# Written Calculation Policy

Multiplication

Reviewed March 2021

Year 1

Understand multiplication is related to doubling and combing groups of the same size (repeated addition)
Washing line, and other practical resources for counting. Concrete objects. Numicon; bundles of straws, bead strings

2 + 2 + 2 + 2 + 2 = 10
2 × 5 = 10
2 multiplied by 5
5 pairs
5 hops of 2
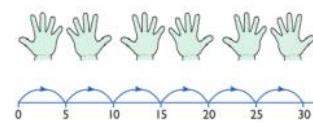
5 + 5 + 5 + 5 + 5 + 5 = 30
5 × 6 = 30
5 multiplied by 6
6 groups of 5
6 hops of 5

Doubling numbers up to 10 + 10
Link with understanding scaling.

2 + 2 + 2 = 6
3 × 2 = 6

double 4 is 8
4 × 2 = 8

2	2	2
?
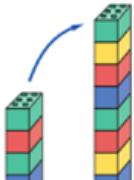
Use arrays to understand multiplication can be done in any order (commutative)

4 × 2 = 8
2 × 4 = 8

2 × 4 = 8
4 × 2 = 8
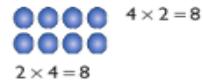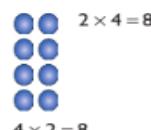
Year 2

Expressing multiplication as a number sentence using x
Using understanding of the inverse and practical resources to solve missing number problems.

$7 \times 2 = \square$ $\square = 2 \times 7$
$7 \times \square = 14$ $14 = \square \times 7$
$\square \times 2 = 14$ $14 = 2 \times \square$
$\square \times \bigcirc = 14$ $14 = \square \times \bigcirc$

Recall multiplication facts for 2,5 & 10 times tables.
Further develop understanding of multiplication using array and number lines (see Year 1). Include multiplications not in the 2, 5 or 10 times tables. Begin to develop understanding of multipli
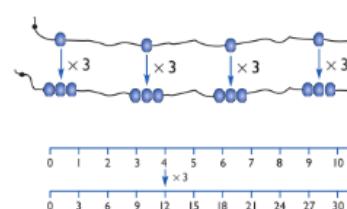

Doubling numbers
Using known doubles to work out double 2d numbers (double 16 = double 10 + double 6

16
10 x2   6 x2
20 + 12 = 32

Arrays leading to Grid method (2d x 1d)
Develop onto the grid method

	10	8
3	30	24

	10	8
3	30	24
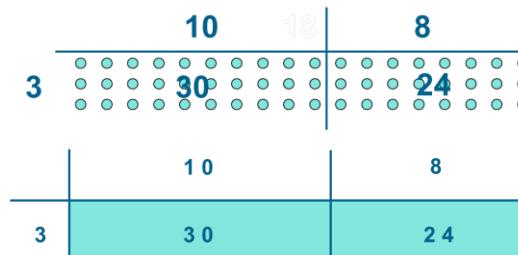
Give children opportunities to explore this and deepen understanding using Diennes apparatus and place value counters

Year 3

Missing number problems
Continue with a range of equations as in Year 2 but with appropriate numbers.
Mental methods
Recall multiplication facts for 3,4 & 8 times tables
Doubling 2 digit numbers using partitioning

39
30 x2   9 x2
60 + 18 = 78

Short Multiplication Method (2d x 1d)

	10	8
3	30	24

18
x 3
2
54

leading to

56
x 8
4 4
448
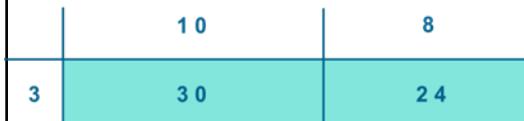
GDS children only to progress onto linking Grid Method (2 digit by 2 digit). E.g. 18 x 13 =
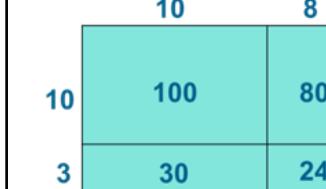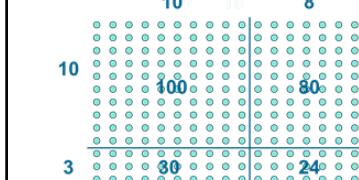
	10	8
10	100	80
3	30	24

