



Multiplication Progression Policy

EYFS to Year 6

Multiplication- Progression in written method Y1 to Y6

Contextualise the mathematics

WHAT DOES THIS NUMBER REPRESENT?

Expose mathematical structure and work systematically

Expect children to use correct terminology and express reasoning

- ❖ Use **stem sentences**.
- ❖ Answer in **complete sentence**.

Identify difficult points

- ❖ Be aware of common misconceptions.
- ❖ Actively seek to uncover these.

Move between concrete, pictorial and the abstract (CPA)

Teach inequality alongside all mathematical concepts.

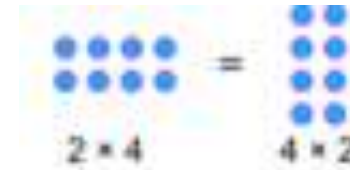


< and > can also help deep understanding of key concepts.



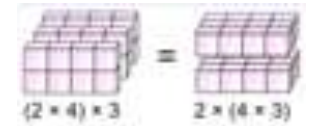
Commutative Law:

This law states that the order you multiply numbers in does not matter. E.g. $2 \times 4 = 4 \times 2$



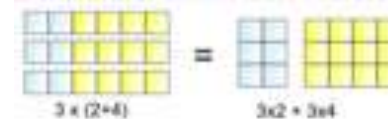
Associative Law:

This law states that the order you carry out the multiplication does not impact the answer. E.g. $3 \times (2 \times 4) = (3 \times 2) \times 4$



Distributive Law:

This law states that you can partition numbers and multiply them without changing the answer. E.g. $3 \times 6 = 3 \times (2 + 4) = (3 \times 2) + (3 \times 4)$



Conceptual variation; different ways to ask children to solve 6 x 23

<table><tr><td>23</td><td>23</td><td>23</td><td>23</td><td>23</td><td>23</td></tr><tr><td colspan="6">?</td></tr></table>	23	23	23	23	23	23	?						Max had to swim 23 lengths, 6 times a week. How many lengths did he swim in one week? With counters, prove that $6 \times 23 = 138$	Find the product of 6 and 23 $6 \times 23 = \underline{\hspace{2cm}}$ $\underline{\hspace{2cm}} = 6 \times 23$ 6	What is the calculation? What is the product? <table><tr><th>100s</th><th>10s</th><th>1s</th></tr><tr><td></td><td> </td><td> </td></tr></table>	100s	10s	1s			
23	23	23	23	23	23																
?																					
100s	10s	1s																			

It is important to use conceptual variation in order for the children to deepen their understanding of the mathematical structure.

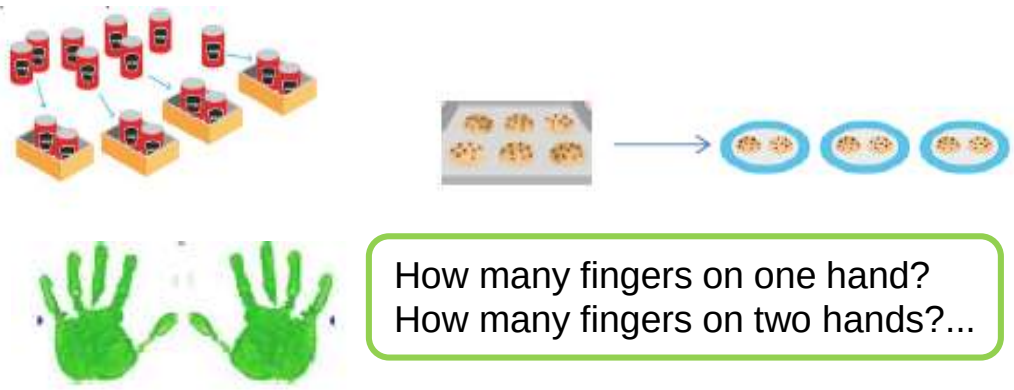
Children will find different ways easier or harder to understand than others. We encourage children to work towards looking for the most efficient methods once they have conceptual understanding of the maths.

