

PROGRESSION THROUGH CALCULATIONS FOR MULTIPLICATION

MENTAL CALCULATIONS (ongoing)

These are a **selection** of mental calculation strategies:

See NNS Framework Section 5, pages 52-57 and Section 6, pages 58-65

Doubling and halving

Knowing that doubling is multiplying by 2

Using multiplication facts

Once children have been taught tables in Year 2 these should be practised regularly, either as part of the mental oral starter or other times as appropriate within the day.

Year 2 2 times table
 5 times table
 10 times table

Year 3 2 times table
 3 times table
 4 times table
 5 times table
 6 times table
 10 times table

Using and applying facts

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

e.g. If I know $3 \times 5 = 15$, what else do I know?

$3 \times 5 = 15$, $30 \times 5 = 150$, $15 \div 5 = 3$, $15 \div 3 = 5$ etc

Multiplying by 10 or 100

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

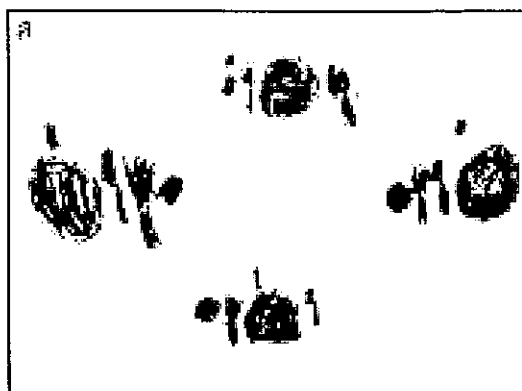
Knowing that the effect of multiplying by 100 is a shift in the digits two places to the left.

MANY MENTAL CALCULATION STRATEGIES WILL CONTINUE TO BE USED. THEY ARE NOT REPLACED BY WRITTEN METHODS.

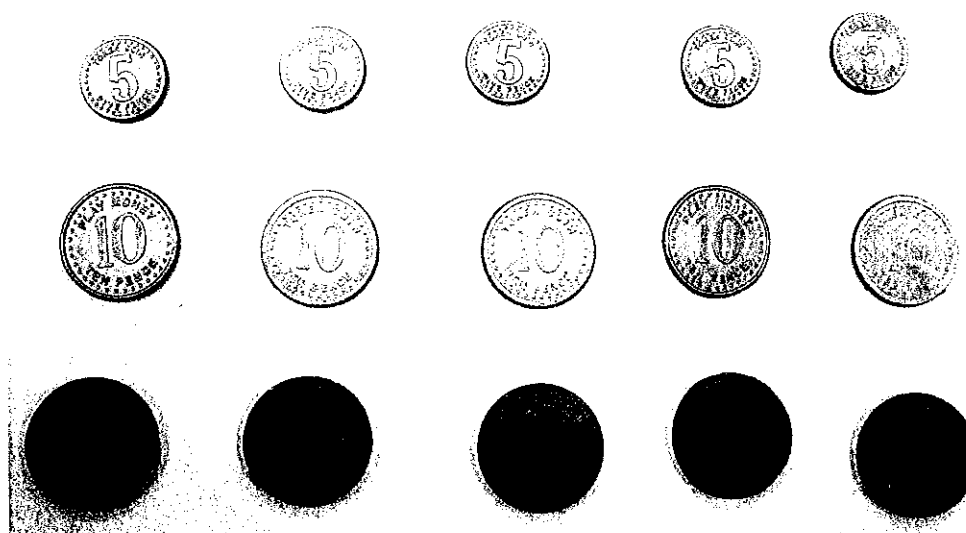
THE FOLLOWING ARE STANDARDS THAT WE EXPECT THE MAJORITY OF CHILDREN TO ACHIEVE.

YR

Children will experience equal groups of objects 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.



Children may count fingers in tens, eyes in twos or use bead strings or coins to count in different ways.

