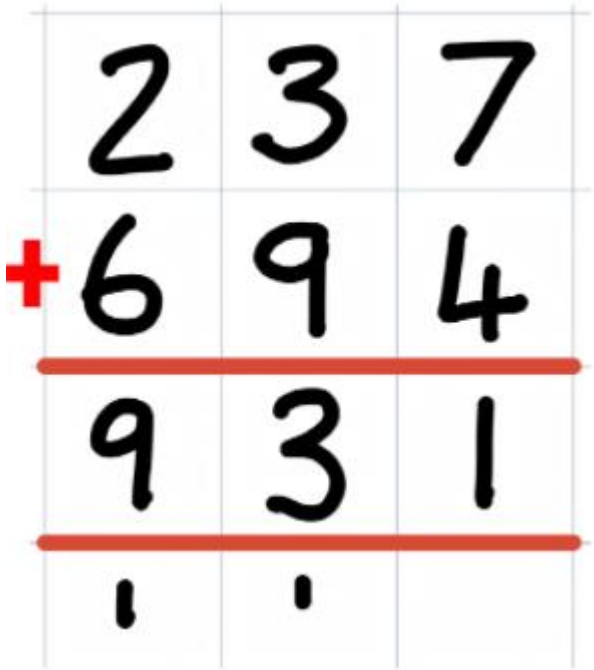
KS2 Calculation Workshop

Addition

Children in KS2 will use formal column subtraction.

In Y3 they build up to using the formal method below:



Before they use this method they need to understand the value of the digits.

Spot the mistake

Write the total.

