



# Calculation Policy

Reviewed January 2016

## Our Mission Statement

Our Parish School of Our Lady of Lourdes  
welcomes everyone in the community,  
to share with us the joys of our Catholic Faith.  
We worship, learn and play together in the love of Jesus,  
helping one another to become the people  
God has created us to be.

## 1. Aims and Objectives

- 1.1 The aim of this Calculation Policy is to ensure that all children are able to use reliable and efficient calculation methods for each of the four operations which are consistent throughout the school, developing their skills in relation to the related year objectives set out in the National Curriculum.
- 1.2 In order for progression to run smoothly vocabulary, mental calculation strategies and rapid recall facts should be introduced at the appropriate stage and reinforced. Throughout KS1 and KS2 mathematical vocabulary will be introduced and used in context.
- 1.3 It is important to notice consistency between methods of written calculations (for example, starting with the units when completing addition and subtraction calculations; when dividing in Y5 and Y6, be consistent with the subtraction method needed for the children to divide by "chunking", i.e. repeated subtraction). Therefore, when adding or subtracting in the earlier years, children should begin with the least significant digits first.

## 2. Calculation methods

- 2.1 Informal written methods are based on the mental methods children are learning - which constitute an interim step between doing everything in their head to using a standard method for large numbers that they cannot handle mentally. It should be made clear to both children and parents that learning a new method of calculating does not mean other ways are no longer relevant. The primary aim is that children should always be looking to solve calculations either wholly or partly mentally.
- 2.2 Children are introduced to the processes of calculation through practical, oral and mental activities. Through these activities, they consolidate their understanding of number facts and begin to develop ways of recording to support their thinking and calculation methods. As children's mental and informal 'jottings' methods are strengthened, they become ready to use more efficient written methods. It is our aim that by the end of Year 6, children will be equipped with mental and written methods that they understand and use correctly.
- 2.3 When faced with a calculation, children should be able to decide which method is most appropriate and have strategies to check its accuracy. This policy focuses on the use of 'standard' written methods - compact methods that are efficient and work for any calculations, including those that involve whole numbers and decimals. Being able to use these written methods gives children an efficient set of tools that they can use when they are unable to carry out the calculation in their heads

## 3. Progression of number and calculation

At Our Lady of Lourdes Catholic Primary School, we follow the National Curriculum objectives for maths, for which the number and calculation objectives are summarised below for each year group.

Year group	Number and place value progression	Calculation progression
Reception	Children count reliably with numbers from one to 20, place them in order and say which number is one more or one less than a given number.	Using quantities and objects, they add and subtract two single-digit numbers and count on or back to find the answer. They solve problems, including doubling, halving and sharing.

<b>Year 1</b>	counting to and across 100; count in multiples of 2, 5, 10; one more/one less; read and write number to 20 (words and numerals)	addition and subtraction to 20; missing number calculations $7 = ?? - 9$ etc; multiplication and division using patterns and arrays - sharing small quantities, doubling etc
<b>Year 2</b>	counting in steps of 2, 3 and 5; place value of 2 digit numbers; order and compare numbers to 100 ( $< > =$ ); read and write numbers to at least 100 (words and numerals)	recall and use addition and subtraction facts to 20 fluently and use related facts up to 100; add and subtract - 2 digit + 1 digit, 2 digit + tens, 2 digit + 2 digit, $3 \times 1$ digit; use commutative law for addition and understand it cannot be used for subtraction; missing number calculations; 2, 5, 10 $\times$ tables; odds and even numbers; use of commutative rule for multiplication and understand it cannot be used for division; solve problems using arrays, concrete materials, mental methods
<b>Year 3</b>	counting in multiples of 4, 8, 50, 100; finding 10 and 100 more or less; place value in 3 digit numbers; read and write numbers to 1000 (words and numerals)	adding and subtracting mentally - 3 digit and 1 digit, 3 digit and tens, 3 digit and hundreds; column addition and subtraction; estimation and use of inverse to check; missing number operations; 3, 4, 8 times tables; write and calculate multiplication and division statements including 2 digit by 1 digit; missing number problems; positive integer scaling; correspondence problems where $n$ objects are connected to $m$ objects
<b>Year 4</b>	count in multiples of 6, 7, 9, 25, 1000; find 100 more or less; count backwards through zero to include negative numbers; place value of 4 digit numbers; round numbers to nearest 10, 100 or 1000; roman numerals to 100	column addition and subtraction using 4 digit numbers; estimate and use inverse to check; 2 step problems using addition and subtraction; Multiplication and division facts to $12 \times 12$ ; use place value to multiply and divide mentally; multiplying together 3 numbers; use factor pairs and commutative rule for mental calculations; use formal written method to multiply 2 and 3 digit numbers by a 1 digit number; solve problems using multiplication and addition
<b>Year 5</b>	read, write, order and compare numbers to at least 6 digits knowing the place value of each digit; count forwards or backwards in steps of powers of 10; interpret negative numbers in context, counting forward and backwards through zero; round numbers to nearest 10,100,1000, 10000, 100000; read roman numerals to 1000 and recognise years	use formal written methods to add and subtract whole numbers with more than 4 digits; use mental methods to add and subtract; use rounding to check answers to calculations; solve multistep problems Identify multiples and factors including common factors; know and use vocabulary of prime numbers, prime factors, composite numbers; recall prime numbers to 19; establish whether a number to 100 is prime; use of long multiplication to multiply 4 digit numbers by one or 2 digit numbers; divide

