Written Calculation Policy
for
Acle St Edmund
Primary School

Help your child with maths

Progression towards a standard written method of calculation

Introduction

This calculation policy has been written in line with the programmes of study taken from the revised **National Curriculum for Mathematics (2014)**. It provides guidance on the appropriate calculation methods and progression. The content is set out in Year blocks under the following headings: addition, subtraction, multiplication and division.

Alongside written calculations, mental calculation strategies will be taught in Maths lessons throughout the school. Pupils will be encouraged to use a range of mental strategies to solve number problems and will be equipped with the necessary recall skills to aid problem solving.

Pupils will be taught to use the most efficient methods for solving both mental and written calculations and to make the right choice, depending on the size and context of the numbers. Children will use mental methods as their first port of call, but for calculations that cannot be done in their heads; they will need to use an efficient written method accurately and with confidence.

Aims of the policy

- To ensure consistency and progression in our approach to calculation.
- To ensure that children develop an efficient, reliable, formal written method of calculation for all operations (addition, subtraction, multiplication and division).
- To ensure that children can use these methods accurately and fluently with confidence and understanding.

How to use this policy

- Use the year group your child belongs to as a guide.
- Always use suitable resources to support your child's understanding of calculation e.g. number line/track, a 100 square, counting apparatus or encourage their use of recording their work by drawing their own number line, multiplication grid or recording their jottings.
- Use the language of place value when supporting your child. Try to use the same language as your child's class teacher (examples are included with each year group) and check their answers are sensible.
- Encourage your child to make suitable choices about the methods they use when solving problems.
- Support your child to develop quick recall of number facts as this is essential in your child's development of efficient and accurate problem-solving e.g. number bonds, doubles and halves and multiplication tables.

+ Addition +

EYFS

Children learn about counting in songs, nursery rhymes, picture books, games and practical activities. They begin to understand addition as **combining two groups** of objects. They are asked to find **one more** than a given number


+  = 6

and begin to use the vocabulary involved in addition in practical activities and discussion.

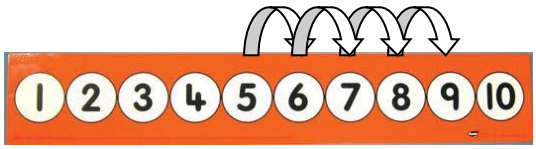

+ 

You have five apples.

I have four apples. How many apples are there **altogether**?

Year 1

Children will begin to use a **number track** to **count on** for addition, counting on from the largest number.



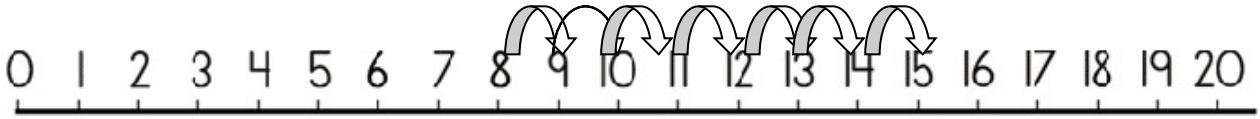
5 + 4 = 9

Put your finger on number five on the number track. Count on four. One, two, three, four. What number are you on now?

Children then progress to a marked **number line**:

8 + 7 = 15

Put your finger on the largest number. Count on seven.

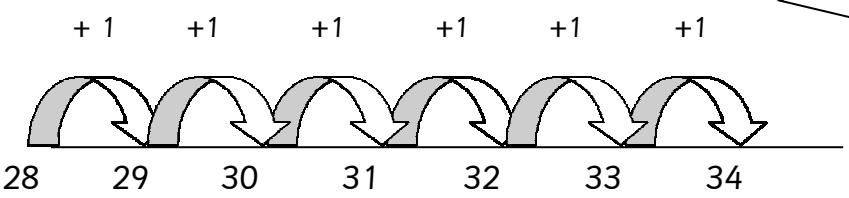


Year 2

Children are introduced to **counting on** using an **empty number line** when they are secure with combining groups and using a number track/marked number line.

Children continue to count on in ones/units using an empty number line within 100. They record the numbers themselves, using only the numbers they need:

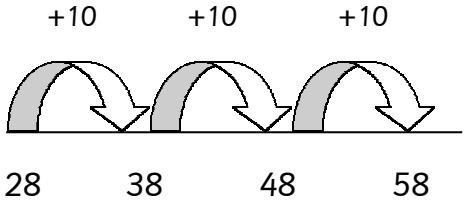
28 + 6 = 34



Put your finger on the largest number. Count on six.

Children also learn to count on in tens using a number line

28 + 30 = 58



and with a 100 number square:

28 + 30 = 58

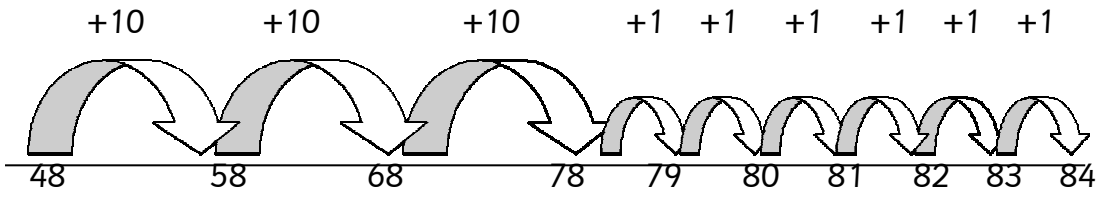
1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Find 28 on the 100 square. Count on ten, twenty, thirty. What number are you on now?

Confident children are taught to add 2-digit numbers on an empty number line:

48 + 36 = 84

Put the biggest number first (48) and then **partition** the smaller number (36 = 30 + 6). Count on in tens first, then in ones.



Along with using a 100 number square: 48 + 36 = 84

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

Find the biggest number (48). Count on in tens first, then in ones/units.