$$36 + 29 = \boxed{55}$$

$$\begin{array}{r} \text{t u} \\ 36 \\ +\ 29 \\ \hline 55 \end{array}$$

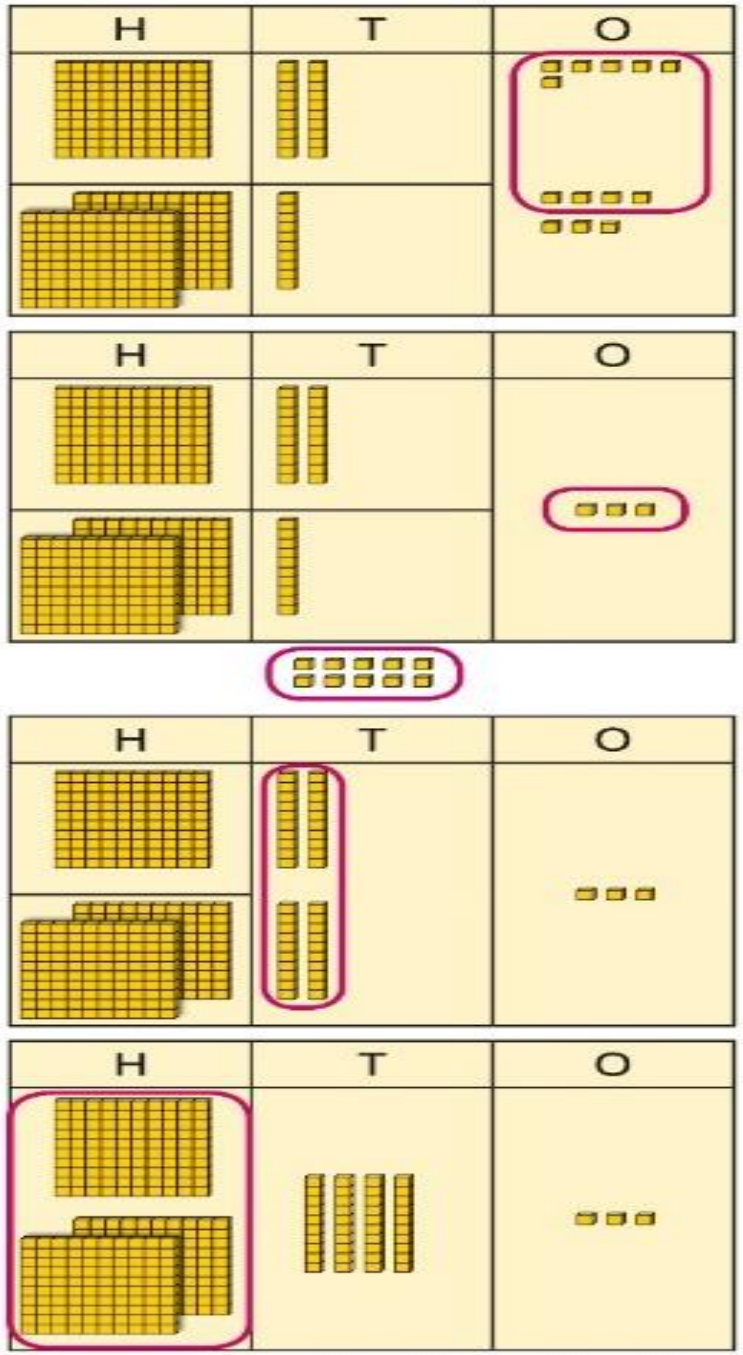
Steps before Formal Method

- **Mental method using partitioning:**

47 + 76 = (40 + 70) + (7 + 6) = 110 + 13 = 123

- **Use an expanded layout**

47	**47**
+ 76	**+ 76**
110	**13**
13	**110**
123	**123**



Maths Mansion Video

Model the stages of column addition using place value equipment on a place value grid.

126 + 217

Have a go!

By the end of Y6 the children should be able to add numbers with 4 or more digits, decimals, several numbers.

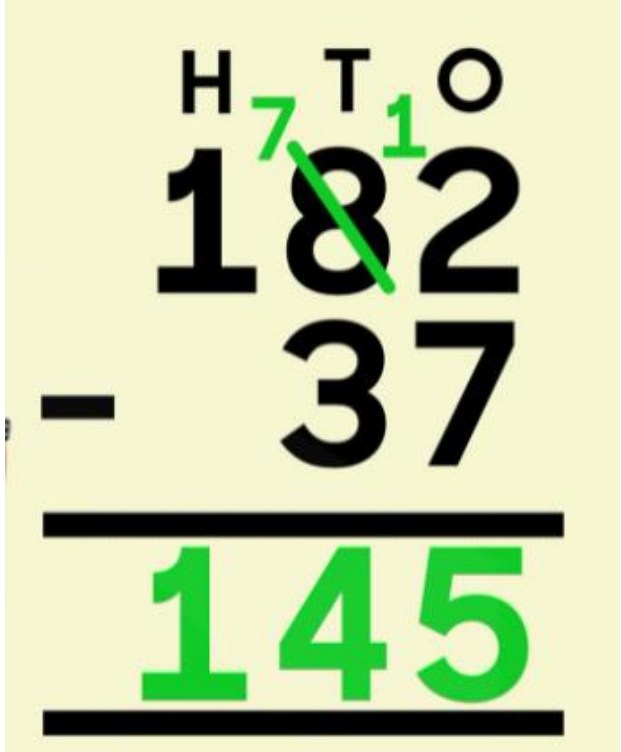
3425 + 1789 £456.15 + £67.92 7.9 + 12.34 + 0.03

$$
\begin{array}{rrrr}
 & 7 & 8 & 9 \\
+ & 6 & 4 & 2 \\
\hline
1 & 4 & 3 & 1 \\
\hline
 & 1 & 1 &
\end{array}
$$

