

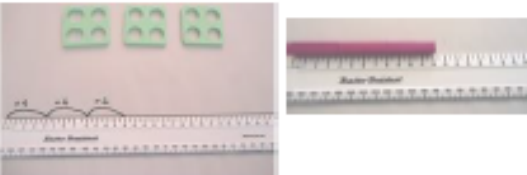

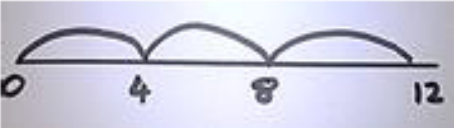

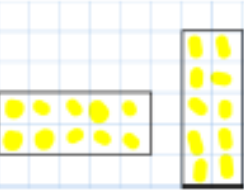


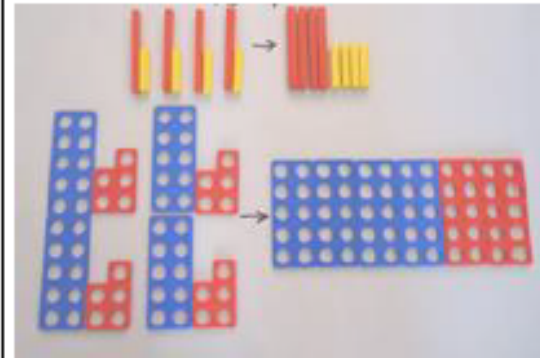
Multiplication-

Key language which should be used: double times, multiplied by, the product of, groups of, lots of, 'is equal to' 'is the same as'

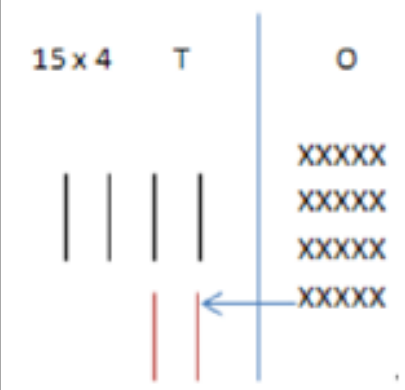
Concrete	Pictorial	Abstract
<p>Repeated grouping/repeated addition (does not have to be restricted to cubes) 3 x 4 or 3 lots of 4</p> 	<p>Children to represent the practical resources in a picture e.g.</p> <p>XX XX XX XX XX XX</p> <p>Use of a bar model for a more structured method</p> 	<p>3 x 4</p> <p>4 + 4 + 4</p>
<p>Use number lines to show repeated groups- 3 x 4</p> 	<p>Represent this pictorially alongside a number line e.g:</p> 	<p>Abstract number line</p> <p>3 x 4 = 12</p> 
<p>Use arrays to illustrate commutativity (counters and other objects can also be used) 2 x 5 = 5 x 2</p> 	<p>Children to draw the arrays</p> 	<p>Children to be able to use an array to write a range of calculations e.g.</p> <p>2 x 5 = 10 5 x 2 = 10 2 + 2 + 2 + 2 + 2 = 10 5 + 5 = 10</p>

Partition to multiply (use numicon, base 10, Cuisenaire rods)

4×15



Children to represent the concrete manipulatives in a picture e.g. base 10 can be represented like:



Children to be encouraged to show the steps they have taken

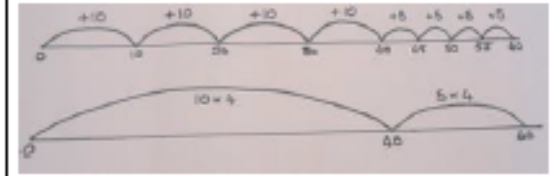
$$\begin{array}{r} 4 \times 15 \\ \swarrow \searrow \\ 10 \quad 5 \end{array}$$

$$10 \times 4 = 40$$

$$5 \times 4 = 20$$

$$40 + 20 = 60$$

A number line can also be used



Formal column method with place value counters or base 10 (at the first stage- no exchanging) 3×23

Make 23, 3 times. See how many ones, then how many tens



Children to represent the counters in a pictorial way



Children to record what it is they are doing to show understanding

$$3 \times 23$$

$$\begin{array}{r} 23 \\ \times 3 \\ \hline 69 \end{array}$$

$$3 \times 20 = 60$$

$$3 \times 3 = 9$$

$$60 + 9 = 69$$

Formal column method with place value counters (children need this stage, initially, to understand how the column method works)

Children to represent the counters/base 10, pictorially e.g. the image below.

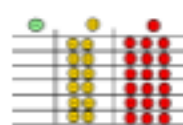
$$6 \times 23$$

$$6 \times 3 = 18$$

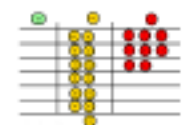
$$6 \times 20 = 120$$

$$120 + 18 = 138$$

6×23



Step 1: get 6 lots of 23



Step 2: 6×3 is 18. Can I make an exchange? Yes! Ten ones for one ten...



Step 3: 6×2 tens and my extra ten is 13 tens. Can I make an exchange? Yes! Ten tens for one hundred...



Step 4- what do I have in each column?



The aim is to get to the formal method but the children need to understand how it works.

$$6 \times 23 =$$

$$23$$

$$\times 6$$

$$\hline 138$$

$$11$$

When children start to multiply $3d \times 3d$ and $4d \times 2d$ etc, they should be confident with the abstract:

To get 744 children have solved 6×124

To get 2480 they have solved 20×124

$$\begin{array}{r}
 124 \\
 \times 26 \\
 \hline
 744 \\
 2480 \\
 \hline
 3224 \\
 11
 \end{array}$$

Answer: 3224

Fluency variation, different ways to ask children to solve 6×23 :

23	23	23	23	23	23
----	----	----	----	----	----

?

With the counters, prove that $6 \times 23 = 138$

Why is $6 \times 23 = 32 \times 6$?

Mai had to swim 23 lengths, 6 times a week. How many lengths did she swim in one week?

Tom saved 23p three days a week. How much did he save in 2 weeks?

Find the product of 6 and 23

$$6 \times 23 =$$

$$\square = 6 \times 23$$

$$\begin{array}{r} 6 \\ \times 23 \\ \hline \end{array}$$

$$\begin{array}{r} 23 \\ \times 6 \\ \hline \end{array}$$

What's the calculation? What's the answer?