Children are then introduced to adding by using the **partitioning method**:

43 + 25 = 68

40 3 20 5

40 + 20 = 60
3 + 5 = 8
60 + 8 = 68

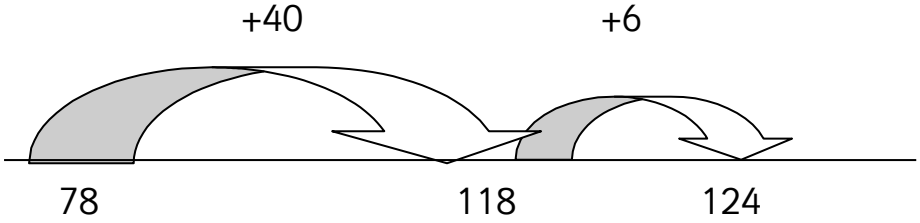
Partition the numbers into tens and ones/units. Add the tens together, and then add the ones/units together. Add together.

Children further develop addition with numbers that bridge 100, using number lines and a 200 number square for support.

Year 3

Children continue to use **empty number lines** with additions that bridge 100 and are encouraged to use more efficient jumps:

78 + 46 = 124



Children can continue to use a 200 number square to support counting on in tens and bridging 100.

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	
81	82	83	84	85	86	87	88		
91	92	93	94	95	96	97	98	99	

Continue adding on the tens... 108, 118. Now count on 6. What number are you on now? 124.

Find 78 and count on forty. Begin on 78, add on the tens first. 88, 98. Now turn your 100 square over....

Children are taught to further develop the **partitioning method**:

85 + 37 = 122

80 5 30 7

80 + 30 = = 110
5 + 7 = 12
110 + 12 = 122

And are then introduced to the **expanded written method** with the addition presented first horizontally and then vertically in columns:

63 + 32 = 95

60 + 3
30 + 2
90 + 5 = 95

```
  63
+ 32
   5     (3 + 2)
  90     (60 + 30)
  95
```

Children are taught to use the **expanded method** for additions where it is necessary to bridge, where you can see all the workings out:

68 + 24 = 92

60 + 8
20 + 4
80 + 12 = 92

This leads to:

```
  76
+ 47
  13    (7 + 6)
 110    (70 + 40)
 123
```

Add the units first, then the tens.

If ready, the children can be introduced to the **formal written method** where it is necessary to 'carry' ten from the unit to the tens column. We use the language of **place value** (units, tens and hundreds) to ensure understanding.

```
  TU
  68
+ 24
  92
  1
```

Add the units first. 8 add 4 equals 12. Write 2 in the units column and 'carry' 1(10) across into the tens column. 60 add 20 and the ten we 'carried' equals 90. Write 9 (90) in the tens column. The answer is 92.

The digit that has been 'carried' should be recorded under the line in the correct column.

Year 4

Children continue to use ***number lines*** *and the* ***partitioning method*** *as needed, adding numbers with up to 3 and 4-digits.*

Children continue to be taught to develop the more efficient ***formal written method****, beginning by adding 3-digit numbers using the* ***expanded method****:*

176 + 147 = 323

```
  176
+ 147
   13   (7 + 6)
  110   (70 + 40)
  200   (100 + 100)
  323
```

In the formal written method, it is necessary to 'carry' ten from the units to the tens column. We use the language of place value (units, tens and hundreds) to ensure understanding.

The digits that have been 'carried' should be recorded under the line in the correct column.

This leads to the formal written method:

176 + 147 = 323

```
   H T U
   147
+ 176
  323
    1
```

Add the units first. 7 and 6 equals 13. Write 3 in the units column and 'carry' 1 (10) across into the tens column. 40 add 70 and the ten we 'carried' equals 120. Write 2 in the tens column (20) and 'carry' 1 (100) across into the hundreds column. 100 add 100 and the 100 that we 'carried' equals 300. Write 3 (300) in the hundreds column. The answer is 323.

Year 5 and Year 6

Children continue to be taught and use ***empty number lines*** *with larger numbers and decimals as needed.*

The ***formal written method*** for addition continues to be developed for larger numbers (and decimal numbers).

21848 + 1523 = 23371

	Th	H	T	U
	2	1	8	4
+		1	5	2
	2	3	3	7
		1	1	

£154.75 + £233.82 = £388.57

	H	T	U	.
	1	5	4	· 75
+	2	3	3	· 82
	3	8	8	·.57
			1	

The digits that are 'carried' are recorded under the line in the correct column.

It is important that the decimal points line up.

Children continue to practise and use the formal written method for larger numbers and decimals and use these methods when solving problems.

Our aim is that by the end of Year 6 children can use mental methods (with jottings) when appropriate but for calculations that they cannot do in their head, they can use an efficient formal written method accurately and with confidence.

- Subtraction -

EYFS

*Children participate in songs, nursery rhymes, picture books, games and practical activities. They will find one less than a given number and begin to understand subtraction as '**taking away**' using objects to count 'how many are left' after some have been taken away.*

6 – 2 = 4

Take two apples away. How many are left?

Children can begin to count back from a given number e.g. 'Ten, nine, eight, seven, six….'

Year 1

Children continue to practise counting back from a given number e.g. 'Twenty, nineteen, eighteen…' and use a **number track** to **count back** for subtraction.

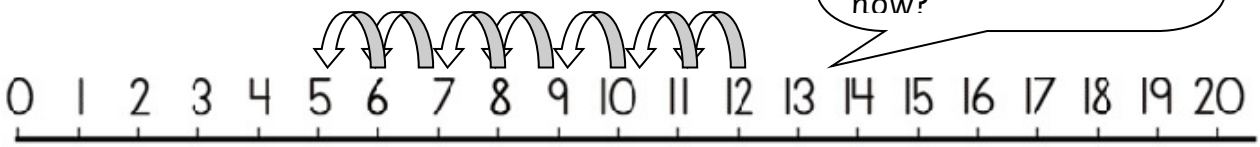
Put your finger on number nine. Count back five.

9 – 5 = 4

*They then progress to a **marked number line**:*

12 – 7 = 5

Put your finger on the number twelve. Count back seven. What number are you on now?



