantom{0} \\
 135 \\
 \underline{126} \phantom{0} \\
 90 \\
 \underline{84} \\
 60
 \end{array}$$

Insert a decimal point and placeholder in the tenths column. Bring the 0 down to make 90 (ignore the place value of decimals at this stage.) Share 90 equally into 14 groups. 14 x 6 = 84 so put 6 in the tenths column and place 84 below 90 to begin subtraction.

0 1 9 . 6 4

$$\begin{array}{r}
 019.64 \\
 14 \overline{) 275.00} \\
 \underline{14} \phantom{0} \\
 135 \\
 \underline{126} \phantom{0} \\
 90 \\
 \underline{84} \phantom{0} \\
 60 \\
 \underline{56} \\
 40
 \end{array}$$

Bring a second 0 down from the hundredths place to make 60. Share 60 into 14 groups. 14 x 4 = 56 so put 4 in the tenths column of the answer. We only need to calculate 2 decimal places even though we have a remainder of 6.



# Step 4 - Divide what is remaining by divisor then work out what is left

16  $\overline{) 055}$

$\underline{80}$

95

$\underline{80}$

15

- 2 x 16 = 32
- 3 x 16 = 48
- 4 x 16 = 64
- 5 x 16 = 80
- 6 x 16 = 96

**Long division success criteria**

275 ÷ 14

14  $\overline{) 275}$

0

14  $\overline{) 275}$

0 1

14  $\overline{) 275}$

0 1

14  $\overline{) 275}$

0 1 9

14  $\overline{) 275}$

1 4

1 2 6

0 0 9

1. List the multiples of the divisor!  
In this case it is 14.

We cannot share 2 into 14 groups, so we put a 0 above the 2.

Now share 27 into 14 groups. There would be 1 in each group so place a 1 above the 27. Underneath the 27 write the number that was shared into a group. (1 x 14 = 14).

To work out how many were remaining and therefore carried over, subtract 14 from 27. This is 13 so write it underneath the 14 as you would in column subtraction. Bring down the 5 ones.

Next share 135 into 14 groups. There would be 9 in each group because 9 x 14 = 126. Write 126 underneath 135 and subtract it to work out how many are carried over, which is 9.

Insert a decimal point and placeholder in the tenths column. Bring the 0 down to make 90 (ignore the place value of decimals at this stage.) Share 90 equally into 14 groups. 14 x 6 = 84 so put 6 in the tenths column and place 84 below 90 to begin subtraction.

Bring a second 0 down from the hundredths place to make 60. Share 60 into 14 groups. 14 x 4 = 56 so put 4 in the tenths column of the answer. We only need to calculate 2 decimal places even though we have a remainder of 6.

# Step 5

$2 \times 16 = 32$

$3 \times 16 = 48$

$4 \times 16 = 64$

$5 \times 16 = 80$

$6 \times 16 = 96$

$7 \times 16 = 112$

$8 \times 16 = 128$

$9 \times 16 = 144$

$$\begin{array}{r}
 055.9 \\
 16 \overline{) 895.00} \\
 \underline{80} \phantom{00} \\
 95 \\
 \underline{80} \phantom{00} \\
 150 \\
 \underline{144} \phantom{00} \\
 60
 \end{array}$$

**Long division success criteria**

275 ÷ 14    14 | 275

0

14 | 275

0 1

14 | 275

1 4

0 1

14 | 275

1 4

1 3 5

0 1 9

14 | 275

1 4

1 2 6

0 0 9

1. List the multiples of the divisor!  
In this case it is 14.

We cannot share 2 into 14 groups, so we put a 0 above the 2.

Now share 27 into 14 groups. There would be 1 in each group so place a 1 above the 27. Underneath the 27 write the number that was shared into a group. (1 x 14 = 14).

To work out how many were remaining and therefore carried over, subtract 14 from 27. This is 13 so write it underneath the 14 as you would in column subtraction. Bring down the 5 ones.

Next share 135 into 14 groups. There would be 9 in each group because 9 x 14 = 126. Write 126 underneath 135 and subtract it to work out how many are carried over, which is 9.

Insert a decimal point and place a 0 in the tenths column. Bring the 0 down to make 90 (ignore the place value of decimals at this stage). Share 90 equally into 14 groups. 14 x 6 = 84 so put 6 in the tenths column and place 84 below 90 to begin subtraction.