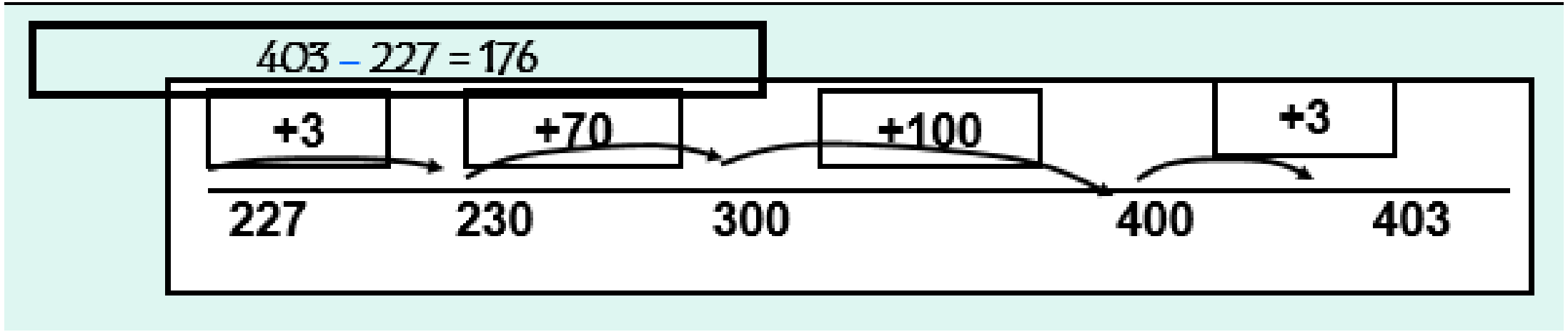
Subtraction

Children in KS2 will use formal column subtraction.

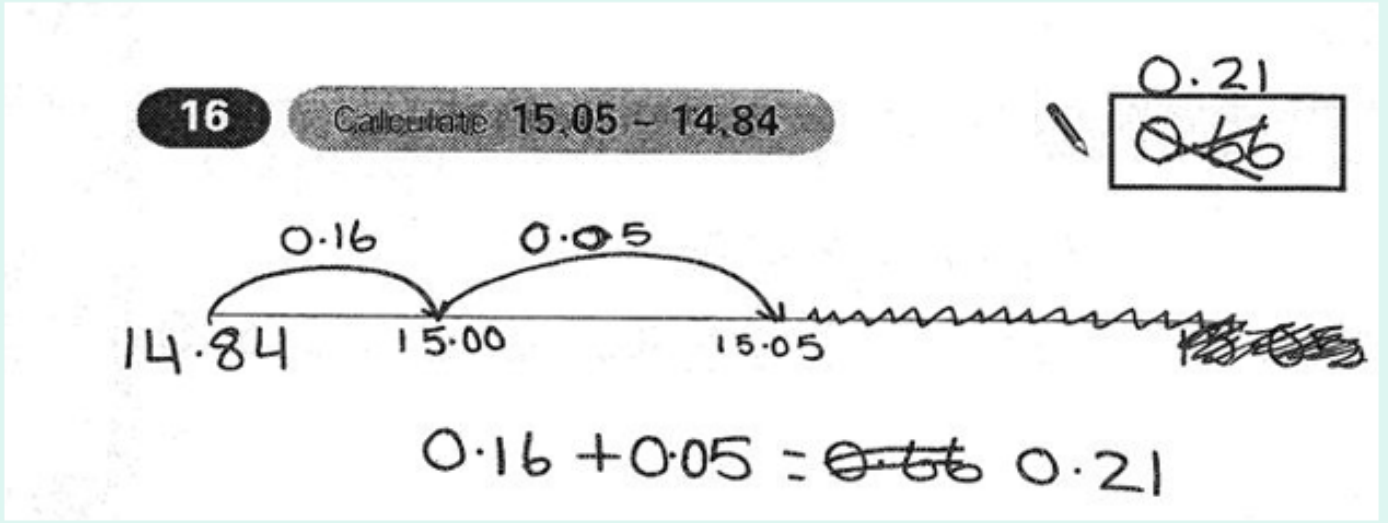
In Y3 they build up to using the formal method below:



Children will already be confident in using number lines:



Number lines are still very useful in KS2



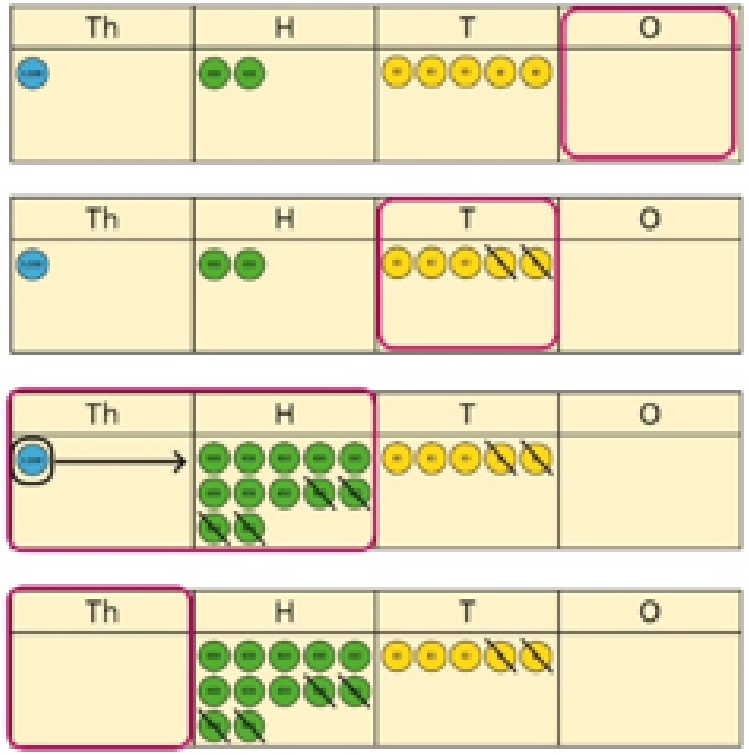
Or for questions with many zeros e.g. 120,000 - 3498

Key thing for pupils to understand is why exchange of a 1,000 for 100s, a 100 for 10s, or a 10 for 1s may be necessary.

Maths Mansion Video

In class staff will model using place value equipment on a place value grid to subtract, including exchanges where needed.

1250 - 420



	Th	H	T	O
	1	2	5	0
−		4	2	0
				0

	Th	H	T	O
	1	2	5	0
−		4	2	0
			3	0

	Th	H	T	O
	~~1~~	12	5	0
−		4	2	0
		8	3	0

	Th	H	T	O
	~~1~~	12	5	0
−		4	2	0
		8	3	0

Have a go!

By the end of Y6 the children should be able to subtract numbers with 4 or more digits including decimals.

17,892 -3, 927

124.5 – 96.89

20 – 2.67

$$
\begin{array}{rccc}
 & 8 & 12 & 1 \\
 & \cancel{9} & \cancel{3} & 2 \\
- & 4 & 5 & 7 \\
\hline
 & 4 & 7 & 5 \\
\hline
\end{array}
$$

Multiplication

By the end of Y6 children need to be confident with the formal methods below:

	2	7	4	1
×				6
1	6	4	4	6
	4	2		

	1	2	
	1	2	4
×		2	6
	7	4	4
2	4	8	0
3	2	2	4
1	1		

Short multiplication up to 4 digit x 1 digit.

Long multiplication up to 4 digit x 2 digit.

Multiplication Strategies

2s → double $6 \times 2 = 12$

4s → double double $6 \times 2 = 12 \times 2 = 24$

8s → double double double $6 \times 2 = 12 \times 2 = 24 \times 2 = 48$

0s → always zero/zilch/nada $6 \times 0 = 0$

1s → always the other factor $6 \times 1 = 6$

5s → multiply by 10 then split in half because 5 is half of 10 $7 \times 10 = 70$, $70 \div 2 = 35$

9s → multiply by 10 then subtract one group $9 \times 10 = 90 - 9 = 81$

10/100s → multiply the leading numbers then add zeroes

$9 \times 100 = 9 \times 1 = 900$ $9 \times 10 = 9 \times 1 = 90$

6s → multiply by 5 then add one group $9 \times 5 = 45 + 9 = 54$

Times tables are key. By the end of Y4 children should know their tables up to 12 x12.