		numbers up to 4 digits by a one digit number and interpret remainders; multiply and divide whole and decimal numbers by 10, 100 and 1000; recognise and use square and cubed numbers; solve problems involving different calculations; solve problems involving scaling by simple fractions and simple rates
<b>Year 6</b>	read, write, order and compare numbers up to 10 000 000 and determine the value of each digit; round any whole number to a required degree of accuracy; calculate intervals across zero	multiply numbers up to 4 digits by a 2 digit number; divide numbers up to 4 digits by a 2 digit number and interpret remainders as fractions, rounding or appropriate for context; perform mental calculations with mixed operations and large numbers; identify common factors, common multiples and prime numbers; solve multistep problems in context; use estimation to check answers

#### 4. Monitoring and Review

4.1 It is the responsibility of the Mathematics subject leader to:

- Provide a strategic lead and direction for the teaching of calculations in the school.
- To secure high quality teaching of calculations, effective use of resources and the highest standards of learning and achievement for all pupils.
- Be a role model and demonstrate good practice - supporting colleagues in their teaching of calculations.
- Annually review the policy document and ensure that it is up to date and in line with the requirements of the National Curriculum.
- Encourage and support staff in the implementation of the agreed procedures and closely monitor the progression of activities and consistency of approach across the year groups and Key Stages.
- Monitor standards in the teaching of calculations across the school through classroom observation, work scrutiny, teachers' planning, discussion with pupils and data analysis.
- Contribute to whole-school curriculum improvement by advising the LT and Governors' Curriculum Committee on areas of strength and weakness and identifying clear targets to improve and sustain pupil achievement.
- Lead the teaching of calculations by example and afford colleagues the opportunity to share in good practice.
- Further parental involvement and knowledge by facilitating support and advice through curriculum evenings and disseminating relevant information.
- Submit regular feedback on standards in Mathematics to the Leadership Team.
- Work to achieve equality of opportunity throughout the school.

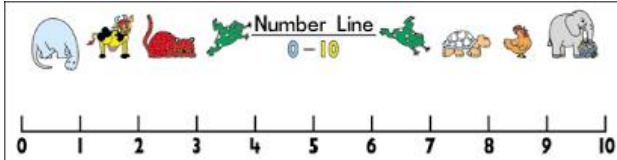
This policy will be reviewed at least every three years.

**Signed:** *Karen Hutton*  
**Date:** *January 2016*

# Addition progression

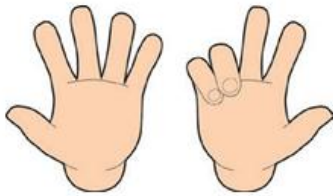
## Reception

Counting on one more, saying the next number



$$7 + 1 = 8$$

Counting on 2, 3 or 4 more from any number up to 10



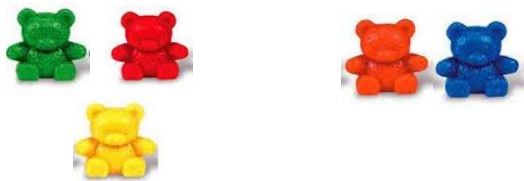
$$5 + 3 = 8$$



$$4 + 2 = 6$$

Use of number bonds - splitting into sets

Splitting a set of 5 into different bonds



$$3 + 2 = 5$$



$$1 + 4 = 5$$



$$4 + 3 = 7$$

Number bonds to 10

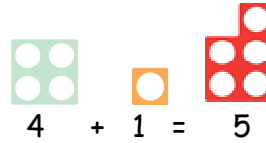
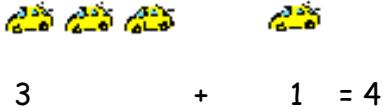
$$4 + 6 = 10$$



## Year 1

Through practical activities in meaningful contexts and informal written methods.

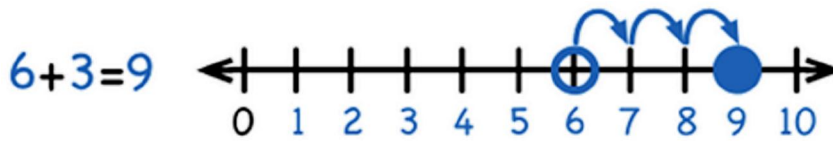
- Recall number bonds to 20 and within 20.
- Pictures and Marks - 1 more / 2 more.  
There are 3 cars in the garage. 1 more came along.



