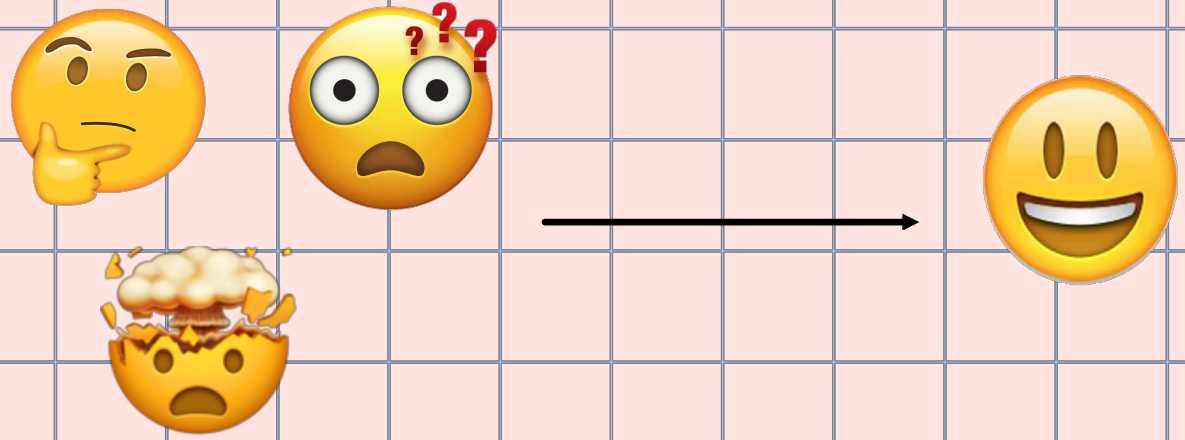
Long Division



Short division or long division?