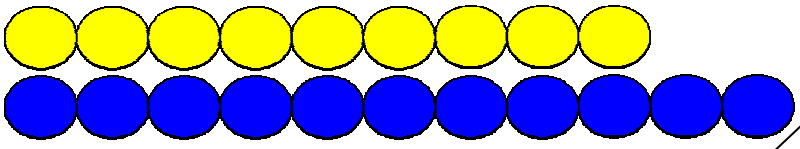
When children are confident using a marked number line, they can move onto a blank number line (see Year 2).

Counting on to find a small ***difference***

*The use of practical activities is important to understand the idea of '**difference**'. Children use apparatus to help them count up from the smallest number to the largest number to find the difference e.g. by using cubes, beads, Numicon, number tracks/lines:*

The difference between 9 and 4 is 5.

9 – 4 = 5.



The difference between 11 and 9 is 2.

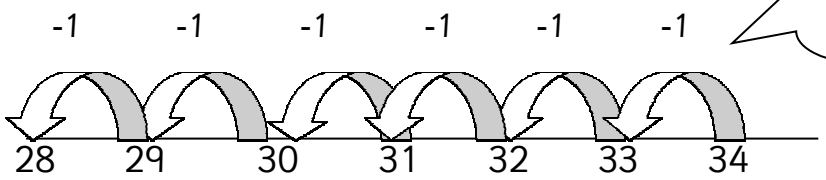
11 – 9 = 2.

<u>Year 2</u>

Children continue to use apparatus, a number track or marked number line to **count back** in ones to work out a subtraction.

If secure, they can count back using an empty number line within 100, in ones…

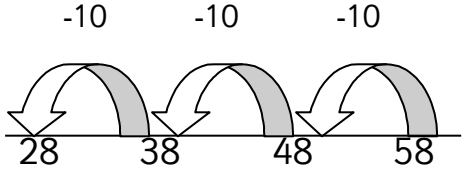
34 – 6 = 28



Start at 34. Count back 6. What number are you on now?

…and in tens:

58 – 30 = 28



Start at 58. Count back 3 tens. Ten, twenty, thirty. What number are you on now?

Children are also shown how to use a 100 number square to count back:

1	2	3	4	5	6	7	8	9	10
11	12	13	14	15	16	17	18	19	20
21	22	23	24	25	26	27	28	29	30
31	32	33	34	35	36	37	38	39	40
41	42	43	44	45	46	47	48	49	50
51	52	53	54	55	56	57	58	59	60
61	62	63	64	65	66	67	68	69	70
71	72	73	74	75	76	77	78	79	80
81	82	83	84	85	86	87	88	89	90
91	92	93	94	95	96	97	98	99	100

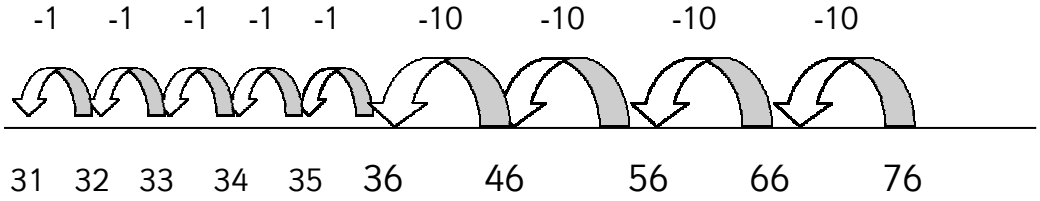
58 – 30 = 28

Find 58 on the 100 square. Count back ten, twenty, thirty. What number are you on now?

If secure, children can use **partitioning** to work out 2–digit subtractions:

76 – 45 = 31

Partition the smaller number (45 = 40 + 5) and count back from the biggest number in tens and then in ones/units.

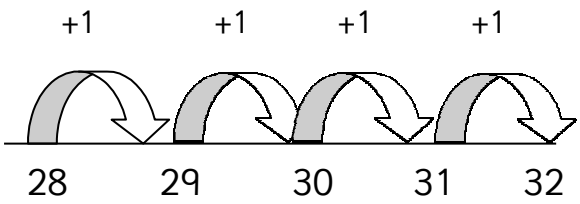


They also use a 100 number square to count back in tens and ones/units.

Counting on to find a small **difference**

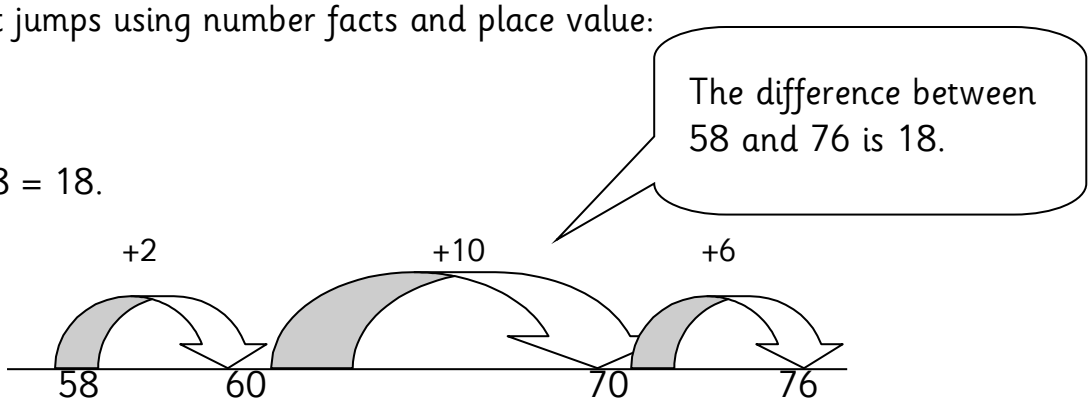
If children are secure finding the difference using apparatus and models (see Year 1), they begin to use a **blank number line**, where they record the numbers they need to count up in ones/units from the smallest number to the largest number to 'find the difference.'

32 – 28 = 4



If children are confident, the method can be developed further with more efficient jumps using number facts and place value:

76 – 58 = 18.

