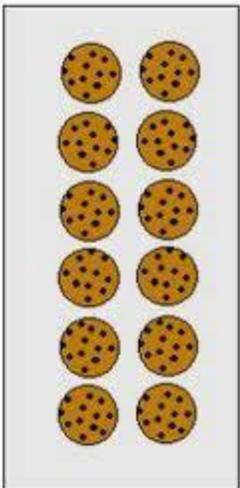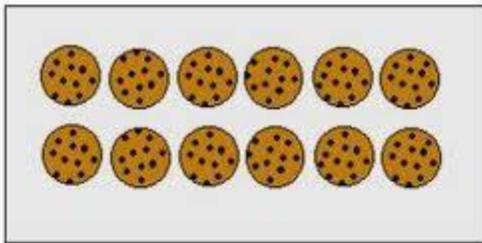# Multiplication

The use of the multiplication sign can cause difficulties. Mathematically 3 x 4 means 3 multiplied by 4 or three, 4 times (not 3 lots). When teachers are modelling the process of multiplication to children it is important that the vocabulary used matches the image being shown. Ultimately children should come to recognise that multiplication is commutative (3 x 4 = 4 x 3) so it can be done in any order.

**6 cookies, 2 times**

**6 x 2 = 12**

**3 x 4 =**

**2 cookies, 6 times**

**2 x 6 = 12**

# Multiplication: Stage 1

At stage 1 children are introduced to multiplication as groups of numbers. As with other calculations, practical equipment and images are imperative to providing a secure foundation for multiplication and children are not expected to use numerals or operation signs unless they are able to associate them with a value or operation.

## Practical understanding at stage 1

Children will count groups of numbers, e.g. 3 groups of 5
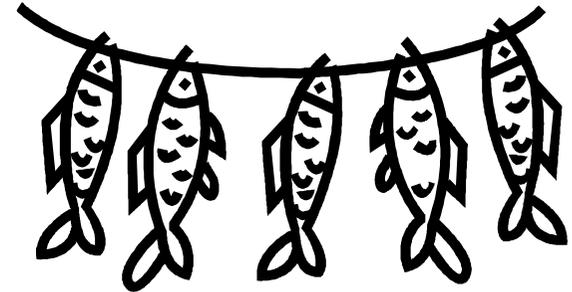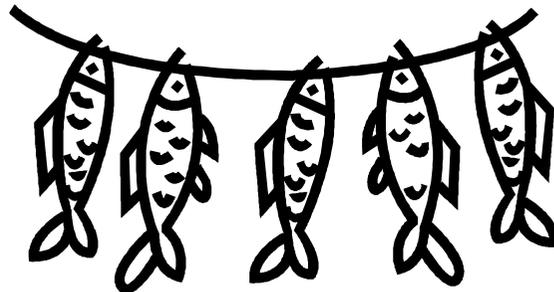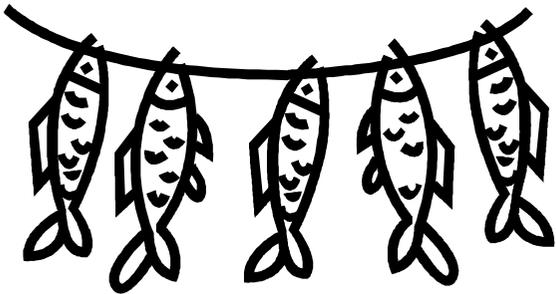
# Informal recording at stage 1

