MULTIPLICATION METHODS

STAGE 1 (From EYFS)

Understanding of multiplication begins with practical work as children begin to work with groups of equal amounts. They learn to count in 2s, 5s and 10s, and this is then linked to practical problems, for example, counting pairs of children in the line, repeated printing of Numicon shapes, counting fingers going to be washed. Children begin to double numbers, initially with objects and later through addition, and link doubling to multiplying by 2.

How many fingers are there on 4 hands?

WAYS TO SUPPORT YOUR CHILD:

- Rehearse counting in 2s, 5s and 10s with your child.
- Explore opportunities to count real objects in repeated steps, eg. count pairs of socks, shoes, people in 2s, fingers on each hand for 5s, fingers or toes altogether for 10s.
- Pay for small items with 2, 5 and 10 pence coins in a shop.

STAGE 2 (From Y1)

The process of multiplication becomes more formal in Years 1 and 2 as pupils learn to solve practical problems involving repeated addition using the Numicon apparatus.

Children initially begin to explore 'lots of' informally using the Numicon shapes…
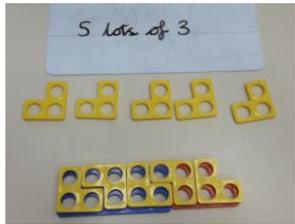
5 lots of 3

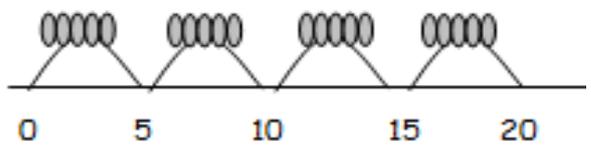Before moving on to putting the shapes 'together' horizontally along a tens line.

0   10   20
zero   ten   twenty
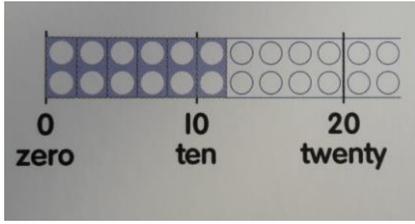
"5 lots of 2 makes 10"

In Year 2, this image may also be supported by pictures, bead strings and arrays.

$$4 \times 5 = 20$$

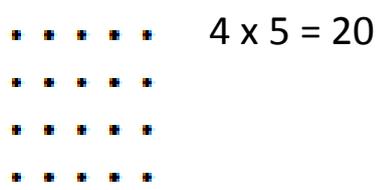||||| ||||| ||||| |||||

0   5   10   15   20

Using pictures or marks

Using a bead string

Arrays are introduced as a way of showing that multiplication can be done in any order.

$$4 \times 5 = 20$$

$$5 \times 4 = 20$$

WAYS TO SUPPORT YOUR CHILD:

- If you have Numicon at home, encourage your child to explore repeated addition through Numicon printing in playdough, paint etc.
- Use real life situations to begin to use the language of multiplication, eg. There are 3 lots of 2 biscuits, 2 groups of 6 eggs.
- Continue to explore the value of coins when paying, eg. paying 20 pence by using four 5 pence coins.
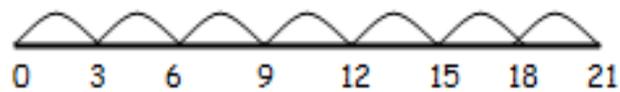
STAGE 3 (From Y2)

When ready, pupils are then introduced to number lines for modelling multiplication as repeated addition, initially alongside the Numicon image.

➢ Counting in repeated groups of the same size

7 x 3 = 21

➢ Partitioning to count in different sized groups

13 x 3 = 39

WAYS TO SUPPORT YOUR CHILD:

- Continue to explore everyday situations where repeated addition is needed, eg. buying tickets of the same price, serving dinner (eg. giving each person 4 potatoes), counting items in packets (eg. kit kat fingers in a whole packet), counting legs on minibeasts
- Give your child access to bead strings, number lines and hundred squares to move along in repeated jumps to support calculations.
- Support your child in learning their times tables by heart (see additional handout)

STAGE 4 (From Y3)

Children begin to record their workings more formally through 'grid method'.

Pupils first partition each number, recording in the grid, before multiplying and adding to find the total.

23 x 8

x	20	3	
8	160	24	=184

Leading to (in Y4)…

38 x 72

x	70	2
30	2100	60
8	560	16

```
  2160
+  576
  2736
```

WAYS TO SUPPORT YOUR CHILD:

- Encourage your child to start multiplying with the largest value calculation (eg. 30 x 70 before 30 x 2)
- When completing final addition, remind your child to line up the digits by place value.
- Partition numbers of increasing size and explore the value of the different digits in a number, eg. What is the value of 9 in 8790?
- Explore multiplying any digit by 10, 100, 1000 by moving the digits to the left.
- Continue to rehearse times tables and make links between related facts, eg. 2 x 3, 20 x 3 and 20 x 30.

STAGE 5 (From Y4)

Children will begin to use the 'expanded method' and later 'compact method' to multiply.

Children begin by multiplying least significant digit first, recording each stage before adding to find the total.

➢ Expanded method

```
        23
     x   7
        21  ( 3 x 7)
      140  (20 x 7)
      161
```

```
        72
     x  38
        16  (2 x 8)
      560 (70 x 8)
        60 (2 x 30)
     2100 (70 x 30)
     2736
       1
```

➢ Moving to compact method by Year 5

```
        23
     x   7
      161
       12
```

```
       372
     x   24
      1488    (372 x 4)
      7740    (372 x 20)
      8928
```

WAYS TO SUPPORT YOUR CHILD:

- Encourage your child to estimate an approximate answer before multiplying, eg. for 23 x 7, use 20 x 7 = 140 to help estimate an answer.
- Reinforce the place value of each digit as your child multiplies each stage.
- Encourage your child to line up digits by place value.
- Remind your child to start adding from least significant digit (right to left).