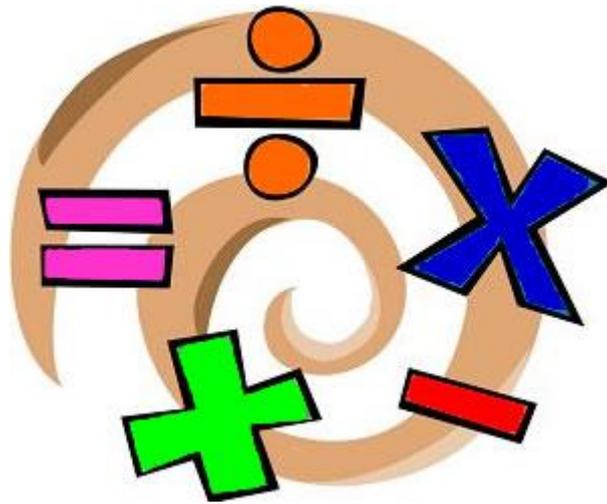




St. Andrew's C E Primary and Nursery School



Progression in the Teaching of Multiplication and Division

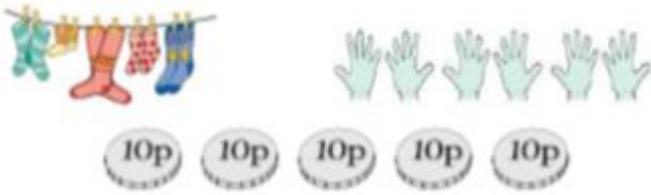
A Guide For Parents

Multiplication

Early experiences- grouping

Children will have real, practical experiences of handling equal groups of objects and counting in 2s, 10s and 5s.

Your child will work on practical problem solving activities involving equal sets or groups.

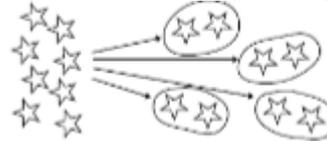


Division

Early experiences - sharing

The children will understand equal groups and share objects out in play and problem solving. They will count in 2s, 10s and 5s.

e.g. 8 sweets get shared between 2 people. How many sweets do they each get?

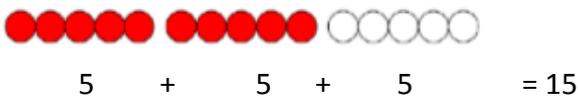


There are 6 sweets. How many people can have 2 sweets each?

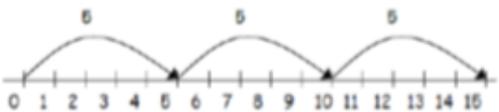


Repeated addition

3 times 5 is taught initially as a repeated addition using practical equipment:

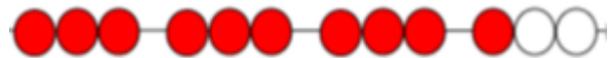
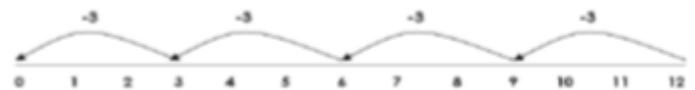


Children then learn that repeated addition can be shown on a number line.



Repeated subtraction using a bead string or number line

$$12 \div 3 = 4$$



The bead string helps children with interpreting division calculations, recognising that $12 \div 3$ can be seen as 'how many 3s make 12?'

Grouping involving remainders

Children will then move onto calculations involving remainders using bead strings, number lines and other practical equipment.

$$13 \div 4 = 3 \text{ r}1$$



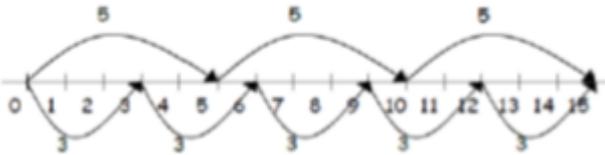
Commutativity

The children will learn that 3×5 has the same total as 5×3 .