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

e.g. 9 5 ÷ 5

1 3 2 ÷ 4

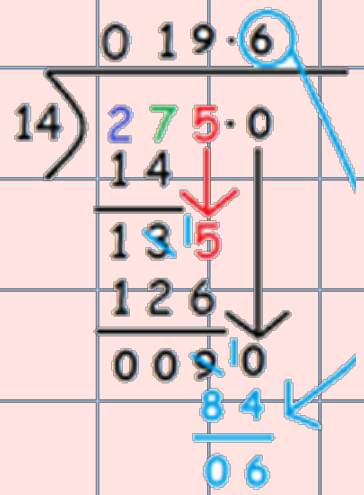
$$5\overline{)7^{2}5\ 5}\quad 1\ 5\ 1$$

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

e.g 3 9 5 ÷ 2 5

7 3 2 ÷ 4 7

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



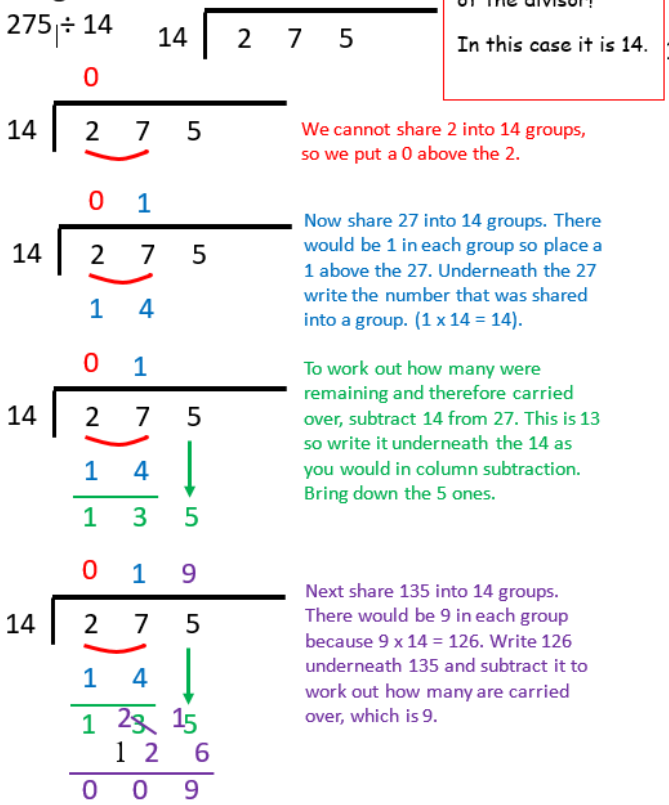
How to teach long division

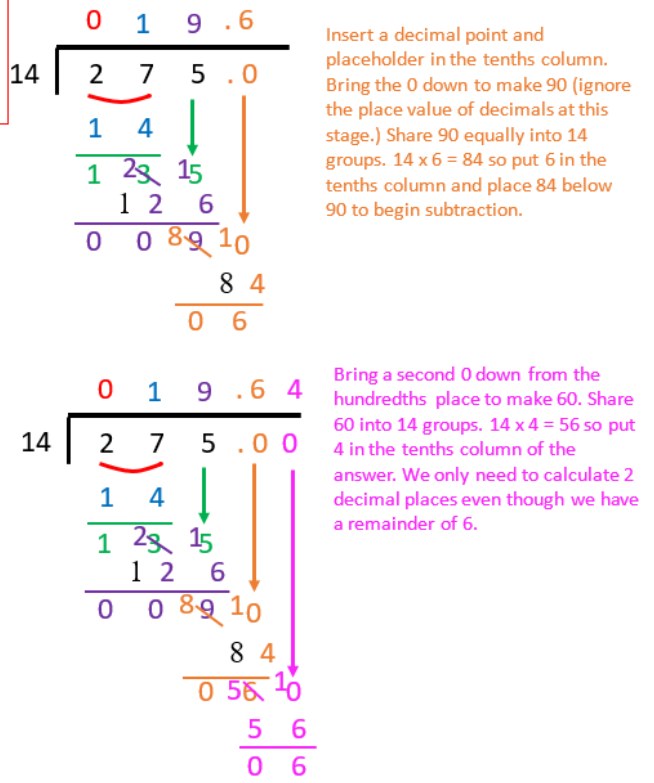
Long division success criteria

275 ÷ 14

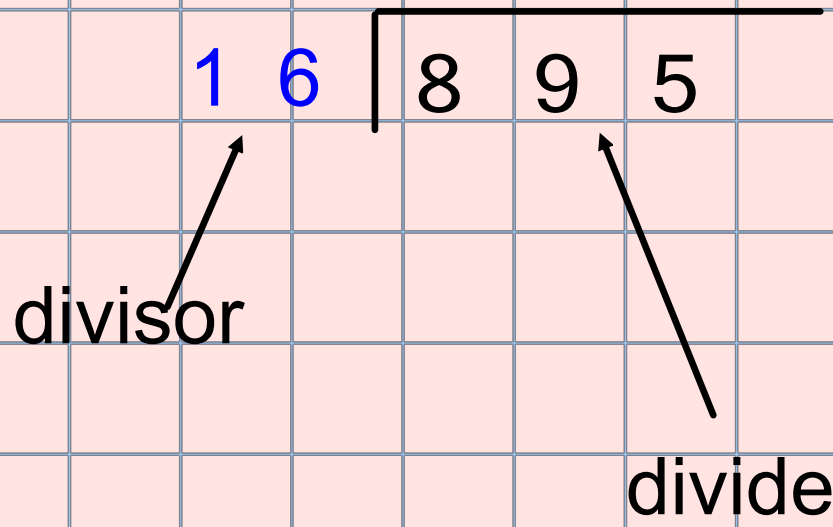
1. List the multiples of the divisor!

In this case it is 14.





