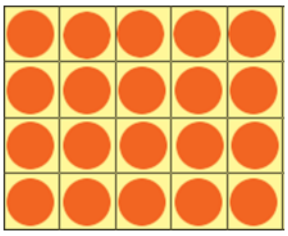
Great Linford Primary School

Multiplication

A handy pocket guide explaining the different stages of learning your child will go through as they learn about Multiplication in our school.

Concrete > Pictorial > Abstract



$$\begin{array}{r} 148 \\ \times \quad 3 \\ \hline 444 \\ \hline {\scriptstyle 1\ \ 2} \end{array}$$

Concrete

We begin all of our maths learning journeys with the use of concrete apparatus. This might include counters, cubes, base 10, beadstrings, numicon, weights, measuring jugs etc. Using concrete apparatus helps children to visualise the numbers and understand their relative size.

Pictorial

We then use models/images to show children a pictorial version of the apparatus they have used. We might use symbols, or draw counters instead of handing them out on tables.

Abstract

Finally, children are confident enough to just use the abstract style of recording that mathematicians use, made up of numbers and symbols.

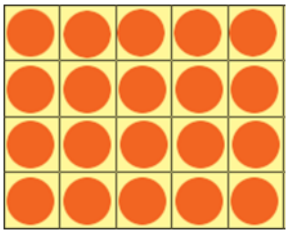
Stage 1 - repeated addition

Counting objects in groups

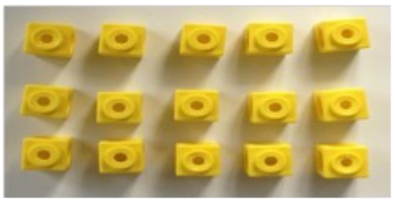
Skills needed:

- Counting objects in multiples e.g. Pairs of socks.
- Drawing their own images to represent numbers.
- Understanding of addition.
- Understanding of multiplication as repeated addition of the same number.
- Doubling a number.

Children use cubes, numicon, groups of beads on a beadstring etc to count in different multiples. They are taught to make equal groups.

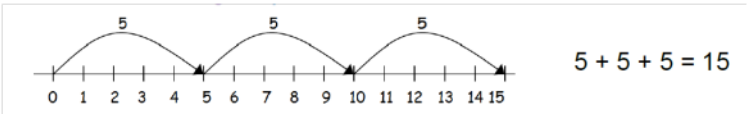


We then begin to understand multiplication by creating arrays using counters or cubes. This helps us to understand that multiplication is commutative (3 x 2 is the same as 2 x 3).



We write our number sentences as repeated addition at first e.g. 5 + 5 + 5 before we learn how to use the multiplication symbol.

We use beadstrings and then numberlines to show our repeated additions.

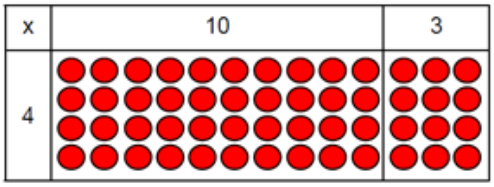


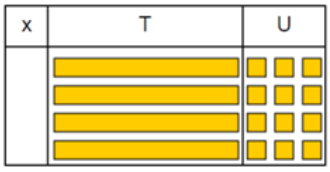
Stage 2 – grid method

Solving multiplication in a grid

Skills needed:

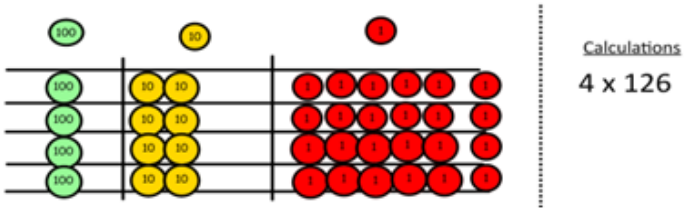
- Counting in groups.
- Recording number sentences using the x symbol.
- Know the relationship between addition and multiplication.
- Mental recall of multiplication facts -particularly the 10s.
- Understanding of arrays.
- Place value to multiply by 10.
- Partitioning of numbers.





We use counters or base 10 to partition multiplication calculations into smaller arrays. E.g. 13 x 4 becomes 10 x 4 and 3 x 4.

Place value counters that represent tens or hundreds help us to keep our grids small and neat.



35 x 7

×	30	5
7	210	35

210 + 35 = 245

Eventually, we learn how to use numbers instead of counters and arrays in our grid methods.

It is important for children to understand how to multiply numbers by multiples of 10 and 100 to succeed in this method e.g. 30 x 7 or 300 x 7.

Stage 3 – column method

Understanding how to record using formal methods

Skills needed:

- Know the relationship between addition and multiplication.
- Mental recall of multiplication facts.
- Place value to multiply by 10, 100 and 1000.
- Place value and partitioning of numbers.
- Place value of decimals (year 4+)

37 x 5

37
x 5
35 (7 x 5)
150 (30 x 5)
180

At first, children are taught a long multiplication method. They are reminded of the grid method and encouraged to record what they are solving in brackets alongside their answers. Some children may still need times table grids, or might choose to use numberlines alongside this method to support calculations.

We then learn a more compact method. We record 'exchanged' digits underneath.

148 x 3

148
x 3
444
1 2

Using their understanding of place value, children can finally progress to long multiplication for multiplication of numbers by a 2 or 3 digit number.

1 1
123
x 35
615
+3690
4305

Year Group Expectations

EYFS - counting pairs of objects

Years 1/2 - 2s, 3s, 5s and 10s.

Years 3/4 - By the end of year 4 children should be able to calculate all times tables up to 12 x 12 mentally.

Year 4 - Multiplying 3 digits by 1 digit e.g. 125 x 5

Years 5 and 6 - Multiplying 4 digits by 2 digits e.g. 2046 x 15

We have a school subscription to www.ttrockstars.com. This great website and app helps you to practise times tables. Ask your class teacher if you are unsure of your login details or how to use it.