Calculation Methods: Multiplication and Division

A Parent's Guide

This leaflet outlines the key methods and strategies of addition taught at Trinity CE Primary School.

Children will develop their mental and written calculation skills throughout their primary education in a range of contexts and particularly through investigations and problem solving activities. Children will have many opportunities to develop their fluency and mathematical understanding through the use of concrete apparatus, pictorial representations as well as the abstract number sentences.

In order to become competent in calculation, it is essential that children develop a strong understanding of place value, number bonds and multiplication facts.

The teaching of calculation skills is not a linear progression whereby children cease to use all previous methods. It is important that children develop the knowledge and understanding of number so that they can choose the most efficient method to solve a particular problem, depending on the numbers involved.

It is not appropriate to relate methods and strategies to particular year groups as this may vary for different children. It is vital that children do not simply learn a process without a secure mathematical understanding that underpins that process, particularly in terms of place value.

Formal written methods are unlikely to be taught before children reach Key Stage 2.

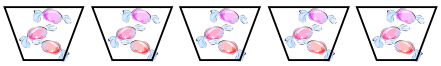
Children will relate multiplication to doubling and counting groups of the same size.

Looking at columns
3 groups of 2

Looking at rows
2 groups of 3

Children will use pictures or bar models to solve problems:

There are 3 sweets in one bag.
How many sweets are there in 5 bags?



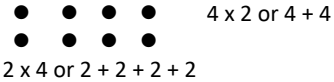
3	3	3	3	3

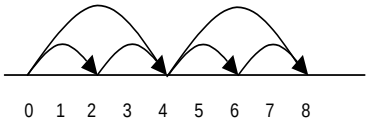
15

solve missing number problems

7 x 2 = □ □ = 2 x 7
7 x □ = 14 14 = □ x 7
□ x 2 = 14 14 = 2 x □
□ x ∇ = 14 14 = □ x ∇

use arrays and repeated addition





Children will understand the commutative law for multiplication (that multiplication can be carried out in any order):

6 x 3 x 5 = 90 3 x 6 x 5 = 90 5 x 6 x 3 = 90

Children will understand the inverse relationship between multiplication and division:

3 x 4 = 12 12 ÷ 4 = 3 12 ÷ 3 = 4

Children will begin to partition e.g. double 6 is the same as double five add double one.

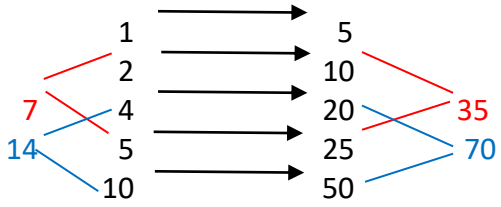
AND double 15

10 + 5
↓ ↓
20 + 10 = 30

OR

X	10	5
2	20	10

Children will explore fact boxes and use these alongside more formal methods of multiplication and division:



Children will use the grid method to multiply 2 and 3-digit numbers:

27 x 4 =

x	20	7	
4	80	28	= 108

135 x 6 =

x	100	30	5	
6	600	180	30	= 810

Children will use the formal short multiplication method (expanded, then 'carrying'):

237 x 8

56
240
1600
1896

237 x 8

1896
2 5

Children will use the formal long multiplication method (with fact boxes alongside to support calculation):

486 x 23

9720 (x20)
1458 (x3)
11178

3	1	486	1458
	2	972	
	4	1944	
	5	2430	
	10	4860	
	20	9720	

Children will share using concrete objects and pictorial representations e.g. 6 sweets are shared between 2 people. How many do they have each?

Children will sort objects into 2s / 3s/ 4s etc
How many pairs of socks are there?

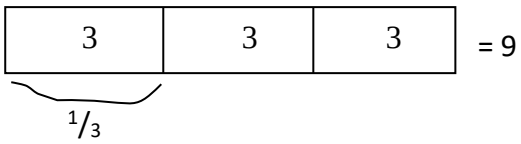
There are 12 crocus bulbs. Plant 3 in each pot. How many pots are there?
Jo has 12 Lego wheels. How many cars can she make?

Children will carry out missing number problems:

6 ÷ 2 = □	□ = 6 ÷ 2
6 ÷ □ = 3	3 = 6 ÷ □
□ ÷ 2 = 3	3 = □ ÷ 2
□ ÷ ∇ = 3	3 = □ ÷ ∇

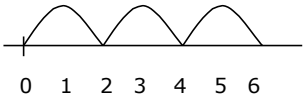
Children will find fractions of shapes, sets of objects and quantities e.g.

$^1/_3$ of 9 = 3

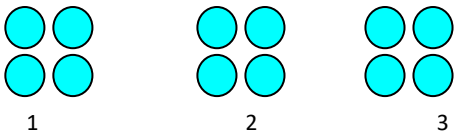


Children will use an empty number line:

6 ÷ 2 can be modelled as:



Children can use informal jottings or diagrams to represent practical division problems e.g. If 12 children got into groups of 4, how many groups would there be?



Children will use the formal short division method:

$$\begin{array}{r} 0\,2\,8\,4 \\ \hline 4\,)\,1^{1}1\,{}^{3}3\,{}^{1}6 \end{array}$$

Children will use the formal long division method (with fact boxes alongside to support calculation):

$$\begin{array}{r} 0\,1\,8\,5 \\ \hline 2\,6\,)\,4\,8\,1\,0 \\ \underline{2\,6}\downarrow \\ 2\,2\,1 \\ \underline{2\,0\,8}\downarrow \\ 1\,3\,0 \end{array}$$

1 →	26
2 →	52
4 →	104
5 →	130
10 →	260

The National Curriculum states that children should be able to rapidly recall the following multiplication and division facts by the end of particular year groups:

End of Year 2: 2, 5 and 10 times tables
End of Year 3: 3, 4 and 8 times tables
End of Year 4: All tables up to 12 x 12