

# Wester Overton Primary School

## Parents Guide to Multiplication



Your child is now learning about multiplication. In order for you to help at home it is important that you are familiar with words and methods your child's teacher will be using in the classroom.

## **Progression Through Calculations for Multiplication** **Mental Calculations (ongoing)**

### **Doubling and halving**

Applying the knowledge of doubles and halves to known facts.  
e.g.  $8 \times 4$  is double  $4 \times 4$

### **Using multiplication facts**

Tables should be practiced every day from P3 onward.

**Primary 3** 2 times table  
3 times table  
4 times table  
5 times table  
10 times table

**Primary 4** 2 times table  
3 times table  
4 times table  
5 times table  
8 times table  
9times table  
10 times table

**Primary 5** Derive and recall all multiplication facts up to  $12 \times 12$

**Primary 6 and 7-** Derive and recall quickly all multiplication facts up to  $12 \times 12$ .

### **Using rounding**

For example, to use rounding strategy to help complete money problems, e.g.  $4 \times \text{£}9.99 = 4 \times 10$   
 $= \text{£}40 - (4 \times 1\text{p})$   
 $= \text{£}39.96$

### Using and applying division facts

Children should be able to utilise their tables knowledge to derive other facts.

e.g. If I know  $3 \times 7 = 21$ , what else do I know?

$$30 \times 7 = 210, 300 \times 7 = 2100, 3000 \times 7 = 21\ 000, 0.3 \times 7 = 2.1 \text{ etc}$$

### Use closely related facts already known

$$\begin{aligned} 13 \times 11 &= (13 \times 10) + (13 \times 1) \\ &= 130 + 13 \\ &= 143 \end{aligned}$$

### Multiplying by 10 or 100

Knowing that the effect of multiplying by 10 is a shift in the digits one place to the left.

Knowing that the effect of multiplying by 100 is a shift in the digits two places to the left.

### Partitioning

$$\begin{aligned} 23 \times 4 &= (20 \times 4) + (3 \times 4) \\ &= 80 + 12 \\ &= 102 \end{aligned}$$

### Use of factors

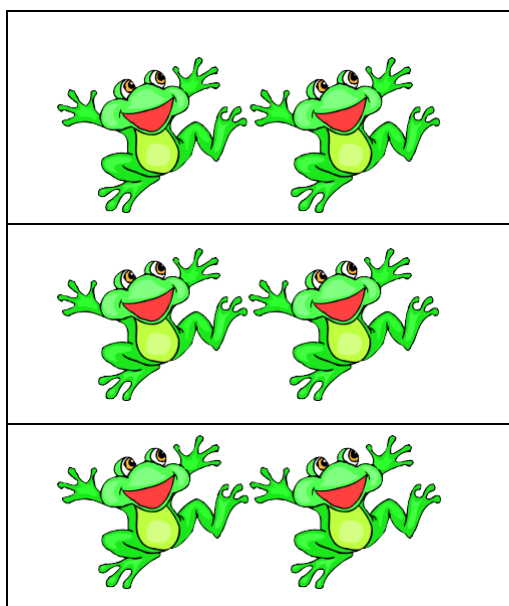
$$8 \times 12 = 8 \times 4 \times 3$$

These mental calculations are the foundations of your child's number knowledge, and will be continued to be used throughout their school career and in life.

In developing their skills in multiplication, children will experience equal groups of objects/ beads and will count in 2s and 10s and begin to count in 5s. They will work on practical problem solving activities involving equal sets or groups between different numbers

### Equivalent Sets

Children lay out sets of objects such as counters, beads etc, each set has the same number of members.



3 sets of 2  
Or  
3 lots of 2

A label could then be placed beside the trays as shown.