In KS2, starting in Y3 children use related facts to multiply e.g. 4 x 2 = 8 40 x 2 = 80

Use partitioning to multiply e.g. 23 x 6

20 x 6 = 120 3 x 6 =18 120 + 18 = 138

In Year 3 and Year 4 before they move onto formal short multiplication, children will use expanded multiplication to ensure they know the value of the digits.

$5 \times 28 = ?$

	T	O	
	2	8	
×		5	
	4	0	5×8
	1	0 0	5×20
	1	4 0	

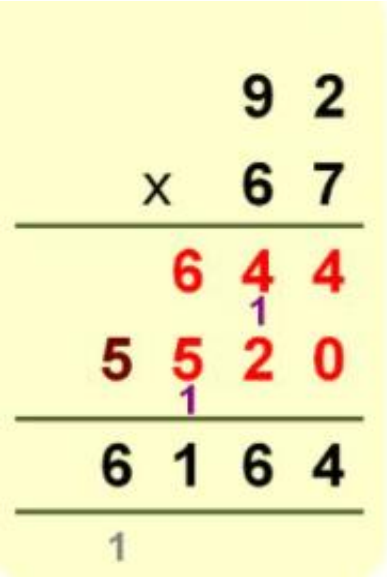
Short multiplication

In Y4 children will move onto formal short multiplication when ready. This is built upon in Y5 and in Y6 children select the most appropriate method for the calculation.

Have a go!

347 x 3 £48.26 x 5

Long Multiplication



In Y5 children are taught the formal long multiplication method. This is also used in Y6.

Video of long multiplication will be put on school website along with this presentation.

Have a go!

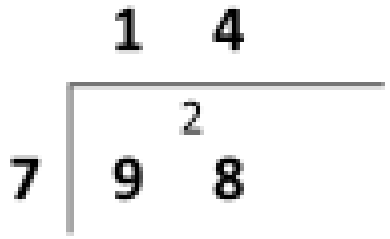
23 X 16

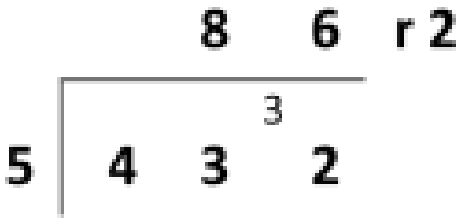
721 x 24

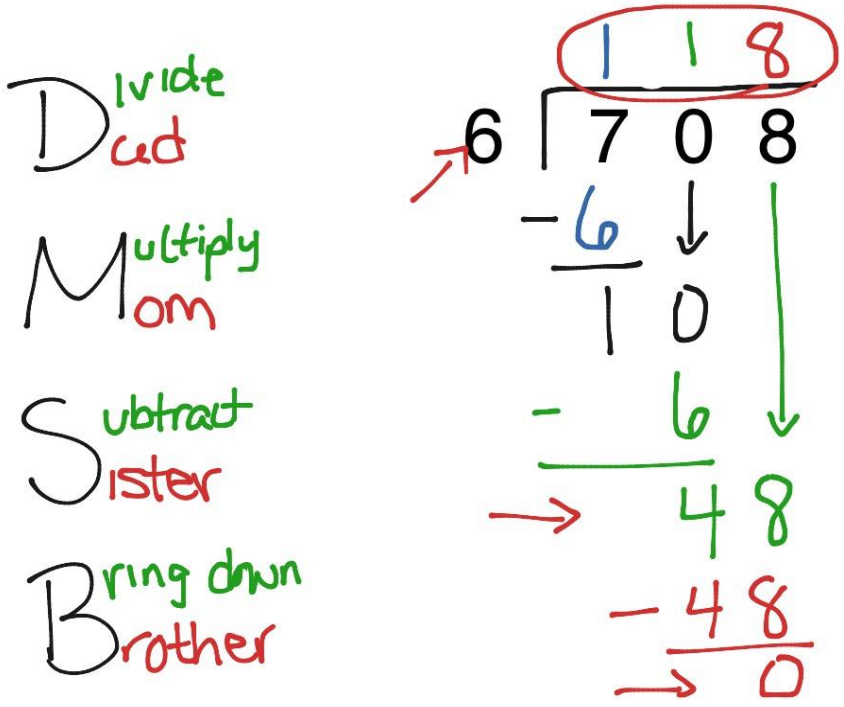
4094 x 32

Division

By the end of Y6 children need to be confident with the formal methods below:







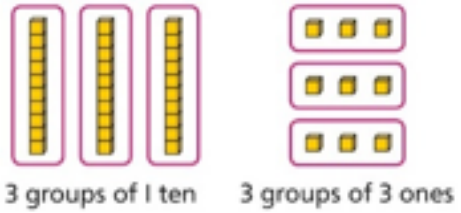
Before formal methods

In Y3 and Y4 children will use known facts to divide e.g.

15 ÷ 3 = 5 *150 ÷ 3 = 50* *1500 ÷ 3 = 500*

Using partitioning

39 ÷ 3 =?

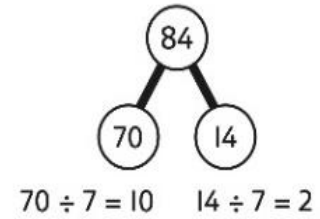


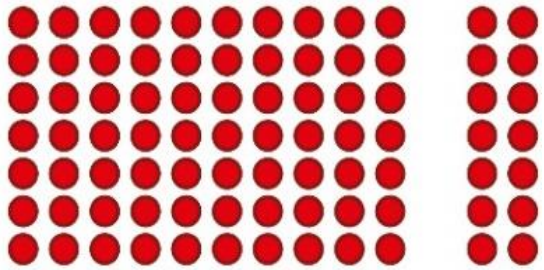
39 = 30 + 9

30 ÷ 3 = 10
9 ÷ 3 = 3
39 ÷ 3 = 13

84 ÷ 7 =?

I will partition into 70 and 14 because I am dividing by 7.





84 ÷ 7 = 12

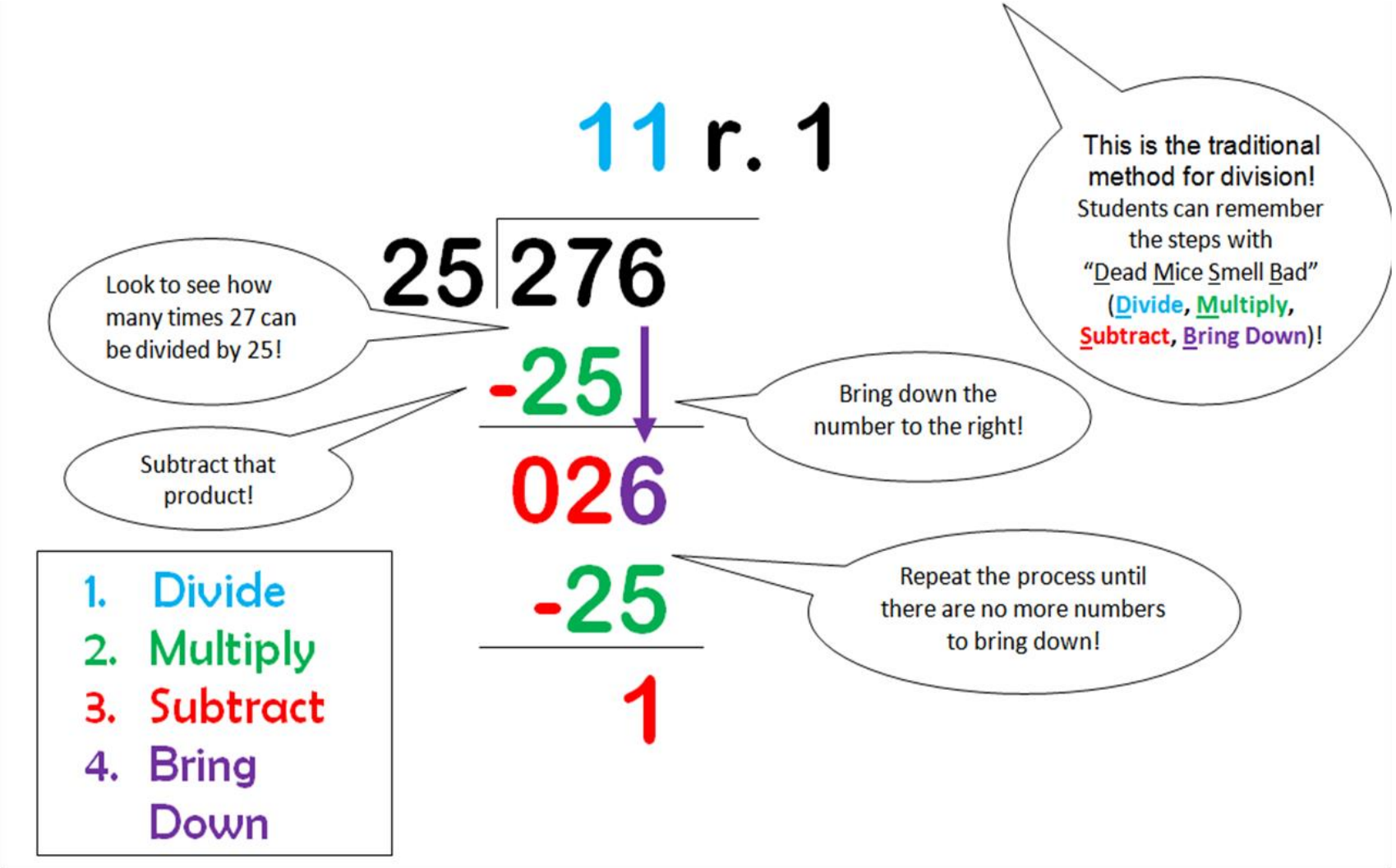
Short Division (Bus Stop Method)