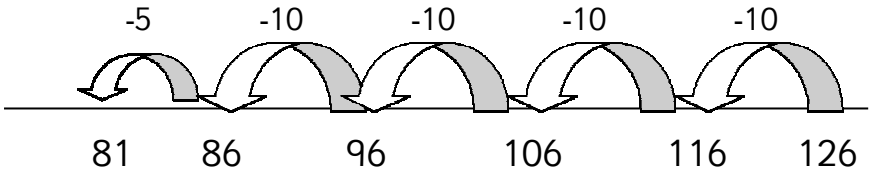


A 200 number square and apparatus, e.g. cubes, diennes, can be used to support subtractions that bridge 100.

Year 3

Children continue to use marked number lines, 200 number squares and apparatus e.g. cubes, diennes, as necessary, and then blank number lines to work out subtractions that bridge 100:

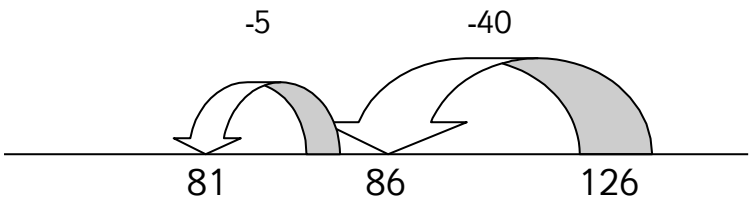
126 – 45 = 81



They continue to **partition** the smaller number (45 = 40 + 5) to count back from the bigger number

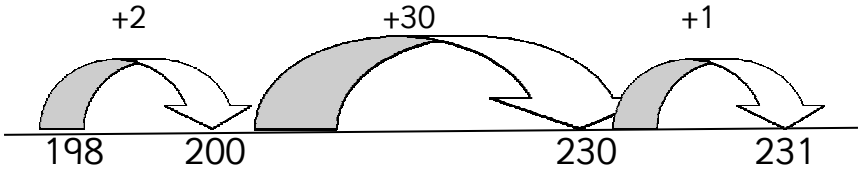
…and then progress to more efficient jumps:

126 – 45 = 81



Children continue to use a blank number line to **count on** when finding a small **difference**:

231 -198 = 33



Children are encouraged to use their knowledge of number facts and place value to make efficient jumps.

Children are introduced to the **expanded written method** for subtraction with the calculation presented both horizontally and vertically (in columns) using 2-digit numbers.

78 – 23 = 55

70 + 8
- 20 + 3
50 + 5 = 55

Partition the numbers into tens and ones/units. Subtract the ones and then subtract the tens. Recombine to give the answer.

This leads into the **formal written method**. It is important to continue to use the language of place value (tens and units):

T U
78
- 23
55

Eight subtract three, seventy subtract twenty.

When **exchange/decomposition** is needed, and the children are secure, the children are introduced to the **expanded written method**:

e.g. 73 – 27 = 46

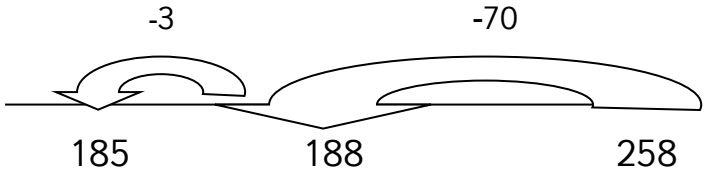
Partition the 73 into 60 + 13 in order to calculate 73 – 27.

70 + 3 becomes 60 + 13
- 20 + 7 - 20 + 7
40 + 6 = 46

Year 4

Children continue to use **empty number lines** to calculate subtractions with up to 3 or 4-digit numbers if needed, to ensure their understanding of the calculation and the numbers involved.

258 – 73 = 185



Children continue to be taught to use the **formal written method** of subtraction using the **expanded written method** (see Year 3 above) and apparatus to support their understanding e.g. cubes, diennes.

78 – 23 = 55

70 + 8
\- 20 + 3
50 + 5 = 55

Partition the numbers into tens and ones/units. Subtract the ones and then subtract the tens. Recombine to give the answer.

When **exchange/decomposition** is needed, children use the **expanded written method** (see Year 3 above) until secure. Children will need to practise partitioning numbers in this way e.g. using apparatus like diennes.

e.g. 258 – 73 = 185

200 + 50 + 8
\- 70 + 3

becomes

100 + 150 + 8
\- 70 + 3
100 + 80 + 5 = 185

This leads to the **formal written method** involving **decomposition**....

73 – 27 = 46

6 13
~~7 3~~
\- 2 7
4 6

We can't subtract seven from three, so we need to exchange a ten or ten ones to give us 60 + 13.

```
  1 15
 2 5 8
-  7 3
 1 8 5
```

We continue to use the language of place value (hundreds, tens and units). If secure, children can then learn to subtract 3-digit numbers.

Year 5 and Year 6

Children continue to use **empty number lines** for subtraction with larger numbers and decimals as needed.

Children are taught to develop an understanding of the **formal written method** for subtraction with 3-digit and 4-digit numbers, if needed using **expanded method** and apparatus, e.g. diennes, to support their understanding.

637 – 252 = 385

```
  600 + 30 + 7      becomes    500 + 130 + 7
- 200 + 50 + 2                - 200 +  50 + 2
                               300 +  80 + 5 = 385
```

This leads to the **formal written method**:

```
    H  T  U
    5 13
  6 3 7
- 2 5 2
  3 8 5
```

When children are confident, we extend with larger numbers (and decimal numbers), returning to the expanded method if necessary. If secure, children can work on calculations where more than one exchange is required.

e.g. 12731 – 1367 = 11364

```
     6 12 11
  1 2 7 3 1
-   1 3 6 7
  1 1 3 6 4
```

Subtraction of decimals can be introduced in the context of money and measures:

e.g. £166·25 - £83·72 = £82·53

```
   16 5  12
 /1 /6 6·/2 5
-   8 3·7 2
  ---------
    8 2·5 3
```

It is important that the decimal points line up.

Children continue to practise and use the **formal written method** for larger numbers and decimals and use these methods when solving problems.

