

National Curriculum For Mathematics



Calculation Policy

Routes through Multiplication

2021

EARLY SKILLS - Most children in Year 1 and Year 2

Children use concrete and pictorial representation to solve multiplication problems. No formal abstract method is expected to record multiplication at Year 1. At Year 2, children are using the multiplication sign in abstract methods.

Multiplication as counting in equal steps - '5, 10, 15, 20', or in twos or tens or other multiples.

Include doubling

Include number rhymes

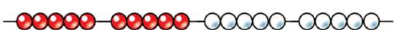
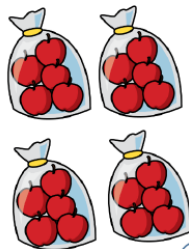
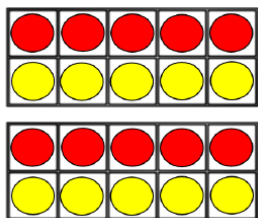
Bar models

Number line - to represent repeated addition

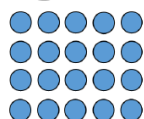
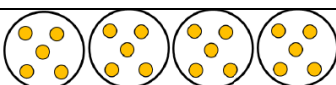
Very practical:

- **Number shapes (numicon)** - useful to support children to explore multiplication as repeated addition
- **Cubes/counters** - support children to cubes/counters in groups of an amounts or arrays.
- **Tens Frame** - To support counting in 2's 5's and 10s
- **Bead Strings** - to show repeated counting in eg 5's

Concrete



Pictorial



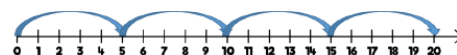
$5 + 5 + 5 + 5 = 20$

$4 \times 5 = 20$

$5 \times 4 = 20$

(Concrete and pictorial methods)

Abstract



$5 + 5 + 5 + 5 = 20$

$4 \times 5 = 20$

$5 \times 4 = 20$

Most children in year 3 and 4

Expanded column method may be taught before the short multiplication method using the place value counters or Base ten to support children's understanding of knowledge of the method.

Children should use their times table knowledge to solve problems and when multiplying larger numbers.

When moving to multiplying 3 digit numbers by 1 digit numbers, this should be when we encourage pupils to use the short, formal method. Base 10 or place value counters continue to support understanding. The number of exchanges are to be limited to move the children away from using resources when multiplying larger numbers.

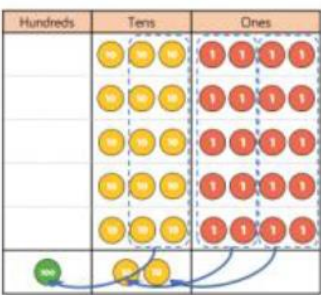
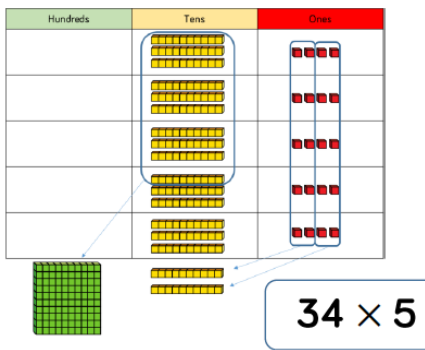
Practical resources support multiplication-

- **Base 10/dienes**
- **Place Value Counters**

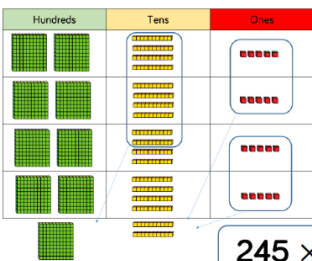
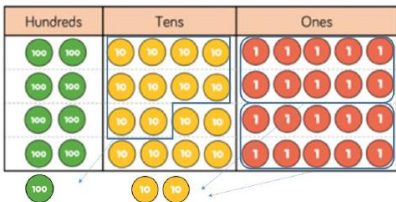
Concrete

Pictorial

Abstract



= 170



	H	T	O	
		3	4	
x			5	
		2	0	(5 x 4)
+	1	5	0	(5 x 30)
	1	7	0	

	H	T	O
		3	4
x			5
	1	7	0
	1	2	

	H	T	O
	2	4	5
x			4
	9	8	0
	1	2	

x	200	30	4
30	6,000	900	120
2	400	60	8

Most children in Year 5 and 6.

Use place value counters to support children's understanding of the formal written method and if children are multiplying larger numbers with their times tables, encourage the use of the multiplication grid.

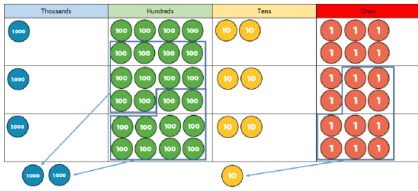
The multiplication grid method matches the area model as an initial method before moving to the formal written method. Use the area model (concrete) to help children understand the size of numbers they are using. (links to finding the area of a rectangle by finding the space covered by Base 10.)

Place value counters become more efficient to use and encourage children to move toward the formal method and seeing links with the grid method.

Practical resources support multiplication-

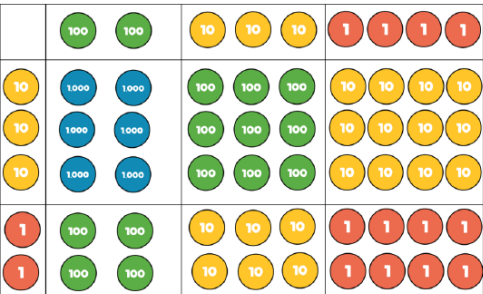
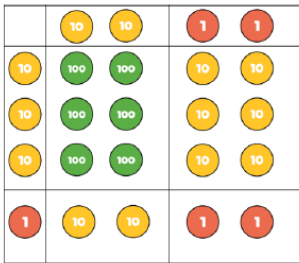
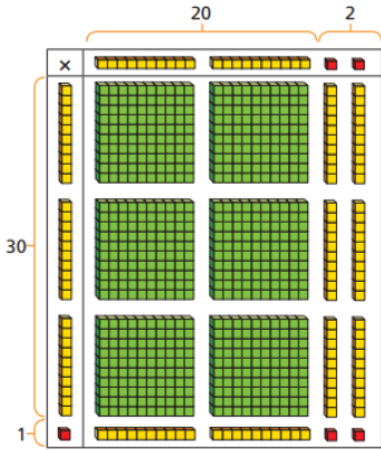
- Base 10/dienes
- Place Value Counters

Concrete



$$1,826 \times 3 = 5,478$$

Area model:



Pictorial

Abstract

	Th	H	T	O
	1	8	2	6
x				3
	5	4	7	8
	2		1	

	H	T	O
		2	2
x		3	1
		2	2
	6	6	0
	6	8	2

x	20	2
30	600	60
1	20	2

TTh	Th	H	T	O
	2	7	3	9
x			2	8
2	1	9	1	2
2	5	3	7	
5	4	7	8	0
1	7	6	6	9
				2
				1

Th	H	T	O
	2	3	4
x		3	2
	4	6	8
17	10	2	0
7	4	8	8

x	200	30	4
30	6,000	900	120
2	400	60	8