

Primary Mathematics

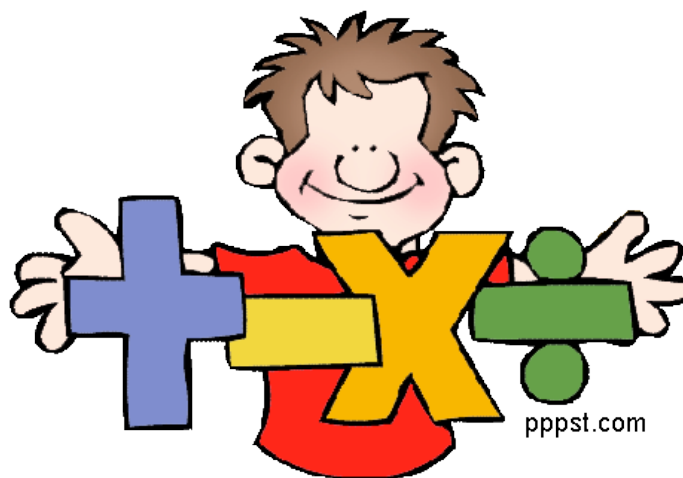
Mathematics in Primary Schools has developed and changed over the years and it continues to do so.

At Fingringhoe Primary School we have developed a policy for the progression of written methods used in the teaching and learning of the four rules of numbers (addition, subtraction, multiplication and division).

As your child progresses through our primary school, they will be taught written methods that will support their developing understanding of the four rules of number. All teachers on the staff have agreed on the methods taught and we believe these to be the most effective methods to support your child's development within this area of Maths.

Each method builds on the one before it, so within one class of children there may be several methods in use. No child is pressured to use a method that he or she doesn't feel comfortable with, or **more importantly** does not understand.

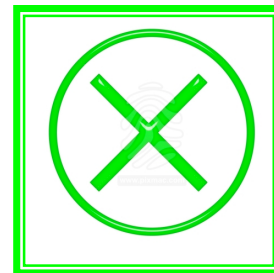
We hope you find the session today useful and as always, if you have any queries or concerns regarding your child's progress within Maths, please see your child's class teacher and/or the subject leader (Mrs.Crowe).



Multiplication:

Your child will begin to learn about the concept of Multiplication through counting and practical play e.g. grouping objects etc.

When they are ready they will be introduced to supporting their thinking by using diagrams and written methods:



Step one:

Counting in twos e.g. around a circle etc.

Step two:

Explore multiplication as repeated addition

e.g. $3 \times 5 = 5 + 5 + 5$ **OR** 3 lots of 5 – **apparatus is KEY here.**

Step three:

Describe and explore arrays, chocolate boxes and food packaging is useful here:



This helps to develop understanding that multiplication can be in any order
e.g. $2 \times 4 = 4 \times 2$

Step four:

Children to be confident with all times tables – rote and embedded through discrete teaching $3 \times 5 = 3$ lots of 5 **using apparatus** etc.

Scaling – number of times as wide as tall etc.

Step five:

Missing numbers e.g.

$$4 \times \square = 16 \text{ etc.}$$

Step six:

Grid layout, with expanded working. Estimating of answers should be encouraged.

$$\text{Example: } \begin{array}{r|l|l|l} x & 30 & 8 & \\ \hline 7 & 210 & 56 & 266 \end{array}$$

$$38 \times 7 = (30 \times 7) + (8 \times 7)$$

Step seven:

The grid layout extended to larger numbers. Estimating and checking of answers should be encouraged.

$$\text{Example: } \begin{array}{r|l|l|l} x & 50 & 6 & \\ \hline 20 & 1000 & 120 & \\ 7 & 350 & 42 & \\ \hline \end{array} \quad \begin{array}{r} 1000 \\ + 350 \\ 120 \\ 42 \\ \hline \end{array}$$

$$56 \times 27 = (50 \times 20 + 6 \times 20) + (7 \times 50 + 7 \times 6)$$

Step eight:

Extend use of the grid to multiplication of bigger numbers and decimals. Estimating and checking of answers should be encouraged.

$$\text{Example: } \begin{array}{r|l|l|l|l} x & 20 & 3 & 0.5 & \\ \hline 10 & 200 & 30 & 5 & 235 \\ 2 & 40 & 6 & 1 & 47 \\ \hline & & & & 282 \end{array}$$

$$23.5 \times 12 = (20 + 3 + 0.5) \times (10 + 2)$$

Step nine:

This step makes the link between the mental (grid) layout and the vertical format. The two formats may be used along side each other to aid understanding by pupils.

