

Wellstead Maths Policy
Multiplication



Wellstead Primary School

Written Calculation Policy for Maths

The calculation policy has been devised to meet the requirements of the National Curriculum 2014 for the teaching and learning of mathematics. It is designed to give a clear progression of learning in calculations across the school. Early learning in number and calculation in Reception (Early Years) follows the 'Development Matters' EYFS document. This policy builds on this learning.

END OF YEAR EXPECTATIONS

This calculation policy has been devised according to the end of year expectations as set out in the National Curriculum 2014, **however** it is vital that children are taught according to the development stage that they are currently working at. Children will be moved onto the next level when the class teacher feels they are secure enough to move on. Some children may be working at a lower than expected level and they will be moved onto the next level accordingly when the class teacher feels they are secure enough to do so.

PROVIDING A CONTEXT FOR CALCULATION

It is important that any type of calculation is given within a real life context or problem solving approach to help build children's understanding of the purpose of calculations. This also helps them to develop skill in choosing appropriate number operations and strategies to solve the calculation.

CHOOSING A CALCULATION METHOD:

Children need to develop skill in deciding which appropriate method to use to solve calculations, depending on the numbers involved.

They will be encouraged to consider which approach to take:

Can I do it in my head using a mental strategy?

Could using jottings help me?

Should I use a written method to work out the answer?

Calculation Strategies

Progression in Multiplication - end of year expectations

EARLY YEARS

Key skills:

- Know double facts to $5+5$; extend to 10

Vocabulary:

count on, double, how many altogether

Solving problems involving doubling

Practical experiences

Through songs, rhymes and doubling activities e.g.

I have 3 apples and you have 3 apples. How many apples altogether?



Children need to be able to:

- Count sets of objects accurately

Calculation Strategies

Progression in Multiplication - end of year expectations

Year 1

Key skills:

- Count in multiples of 2, 5 and 10
- Know double facts to 10; extend to 20
- Derive halves to 20

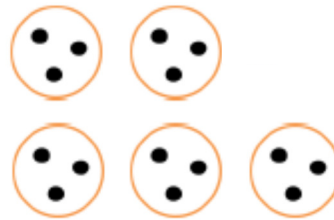
Vocabulary:

lots of, times, altogether, multiply, double

Solve one step problems involving multiplication

Using a range of practical resources

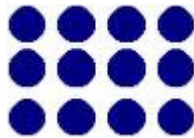
5 children each have 3 sweets.
How many sweets are there altogether



Using arrays

$$4 \times 3 = 12$$

$$3 \times 4 = 12$$



$$2 \times 6 = 12$$

$$6 \times 2 = 12$$



Children need to be able to:

- Partition numbers into multiples of 10s & 1s
- Know that multiplication of 2 numbers can be done in any order (commutative)
- Understand that multiplication & division are inverse operations of each other & derive facts
- Mentally calculate e.g. How many 2s make 10? How many 5s in 20?

Calculation Strategies

Progression in Multiplication - end of year expectations

Year 2

Key skills:

- Count in multiples of 2, 3, 5 and 10
- Recognise odd and even numbers
- Know double facts to 20; double facts for multiples of 10

Vocabulary:

Multiplication, multiply, lots of, times, array, repeated addition, double

Calculate mathematical statements for multiplication

e.g. $5 \times 3 =$

Build on using arrays

$$5 \times 3 = 15$$



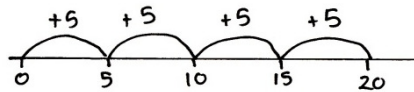
$$3 \times 5 = 15$$



Using repeated addition on an unstructured number line

$$4 \times 5 = 20$$

(4 lots of 5)



Children need to be able to:

- Partition numbers into multiples of 100s, 10s & 1s
- Know that multiplication of 2 numbers can be done in any order (commutative)
- Understand that multiplication & division are inverse operations of each other & derive facts
- Mentally calculate e.g. How many 10s make 80? How many 5s in 35?