EYFS Objectives

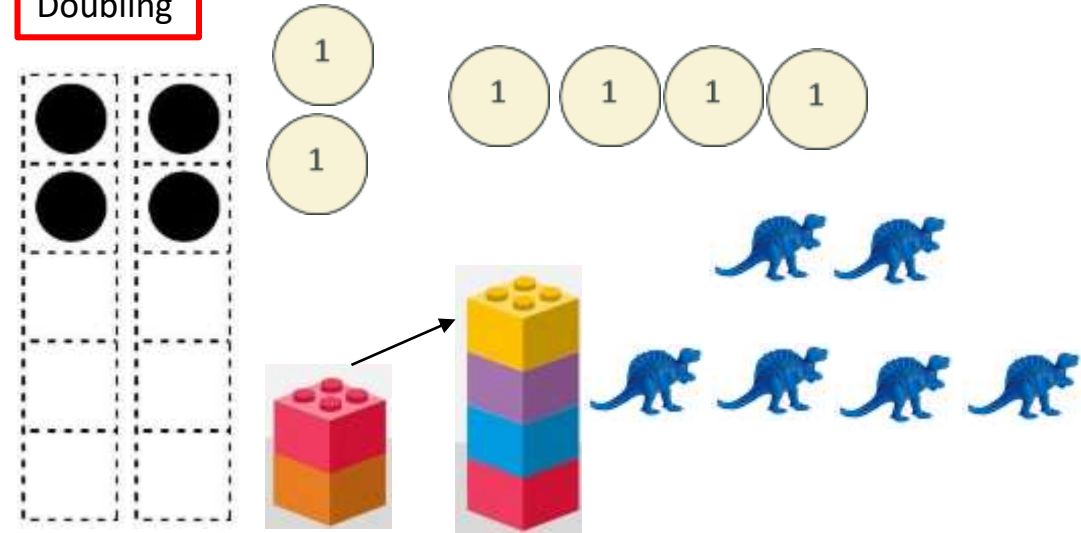
- ❖ Solve problems in real life contexts using concrete object and pictorial representation, including doubling.
- ❖ Count in multiples of 2, 10 and 5.



Real life contexts



Doubling



Count in multiples of 5



Count in multiples of 10



Count in multiples of 2



Y1 Objectives

- ❖ Equal groups.
- ❖ Calculate the answer using concrete object pictorial representation and arrays, showing repeated addition.
- ❖ Doubling.



3 cookies in 1 row
6 cookies in 2 rows
12 cookies in 4 rows
___ cookies in 6 rows

Real life contexts

Make equal groups, add them and show repeated addition in concrete and pictorial representations.



$2 + 2 + 2 + 2 + 2 =$



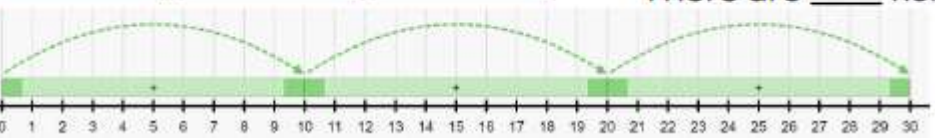
There are ___ groups of ___ pencils.



There are ___ groups of ___ flowers.



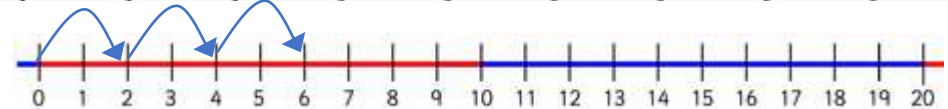
___ + ___ + ___ = ___
There are ___ fish.



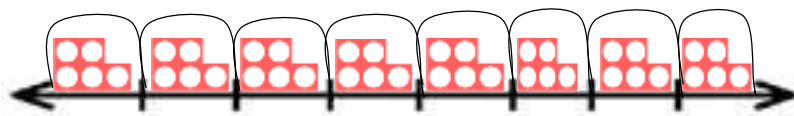
Count in multiples of 2



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

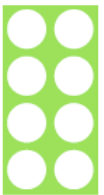
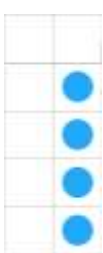


Count in multiples of 5



20

Doubling



+



Count in multiples of 10



There are ___ flowers in each bunch.
There are ___ bunches.
There are ___ flowers altogether.