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



2 x 16 = 32

3 x 16 = 48

4 x 16 = 64

5 x 16 = 80

6 x 16 = 96

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

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

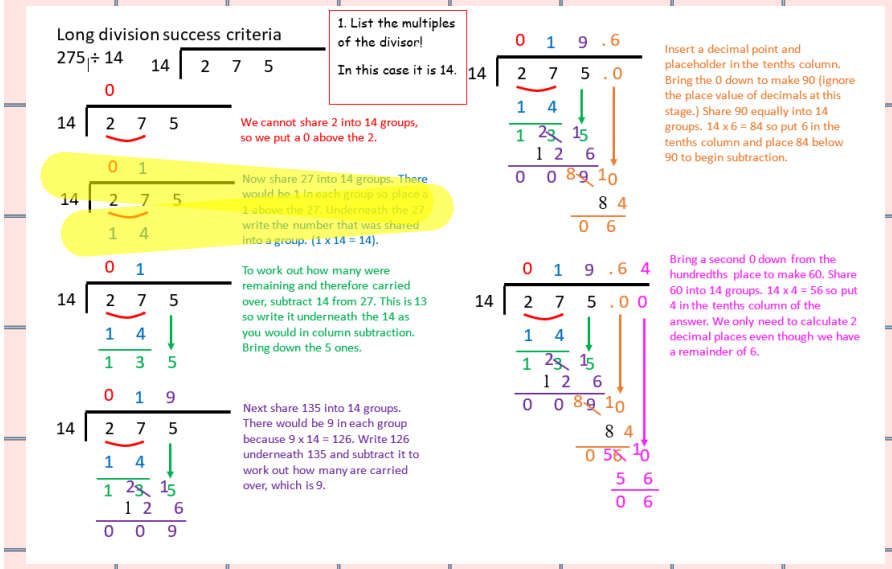
2 x 16 = 32

3 x 16 = 48

4 x 16 = 64

5 x 16 = 80

6 x 16 = 96



Step 3 - Divide the first 2 digits by the divisor

$$\begin{array}{r} 0\ 5 \\ 16\overline{)\,8\ 9\ 5} \\ 8\ 0 \end{array}$$

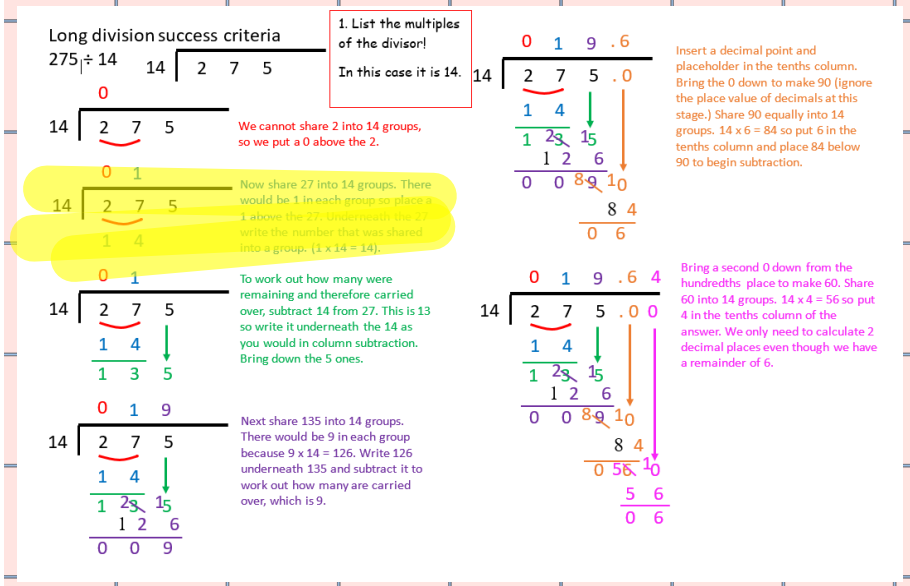
2 x 16 = 32

3 x 16 = 48

4 x 16 = 64

5 x 16 = 80

6 x 16 = 96



Step 3 - work out what we have remaining

$$\begin{array}{r} 0\ 5 \\ 16\overline{)\ 8\ 9\ 5} \\ -\ 8\ 0 \\ \hline 0\ 9 \end{array}$$