Obj Gui **Year 4** Vid Ex	Obj Gui **Year 5** Vid Ex	Obj Gui **Year 6** Vid Ex
Continue with a range of equations as in Year 2 but with appropriate numbers. Also include equations with missing digits □2 x 5 = 160	Continue with a range of equations as in Year 2 but with appropriate numbers. Also include equations with missing digits	Continue with a range of equations as in Year 2 but with appropriate numbers. Also include equations with missing digits

Year 4

Mental methods

Counting in multiples of 6, 7, 9, 25 and 1000, and steps of 1/100.
Recall multiplication facts for tables up to 12 x 12
Recognise factor pairs
Solve practical problems where children need to scale up. Relate to known number facts. (e.g. how tall would a 25cm sunflower be if it grew 6 times taller?)

Short Multiplication Methods (progressing to 3d x 1d)

$$\begin{array}{r} 4\,1\,8 \\ \times\quad 7 \\ \hline {}^{2}\,{}^{1}\,{}^{5} \\ 2\,9\,2\,6 \\ \hline \end{array}$$

Children begin to explore how the grid method supports an understanding of long multiplication (for 2d x 2d)

$$\begin{array}{r} 1\,8 \\ \times 1\,3 \\ {}^{2} \\ 5\,4 \\ 1\,8\,0 \\ {}^{1} \\ \hline 2\,3\,4 \end{array}$$

Year 5

Mental methods

Multiply whole and decimal numbers by 10, 100, 1000
Use practical resources and jottings to explore equivalent statements (e.g. 4 x 35 = 2 x 2 x 35)
Recall of prime numbers up 19 and identify prime numbers up to 100 (with reasoning)
Solve practical problems where children need to scale up. Relate to known number facts.
Identify multiple and factors, including finding all pairs of a number, and common factors of two numbers.

Short Multiplication Methods (progressing to 4d x 1d)

$$\begin{array}{r} 6\,5\,3\,7 \\ \times\qquad 6 \\ \hline {}^{3}\,{}^{3}\,{}^{2}\,{}^{4} \\ 3\,9\,2\,2\,2 \\ \hline \end{array}$$

Long Multiplication Methods Secure 2d x 2d and then progress onto 3d x 2d)

$$\begin{array}{r} 1\,8 \\ \times 1\,3 \\ {}^{2} \\ 5\,4 \\ 1\,8\,0 \\ {}^{1} \\ \hline 2\,3\,4 \end{array} \longrightarrow \begin{array}{r} 2\,1\,8 \\ \times\;2\,5 \\ {}^{1}\qquad{}^{4} \\ 1\,0\,9\,0 \\ {}^{1} \\ 4\,3\,6\,0 \\ {}^{1} \\ \hline 5\,4\,5\,0 \end{array}$$

Year 6

Mental methods

Multiply whole and decimal numbers by 10, 100, 1000, 10,000.
Identifying common factors, common multiples and prime numbers
Solve practical problems where children need to scale up. Relate to known number facts.

Long Multiplication Methods (progressing to 4d x 2d)

$$\begin{array}{r} 3\,4\,2\,8 \\ \times 4\,9 \\ \hline {}^{3}\;\;{}^{3}\;\;{}^{2}\;\;{}^{7} \\ 3\,0\,8\,5\,2 \\ {}^{1}\;\;{}^{1}\;\;{}^{1}\;\;{}^{3} \\ 1\,3\,7\,1\,2\,0 \\ \hline 1\,6\,7\,9\,7\,2 \\ \hline \end{array}$$

Problem Solving

Teachers should ensure that pupils have the opportunity to apply their knowledge in a variety of contexts and problems (exploring cross curricular links) to deepen their understanding. The bar model should continue to be used to help visualise when problem solving E.g.