Y2 Objectives

- ❖ Multiplication and division facts for the 2x, 5x and 10x tables.
- ❖ Commutative property.
- ❖ Solve problems in multiplication using arrays, repeated addition, mental methods and multiplication facts.

Use a range of resources and methods before moving to the abstract form.

Count in twos.



1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20

There are 20 cupcakes altogether.

What number pattern do you see on the number chart?



Consolidate repeated addition and link to multiplication



How many cupcakes are there altogether?

$$3 + 3 + 3 + 3 = 12$$

$$4 \text{ threes} = 12$$

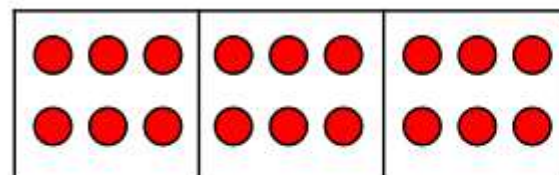
$$4 \text{ groups of } 3 = 12$$

$$4 \times 3 = 12$$

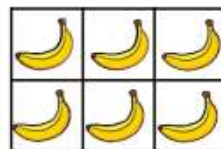
There are 12 cupcakes altogether.

$4 \times 3 = 12$ is read as 4 times 3 equals 12.

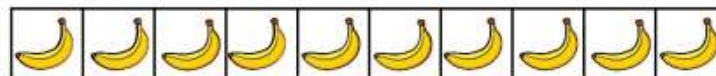
There are 4 groups. Each group has 3 cupcakes.



There are ___ equal groups with ___ in each group.
There are three ___.



$$2 \times 3 \quad \text{and} \quad _ \times _$$



$$_ \times _ \quad \text{and} \quad _ \times _$$



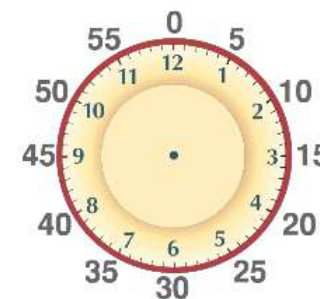
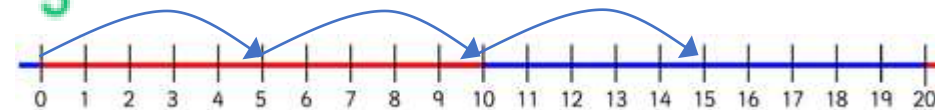
Commutativity



$$2 \times 5 = 10$$

$$5 \times 2 = 10$$

Link the 5x and 10x table through doubling and halving.



Link the 5x table to intervals on a clock face.

Solve problems

Each bag holds 5 apples.
How many apples are there in 3 bags?



Anna has 7 pies.
She cuts each pie into 10 slices.
How many slices of pie are there in total?



A bicycle has 2 wheels.
How many wheels do 3 bicycles have?



Y3 Objectives

- ❖ Multiplication and division facts for the 3x, 4x and 8x table.
- ❖ 2 digit number x 1 digit number (mental and formal written method).
- ❖ Missing number problems.
- ❖ Commutativity property.
- ❖ Choose appropriate operation to solve problems.

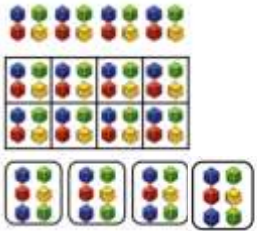


2 digit number x 1 digit number
concrete and pictorial

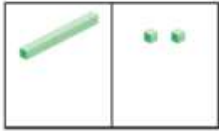
8 x 4

4 x 4

4 x 6



12 x 4 =
Multiply 12 by 4.



Step 1 Multiply the ones by 4.

2 ones x 4 = 8 ones

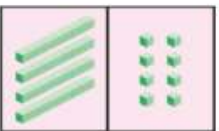
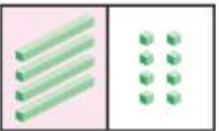
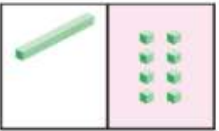


Step 2 Multiply the tens by 4.