Our aim is that by the end of Year 6 children can use mental methods (with jottings) when appropriate but for calculations that they cannot do in their head, they can use an efficient formal written method accurately and with confidence.

X Multiplication X

EYFS

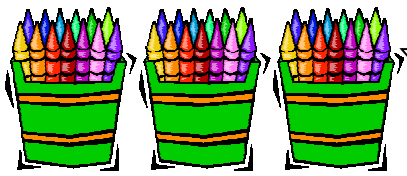
Children participate in songs, nursery rhymes, picture books and games. In practical activities and though discussion, children will begin to solve problems involving **doubling**.

I have three apples and you have three apples. How many apples do we have altogether?

Year 1

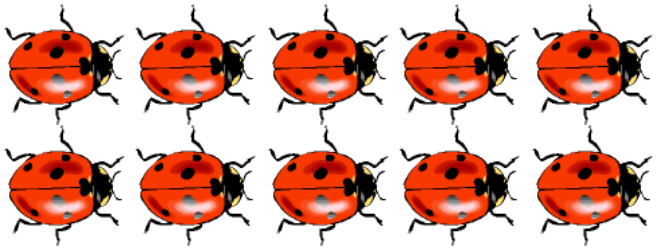
Children begin to understand multiplication in practical activities as **repeated groups** of the same size. They use the vocabulary of multiplication in practical contexts and solve practical problems that involve **combining** groups of 2, 5 or 10 e.g. pairs of socks, fingers, cubes, Numicon.

Here are five pairs of socks. How many socks are there altogether? Let's count in two's: 2, 4, 6, 8,10. There are 10 socks altogether.



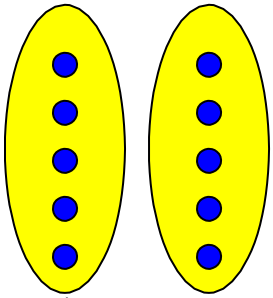
There are ten crayons in a pot. How many crayons are there altogether? Let's count in 10s:10, 20, 30. There are 30 crayons altogether.

Children also begin to use ***arrays*** *to support early multiplication.*



We have five groups of two ladybirds. How many ladybirds are there altogether? Ten ladybirds. We have two groups of five ladybirds. How many ladybirds now?

Children solve practical and pictorial problems, developing the language of multiplication using a variety of apparatus and picture resources.



There are 2 ***groups*** *of 5. How many altogether?*

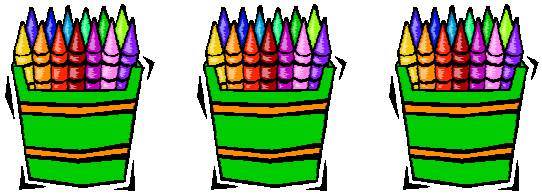
Double *five is ten.*

5 + 5 = 10.

Year 2

Children continue to use a range of vocabulary to describe multiplication and use practical resources, pictures, diagrams and the multiplication (x) symbol to record their work. Children are expected to begin learning their times tables starting with 2x, 5x and 10x.

Multiplication is described as **repeated addition** or combining groups.



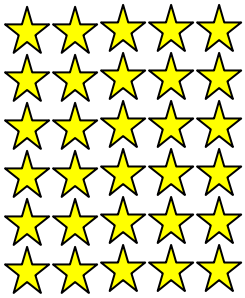
There are three ***groups*** *of ten crayons. How many crayons are there altogether?*

What is 3 **times** 10?

We also say:
10 + 10 + 10 = 30
3 **groups** of 10
3 **lots** of 10
3 x 10 = 30 or 10 x 3 = 30

Children use **arrays** to support multiplication:

6 x 5 = 30



Different ways to describe this ***array*** *are:*

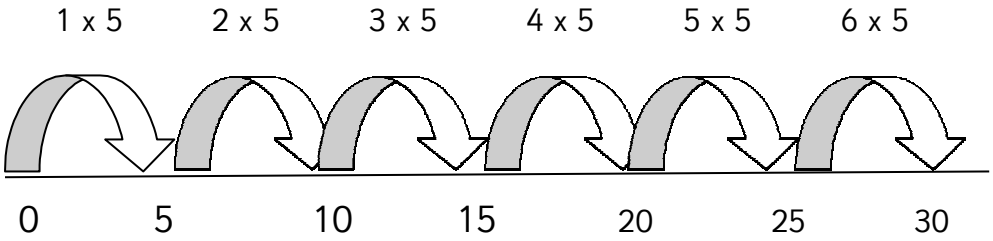
5 + 5 + 5 + 5 + 5 + 5 = 30

6 **rows** of 5

6 **groups** of 5

5 x 6 = 30 and 6 x 5 = 30

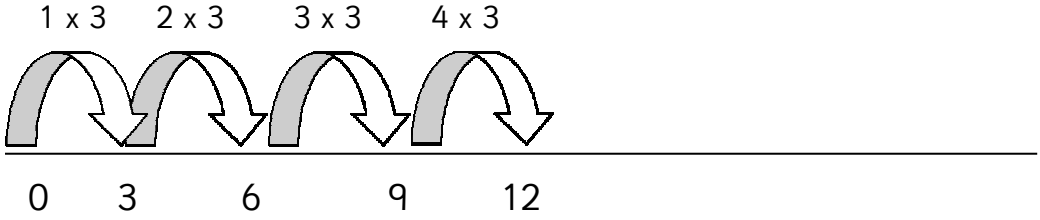
Children begin to use an **empty number line** to record their work and make the link to **repeated addition**:



Year 3

Children continue to use **arrays** and **empty number lines** to support their understanding of multiplication. Children are expected to continue learning 3x, 4x and 8x tables which can then be applied in their problem solving.

4 x 3 = 12



Children are introduced to the **partitioning method** for multiplication of 2-digit numbers by a 1-digit number:

13 x 5 = 65

10 3

10 x 5 = 50
3 x 5 = 15
50 + 15 = 65

Partition 13 into 10 + 3 and use the times tables you know to work out the total.