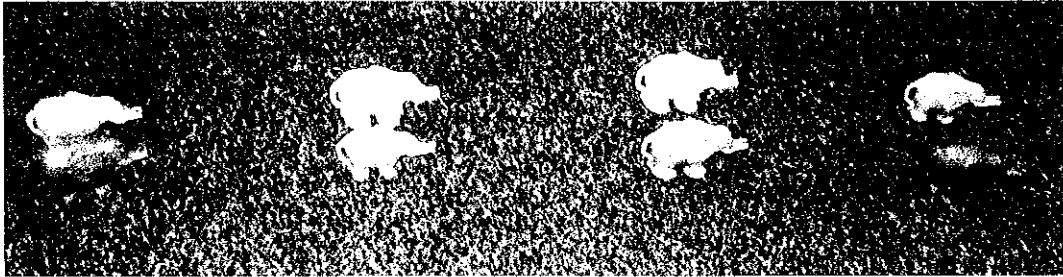


Y1

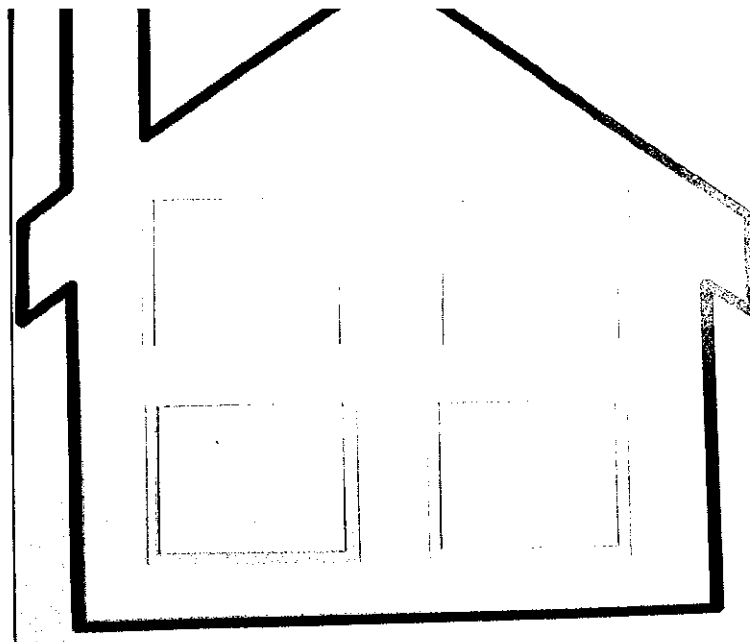
Children will experience equal groups of objects and will count in 2s and 10s and 5s. They will work on practical problem solving activities involving equal sets or groups.

Children will solve one-step problems involving multiplication using concrete objects, pictorial representations and arrays with the support of the teacher.

They make connections between arrays, number patterns, addition calculations and counting in 2's, 5's and 10's.



Children may use the elephants to show the calculation 4×2



Children may use objects to put 10 in each window to show the calculation 4×10

Y2

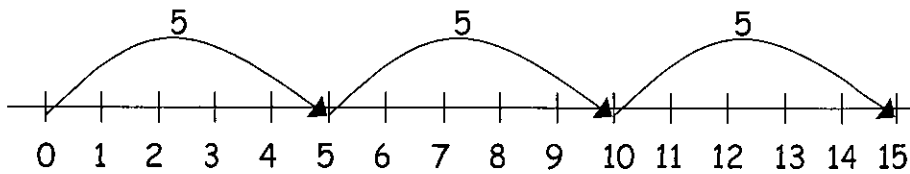
Children will develop their understanding of multiplication and use pictures, apparatus and jottings to support their calculations:

✓ Repeated addition

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

Repeated addition can be shown easily on a number line:

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



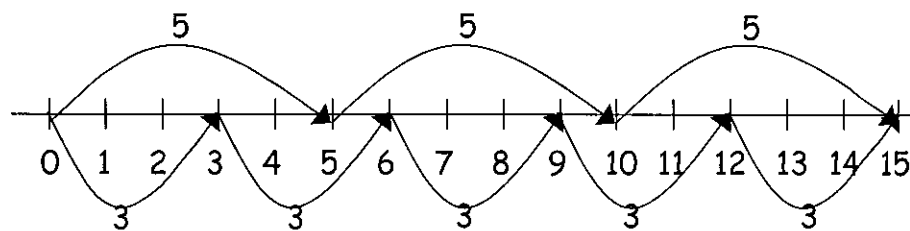
and on a bead bar:

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



✓ Commutativity

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



✓ Arrays

Children should be able to model a multiplication calculation using an array. This knowledge will support with the development of the grid method. They should be able to use this strategy to solve any multiplication problem, not just problems involving the 2, 5 and 10 times tables.

○ ○ ○ ○ ○	
○ ○ ○ ○ ○	
○ ○ ○ ○ ○	$5 \times 3 = 15$
$3 \times 5 = 15$	

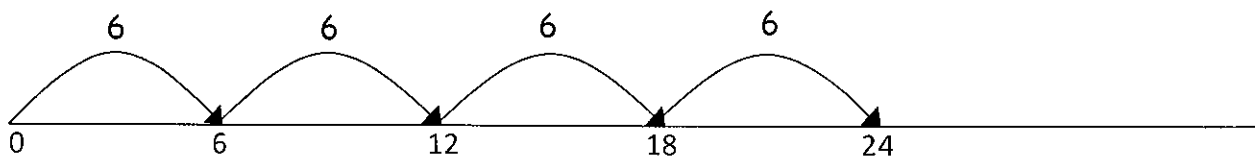
Y3

Children will continue to use:

✓ **Repeated addition**

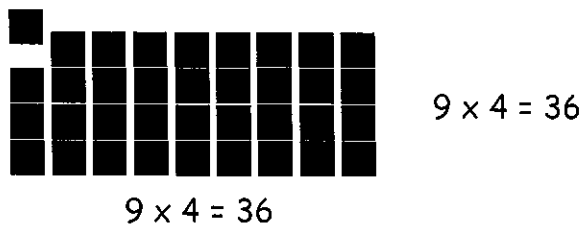
4 times 6 is $6 + 6 + 6 + 6 = 24$ or 4 lots of 6 or 6×4

Children should use number lines or bead bars to support their understanding.



✓ **Arrays**

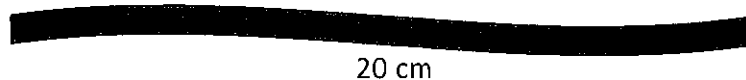
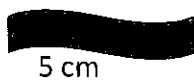
Children should be able to model a multiplication calculation using an array. This knowledge will support with the development of the grid method.



Children will also develop an understanding of

✓ **Scaling**

e.g. Find a ribbon that is 4 times as long as the blue ribbon



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

$$\square \times 5 = 20$$

$$3 \times \triangle = 18$$

$$\square \times \bigcirc = 32$$