Terry has 3 apples and Tony has 2 apples. How many altogether?



- Number lines to 20.



- Derive related facts to 20.

$$\square = 5 + 4$$

$$5 + 4 = \square$$

$$\square + 4 = 9$$

$$\square + \square = 9$$



- Money and addition up to 20p.



- Read, write and interpret mathematical statement involving addition (+) and equals (=).

**National Curriculum requirements:**

Add 1 digit and 2 digit numbers to 20, including 0.

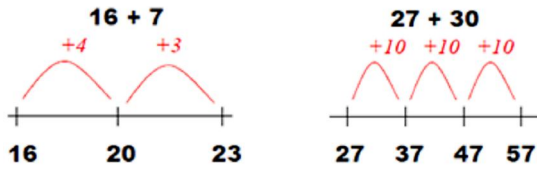
## Year 2

Through practical activities in meaningful contexts and informal written methods.

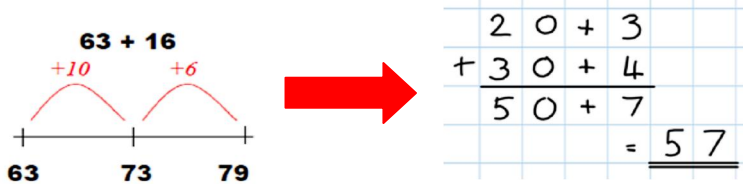
- Fluent recall of bonds to 20 and within 20.
- Derive and use related facts up to 100.
- Addition of money up to £1.



- Add numbers using concrete objects, pictorial representations and mentally.



- Show that addition of two numbers can be done in any order (commutative).
- Recognise and use the inverse relationship between addition and subtraction.
- Progressing to partitioned column method (in preparation for year 3).



**National Curriculum requirements:**

*(using concrete objects, pictorial representations and mentally)*

*Add 2 digit numbers and ones.*

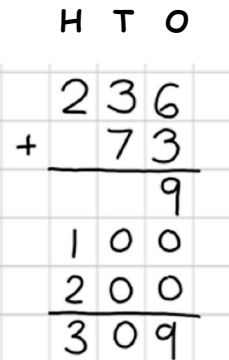
*Add 2 digit number and tens.*

*Add two 2 digit numbers.*

*Add three 1 digit numbers.*

**Year 3**

- Continue with partitioned column method.
- Introduce expanded column addition.



Progressing to the compact column method.

T O	H T O	T O	H T O	T O	H T O
2 3	3 1 5	9 4	5 6 1	4 7	2 3 7
+ 4 2	+ 6 2 4	+ 7 3	+ 7 1 8	+ 2 5	+ 5 1 6
<u>6 5</u>	<u>9 3 9</u>	<u>1 6 7</u>	<u>1 2 7 9</u>	<u>7 2</u>	<u>7 5 3</u>
				1	1

- Add money using both £ and pence in practical contexts.

**National Curriculum requirements:**

*Add numbers with up to 3 digits, using the formal written method of column addition.*

### Year 4

- Continue with column addition.

H T O	H T O	Th H T O
3 7 1	3 7 6	2 3 8 8
+ 4 8 5	+ 4 8 5	+ 1 1 2 4
<u>8 5 6</u>	<u>8 6 1</u>	<u>3 5 1 2</u>
1	1 1	1 1

- Estimate and use inverse operations to check answers to a calculation.
- Add money using both £ and pence in practical contexts.

**National Curriculum requirements:**

*Add numbers with up to 4 digits, using the formal written method of column addition.*

### Year 5

- Continue to use column addition, adding numbers with more than 4 digits.

$$\begin{array}{r}
 3\ 2\ 8\ 7\ 9 \\
 +\ 3\ 5\ 9\ 8\ 7 \\
 \hline
 6\ 8\ 8\ 6\ 6
 \end{array}$$

- Addition of money and decimals.

$$\begin{array}{r}
 \text{€ } 23.59 \\
 + \text{€ } 7.55 \\
 \hline
 \text{€ } 31.14
 \end{array}$$

$$\begin{array}{r}
 19.01 \\
 3.65 \\
 + 0.70 \\
 \hline
 23.36
 \end{array}$$

**National Curriculum requirements:**

Add whole numbers with more than 4 digits, using the formal written method of column addition.