Bring a second 0 down from the hundredths place to make 60. Share 60 into 14 groups. 14 x 4 = 56 so put 4 in the tenths column of the answer. We only need to calculate 2 decimal places even though we have a remainder of 6.

# Step 6

Stop at 2 decimal places

$2 \times 16 = 32$

$3 \times 16 = 48$

$4 \times 16 = 64$

$5 \times 16 = 80$

$6 \times 16 = 96$

$7 \times 16 = 112$

$8 \times 16 = 128$

$9 \times 16 = 144$

$$\begin{array}{r}
 055.93 \\
 16 \overline{) 895.00} \\
 \underline{80} \phantom{00} \\
 95 \phantom{00} \\
 \underline{80} \phantom{00} \\
 150 \phantom{00} \\
 \underline{144} \phantom{00} \\
 60
 \end{array}$$

**Long division success criteria**

$275 \div 14$      $14 \overline{) 275}$

1. List the multiples of the divisor!  
In this case it is 14.

$14 \overline{) 275}$   
We cannot share 2 into 14 groups, so we put a 0 above the 2.

$14 \overline{) 275}$   
Now share 27 into 14 groups. There would be 1 in each group so place a 1 above the 27. Underneath the 27 write the number that was shared into a group. ( $1 \times 14 = 14$ ).

$14 \overline{) 275}$   
To work out how many were remaining and therefore carried over, subtract 14 from 27. This is 13 so write it underneath the 14 as you would in column subtraction. Bring down the 5 ones.

$14 \overline{) 275}$   
Next share 135 into 14 groups. There would be 9 in each group because  $9 \times 14 = 126$ . Write 126 underneath 135 and subtract it to work out how many are carried over, which is 9.

$14 \overline{) 275.0}$   
Insert a decimal point and place a 0 in the tenths column. Bring the 0 down to make 90 (ignore the place value of decimal at this stage). Share 90 equally into 14 groups.  $14 \times 6 = 84$  so put 6 in the tenths column and place 84 below 90 to begin subtraction.

$14 \overline{) 275.00}$   
Bring a second 0 down from the hundredths place to make 60. Share 60 into 14 groups.  $14 \times 4 = 56$  so put 4 in the tenths column of the answer. We only need to calculate 2 decimal places even though we have a remainder of 6.



**Long division success criteria**

275 ÷ 14 = 14 | 2 7 5

1. List the multiples of the divisor!  
In this case it is 14.

We cannot share 2 into 14 groups, so we put a 0 above the 2.

Now share 27 into 14 groups. There would be 1 in each group so place a 1 above the 27. Underneath the 27 write the number that was shared into a group. (1 x 14 = 14).

To work out how many were remaining and therefore carried over, subtract 14 from 27. This is 13 so write it underneath the 14 as you would in column subtraction. Bring down the 5 ones.

Next share 135 into 14 groups. There would be 9 in each group because 9 x 14 = 126. Write 126 underneath 135 and subtract it to work out how many are carried over, which is 9.

0 1 9 . 6

14 | 2 7 5 . 0

1 4  
1 2 6  
0 0 8 9 1 0  
8 4  
0 6

Insert a decimal point and placeholder in the tenths column. Bring the 0 down to make 90 (ignore the place value of decimals at this stage.) Share 90 equally into 14 groups. 14 x 6 = 84 so put 6 in the tenths column and place 84 below 90 to begin subtraction.

0 1 9 . 6 4

14 | 2 7 5 . 0 0

1 4  
1 2 6  
0 0 8 9 1 0  
8 4  
0 5 6 1 0  
5 6  
0 6

Bring a second 0 down from the hundredths place to make 60. Share 60 into 14 groups. 14 x 4 = 56 so put 4 in the tenths column of the answer. We only need to calculate 2 decimal places even though we have a remainder of 6.

0 4 8 . 2 1

1 4 | 6 7 5 . 0 0

5 6

1 1 5

1 1 2

~~2 3~~ 1 0

2 8

0 2 0

- 1 x 14 = 14
- 2 x 14 = 28
- 3 x 14 = 42
- 4 x 14 = 56
- 5 x 14 = 70
- 6 x 14 = 84
- 7 x 14 = 98
- 8 x 14 = 112