Children are then introduced to the **grid method**:

13 x 8 = 104

X	10	3
8	80	24

Partition 13 into 10 + 3 and then multiply each number by 8. Add the ***partial products*** *(80 and 24) together.*

80 + 24 = 104

Year 4

Children continue to use **empty number lines** to support their understanding of multiplication, if needed (see Year 3). By the end of Year 4 children are expected to have learnt all times tables up to 12 x 12 which can then be applied in their problem solving.

The **grid method** is further developed for 2-digit numbers multiplied by a 1-digit number.

36 x 4 = 144

x	30	6
4	120	24

120 + 24 = 144

Partition 36 into 30 + 6 and then multiply each number by 4. Add the **partial products** (120 and 24) together.

120 + 24 = 144

This leads to **expanded short multiplication** (2-digit number by a 1-digit number) where you can see all the workings out:

36 x 4 = 144

Make sure you include the addition symbol when adding partial products.

```
 30 + 6
 x   4
   24      (4 x 6 = 24)
 + 120     (4 x 30 = 120)
  144
```

This leads to:

```
  36
 x 4
+ 24    (4 x 6)
 120    (4 x 30)
 144
```

…and then into the formal method for **short multiplication**:

```
  36
 x 4
 144
  2
```

Make sure that the digit 'carried over' is written under the line in the correct column.

When confident, children learn to multiply 3-digit numbers by a 1-digit number.

Year 5 and Year 6

Children continue to develop their understanding of multiplication using the **grid method**, and move onto **short multiplication** when confident. It is important children continue to learn and practise all the times tables up to 12 x 12 so that these can be applied in their problem solving.

Children are taught to multiply numbers up to 4-digits by a 1 or 2-digit number using the **grid method**

23 x 13 = 299

x	20	3
10	200	30
3	60	9

(200 + 30) + (60 + 9) = 299

***Partition** each number*
23 (20 + 3)
13 (10 + 3)
*Multiply them together and then add the **partial products** together.*

If children are confident using the **grid method**, they are taught to use **expanded long multiplication** where all the workings out are shown

23 x 13 = 299

```
  23
x 13
   9  (3 x 3)
  60  (3 x 20)
+ 30  (10 x 3)
 200  (10 x 20)
 299
```

…which leads to **short multiplication**:

```
  23
x 13
+ 69
 230
 299
```

Remember to add the partial products to work out the answer.

Children further develop their understanding of multiplication by multiplying 3-digit numbers by a 2-digit number, and also decimal numbers, initially in the context of money and measures.

Our aim is that by the end of Year 6 children can use mental methods (with jottings) when appropriate but for calculations that they cannot do in their head, they can use an efficient formal written method accurately and with confidence.

÷ Division ÷

EYFS

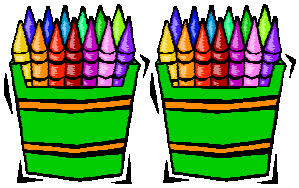
Children participate in songs, nursery rhymes, picture books and games. In practical activities and though discussion, children will begin to solve problems involving **halving** and **sharing**.

Half of the apples for you and half of the apples for me.

Year 1

Children begin to understand division as **sharing.** They use a variety of practical resources and contexts to share objects into **equal groups**. They count in multiples of 2, 5 and 10.

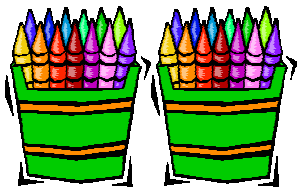
I have eight apples. If I share my apples equally between two children, how many apples will each child have?



Share 20 crayons between 2 pots.

How many crayons are there in each pot?

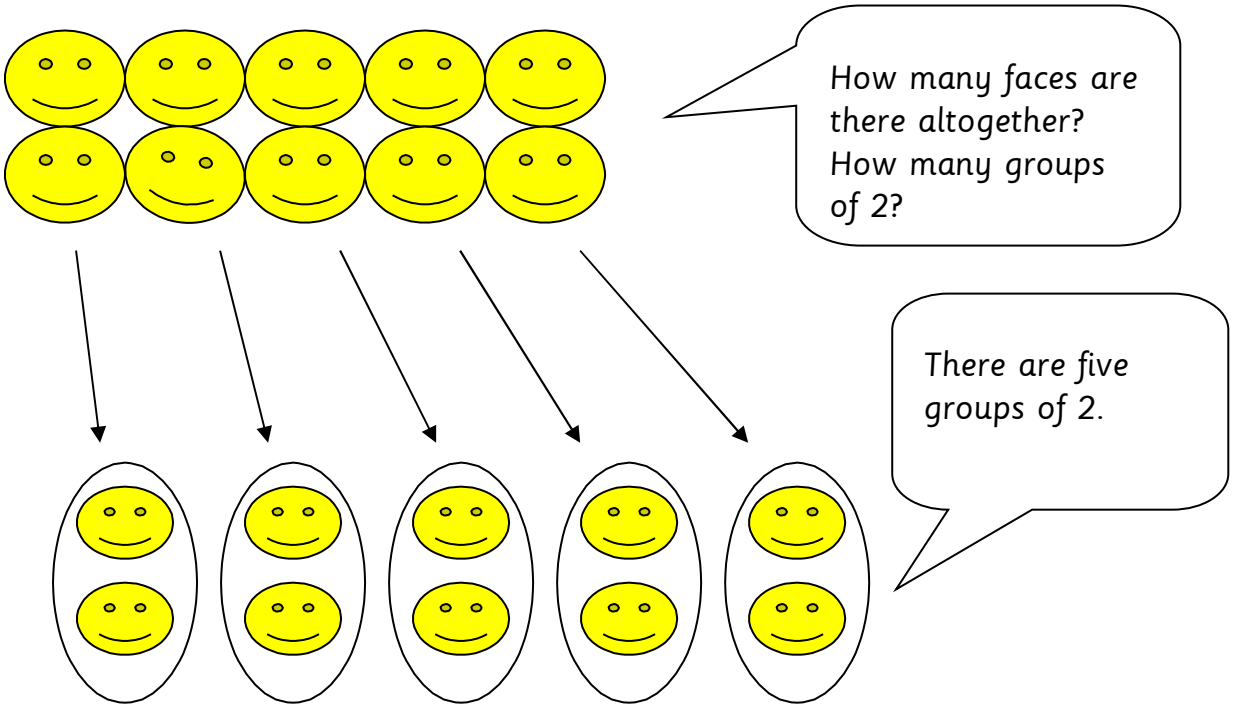
Children then move from **sharing** to **grouping** objects.