**Year 6**

- Add several numbers of increasing complexity using column addition.

$$\begin{array}{r}
 23.361 \\
 9.080 \\
 59.770 \\
 + 1.300 \\
 \hline
 93.511
 \end{array}$$

$$\begin{array}{r}
 81,059 \\
 3,668 \\
 15,301 \\
 + 20,551 \\
 \hline
 120,579
 \end{array}$$

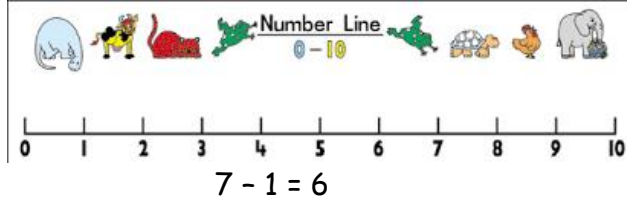
**National Curriculum requirements:**

Add whole numbers with more than 4 digits, using the formal written method of column addition.

## Subtraction progression

### Reception

Counting back 1 less, saying the number before



Take away 2 or 3 or 4 from any number up to 10



$$5 - 2 = 3$$



$$7 - 1 = 6$$

Use of number bonds - splitting into sets



$$6 - 2 = 4$$



$$7 - 4 = 3$$



$$5 - 2 = 3$$



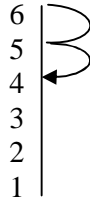
$$5 - 4 = 1$$

## Year 1

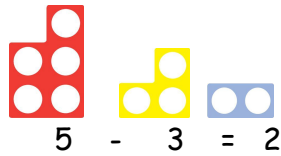
Through practical and meaningful contexts and informal written methods.


- We made 6 cakes. We ate 2 of them.

How many cakes are left?



- Link to vertical number line  $6 - 2 =$



- Find the difference within 20. 
- Represent and use number bonds within 20.
- Record using subtraction (-) and equals signs (=)
- Derive related facts up to 20.

$$\begin{array}{l}
 5 - 2 = \square \\
 5 - \square = 3 \\
 \square - 2 = 3 \\
 \square - \square = 3
 \end{array}
 \quad
 \begin{array}{l}
 \square = 5 - 2 \\
 3 = \square - 2 \\
 3 = 5 - \square \\
 3 = \square - \square
 \end{array}$$



- Counting back on a 100 square and a vertical number line.

**National Curriculum requirements:**

*Subtract 1 digit and 2 digit numbers up to 20, including 0.*

*Represent and use number bonds and related subtraction facts.*

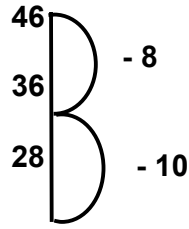
## Year 2

Through practical and meaningful contexts.

- Fluent recall of bonds to 20 and within 20.
- Derive and use related facts up to 100  
e.g.  $10 - 7 = 3$  so  $100 - 70 = 30$ .

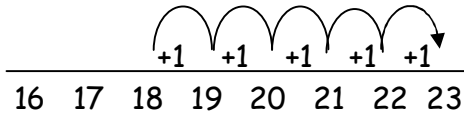
- Counting back by partitioning second number. **Subtract the ones first to be in line with column subtraction.**

E.g.  $46 - 18$   
 $46 - 10 - 8$



- Find the difference by counting up (only when the difference is small).

$23 - 18 = 5$



- Recognise and use the inverse relationship between addition and subtraction
- Show that subtraction is not commutative (done in any order)
- (Progressing to the partitioned columnar method in preparation for year 3)
- Subtraction of money, including change.

**National Curriculum requirements:**

*(using concrete objects, pictorial representations and mentally)*

*Subtract 2 digit numbers and ones.*

*Subtract 2 digit number and tens.*

*Subtract two 2 digit numbers.*

*Subtract three 1 digit numbers.*

**Year 3**

- Continue with vertical number line subtraction progressing to the expanded column subtraction method.

$89 - 35 = 54$

$$\begin{array}{r} 80 + 9 \\ - 30 + 5 \\ \hline 50 + 4 = 54 \end{array}$$

- Introduce exchanging through the expanded column subtraction method.

$$72 - 47$$



$$\begin{array}{r} \overset{60}{70} \overset{12}{- 40 + 7} \\ \hline 20 + 5 = 25 \end{array}$$

- Progressing on to compact columnar subtraction.

$\begin{array}{r} \text{T O} \\ 47 \\ - 23 \\ \hline 24 \end{array}$	$\begin{array}{r} \text{H T O} \\ 864 \\ - 621 \\ \hline 243 \end{array}$	$\begin{array}{r} \text{T O} \\ \overset{4}{5}1 \\ - 36 \\ \hline 15 \end{array}$
--	---	---

- Emphasise value of digit, e.g. 4 tens subtract 2 tens = 2 tens. **Use the correct language for subtraction i.e. exchange rather than borrow.**
- Subtract amounts of money to give change.

**National Curriculum requirements:**

*Subtract numbers with up to 3 digits using the formal written method of column subtraction.*

### Year 4

- Continue with partitioned column subtraction progressing to compact column subtraction.