Example:

$$\begin{array}{r} 38 \\ \times 7 \\ \hline 266 \end{array} \quad \begin{array}{l} (7 \times 8 = 56) \\ (7 \times 30 = 210) \end{array} \quad \begin{array}{|c|c|c|} \hline x & 30 & 8 \\ \hline 7 & 210 & 56 \\ \hline \end{array} = 266$$

Example:

$$\begin{array}{r} 56 \\ \times 27 \\ \hline 42 \\ 350 \\ 120 \\ \hline 1000 \\ \hline 1512 \\ 1 \end{array} \quad \begin{array}{l} (7 \times 6) \\ (7 \times 50) \\ (20 \times 6) \\ (20 \times 5) \end{array} \quad \begin{array}{|c|c|c|c|} \hline x & 50 & 6 & \\ \hline 20 & 1000 & 120 & 1120 \\ \hline 7 & 350 & 42 & 392 \\ \hline & & & 1512 \end{array}$$

Step ten:

This final step involves pupils using the vertical format with compact working. When pupils begin to attempt 'long multiplication' calculations (example two) it may be useful for the link to be made to the grid method, and for pupils to use informal jottings to support their calculations.

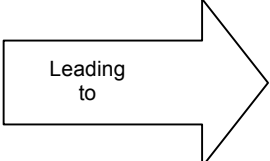
Example:

$$\begin{array}{r} 38 \\ \times 7 \\ \hline 266 \\ 5 \end{array}$$

Example 2:

$$\begin{array}{r} 56 \\ \times 7 \\ \hline \end{array} + \begin{array}{r} 56 \\ \times 20 \\ \hline \end{array} \quad \begin{array}{r} 56 \\ \times 27 \\ \hline 392 \quad (56 \times 7) \\ +1120 \quad (56 \times 20) \\ \hline 1512 \\ 1 \end{array}$$

Leading to



Step eleven:

Multiplying decimal numbers:

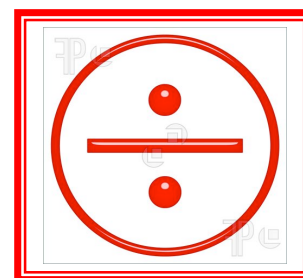
For multiplying decimals the most clear method to use is partitioning

e.g. 4.26×6

$$\begin{array}{r} = 4.00 \times 6 = 24.00 \\ 0.20 \times 6 = 1.20 \quad + \\ 0.06 \times 6 = 0.36 \\ \hline 25.56 \\ \hline \end{array}$$

Division:

Your child will begin to learn about the concept of Division through practical play e.g. grouping/sharing objects etc.



When they are ready they will be introduced to supporting their thinking by using diagrams and written methods:

Step one:

Explore division as **sharing** e.g.

We have 6 sweets, if we share them **EQUALLY** between 2 people how many sweets will each person get? – 3 etc.

The use of apparatus at this stage is **essential**.

Step two:

Move on to **grouping** e.g.

We have 9 apples, we need 3 apples in a bag, how many bags of apples can I make?

The use of apparatus at this stage is essential.

Move on to oral questions which chn should be able to respond rapidly to e.g.

- Share 12 between 2
- Divide 6 by 3
- How many 10s make 60? etc.

Step three

Missing number questions e.g.

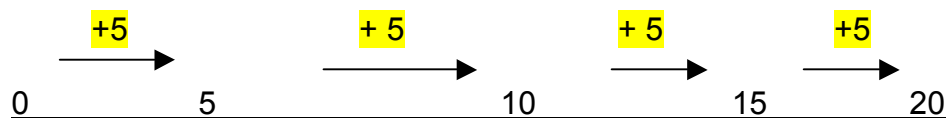
$$6 \div 2 = \square$$

$$8 \div \square = 2 \text{ etc.}$$

Step four: NUMBER LINE

Informal written methods: Use the empty number line to show grouping e.g.

$$20 \div 5:$$



= 4 (4 groups of 5) NOTE – the jumps along the number line will often be represented by curved lines, when drawn by hand, to represent “jumps” rather than the arrows above.

Sep five: CHUNKING

Begin with calculations that the pupils can already do mentally. Encourage the pupils to estimate first.

Example: $35 \div 8 = 4 \text{ r}3$

$$\begin{array}{r} 35 \\ -32 \quad (\underline{4} \times 8) \\ \hline 3 \end{array}$$

Step six:

Use the above method with larger numbers.

Example: $196 \div 6 = 32 \text{ r}4$

$$\begin{array}{r} 196 \\ -60 \quad (\underline{10} \times 6) \\ \hline 136 \\ -60 \quad (\underline{10} \times 6) \\ \hline 76 \\ -60 \quad (\underline{10} \times 6) \\ \hline 16 \\ -12 \quad (\underline{2} \times 6) \\ \hline 4 \end{array}$$

Step seven:

The chunking method can be contracted, as pupils become more secure in mental strategies. For example, 30 x 6 instead of 10 x 6 three times.

Example: $196 \div 6 = 32 \text{ R } 4$

$$\begin{array}{r} 196 \\ - \underline{180} \text{ (} \underline{30} \times 6 \text{)} \\ 16 \\ - \underline{12} \text{ (} \underline{2} \times 6 \text{)} \\ 4 \end{array}$$

Using the same method pupils divide larger numbers.