Children will choose how they represent their own multiplication calculations and are encouraged to explain what it shows. A teacher or adult may model a number sentence but the children are not expected to record using numerals or operation signs unless they are able to associate them with a value or operation.
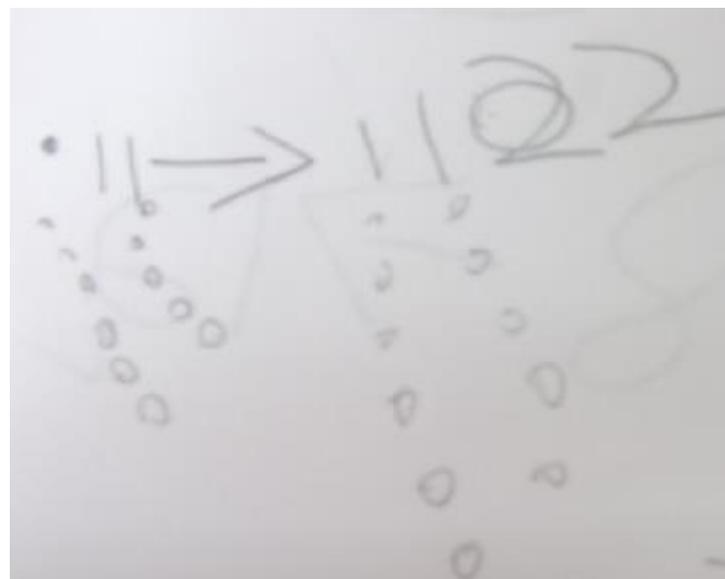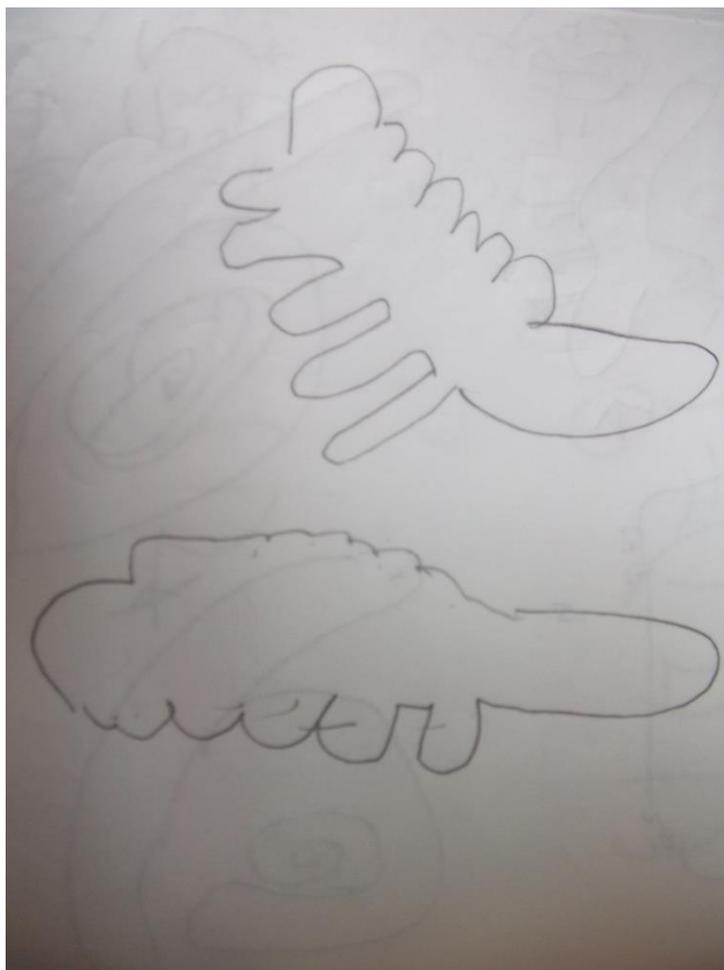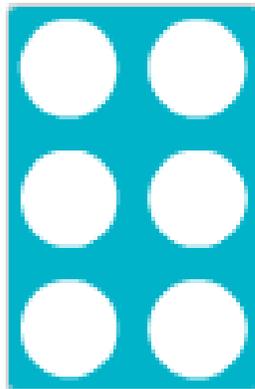