$\begin{array}{r} \text{H T O} \\ \overset{3}{4} \overset{1}{3} 7 \\ - 182 \\ \hline 255 \end{array}$	$\begin{array}{r} \text{H T O} \\ \overset{3}{4} \overset{12}{3} \overset{12}{1} 2 \\ - 187 \\ \hline 245 \end{array}$	$\begin{array}{r} \text{H T O} \\ \overset{5}{6} \overset{9}{0} \overset{1}{4} \\ - 347 \\ \hline 257 \end{array}$	$\begin{array}{r} \text{Th H T O} \\ 8 \overset{3}{4} \overset{11}{2} 16 \\ - 2177 \\ \hline 6249 \end{array}$
---	--	--	--

- Estimate and use inverse operations to check answers to a calculation.
- Subtract amounts of money using columnar method.

**National Curriculum requirements:**

*Subtract numbers up to 4 digits using the formal written method of columnar subtraction.*

### Year 5

- Continue with compact columnar subtraction, including subtraction of decimals.

$$\begin{array}{r}
 \overset{2}{\cancel{3}} \overset{10}{\cancel{1}} \overset{0}{\cancel{0}} \overset{5}{\cancel{5}} \overset{6}{\cancel{6}} \\
 - \quad \quad 2128 \\
 \hline
 28,928
 \end{array}$$

$$\begin{array}{r}
 \overset{6}{\cancel{7}} \overset{10}{\cancel{1}} \overset{6}{\cancel{6}} \overset{8}{\cancel{8}} \overset{0}{\cancel{0}} \\
 - \quad \quad 372.5 \\
 \hline
 6796.5
 \end{array}$$

- Use rounding to check answers to calculations and to determine, in the context of a problem, levels of accuracy.

**National Curriculum requirements:**

*Subtract numbers with more than 4 digits.*

### Year 6

- Continue with compact columnar subtraction, including subtraction of decimals.

$$\begin{array}{r}
 \overset{0}{\cancel{1}} \overset{10}{\cancel{5}} \overset{9}{\cancel{9}} \overset{6}{\cancel{6}} \overset{9}{\cancel{9}} \\
 - \quad \quad 89,949 \\
 \hline
 60,750
 \end{array}$$

$$\begin{array}{r}
 \overset{0}{\cancel{1}} \overset{10}{\cancel{5}} \overset{5}{\cancel{5}} \cdot \overset{3}{\cancel{4}} \overset{11}{\cancel{1}} \overset{9}{\cancel{9}} \text{ kg} \\
 - \quad \quad 36 \cdot 08 \text{ kg} \\
 \hline
 69 \cdot 339 \text{ kg}
 \end{array}$$

- Use estimation to check answers to calculations and to determine, in the context of a problem, levels of accuracy.

**National Curriculum requirements:**

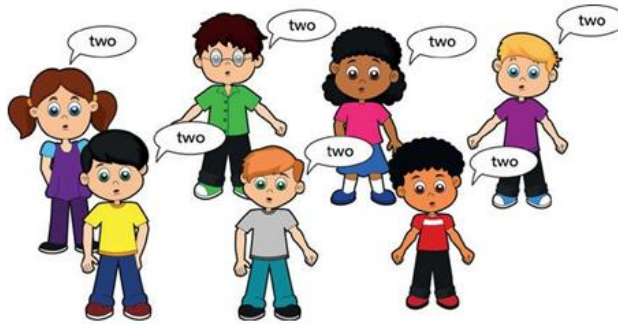
*Subtract numbers with more than 4 digits.*

# Multiplication progression

## Reception

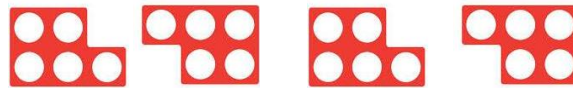
Once confident in counting from 1 to 20 individually move progress to counting in steps

Begin to count in 2s



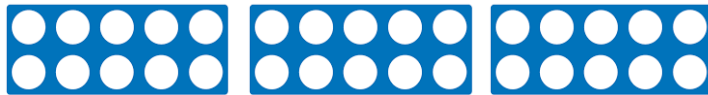
Two, four, six....

Begin to count in 5s



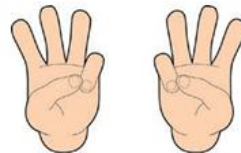
Five, ten, fifteen, twenty..

Begin to count in 10s



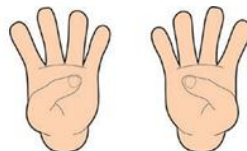
Ten, twenty, thirty, ...