$$
\begin{array}{r|rrrr}
 & 0 & 5 & 5 & 6 \\
\hline
7 & 3 & {}^{3}8 & {}^{3}9 & {}^{4}2
\end{array}
$$

Have a go!

429 ÷ 3 764 ÷ 4 2280 ÷ 5

Long Division



Long Division

315 ÷ 21

234 ÷ 18

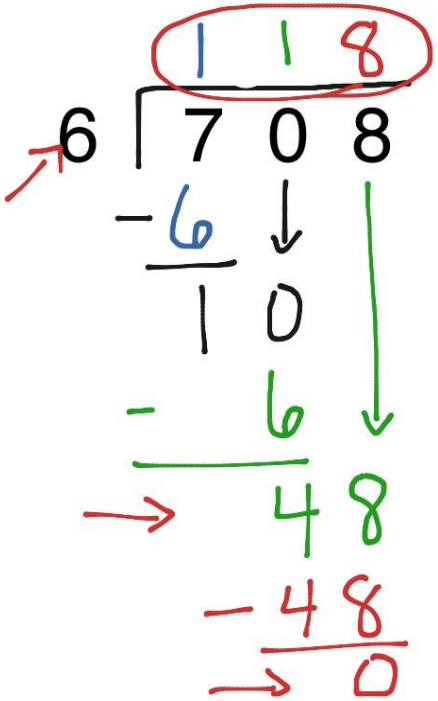
7956 ÷12

Divide
Dad

Multiply
Mom

Subtract
Sister

Bring down
Brother



[KS2 - Long Division - YouTube]

Useful Websites to support learning

- Hit the Button – number bonds, doubles, times tables

Hit the Button - Quick fire maths practise for 6-11 year olds (topmarks.co.uk)

- Times Table Rock Stars
- Topmarks maths – lots of games for all areas of maths

Learn to Count with fun Counting Games for KS1 Children (topmarks.co.uk)

- Time table tester

Times Table Tester | CGP Books

- Times table tips

Help with times tables: fun ideas, videos and quizzes | Oxford Owl

Y6 Arithmetic Practice - Mathsframe