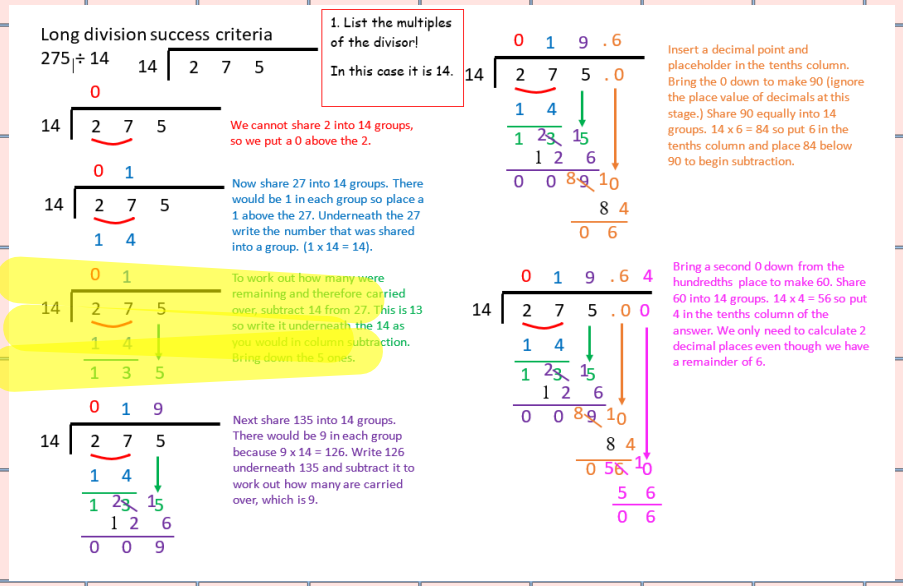
2 x 16 = 32

3 x 16 = 48

4 x 16 = 64

5 x 16 = 80

6 x 16 = 96



Step 4 - bring down the next digit of the dividend

$$\begin{array}{r} 0\ 5 \\ 16\overline{)\,8\ 9\ 5} \\ -\ 8\ 0 \\ \hline 9\ 5 \end{array}$$

2 x 16 = 32

3 x 16 = 48

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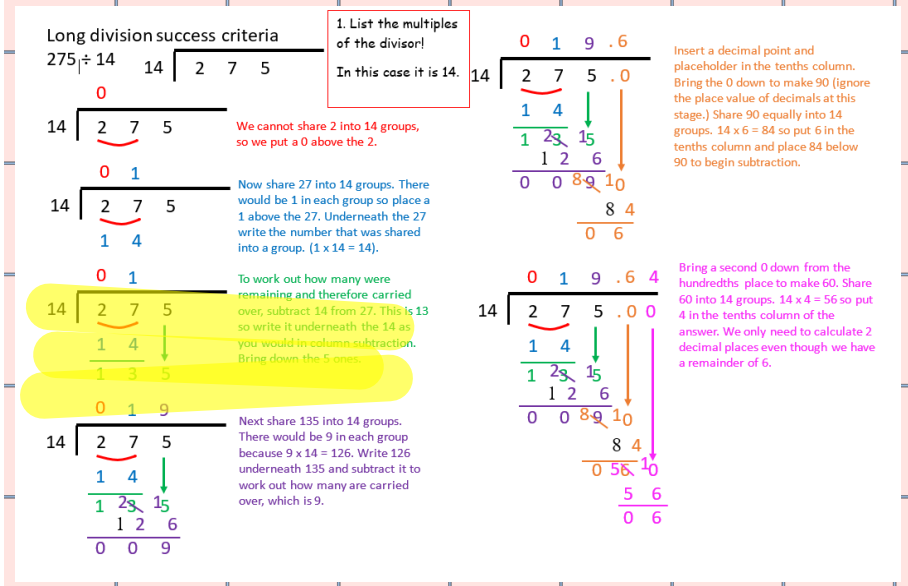

Step 4 - Divide what is remaining by divisor then work out what is left

$$
\begin{array}{r|lll}
 & 0 & 5 & 5 \\
\hline
16 & 8 & 9 & 5 \\
 & 8 & 0 & \downarrow \\
\hline
 & & 9 & 5 \\
- & & 8 & 0 \\
\hline
 & & 1 & 5
\end{array}
$$

