

# **Wyborne Primary School**

## **Calculations Policy**

**March 2017**

## **Introduction**

This document is a statement of the aims, principles and strategies for teaching and learning of calculation strategies in Mathematics at Wyborne Primary School.

### **Developmental Aims:**

- To introduce children to the processes of calculation through practical, oral and mental activities.
- To support children in developing ways of recording to support their thinking and calculation methods
- Enable children to learn to interpret and use the signs and symbols.
- To facilitate children's use of models and images, such as empty number lines, bead strings and Numicon to support their mental and informal written methods of calculation.
- To enable children to strengthen and refine their mental methods in order to develop informal written methods.
- To support children in becoming more efficient and succinct in their recordings which will ultimately lead to efficient written methods that can be used more generally.
- By the end of Key Stage 2 children should be equipped with mental, written and calculator methods that they understand and can use correctly.
- By the end of Key Stage 2, when faced with a calculation, children will be able to decide which method is most appropriate and have strategies to check its accuracy.

At whatever stage in their learning, and whatever method is being used, children's methods of calculating will be underpinned by a secure and appropriate knowledge of number facts, along with the mental skills that are needed to carry out the process and judge if it was successful.

### **The overall aims when children leave primary school are for them to:**

- have a secure understanding of mental maths facts to apply to written mathematics;
- have a secure knowledge of number facts and a **good** understanding of the four operations
- have an efficient, reliable, compact written method of calculation for each operation that children can apply with confidence when undertaking calculations that they cannot carry out mentally;
- be able to use this knowledge and understanding to solve problems;
- use a calculator effectively, using their mental skills to monitor the process, check the steps involved and decide if the numbers displayed make sense.

### **Mental methods of calculation**

Oral and mental mathematics is essential, particularly so in calculation. Early practical, oral and mental work lays the foundations by providing children with a good understanding of how the four operations build on efficient counting strategies and a secure knowledge of place value and number facts. Later learning and skill development must ensure that children recognise how the operations relate to one another and how the rules and laws of arithmetic are to be used and applied. Ongoing oral and mental mathematics learning provides practice and consolidation of these ideas. It must give children the opportunity to apply what they have learned to particular cases, exemplifying how the rules and laws work, and to general cases where children make decisions and choices for themselves.

The ability to calculate mentally forms the basis of all methods of calculation and has to be maintained and refined. A good knowledge of numbers or a 'feel' for numbers is the product of structured practice and repetition. It requires an understanding of number patterns and relationships developed through directed enquiry, use of models and images and the application of acquired number knowledge and skills. Secure mental calculation requires the ability to:

- recall key number facts instantly - for example, all addition and subtraction facts for each number to 20 together with multiples of 10 that make 100 and doubles and halves (Year 2), multiples of 10 and 5 that make 100 (Year 3)
- recall all times tables up to  $12 \times 12$  by the end of year 4. Learnt as follows:

**Foundation** – by end of year begin counting sequences

**Year 1** – counting in multiples of 2, 10 and 5. By the end of year 1, children can start learning 2, 10 and 5 times tables.

**Year 2** – Recall 2, 10, 5 times tables. Learn 3 times tables.

**Year 3** – Recall 2, 10, 5, 3, times tables. Learn 4 and 8 times tables.

**Year 4**– Recall 2, 10, 5, 3, 4, 8 times tables. Learn 6, 7, 9, 11, 12 times tables.

**Year 5/6** – continue practice of all times tables up to  $12 \times 12$ , use these to inform division and to work out other times tables higher than 12 (e.g. double 12 times tables to generated 24 times tables).

- use taught strategies to work out the calculation - for example, recognise that addition can be done in any order and use this to add mentally a one-digit number or a 2 digit number to 20 (Year 1), partition two-digit numbers in different ways including into multiples of ten and one and add the tens and ones separately and then recombine (Year 2), add and subtract mentally 1, 10 and 100 to any 3 digit number.
- understand how the rules and laws of arithmetic are used and applied - for example, to add or subtract mentally combinations of one-digit and two-digit numbers (Year 3), and to calculate mentally with whole numbers and decimals (Year 6).

*NB: See D of E Programme of study for Mathematics and Wyborne School Maths Overview (Abacus)*

The aim is that by the end of Key Stage 2, the great majority of children should be able to use an efficient written method for each operation with confidence and understanding. Children will develop the ability to use what are commonly known as 'standard' written methods - methods that are efficient and work for any calculations, including those that involve whole numbers or decimals. They are compact and consequently help children to keep track of their recorded steps. Being able to use these written methods gives children an efficient set of tools they can use when they are unable to carry out the calculation in their heads or do not have access to a calculator. We want children to know that they have such a reliable, written method to which they can turn when the need arises.

In setting out these aims, the intention is that there will be a consistent approach to the learning of calculation strategies and that all teachers understand the progression of skills and key concepts. The great majority of children will benefit greatly from learning how to use the most efficient methods. The challenge for teachers will be in determining when their children should move on to a refinement in the method and become confident and more efficient at written calculation. Guidance is given below for the steps in reaching the most efficient methods for each of the four number operations.