Put 20 crayons into groups of 10.

How many pots do we need?

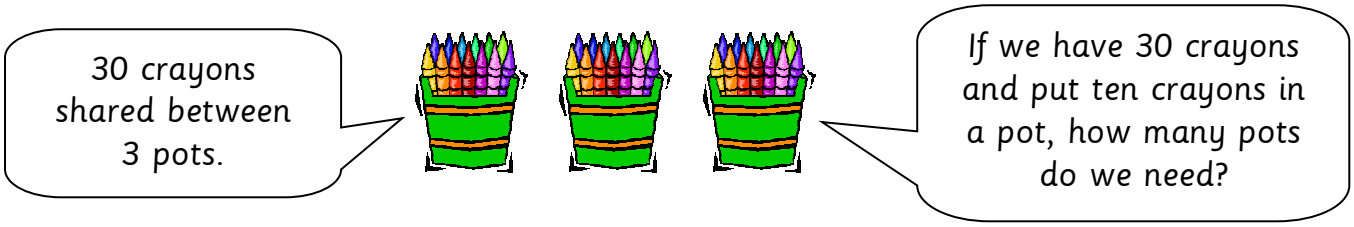
Children begin to use **arrays** to support early division,



Year 2

Children continue to use a range of vocabulary to describe division as well as practical resources, pictures and diagrams, and begin to use the division (÷) symbol to record their work. They learn the multiplication and division facts for the 2x, 5x and 10x tables and apply them in their problem solving.

Division as **sharing** Division as **grouping**



We also say,
30 divided by 10 = 3
30 divided by 3 equals 10
30 ÷ 10 = 3
30 ÷ 3 = 10

Children continue to use **arrays** to support their understanding of division.

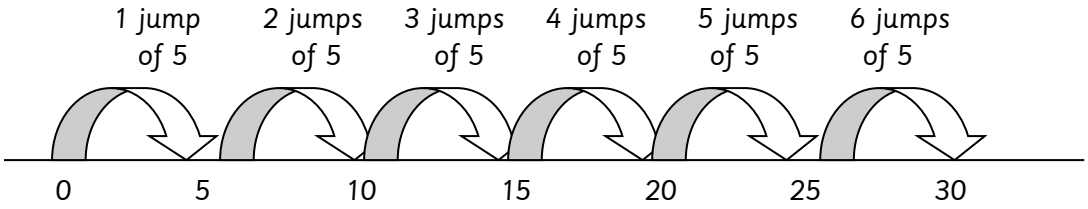
15 ÷ 5 = 3
15 ÷ 3 = 5

How many groups of 3?
How many groups of 5?
What is 15 shared between 3 people?
15 shared between 5 people is?

15 divided by 5 = 3
15 divided by 3 equals 5

When children are secure solving problems using practical resources and **arrays**, they move onto using an **empty number line** to count forwards:

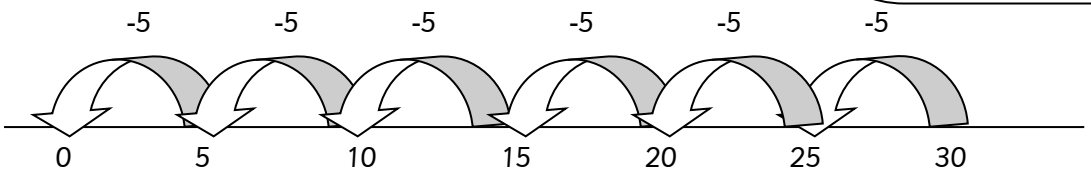
30 ÷ 5 = 6



And make the link with **repeated subtraction**:

30 ÷ 5 = 6

Start at 30 and keep taking away 5.



Year 3

Children learn and use multiplication and division facts for the 3x, 4x and 8x table (and continue to learn and practise 2x, 5x and 10x tables) and apply them in their problem solving.

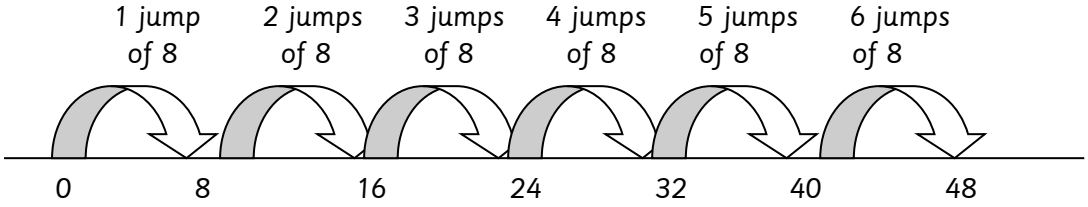
They use the division (÷) symbol to record their work and write and calculate mathematical statements for division using the multiplication tables that they know, including 2-digit numbers divided by 1-digit numbers.

They may continue to use practical resources, pictures, diagrams, ***number lines*** *and* ***arrays*** *in their problem solving.*

And then move onto using an ***empty number line*** *to count forwards…..*

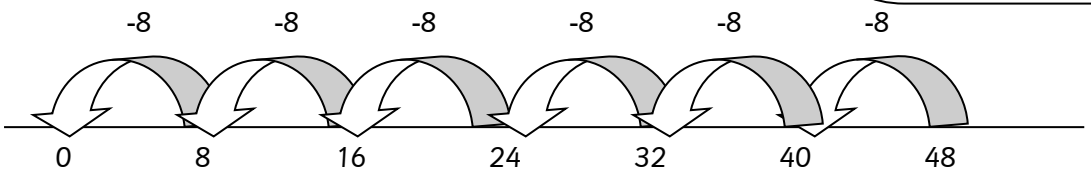
48 ÷ 8 = 6

How many eights are there in 48?



