

Written Calculation Policy  
for  
Acle St Edmund  
Primary School



Help your child with maths

Years 5 and 6

## 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                    +

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).

$$21848 + 1523 = 23371$$

$$\begin{array}{r} \text{Th H T U} \\ 21848 \\ + 1523 \\ \hline 23371 \\ \text{1 1} \end{array}$$

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

$$£154.75 + £233.82 =$$

$$\begin{array}{r} \text{HTU.} \\ 154 \cdot 75 \\ + 233 \cdot 82 \\ \hline 388 \cdot 57 \\ \text{1} \end{array}$$

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 -

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.

$$637 - 252 = 385$$

$$\begin{array}{r} 600 + 30 + 7 \\ - \underline{200 + 50 + 2} \end{array} \quad \text{becomes} \quad \begin{array}{r} 500 + 130 + 7 \\ - \underline{200 + 50 + 2} \\ 300 + 80 + 5 = 385 \end{array}$$

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

$$\begin{array}{r} \text{H T U} \\ 5 \ 13 \\ \del{6}37 \\ - \underline{252} \\ \underline{385} \end{array}$$

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.  $12731 - 1367 = 11364$

$$\begin{array}{r} \phantom{1} \phantom{2} \phantom{7} \phantom{3} \phantom{1} \\ \phantom{1} \phantom{2} \phantom{7} \phantom{3} \phantom{1} \\ - \phantom{1} \phantom{2} \phantom{7} \phantom{3} \phantom{1} \\ \underline{\phantom{1} \phantom{2} \phantom{7} \phantom{3} \phantom{1}} \\ \phantom{1} \phantom{2} \phantom{7} \phantom{3} \phantom{1} \end{array}$$

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

e.g.  $£166.25 - £83.72 = £82.53$



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

$$23 \times 13 = 299$$

$$\begin{array}{r} 23 \\ \times 13 \\ \hline 9 \quad (3 \times 3) \\ 60 \quad (3 \times 20) \\ + 30 \quad (10 \times 3) \\ \hline 200 \quad (10 \times 20) \\ \hline 299 \end{array}$$

...which leads to **short multiplication**:

$$\begin{array}{r} 23 \\ \times 13 \\ \hline 69 \\ \hline 230 \\ \hline 299 \end{array}$$

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 ÷

### 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.

$$\begin{array}{r} 351 \text{ r}1 \\ \overline{7 \overline{) 2458}} \\ \underline{14} \phantom{00} \\ 10 \phantom{00} \\ \underline{7} \phantom{00} \\ 30 \phantom{00} \\ \underline{28} \phantom{00} \\ 20 \phantom{00} \\ \underline{14} \phantom{00} \\ 60 \phantom{00} \\ \underline{58} \phantom{00} \\ 2 \phantom{00} \end{array}$$

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:

$$10 \times 13 = 130$$

$$9 \times 13 = 117$$

$$8 \times 13 = 104$$

$$7 \times 13 = 91$$

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.