Doubling numbers 1 - 5



double 3 is 6

Halving even numbers to 10

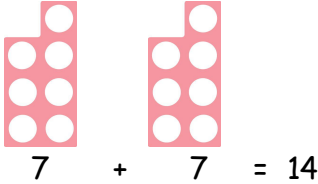


Half of 8 is 4

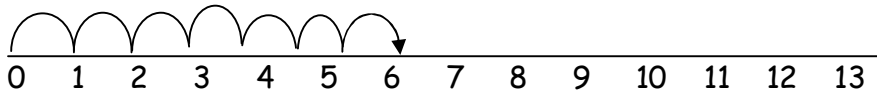
## Year 1

Through practical activities and meaningful contexts using concrete objects, pictorial representations and arrays with the support of the teacher.

- Doubles.



- Make connections between arrays, number patterns and counting in 2's, 5's to 50 and 10's to 100.
- Use of number lines.



- "100 Square" to count in 2's, 5's and 10's.

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

- There are 2 sweets in one bag. How many sweets are there in 5 bags?



- Counting multiples of coins: 2p, 5p, 10p.

$$2p + 2p + 2p$$



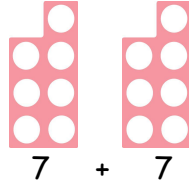
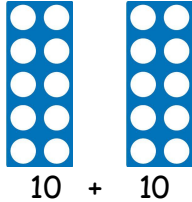
### **National Curriculum requirements:**

*Solve one step problems involving multiplication, by calculating the answer using concrete objects, pictorial representations and arrays with the support of the teacher.*

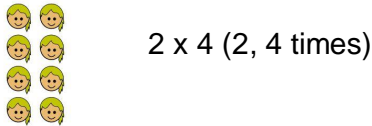
## Year 2

Through practical activities and meaningful contexts using concrete objects, pictorial representations and arrays.

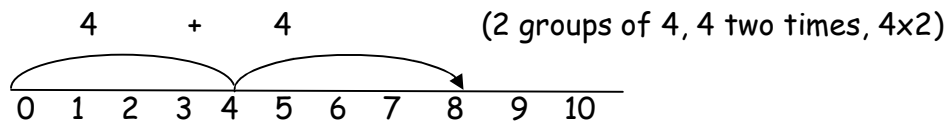
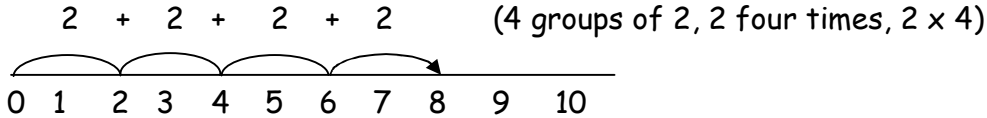
- Double numbers (by partitioning and recombining)  $17 + 17$ .



- Understand multiplication as repeated addition/groups/lots.
- Read arrays.



- Repeated addition on a number line.



- Know the multiplication tables for 2, 5 and 10.
- Understanding of 3 times tables through repeated addition and counting in multiples of 3

$3 \times 3 =$ $\frac{3}{4}$ of 40 = $3 \times 8 = 2 \times \square$
--

- tables using the multiplication (x) and equals (=) signs.
- Show that the multiplication of two numbers can be done in any order (commutative).

**National Curriculum requirements:**

*Solve problems involving multiplication using materials, arrays, mental methods and multiplication facts.*

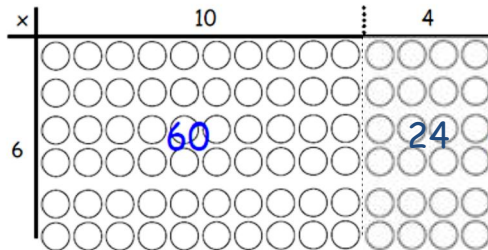
*Although the curriculum refers to pupils needing to know their 2, 5 and 10 times multiplication tables, questions using the 3 times multiplication table may also be included.*

*The inclusion of this area reflects the expectation that pupils are able to solve multiplication by repeated addition, as well as meeting the requirement to count in multiples of 3 by the end of year 2.*

### Year 3

- Recall and use multiplication tables for 3, 4 and 8.
- Continue to use arrays and number lines/Cuisenaire rods for 3, 4 and 8 multiplication tables.
- Write and calculate mathematical statements for multiplication. Statements to include the multiplication tables that they know and 2 digit numbers x 1 digit numbers. Pupils use mental methods and progress to formal written methods.
- Introduce grid model.

$$\begin{array}{r|l} \times & 10 \quad 4 \\ 6 & 60 + 24 = 84 \end{array}$$



- Progressing to expanded method of multiplication.

$$\begin{array}{r} 70 \\ 14 \\ \times \quad 5 \\ \hline 20 \quad (5 \times 4) \\ + 50 \quad (5 \times 10) \\ \hline 70 \end{array}$$

***National Curriculum requirements:***

*Multiply 2 digits by 1 digit, using mental and progressing to formal written methods.*

## Year 4

- Recall and use multiplication tables up to 12x12 (Including multiplying by 0 and 1).
- Continue using grid method and expanded method as appropriate, progressing to short multiplication.

x	100	30	6
5	500	150	30



	3	2	7
x			4
<hr/>			
1	3	0	8
	1	2	

- Short Multiplication.