*Examples of children's recording in doubling*

# Multiplication: Stage 2

**Practical equipment and images are still incredibly important at this stage and children are now beginning to use signs and numerals to record their number sentences. Children will be introduced to the idea that multiplication is the same repeated addition.**
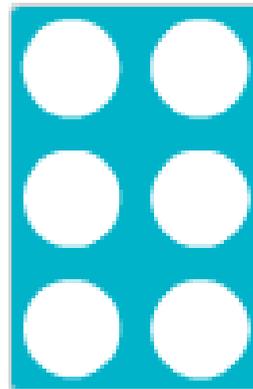
## Practical understanding at stage 2

Children will continue as in stage 1, drawing pictures and using practical resources to support their understanding, e.g. through use of Numicon.
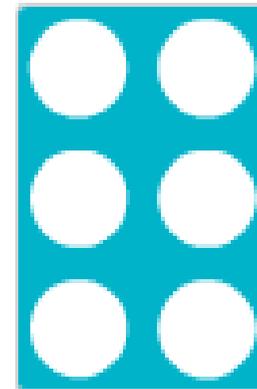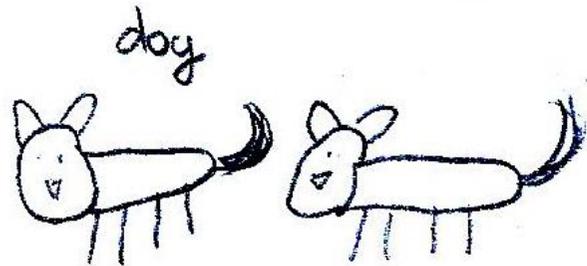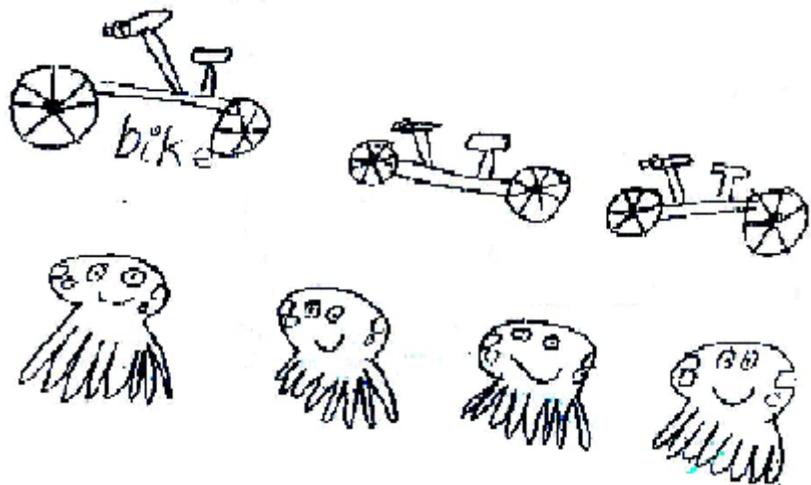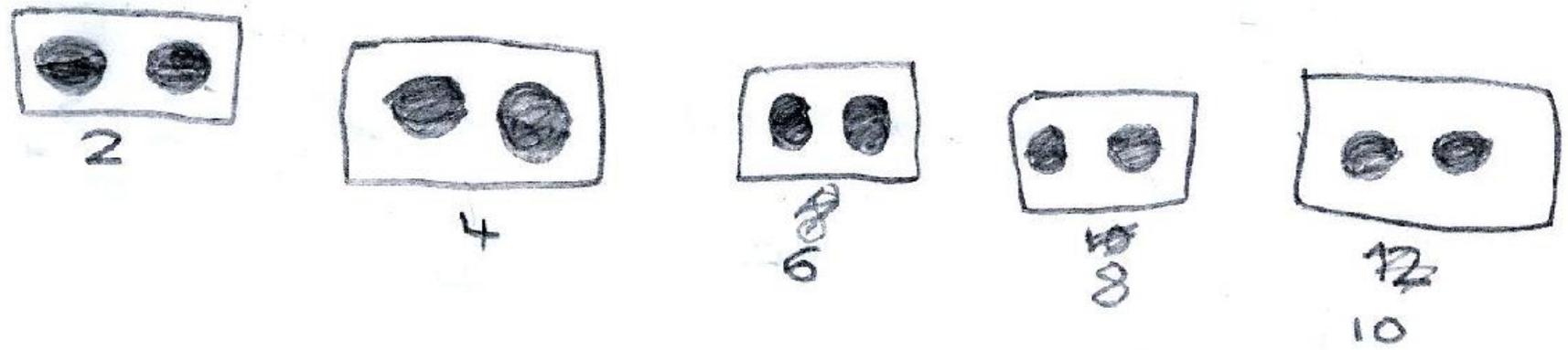