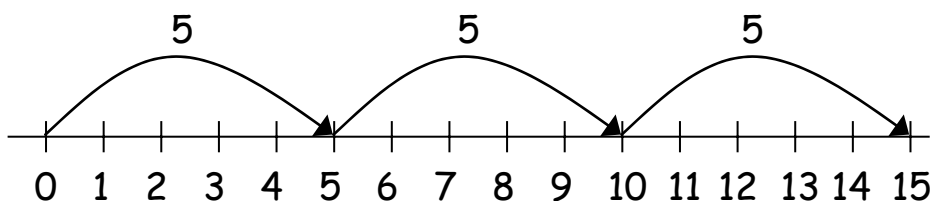
Children will develop their understanding of multiplication and use a number line to support calculation:

### Repeated addition

3 times 5 is  $5 + 5 + 5 = 15$  or 3 lots of 5 or  $5 \times 3$

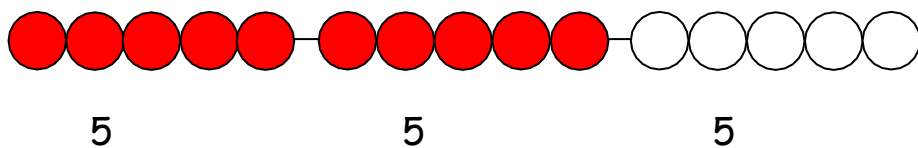
Repeated addition can be shown easily on the number line:

$$5 \times 3 = 5 + 5 + 5$$



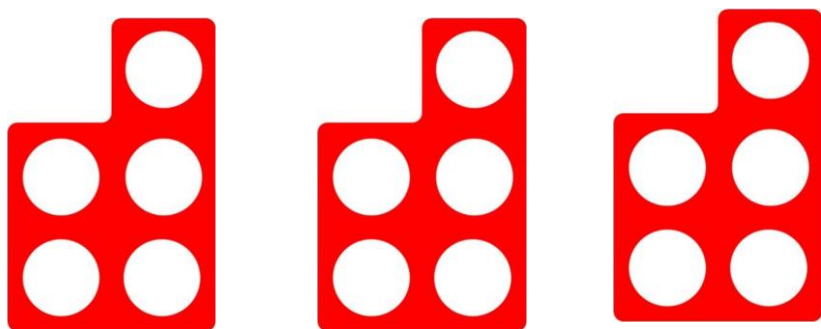
Or using beads:

$$5 \times 3 = 5 + 5 + 5$$



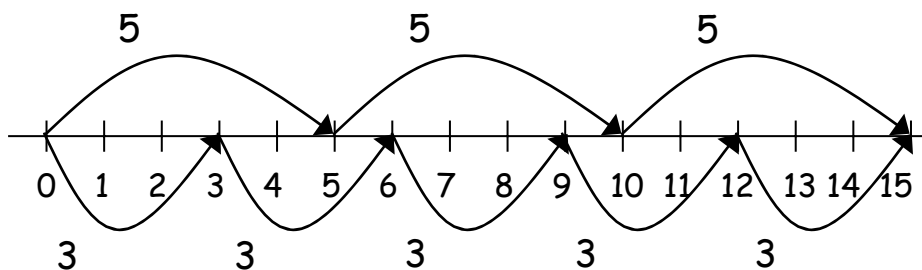
Or using Numicon:

$$5 \times 3 = 5 + 5 + 5$$



### The Commutative Law

Children should know that  $3 \times 5$  has the same answer as  $5 \times 3$ . This can also be shown on the number line.



### Introducing "times" and "x"

The children are asked to carry out a number of practical activities such as:

- Building towers of cubes
- Making piles of coins
- Setting out counters on trays

Through this, the children begin to realise that each of the phrases "piles of", "towers of" and "trays of" and "sets of" can be replaced by "**times**" and that is symbolised by "**x**".

Further activities would then be carried out reinforcing the variety of vocabulary that represents "times" and "x".

