Written Calculation Policy
for
Acle St Edmund
Primary School

Help your child with maths

Year 4

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.

<p style="text-align:center">+   <u>Addition</u>   +</p>

<u>Year 4</u>

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
```

This leads to the formal written method:

176 + 147 = 323

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

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.

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

- <u>Subtraction</u> -

<u>Year 4</u>

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

-3   -70

185   188   258
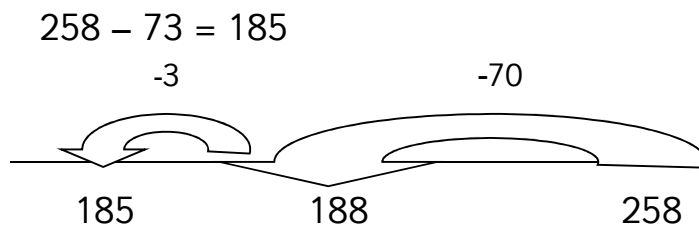
Children continue to be taught to use the **formal written method** of subtraction using the **expanded written method** (*see Year 3 above*) and apparatus to support their understanding e.g. cubes, diennes.

78 – 23 = 55

$$70 + 8$$
$$- \underline{20 + 3}$$
$$50 + 5 = 55$$

> 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

$$200 + 50 + 8$$ $$100 + 150 + 8$$
$$- \underline{\quad\quad 70 + 3}$$ becomes $$- \underline{\quad\quad\quad 70 + 3}$$
                                      $$100 + \ 80 + 5 = 185$$

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

73 – 27 = 46

```
  6 13
  7̶ 3̶
- 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
  2̶ 5̶ 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.

X   Multiplication   X

<u>Year 4</u>

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:

$$36 \times 4 = 144$$

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

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

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.

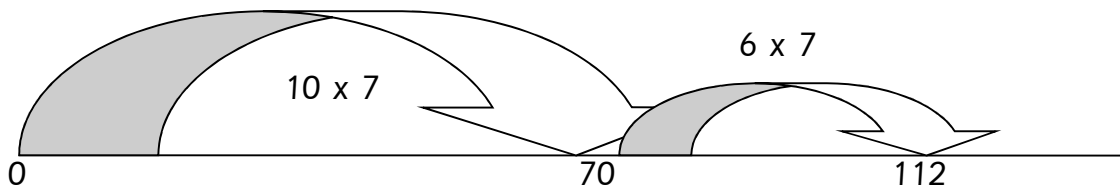When confident, children learn to multiply 3-digit numbers by a 1-digit number.

$\div$ <u>Division</u> $\div$

<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**...

$112 \div 7 = 16$

6 x 7

10 x 7

0   70   112

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

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

Which leads to...

$$\begin{array}{r} 16 \\ 7 \overline{)11^4 2} \end{array}$$

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.