No carrying	Extra digit	Carrying	Zeros	Ext.
<b>T O</b>	<b>H T O</b>	<b>H T O</b>	<b>H T O</b>	<b>H T O</b>
3 2	5 1	3 8	2 0 2	□ 5 □
x <u>3</u>	x <u>2</u>	x <u>7</u>	x <u>4</u>	x <u>4</u>
<u>9 6</u>	<u>1 0 2</u>	<u>2 6 6</u> 5	<u>8 0 8</u>	<u>6 1 2</u> 2 1

**National Curriculum requirements:**

*Multiply 2 digits by 1 digit using formal written layout.*

*Multiply 3 digits by 1 digit using formal written layout.*

## Year 5

- Recall and use multiplication tables up to 12x12 (Including multiplying by 0 and 1).

- Continue to practise short multiplication.
- Use Grid Method to introduce long multiplication.

	10	8
10	100	80
3	30	24



		1	8
	×	1	3
		5	4
	1	8	0
	2	3	4

**National Curriculum requirements:**

Multiply numbers up to 4 digits by a 1 digit number using the formal written method of short multiplication.

Multiply numbers up to 4 digits by a 2 digit number using the formal written method of long multiplication.

Multiply whole numbers and those involving decimals by 10, 100, 1000.

**Year 6**

Recall and use multiplication tables up to 12x12 (Including multiplying by 0 and 1).

- Continue to practise short multiplication.
- Continue to practise long multiplication.

	3	6	5	2
×				8
	<hr/>			
2	9	2	1	6
	5	4		

	1	2	3	4
×			1	6
	<hr/>			
	7	4	0	4
1	2	3	4	0
	<hr/>			
1	9	7	4	4

- Multiply decimals using the grid method and progressing on to short multiplication.
- Use estimation to check answers to calculations and determine, in the context of a problem, an appropriate degree of accuracy.

***National Curriculum requirements:***

*Multiply up to 4 digits by 2 digits using the formal written method of long multiplication.*

*Multiply numbers by 10, 100, 1000 giving answers up to 3 decimal places.*

## Division progression

### Reception

Idea of sharing introduced - Share multiples of 2 and 4 into halves and quarters

To share 2 cakes between 2 people you will get 1 each



To share 1 cake between 2 people you will get a half



### Year 1

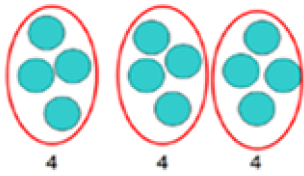
Through practical activities in meaningful contexts.

- Division as sharing.

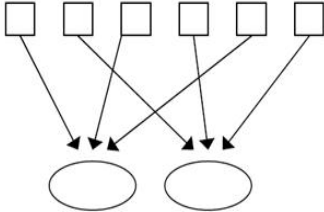
Emphasise the importance of sharing equally.

Share a bag of 15 sweets between 5 children - one for you, one for you, one for you, one for you, one for me.





12 shared between 3 is 4



This is an important stage in teaching the difference between **grouping** and **sharing**.

- Introduce halving even numbers up to 10.

Half of 4



**National Curriculum requirements:**

*Solve one step problems involving division, by calculating the answer by using concrete objects, pictorial representations and arrays with the support of the teacher.*

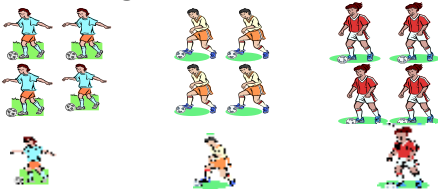
## Year 2

Through practical activities in meaningful contexts.

- Recall and use division facts for 2, 5 and 10 times tables.
- Continue to use division as sharing.
- Division as grouping.



- 15 children get into teams of 5 to play a game. How many teams are there?

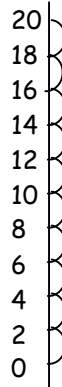


How many groups of 5 in 15?

How many 5's have been counted?

-  How many 2's in 10?