3 sets of 2

3 times 2

3 twos

3 x 2

### The link with addition

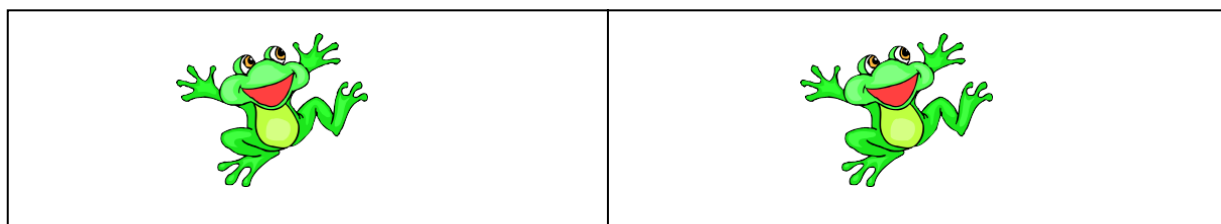
After developing the language of multiplication, the children learn how to find a product using a process of repeated addition.

$$3 \times 2 = 2 + 2 + 2$$

### Building up the tables

Each table is built up systematically using materials and diagrams thus reinforcing the concept of multiplication.

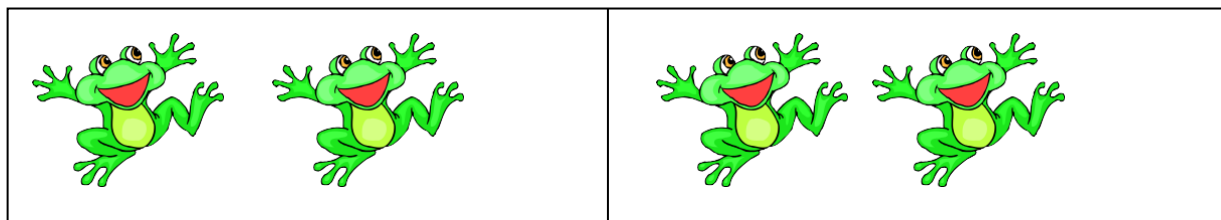
"Put 1 frog in each box. We have 2 ones; that's 2 altogether. So 2 times 1 equals 2"



2 ones

$$2 \times 1 = 2$$

"Put another frog in each box. We have 2 twos; that's 4 altogether. So 2 times 2 equals 4."

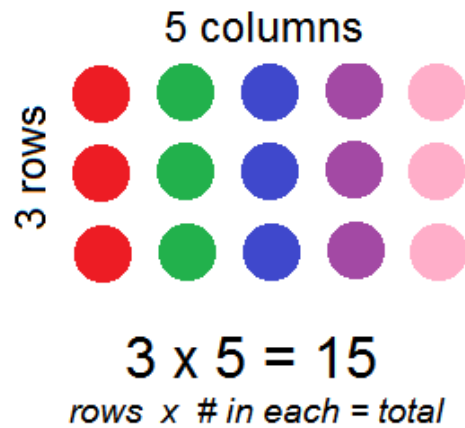
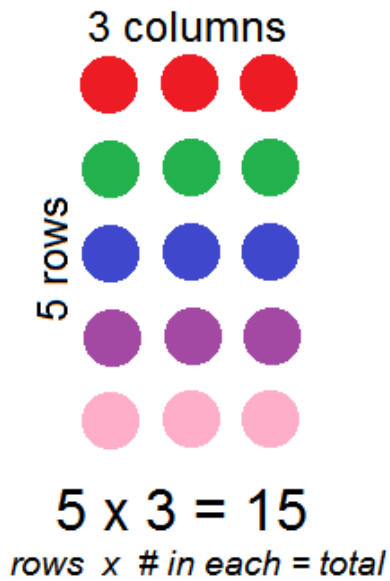