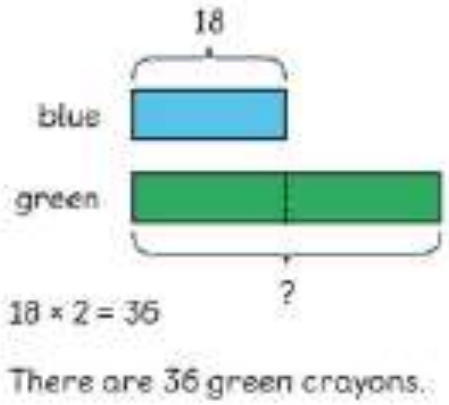
1 ten x 4 = 4 tens



Step 3 2 ones x 4 = 8
1 ten x 4 = 40
12 x 4 = 8 + 40 = 48



Solve problems

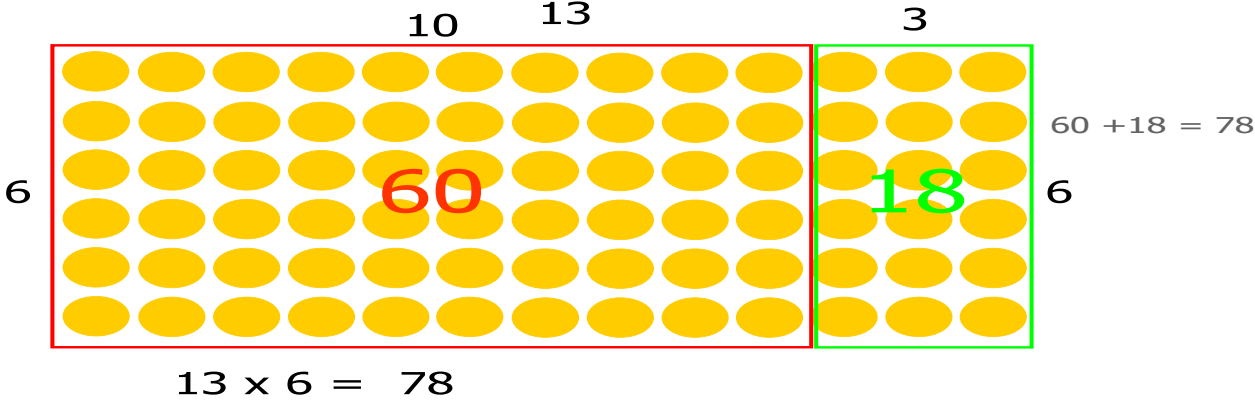


Continue to use CPA approach and bar model when solving multiplication and division problems.

Commutativity



2 digit number x 1 digit number
pictorial and abstract



13
x 6
—
18 (6 x 3)
60 (6 x 10)
—
78

Y4 Objectives

- ❖ Multiplication and division facts up to 12x table.
- ❖ Multiply by 0 and 1.
- ❖ 1 digit number x 1 digit number x 1 digit number.
- ❖ 2 digit number x 1 digit number
- ❖ 3 digit number by 1 digit number
- ❖ Factor pairs and commutativity
- ❖ Solving problems.



Efficient multiplication



$$15 \times 6$$

$$3 \times 5 \times 6$$

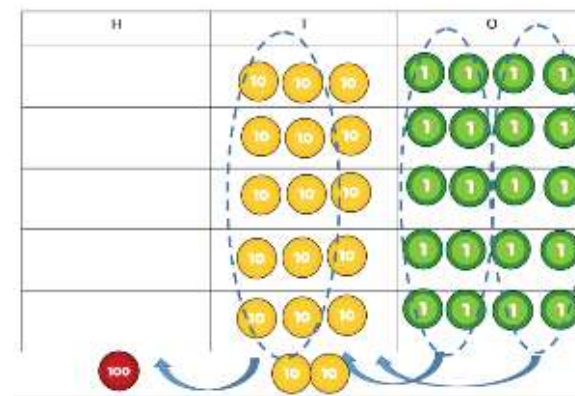
2 digit number or 3 digit number x 1 digit number