6     +     6     +     6     = 18

# Informal recording at stage 2



*Using pictures to represent 2 x 3 and 8 x 4*

dog

$4 * 2 = 8$



2

4

6
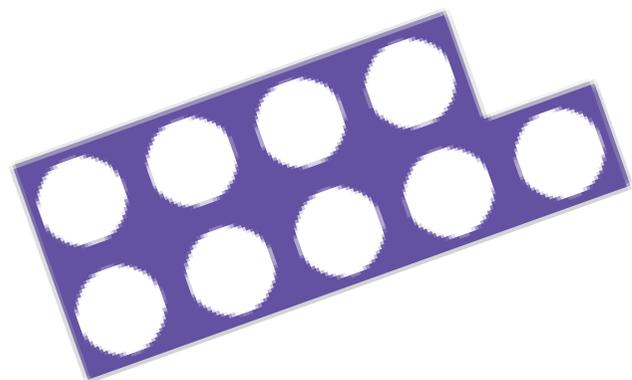
8

10

# Multiplication: Stage 3

Practical equipment and images are still incredibly important at this stage and children are now beginning to use signs and numerals to record their number sentences. Children will be introduced to the multiplication symbol and understand this as groups of number. They will begin to know number facts off by heart and be developing a repertoire of strategies to support their mental calculations.

It is hoped by stage 3 that children are becoming more confident with their mental calculations. Children therefore need to be able to understand and access the following before moving towards other stages of calculations.

- Know that doubling is the same as adding the same number twice
- Know doubles of numbers up to and including 10.
- Recognise repeated addition as multiplication
- Understand how to count in 2s, 5s and 10s and begin to relate this to multiplication
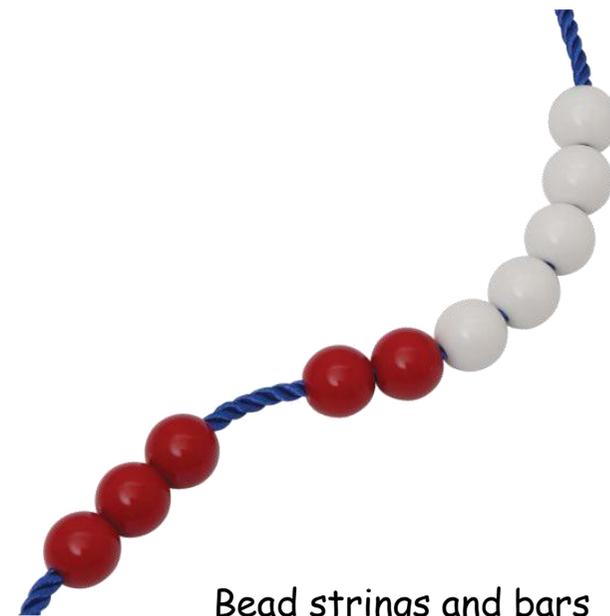
## Practical understanding at stage 3