2 twos

$$2 \times 2 = 4$$

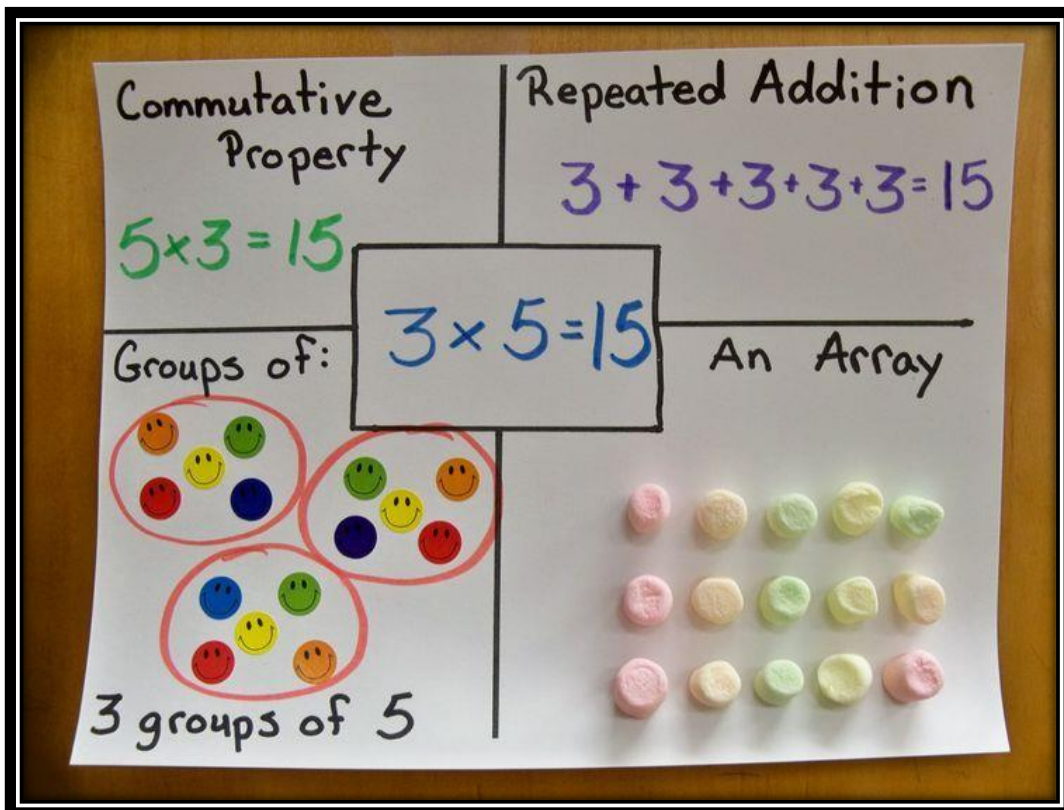
## Arrays

Children should be able to model a multiplication calculation using an array. This knowledge will support with the development of written methods.



## Using the table

Once the table is built up it could be displayed and used as a basis of oral work.



Commutative Property

$$5 \times 3 = 15$$

Repeated Addition

$$3 + 3 + 3 + 3 + 3 = 15$$

Groups of:

$$3 \times 5 = 15$$

An Array

3 groups of 5

## Sequences

Children should be aware of the sequence of the table in ascending and descending order, formed by the "stations" in the table.

Children should be given practice entering missing numbers / stations in sequences 2, 4, 6, 8, ?

Using symbols to stand for unknown numbers to complete equations using inverse operations

$$\square \times 5 = 20 \quad 3 \times \triangle = 18 \quad \square \times \circ = 32$$

The zero facts

The zero facts are difficult for some children to grasp. Working with sequences provides an opportunity to introduce the zero fact. Practical activities are used to consolidate this understanding.

Partitioning

Children are taught to partition two digit numbers, before moving on to more formal written methods/

$$38 \times 5 = 30 \times 5 \text{ plus } 8 \times 5$$

$$\begin{aligned} &= 30 \times 5 = 150 \\ &= 8 \times 5 = 40 \\ &= 190 \end{aligned}$$

Expanded method for multiplication by a single digit

$$\begin{array}{r} \text{TU} \times \text{U} \\ \text{HTU} \\ \underline{23} \\ \times 8 \\ 160 \text{ (20} \times 8\text{)} \\ \underline{24 \text{ (3} \times 8\text{)}} \\ \underline{184} \end{array}$$

Pupils will become more aware of place value with the layout of the partitioning already under relevant place value positions with pupils describing actual values of the digits in the columns. Children who are secure with multiplication for TU x U will be more confident in using the same method for



HTU  $\times$  U.