$$6 \times 23 = \square$$

10	10	1	1	1
10	10	1	1	1
10	10	1	1	1
10	10	1	1	1
10	10	1	1	1
10	10	1	1	1

2 digit number or 3 digit number x 1 digit number
continue to use CPA approach

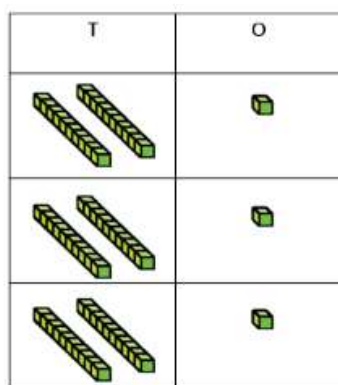
Teacher to model the expanded method alongside the CPA methods to illustrate the link between.



$$\begin{array}{r} 34 \\ \times 5 \\ \hline 20 \\ 150 \\ \hline 170 \end{array}$$

(5 x 4)
(5 x 30)

Teacher to ensure children are secure in multiplying a 2 digit number by a 1 digit number, before moving onto 3 digit numbers.



	T	O			
	2	1			
x		3			
		3	(3 x 1)		
+	6	0	(3 x 20)		
	6	3			

$$\begin{array}{r} 136 \\ \times 5 \\ \hline 30 \\ 150 \\ 500 \\ \hline 680 \end{array}$$

(6 x 5)
(30 x 5)
(100 x 5)

3 digit number x 1 digit number
compact method

$$\begin{array}{r} 345 \\ \times 6 \\ \hline 2070 \\ \hline \end{array}$$

23

Y5 Objectives

- ❖ Multiples and factors.
- ❖ Prime numbers and composite numbers.
- ❖ Square and cube numbers.
- ❖ 4 digit number x 1 digit number
- ❖ 4 digit number x 2 digit number (long multiplication)
- ❖ Decimal numbers x 10, x 100 and x 1000.



4 digit number x 1 digit number or 2 digit number
expanded method

$$\begin{array}{r} 1236 \\ \times \quad 7 \\ \hline 42 \quad (6 \times 7) \\ 210 \quad (30 \times 7) \\ 1400 \quad (200 \times 7) \\ 7000 \quad (1000 \times 7) \\ \hline 8652 \end{array}$$

Start with 4 digits multiply by 1 digit, before slowly working towards multiplying 4 digits or more by a two digit number. Show regrouping **below** the calculation.

$$\begin{array}{r} 72 \\ \times \underline{38} \\ 16 \quad (2 \times 8) \\ 560 \quad (70 \times 8) \\ 60 \quad (2 \times 30) \\ 2100 \quad (70 \times 30) \\ \hline 2736 \\ 1 \end{array}$$

4 digit number x 1 digit number
compact method

$$\begin{array}{r} 345 \\ \times \quad 6 \\ \hline 2070 \\ \textcolor{red}{23} \end{array}$$

$$\begin{array}{r} 4769 \\ \times \quad 3 \\ \hline 14307 \\ \textcolor{red}{1222} \end{array}$$

Y6 Objectives

- ❖ Multiply multi-digit number up to 4 digit number x 2 digit number.
- ❖ Common factors, common multiples and prime number.
- ❖ Multiplication of decimal umbers by 1 digit number.
- ❖ Order of operations.
- ❖ Solve problems.



4 digit number x 2 digit number
compact method

124 x 26 =

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

$$\begin{array}{r} 3 \\ \times 45 \\ \hline 615 \\ + 4920 \\ \hline 5535 \end{array}$$

123 x 45 = 5535

Decimals x 1 digit number
expanded

9.30 x 2 =

$$\begin{array}{r} 9.30 \\ \times 2 \\ \hline 0.60 \\ 18.00 \\ \hline 18.60 \end{array}$$

0.23 x 9 =

$$\begin{array}{r} 0.23 \\ \times 9 \\ \hline 0.27 \\ 1.80 \\ \hline 2.07 \end{array}$$

1

Decimals x 1 digit number
compact

$$\begin{array}{r} 23 \\ \times 9 \\ \hline 207 \end{array}$$

1 2