Children will continue to access equipment to support their multiplication, including the use of;
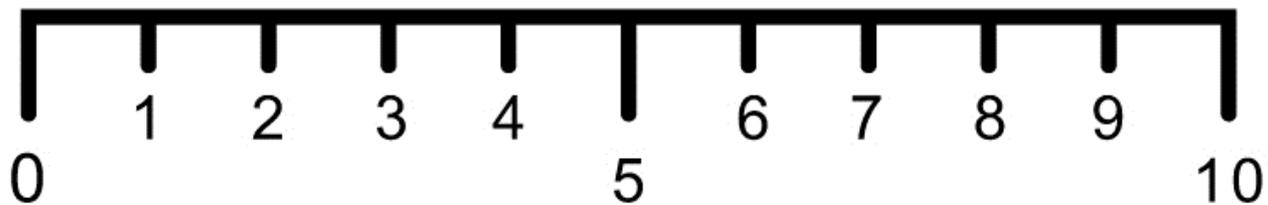
Counting equipment, e.g. compare bears

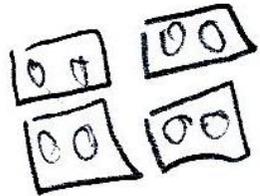Numicon

Bead strings and bars

Number-lines

0 1 2 3 4 5 6 7 8 9 10

## Informal recording at stage 3
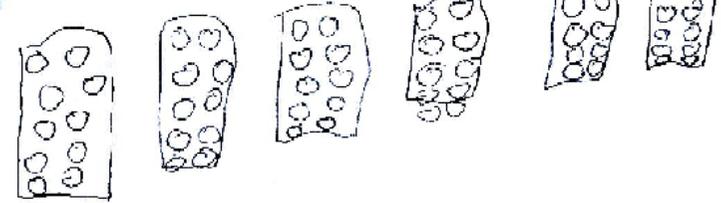
Children will continue to represent multiplication using their own representations.
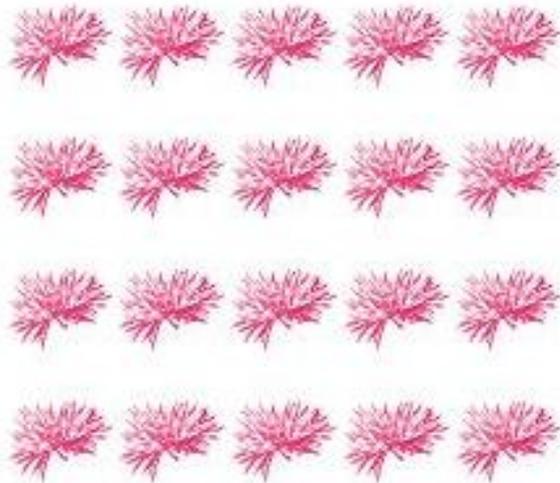
$2 \times 4 = 8$

$5 \times 5 = 25$
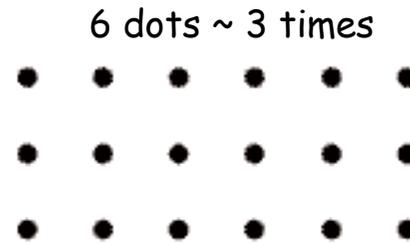
$10 \times 6 = 60$

## Formal recording at stage 3

Children will be introduced to drawing arrays to support their multiplication.
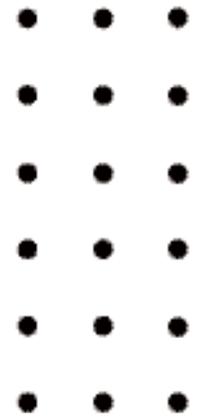
**5 objects 4 times**