### Short multiplication method for multiplication by a single digit

$$\begin{array}{r} \text{HTU} \\ 2 \\ 23 \\ \times 8 \\ \hline 184 \end{array}$$

To emphasise place value of digits within a calculation, particularly when referring to numbers placed in columns larger than Units (i.e. 2 has a value of 20), it is important that children are secure in their understanding of partitioning and how numbers are 'made up'.

### Partitioning method HTU $\times$ U

$346 \times 9$  is approximately  $350 \times 10 = 3500$  (by this stage children should be at secure in estimating answers using their number facts)

$$\begin{aligned} 346 \times 9 &= (300 \times 9) + (40 \times 9) + (6 \times 9) \\ &= 2700 + 360 + 54 \\ &= 3114 \end{aligned}$$

$$\begin{array}{r} \text{HTU} \\ 35 \\ 346 \\ \times 9 \\ \hline 3114 \end{array}$$

### Expanded method for long multiplication

TU  $\times$  TU- Children will estimate first-  $72 \times 38$  is approximately  $70 \times 40 = 2800$

$$\begin{array}{r} \text{HTU} \\ 72 \\ \times 38 \\ \hline 2100 \text{ (} 70 \times 30 \text{)} \\ 560 \text{ (} 70 \times 8 \text{)} \\ 60 \text{ (} 2 \times 30 \text{)} \\ \hline 16 \text{ (} 2 \times 8 \text{)} \\ \hline 2736 \end{array}$$

Children are encouraged to describe what they do referring to the actual values of the digits in the columns. For example, the step that involves  $30 \times 2$  should be described as 'thirty multiplied by two', not 'three multiplied by two', although the relationship  $3 \times 2$  is used.

## Short method for long multiplication

$$\begin{array}{r} \text{HTU} \\ 2 \\ 372 \\ \times 24 \\ \hline 1488 \\ 7440 \\ \hline 8928 \\ 1 \end{array}$$

$$372 \times 24$$

Children will estimate first

$372 \times 24$  is approximately  $400 \times 25 = 10000$

First, calculate  $372 \times 4$

Then, calculate  $372 \times 20$

Now, add both answers together.

## Multiplying Decimals

In the upper stages and using similar methods, children can multiply decimals. Children must remember that decimal points line up under each other.

U. th hth  $\times$  U

$$4.92 \times 3$$

Children will be encouraged to estimate first:

$$4.92 \times 3 \text{ is approximately } 5 \times 3 = 15$$

$$\begin{array}{r} \text{U. th} \\ 2 \\ 4.92 \\ \times 3 \\ \hline 14.76 \end{array}$$

This calculation is completed in the same way as  $492 \times 3$  by adjusting the calculation to suit place value. This is done by placing the decimal point in the answer 2 units from the left due to there being 2 decimal places in the question. **Children are taught to line up decimal points before beginning the calculation.**

## Language of multiplication

We will endeavour to use a variety of language when teaching multiplication in order for the pupils to be aware of and comfortable using a variety of phrases. For example, the fact  $3 \times 6 = 18$  could be stated as "3 times 6 is equal to / equals 18" or "3 times 6 is 18" or "3 sixes are 18".

Building up the multiplication facts requires a large amount of oral work and a wide variety of experience. You can help your child by playing games with them asking them to recite the times tables.

Multiplication facts are the basis for much of maths including fractions, area and volume, so it is important that children are secure in applying their table facts.

The aim should be to **memorise** these facts so they can be rapidly recalled. Much of the work we undertake in our "Big Maths" programme helps support this.

This parent guide has been produced to help inform and involve you in the working of the school and in your child's learning.

Only when families and school work together in partnership can we ensure the best for your child. Information from the school is only one part of this, and our willingness to answer your questions and listen to suggestions provides the other crucial part of this partnership.

Should you wish further information, please contact me at the school.

**June Moir**  
**Head Teacher**