2 x 16 = 32

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4 x 16 = 64

5 x 16 = 80

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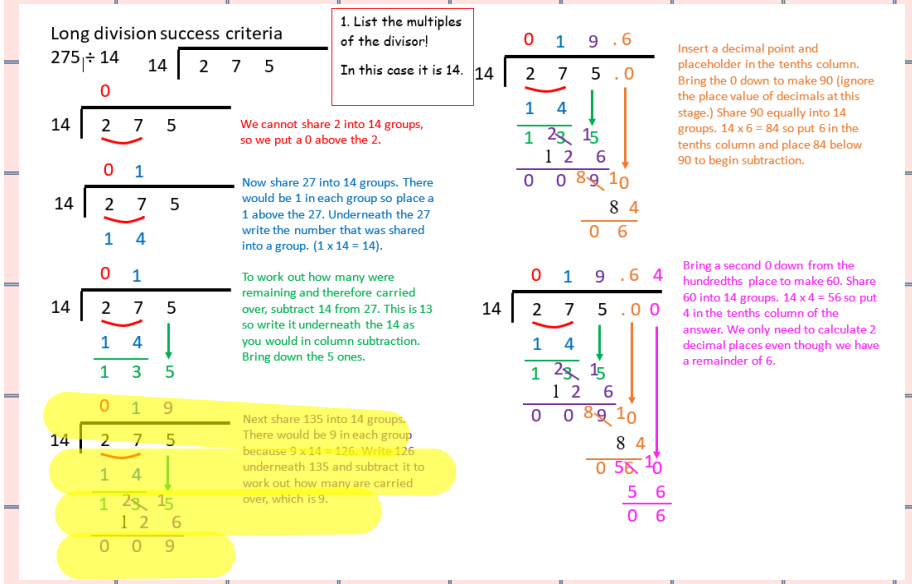


Step 5

2 x 16 = 32

3 x 16 = 48

4 x 16 = 64

5 x 16 = 80

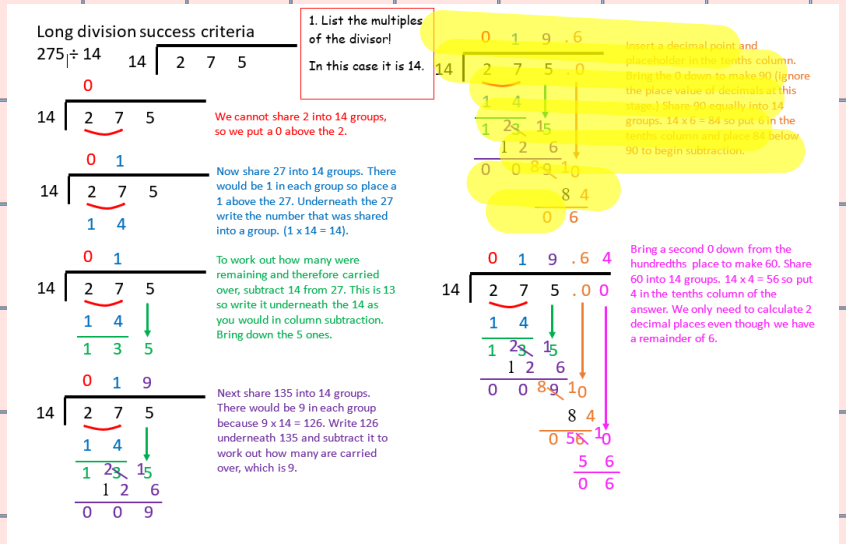
6 x 16 = 96

7 x 16 = 112

8 x 16 = 128

9 x 16 = 144

$$
\begin{array}{r}
0\,5\,5\cdot 9 \\
16\overline{)\,8\,9\,5\cdot 0\,0} \\
\underline{8\,0} \\
9\,5 \\
\underline{8\,0} \\
1\,5\,{}^{1}0 \\
\underline{1\,4\,4} \\
6\,0
\end{array}
$$