Calculation Strategies

Progression in Multiplication - end of year expectations

Year 3

Key skills:

- Count in multiples of 3, 4, 8, 50 and 100
- Recall and use multiplication and division facts for 3, 4 and 8 multiplication tables

Vocabulary:

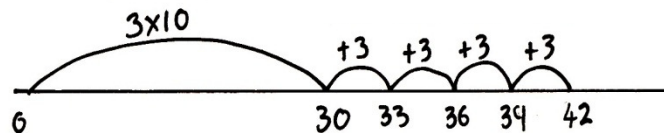
Multiplication, multiply, lots of, times, array, repeated addition, double, multiple of, product

Calculate mathematical statements for multiplication using the multiplication tables that they know, including 2-digit x 1-digit numbers

Building on using repeated addition on an unstructured number line

$$14 \times 3 =$$

$$10 \times 3 \quad 4 \times 3$$



Using grid method

$$14 \times 3 = 42$$

x	10	4
3	30	12

$$30 + 12 = 42$$

Children need to be able to:

- Partition numbers into multiples of 100s, 10s & 1s
- Work out products using related facts & knowledge of place value e.g. 70×5 using 7×5
- Understand that multiplication & division are inverse operations of each other & derive facts
- Calculate doubles
- Mentally calculate e.g. How many 10s make 80? How many 8s in 48?

When the class teacher feels that the children show that they are secure and confident using the grid method, they will be moved onto short multiplication (see Y4)

Calculation Strategies

Progression in Multiplication - end of year expectations

Year 4

Key skills:

- Count in multiples of 6, 7, 9, 25 and 1000
- **Recall multiplication and division facts for multiplication tables up to 12x12**

Vocabulary:

Multiplication, multiply, lots of, times, array, repeated addition, double, multiple of, product, factor

Multiply

- 2-digit x 1-digit numbers
- 3-digit x 1-digit numbers
- 2-digit x 2 -digit numbers

Building on grid method

$24 \times 15 = 360$

x	20	4		
10	200	40		240
5	100	20		120

$240 + 120 = 360$

Using short multiplication

46×4			4	6	
		x		4	
			2	4	(4 x 6)
	+	1	6	0	(4 x 40)
		1	8	4	

Moving to

	4	6
x		4
1	8	4
	2	

Children need to be able to:

- **RECALL ALL MULTIPLICATION FACTS TO 12X12**
- Partition numbers into multiples of 100s, 10s & 1s
- Work out products using related facts & knowledge of place value
e.g. 70×5 , 70×50 , 700×5 using 7×5
- Understand that multiplication & division are inverse operations of each other & derive facts
- Calculate doubles
- Mentally calculate e.g. How many 100s make 800? How many 7s in 350?

Calculation Strategies

Progression in Multiplication - end of year expectations

Year 5

Key skills:

- Count forwards and backwards in steps of 10, 100, 1000, 10000, 100000
 - Identify multiples and factor pairs
 - Recall prime numbers to 19
 - Multiply and divide numbers mentally drawing upon known facts
 - Multiply and divide whole numbers and decimal numbers by 10, 100 and 1000
- Recognise and use square numbers 5^2 (5x5) and cube numbers 5^3 (5x5x5)

Vocabulary:

Multiplication, multiply, lots of, times, array, repeated addition, double, multiple of, product, factor, prime number, square number

Multiply numbers up to 4-digits

4-digit x 1 digit numbers

4-digit x 2-digit numbers

Building on short multiplication

$146 \times 4 =$

	1	4	6
x			4
	5	8	4
	1	2	

Using long multiplication

36×24

		3	6	
	x	2	4	
		2	4	4×6
	1	2	0	4×30
	1	2	0	20×6
+	6	0	0	20×30
	8	6	4	

Moving to

		3	6
	x	2	4
	1	4	4
		2	
+	7	2	0
	1		
	8	6	4

Calculation Strategies

Progression in Multiplication - end of year expectations

Year 6

Key skills:

- Count forwards and backwards in steps of 10, 100, 1000, 10000, 100000
 - Identify multiples and factor pairs
 - Recall prime numbers to 19
 - Multiply and divide numbers mentally drawing upon known facts
 - Multiply and divide whole numbers and decimal numbers by 10, 100 and 1000
- Recognise and use square numbers 5^2 (5x5) and cube numbers 5^3 (5x5x5)

Vocabulary:

Multiplication, multiply, lots of, times, array, repeated addition, double, multiple of, product, factor, prime number, square number

Multiply multi-digit numbers up to 4-digits

4-digit x 1 digit numbers

4-digit x 2-digit numbers

Using short multiplication

	4	.	6
x			4
1	8	.	4
	2		

Using long multiplication

		5	7	.	2
	x		2	.	4
	2	2	8		8
		2			
1	1	4	4		0
	1				
1	3	7	.	2	8
		1			