'Learning by Heart'

Developing children's knowledge of mathematical facts so that they know them 'by heart' is a valuable tool to support calculation strategies, and also helps to build confidence. Regular practice is needed to secure knowledge and help children instantly recall facts.

We encourage children to think 'Can I do this in my head?' Having a range of number facts at their fingertips really empowers the children and enables them to approach tasks with confidence.

Year 6 Autumn Term 1: To multiply and divide whole and decimal numbers by 10, 100 and 1000

When you multiply by 10, 100 or 1000, the place value of the digits change. The number is getting greater so the digits move to the left.

Multiply by 10

When you multiply by 10 all the digits move one place to the left.

21 × 10 = 210

The tens digit moves to the hundreds. The ones digit increases in value to become a ten.

Why is there now a zero in the ones column?

You need to include a zero to represent the fact that now the other digits have increased in value. There are now no ones.

If you didn't include the zero in the ones, the number would still look like twenty-one, not two hundred and ten.

Multiply by 100

When you multiply by 100 move all the digits two places to the left.

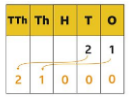
21 × 100 = 2100

Multiply by 1000

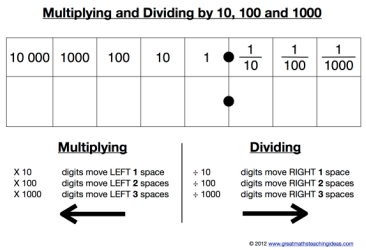
What do you think will happen when you multiply by 1000?

The digits move three places to the left.

21 x 1000 = 21,000



The same principle applies to decimal numbers:

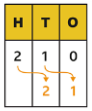


If the place value of the digits increases and move to the left when multiplying, then it makes sense that the place value of the digits decreases and move to the right when dividing by a power of 10, since it is the inverse operation.

Dividing by 10

When you divide by 10 move the digits one place to the right.

210 ÷ 10 = 21



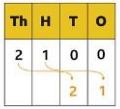
Since the digits have moved to the right, the zero also moves place value – it does not just disappear! The zero also moves to the right into the tenth's column after the decimal point.

So you could write 21.0. But since there's nothing to show after the decimal point, we just don't write it.

Dividing by 100

When you divide by 100, move the digits two places to the right.

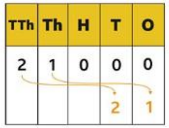
2100 ÷ 100 = 21



Dividing by 1000

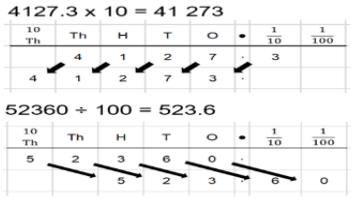
If you divide by 1000 move the digits three places to the right.

21,000 ÷ 1000 = 21



Vocabulary:

Multiply place value move digits greater
Divide smaller zero place holder increase decrease
Thousands tens ones tenths hundredths thousandths decimal point



Autumn Term 2: Consolidate multiplication and division facts to 12 x 12 and 10 x 100

- Step 1 - Consolidate knowledge of times tables from x2 → x10, recalling the times tables in order
- Step 2 - Ask random times tables questions requiring a deeper knowledge and understanding of the number facts. Add the element of a 'time challenge' as your child becomes more efficient e.g. How many can you get right in 1 minute? or give a 10 second time limit per answer. Challenge your child to work out the answer before you can – adding some competition.
- Step 3 – Give the multiplication fact and ask for a linked division fact e.g. 3 x 4 = 12 …. child could answer with 12 ÷ 3 = 4 or 12 ÷ 4 = 3
- Step 4 – Recall of division facts 45 ÷ 9 = ?

For example:

0 x 9 = 0	9 x 0 = 0		
1 x 9 = 9	9 x 1 = 9	9 ÷ 9 = 1	9 ÷ 1 = 9
2 x 9 = 18	9 x 2 = 18	18 ÷ 9 = 2	18 ÷ 2 = 9
3 x 9 = 27	9 x 3 = 27	27 ÷ 9 = 3	27 ÷ 3 = 9
4 x 9 = 36	9 x 4 = 36	36 ÷ 9 = 4	36 ÷ 4 = 9
5 x 9 = 45	9 x 5 = 45	45 ÷ 9= 5	45 ÷ 5 = 9
6 x 9 = 54	9 x 6 = 54	54 ÷ 9 = 6	54 ÷ 6 = 9
7 x 9 = 63	9 x 7 = 63	63 ÷ 9 = 7	63 ÷ 7 = 9
8 x 9 = 72	9 x 8 = 72	72 ÷ 9 = 8	72 ÷ 8 = 9
9 x 9 = 81	9 x 9 = 81	81 ÷ 9 = 9	81 ÷ 9 = 9
10 x 9 = 90	9 x 10 = 90	90 ÷ 9 = 10	90 ÷ 10 = 9

Practical ideas to help your child

Chanting is still an effective way to learn multiplication tables. Musical times tables tapes are also quite useful – children often learn the 'rhythm and rhyme' of a song quite quickly and therefore learn to recite and recall the facts.

It is really important that children are as confident with division facts as they are with multiplication facts.

Practice the idea of 'Family of facts' e.g.

if I know that 4 x 9 = 36 ….. I also know 9 x 4 = 36,
that 36 ÷ 9 = 4 and that 36 ÷ 4 = 9

Vocabulary

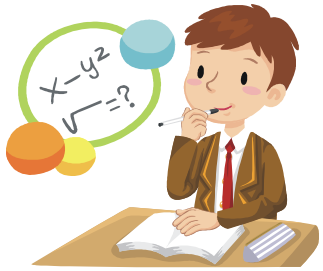
times multiply multiple of
lots of groups of divided by

https://www.primaryresources.co.uk/maths/mathsC2.htm

https://mathsframe.co.uk/en/resources/resource/60/itp-moving-digits

St Matthew's C.E. Primary Academy

Rapid Recall and Deriving Facts Year 6



Parent's and carer's guide to support children with the 'Learning by Heart' programme

Autumn Term