



What is the aim of the calculation policy?

This policy has been written to ensure a consistent approach and progression in the teaching of calculations in key stage 2. A key element of this is to ensure that pupils hear and use a consistent and agreed mathematical vocabulary. As they progress through the school, pupils' mathematical vocabulary will broaden.

Who is the calculation policy for?

The policy is for all teachers and teaching assistants in the school. It is important for new members of staff to be introduced to the policy. The policy is also for parents. The policy has been kept deliberately short and easy to read (two sheets for each year group) so that anyone helping with homework or in school can refer to it quickly and easily. Pupils in Year 4 upwards may also find it useful to have their year group sheet stuck in the back of their books.



When should written methods be introduced?

Teachers will judge whether a child is ready to move on to written methods of calculation. As a guide, for addition and subtraction formal written methods, pupils need to understand place value and be able to partition numbers. As a guide for multiplication and division formal written methods, pupils need to understand 0 as a place holder and be able to multiply two and three digit numbers by 10 and 100. Pupils also need to be able to explain their mental strategies orally and record them using informal jottings. The more formal written methods will be introduced in Year 3.

How does the use of written methods fit into our overall approach to mathematics?

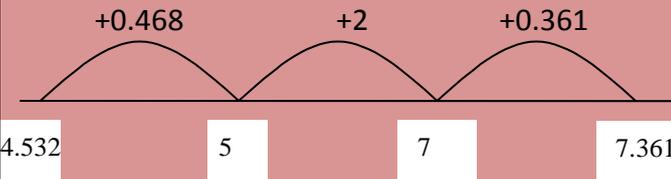
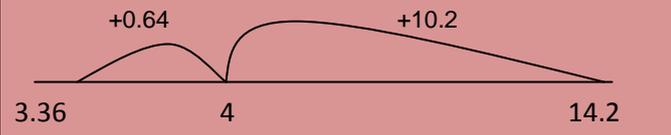
Fostering understanding in mathematics is at the heart of every lesson. Children do not simply follow a written process. The emphasis is on choosing the best method of calculation to use, depending on the particular problem and numbers involved. A formal written method is used if the sum is too difficult to calculate mentally. For example, pupils would not use a vertical subtraction method to calculate $701 - 698 =$. Instead, pupils would be encouraged to see that in this case, it is much easier to count on from the smaller number, making jottings if needed.

Teachers help pupils to consolidate their ideas by providing lots of opportunities for them to explain their thinking and choice of method to someone else. From Year 4 onwards, pupils approximate their answer first.

There will be occasions in lessons, where quiet, contemplative work is required. However, this is balanced with lively discussion at other times. Pupils discuss how to solve problems, the best method to use and whether the answer makes sense. To summarise, our aim is to make mathematics an interesting and exciting subject where pupils can work collaboratively to solve problems and have an increasing awareness of the application of mathematics in the real world.



Written Methods of Calculation in Year 6

Operation and Examples	Name of method	Examples
<p>Addition</p> <p>Use number bonds to 1 and the next multiple of 1 to add decimals $4.532 + 2.829$</p> 	<p>Compact Column Addition</p> <p>Using a number line</p>	<p>£345.61 £73.67 + £1.85 ----- 1 1 2 1 £421.13</p> <p>Use method with decimal numbers and mixed amounts (need to convert to a common unit of measurement)</p> <p>$73.90\text{km} + 568\text{m} =$</p> <p>$73.90\text{km}$ $+ 0.568\text{km}$ ----- (line up decimal points)</p>
<p>Subtraction</p> <p>Think of the best method to use depending on the numbers.</p> <p>Counting up can be used when dealing with money or using decimal numbers.</p> <p>$14.2 - 3.36 = 10.84$</p> 	<p>Compact Column Subtraction</p> <p>Using a number line</p>	<p>Subtract numbers with different numbers of digits with exchanging.</p> <p>983219 $- 1243$ ----- 981976 (complete by using exchange)</p> <p>Use decimal numbers in context, using numbers with two decimal places or more.</p> <p>8.457 $- 3.624$ ----- 3 (complete by using exchange)</p>

Multiplication

Pupils can also use the grid method to multiply decimal numbers by single digits
(eg 1.39×6)

The numbers in white are carried and can be crossed off when counted.

The Grid Method



Some pupils will choose to use the grid method but will also be introduced to the other methods of multiplication.

$$323 \times 7 =$$

x	300	20	3
7	2100	140	21

=2261

Short multiplication



$$\begin{array}{r} 6738 \\ \times \quad 7 \\ \hline 47166 \\ 525 \end{array}$$

(Use for any digit number multiplied by a single digit)

Long multiplication of any number multiplied by a two digit number



(Use for any digit number multiplied by a 2 digit number)

$$\begin{array}{r} 4873 \\ \times \quad 26 \\ \hline 97460 \\ 29238 \\ \hline 126698 \end{array}$$

(Carried numbers: 1, 1, 5, 4, 1, 1)

Division

Pupils are taught to think about the best method to use, be it written or mental.

Chunking

Write notes at the side:

$$10 \times 36 = 360$$

$$2 \times 36 = 72$$

$$20 \times 36 = 720$$

$$5 \times 36 = 180$$



Short Division



$$977 \div 36 =$$

$$\begin{array}{r} 27 \text{ r} 5 \\ 36 \overline{) 977} \\ - 720 \quad (20 \times 36) \\ \hline 257 \\ - 180 \quad (5 \times 36) \\ \hline 77 \\ - 72 \quad (2 \times 36) \\ \hline 5 \end{array}$$

Answer: 27 r 5 = 27 and 5/36

$$\begin{array}{c} \text{quotient} \\ \text{divisor } 5 \overline{) 847} \text{ dividend} \end{array}$$

$$\begin{array}{r} 169 \text{ r} 2 \\ 5 \overline{) 847} \end{array}$$

(Divide 3 and 4 digit numbers by a single digit)