$5 \times 4 = 20$

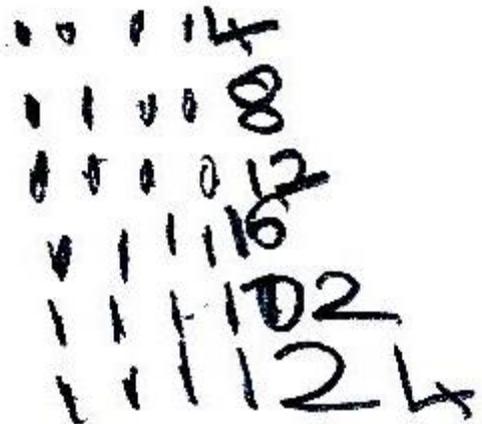6 dots ~ 3 times

$6 \times 3$

3 dots ~ 6 times

$3 \times 6$

15 X 4 = 60



14
8
12
16
102
124

# Multiplication: Stage 4

**Practical equipment and images are still incredibly important at this stage and children are now beginning to use signs and numerals to record their number sentences. Children will continue to use arrays to support their understanding of multiplication and will begin to use their knowledge of place value to support this further.**

## Practical understanding at stage 4

Children will continue to access practical equipment as above in stages 1, 2 and 3. Please note that it is important children have this support at **all times** throughout their mathematics development and working practically should be encouraged when needed.

## Informal recording at stage 4

Children will continue to record maths in methods they deem appropriate, but will be encouraged to use arrays to develop accuracy.

$10 \times 3 = 30$
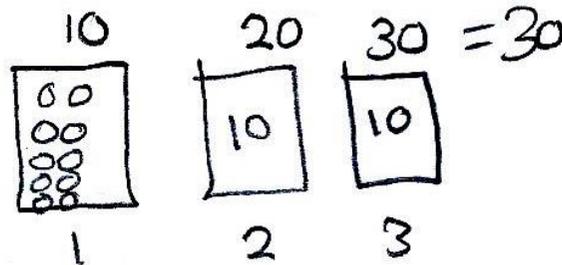
$5 \times 3 = 15$

## Formal recording at stage 4

Children will draw on their knowledge of place value to support their multiplication. They will begin to understand what happens when numbers are mulplied by 10 and 100 and be able to use this knowledge in their calculations.

12 x 8 = 96

T: 10 x 8 = 80

U:  2 x 8 = 16

15 x 5 = 75

T: 10 x 50 = 50

U:  5  x  5 = 25

# Multiplication: Stage 5

**<u>Practical understanding at stage 5</u>**

Children will continue to access practical equipment. Children will have this support at *all times* throughout their mathematics development and working practically should be encouraged when needed.
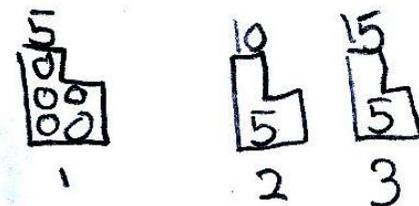
**<u>Informal recording at stage 5</u>**

Informal recording is less common at this stage as children should have a secure understanding of methods taught at stage 4.

**Practical equipment and images are still incredibly important at this stage and children are now beginning to use signs and numerals to record their number sentences. Children continue to use arrays and partitioning to support their understanding of multiplication and will begin to use their knowledge of multiples of 10 to make mental calculations quicker, e.g.**
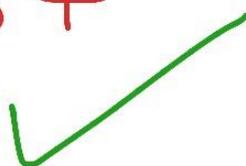
$$4 \times 30 =$$
$$4 \times 3 = 12$$
$$12 \times 10 = 120$$

## Formal recording at stage 5

In order to gain confidence working with larger multiplication calculations, children will be taught to use the grid method. The grid method uses knowledge of number facts and the idea of splitting a number into its parts to help children understand the process of multiplication.

$14 \times 6 = 84$ ✓

| × | 6 |
|---|---|
| 10 | 60 |
| 4 | 24 |

84

$15 \times 13 =$

| X | 10 | 3 | |
|---|----|---|---|
| 10 | 100 | 30 | = 130 |
| 5 | 50 | 15 | = 65 |

= 195