And make the link with ***repeated subtraction****:*

Start at 48 and keep taking away 8.



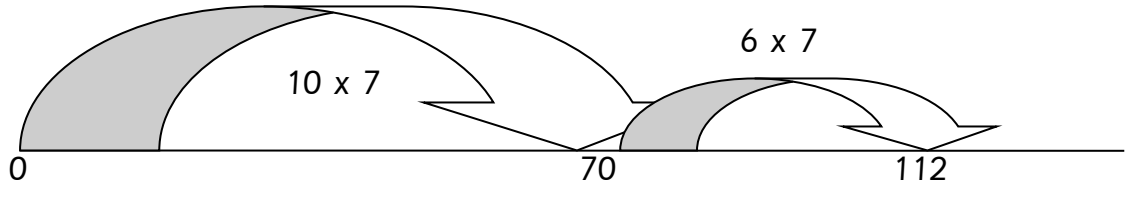
<u>Year 4</u>

Children learn and use the multiplication and division facts for multiplication tables up to 12 x 12. They use ***place value****, known and derived facts to divide mentally and begin to divide 2-digit and then 3-digit numbers by a 1-digit using formal written layout.*

Use chunking to work up to 112. Use groups of seven to help you reach your target. Try to use the most efficient jumps you can e.g. 10 groups of 7 (10 x 7) takes us to 70 and a further 6 groups (6 x 7) takes us to 112. Add the groups together to get the answer (10 + 6) which is 16.

Using an ***empty number line****…*

112 ÷7 = 16



Using formal written layout for **short division** using known multiplication facts…

$$\begin{array}{r} 12 \\ 6\overline{)\,72} \end{array}$$

Which leads to…

$$\begin{array}{r} 16 \\ {\scriptstyle 4}\,\overline{)\,112} \\ 7 \end{array}$$

There are 10 sevens in 110 (7 x 10). Write a 1(10) above 110. Carry the forty. There are 6 sevens in 42 (6 x 7). Write 6 above the 42. The answer is 16.

Year 5 and Year 6

Children continue to learn, practise and use the multiplication and division facts for multiplication tables up to 12 x 12. They continue to use **place value**, and known and derived facts to divide mentally.

In Year 5, Children are taught to divide numbers up to 4-digits by a 1-digit number using the formal written method of **short division**, with whole number answers and with remainders.

$$\begin{array}{r} 351\ r1 \\ {\scriptstyle 3}\,\overline{)\,2458} \\ 7 \end{array}$$

It is important that you remember the value of each digit so you know whether your answer makes sense. Only use this method when you are confident with mental and chunking methods of division.

In Year 6, children continue to practise the formal method of **short division**, progressing to dividing numbers up to 4-digits by a 2-digit number with or without remainders using the language of **place value** to ensure understanding. If confident, children are taught to solve problems where the formal written method of **long division** is required (by repeated subtraction using multiples of the divisors).

$$\begin{array}{r} 187 \\ 13\overline{)\,2431} \end{array}$$

Make a list of facts about the 13 times table that will help you solve the problem efficiently. Start with straight forward numbers and then work up or down to the target number. In this problem, we will work down:

10 x 13 = 130 9 x 13 = 117

8 x 13 = 104 7 x 13 = 91

Our aim is that by the end of Year 6 children can use mental methods (with jottings) when appropriate, but for calculations that they cannot do in their heads, they can use an efficient formal written method accurately and with confidence.

Glossary of useful mathematical vocabulary

array	An ordered collection of counters, numbers or objects in rows or columns.
columnar addition or subtraction	A formal method of setting out an addition or subtraction in ordered columns with each column representing a decimal place value and ordered from right to left in creasing powers of 10. With addition, more than two numbers can be added together using column addition, but this extension does not work for subtraction.
exchange	Change a number for another of equal value. The process of exchange is used in some standard compact methods of calculation e.g. 'carrying' in addition, multiplication or division; and 'decomposition' in subtraction.
double	To multiply by 2 e.g. double 13 is (13 x 2) = 26 The number that is twice another e.g. 26 is double 13. A near double is one away from a double e.g. 27 is a near double of 13 and 14. Spotting near doubles can be a useful mental calculation strategy e.g. seeing 25 + 27 as 2 more than double 25.
efficient methods	A means of calculation (which can be written or mental) that achieves a correct answer with as few steps as possible. In written calculations this often involves setting out calculations in a columnar layout.

partition	*To split a number into component parts e.g. the 2-digit number 38 can be partitioned into 30 + 8, 20 + 18 or 19 + 19.*
place value	*The value of a digit that relates to its position or place in a number e.g. in 1482 the digits represent 1 thousand, 4 hundreds, 8 tens and 2 ones; in 12.34 the digits represent 1 ten, 2 ones, 3 tenths and 4 hundredths.*
number line	*A line where numbers are represented on it.*
number track	*A numbered track along which counters might be moved.*
number sentence	*A mathematical sentence involving numbers e.g. 3 + 6 = 9 and 9 > 3.*
number square (or grid)	*A square grid in which cells are numbered in order.*
repeated addition	*The process of repeatedly adding the same number or amount. One model for multiplication e.g. 5 + 5 + 5 + 5 = 5 x 4.*
repeated subtraction	*The process of repeatedly subtracting the same number or amount. One model for division e.g. 35 – 5 – 5 – 5 – 5 – 5 – 5 – 5 = 0, so 35 ÷ 5 = 7 remainder 0.*

Addition words +	*add* *altogether* *and* *increase* *more than* *plus* *sum* *together* *total*
Subtraction words –	*decrease* *difference between* *fewer* *less than* *minus* *reduce* *subtract* *take from* *taking away*
Division words ÷	*divide* *divide by* *divisible by* *group* *share* *share equally*
Multiplication words x	*groups of* *lots of* *multiply* *multiplied by* *product* *times* *times tables*