- Understand '÷ 2' as 'half of'.
- Understand that division is not commutative.
- Recognise relationship between  $\times$  and  $\div$
- Record using division ( $\div$ ) and equals ( $=$ ) signs.
- Use number lines to answer questions such as  $20 \div 2 =$



**National Curriculum requirements:**

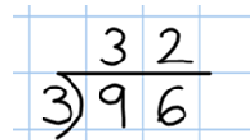
*Solve problems involving division using materials, mental methods and division facts.*

**Year 3**

- Recall and use division facts for 3, 4, and 8 times tables.
- Continue with repeated subtraction on a vertical number line.
- Write and calculate mathematical statements for division using the tables they know.
- Introduce grouping method before short division, encourage children to estimate answers before attempting calculation. Create fact box to encourage efficient grouping e.g. not always groups of 10 - 1x, 2x, 5x, 10x, 20x, 50x, 100x.

$$\begin{array}{r}
 \underline{13} \\
 5) 65 \\
 \underline{-50} \quad (5 \times 10) \\
 15 \\
 \underline{-15} \quad (5 \times 3) \\
 \underline{0}
 \end{array}$$

- Introduce short division, with exact answers.



- Progressing to short division involving carrying, with exact answers.

**National Curriculum requirements:**

Division questions based on multiplication tables they know.

Divide 2 digits by 1 digit, progressing to formal written methods.

*The National Curriculum statutory requirements for Year 3 and the use of written methods are not clear therefore our guidance for Year 3 has been based on the skills required to access Year 4 statutory requirements.*

### Year 4

- Recall and use all division facts for all tables up to 12 (Including dividing by 1).
- Continue with short division method.

$$\begin{array}{r} 18 \\ 4 \overline{)732} \\ \underline{4} \phantom{0} \\ 33 \\ \underline{32} \\ 2 \end{array}$$

$$\begin{array}{r} 037 \\ 5 \overline{)185} \\ \underline{15} \phantom{0} \\ 35 \\ \underline{35} \\ 0 \end{array}$$

$$\begin{array}{r} 218 \\ 4 \overline{)872} \\ \underline{8} \phantom{0} \\ 70 \\ \underline{68} \\ 22 \\ \underline{20} \\ 2 \end{array}$$

- Progressing to short division with remainders.

$\begin{array}{r} 204 \\ 4 \overline{)816} \end{array}$	$\begin{array}{r} 141r1 \\ 3 \overline{)424} \end{array}$
---	---

**National Curriculum requirements:**

Divide 2 digits by 1 digit and 3 digits by 1 digit becoming fluent with formal written method of short division with exact answers and progressing to remainders.

*The National Curriculum statutory requirements for Year 4 and the use of written methods are not clear therefore our guidance for Year 4 has been based on the skills required to access Year 5 statutory requirements.*

## Year 5

- Consolidate the use of the formal written method of short division.

$$\begin{array}{r} 0663r5 \\ 8 \overline{) 5350^29} \end{array}$$

***National Curriculum requirements:***

*Divide 2 digits by 1 digit.*

*Divide 3 digits by 1 digit.*

*Divide 4 digits by 1 digit.*

## Year 6

- Consolidate short division.
- Children should be able to interpret remainders as whole number remainders, fractions or by rounding, as appropriate for the context.

98 ÷ 7 becomes

$$\begin{array}{r} 14 \\ 7 \overline{) 98} \\ \underline{7 \phantom{0}} \\ 20 \\ \underline{14} \\ 6 \end{array}$$

- Answer: 14

432 ÷ 5 becomes

$$\begin{array}{r} 86 \text{ r } 2 \\ 5 \overline{) 432} \\ \underline{40 \phantom{0}} \\ 32 \\ \underline{30} \\ 2 \end{array}$$

Answer: 86 remainder 2

496 ÷ 11 becomes

$$\begin{array}{r} 45 \text{ r } 1 \\ 11 \overline{) 496} \\ \underline{44 \phantom{0}} \\ 56 \\ \underline{55} \\ 1 \end{array}$$

Answer:  $45 \frac{1}{11}$

- Introduce long division.

432 ÷ 15 becomes

$$\begin{array}{r} 28 \text{ r } 12 \\ 15 \overline{) 432} \\ \underline{30 \phantom{0}} \\ 132 \\ \underline{150} \\ 12 \end{array}$$

Answer: 28 remainder 12

432 ÷ 15 becomes

$$\begin{array}{r} 28 \\ 15 \overline{) 432} \\ \underline{30 \phantom{0}} \\ 132 \\ \underline{150} \\ 12 \end{array} \begin{array}{l} 15 \times 20 \\ 15 \times 8 \end{array}$$

$$\frac{\cancel{12}}{\cancel{15}} = \frac{4}{5}$$

Answer:  $28 \frac{4}{5}$

432 ÷ 15 becomes

$$\begin{array}{r} 28.8 \\ 15 \overline{) 432.0} \\ \underline{30 \phantom{0}} \\ 132 \\ \underline{150} \\ 120 \\ \underline{150} \\ 0 \end{array}$$

Answer: 28.8

**N.B:** The above examples are taken from the National Curriculum for Mathematics appendix.

**National Curriculum requirements:**

*Divide numbers up to 4 digits by a 2 digit number using the formal written method of short division where appropriate.*

*Divide up to 4 digits by a 2 digits whole number using the formal written method of long division.*