This can also be shown on the number line.

$$3 \times 5 = 15$$

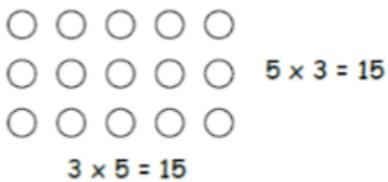
$$5 \times 3 = 15$$



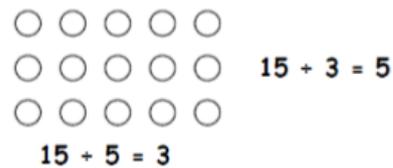
Children learn that division is **not** commutative i.e that the numbers in the division cannot be swapped around to get the same answer.

Arrays

The children also learn to model a multiplication calculation using an array.



Children learn to model a division calculation using an array.



Inverse operations

Children learn to state the 4 related facts.

$$3 \times 4 = 12$$

$$4 \times 3 = 12$$

$$12 \div 3 = 4$$

$$12 \div 4 = 3$$

They will also complete equations using inverse operations.

e.g.

$$\square \times 5 = 20 \quad 3 \times \Delta = 18 \quad O \times \square = 32$$

$$24 \div 2 = \square \quad 15 \div O = 3 \quad \Delta \div 10 = 8$$

Multiplying larger numbers

Grid method

This strategy is introduced for the multiplication of TO x O to begin with. The children partition the numbers and multiply each of them before adding to find the total.

$36 \times 4 =$

	30	6
4	$30 \times 4 = 120$	$6 \times 4 = 24$

$120 + 24 = 144$

Dividing larger numbers

The vertical method- 'chunking' leading to long division

$78 \div 3 =$

$$\begin{array}{r} 78 \\ - \underline{30} \quad (10 \times 3) \\ 48 \\ - \underline{30} \quad (10 \times 3) \\ 18 \\ - \underline{18} \quad (6 \times 3) \\ 0 \end{array}$$

$So 78 \div 3 = 10 + 10 + 6 = 26$

This method **may** be used to support some children's understanding of dividing a number into groups.

Short multiplication — multiplying by a single digit

$$\begin{array}{r} 24 \\ \times 6 \\ \hline \end{array}$$

$$\begin{array}{r} 24 \\ \times 6 \\ \hline 4 \\ \hline \end{array}$$

$$\begin{array}{r} 24 \\ \times 6 \\ \hline 44 \\ \hline \end{array}$$

$$\begin{array}{r} 24 \\ \times 6 \\ \hline 144 \\ \hline \end{array}$$

Short division — dividing by a single digit

$$\begin{array}{r} 3 \\ 4 \overline{) 136} \\ \underline{12} \\ 16 \\ \underline{12} \\ 4 \end{array}$$

$$\begin{array}{r} 34 \\ 4 \overline{) 136} \\ \underline{12} \\ 16 \\ \underline{12} \\ 4 \end{array}$$

Long multiplication—multiplying by more than one digit

This may be taught using the grid method by partitioning both numbers and then adding all the answers

e.g. $24 \times 35 =$

X	20	4	
30	600	120	= 720
5	100	20	= 120

$$720 + 120 = 840$$

Long division —dividing by more than one digit

$432 \div 15$ becomes

$$\begin{array}{r} 28 \text{ r } 12 \\ 15 \overline{) 432} \\ \underline{30} \\ 132 \\ \underline{120} \\ 12 \end{array}$$

Answer: 28 remainder 12

$432 \div 15$ becomes

$$\begin{array}{r} 28 \\ 15 \overline{) 432} \\ \underline{30} \\ 132 \\ \underline{120} \\ 12 \end{array}$$

15×20
 15×8

$$\frac{12}{15} = \frac{4}{5}$$

Answer: $28 \frac{4}{5}$

$432 \div 15$ becomes

$$\begin{array}{r} 28.8 \\ 15 \overline{) 432.0} \\ \underline{30} \\ 132 \\ \underline{120} \\ 120 \\ \underline{120} \\ 0 \end{array}$$

Answer: 28.8

Children completing long multiplication will be confident with place value.

Initially they may need to show the steps they are making, (see example 1)but as this is quite cumbersome they will swiftly move on to a more efficient method. (See example 2)

Example 1

286

X 29

4000 (200 x 20)

1600 (80 x 20)

120 (6 x 20)

1800 (200 x 9)

720 (80 x 9)

54 (6 x 9)

8294

1

Example 2

286

X 29

2574 (9 x 286)

5720 (286 x 20)

8294