Step 6

2 x 16 = 32

3 x 16 = 48

4 x 16 = 64

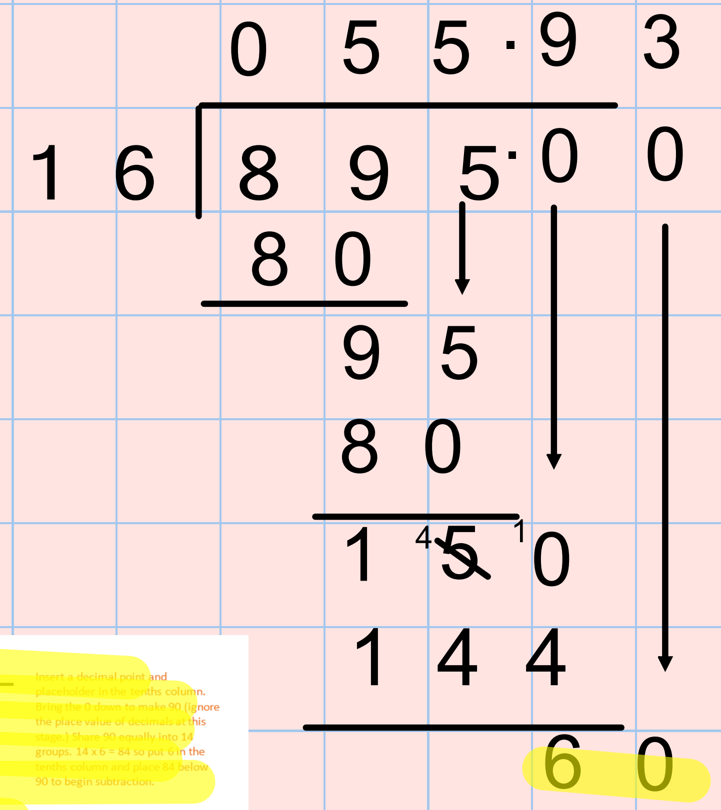
5 x 16 = 80

6 x 16 = 96

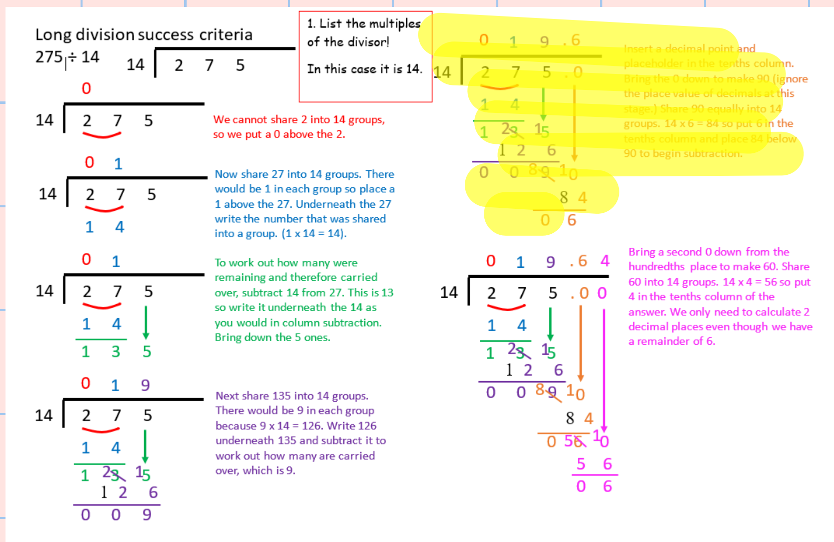
7 x 16 = 112

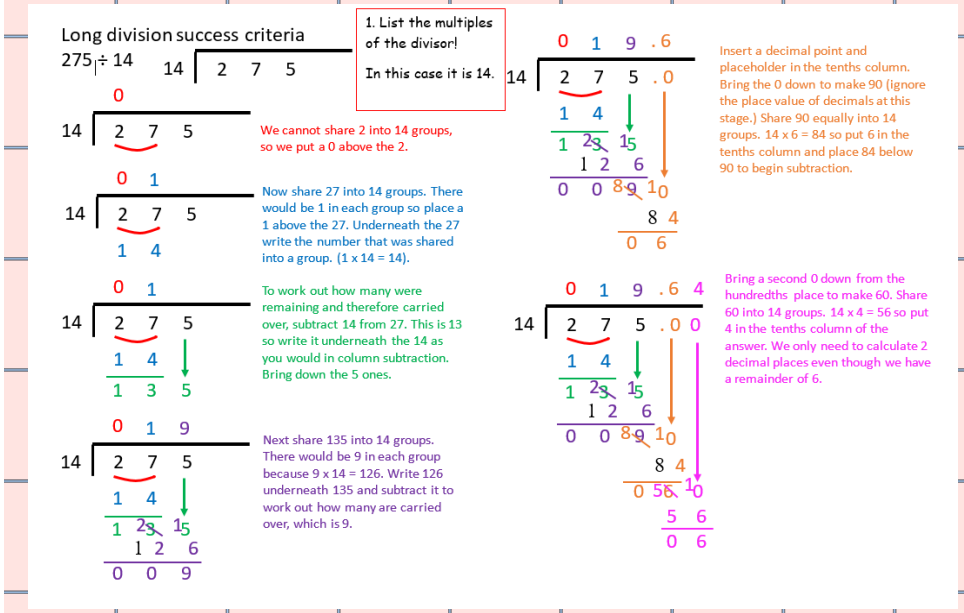
8 x 16 = 128

9 x 16 = 144



Stop at 2 decimal places


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.
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.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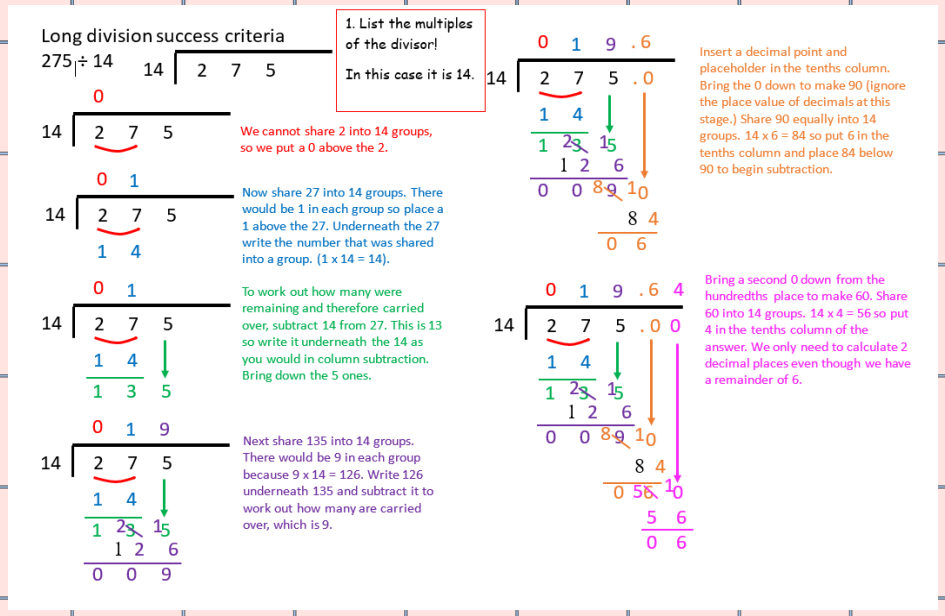
14 | 6 7 5



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

Example SATs questions

13 A box contains 2.6 kg of washing powder.

Jack uses 65 grams of powder for each wash.

He uses all the powder.

How many washes did Jack do?

Show your method

washes

22 $4\,3\overline{)6\,4\,5}$

Show your method

2 marks

36 $9\,7\overline{)8\,8\,2\,7}$

Show your method

2 marks