



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?

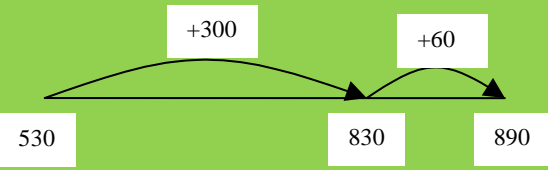
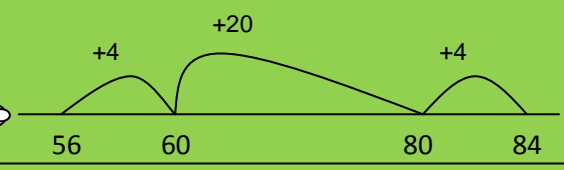
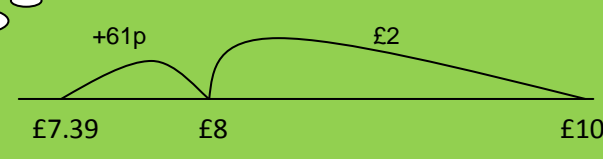
Fostering understanding in mathematics is at the heart of every lesson. Children do not simply follow a written process. The emphasis is on choosing the best method of calculation to use, depending on the particular problem and numbers involved. A formal written method is used if the sum is too difficult 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.

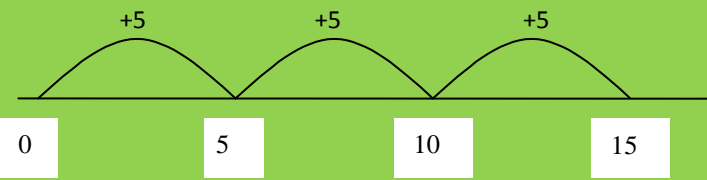
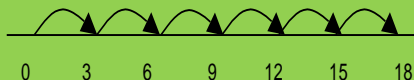
Teachers help pupils to consolidate their ideas by providing lots of opportunities for them to explain their thinking and choice of method to someone else. From Year 4 onwards, pupils approximate their answer first.

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 3

Operation	Name of method	Examples
Addition	Counting On	$530 + 360 = 890$ 
	Column Addition	$\begin{array}{r} 500 & 40 & 3 \\ + 200 & 70 & 8 \\ \hline 700 & 110 & 11 \end{array}$ <div data-bbox="1066 573 1449 680" style="border: 1px solid black; padding: 5px;">Use expanded column addition with two 3-digit numbers</div> <p>Then with carrying:</p> $\begin{array}{r} 500 & 40 & 3 \\ + 200 & 70 & 8 \\ \hline 100 & 10 & \\ \hline 800 & 20 & 1 \end{array}$ <div data-bbox="1098 869 1369 976" style="border: 1px solid black; padding: 5px;">Leading to addition with carrying</div>
	Compact Column addition with 3 or 4 digit numbers	$\begin{array}{r} 288 \\ + 456 \\ \hline 11 \\ \hline 744 \end{array}$ <div data-bbox="1054 1137 1310 1272" style="border: 1px solid black; padding: 5px;">"carry" here so you remember to add</div>
Subtraction	Counting up	$84 - 56 = 28$  <div data-bbox="368 1467 762 1682" style="border: 1px solid black; border-radius: 50%; padding: 10px; width: fit-content;">Use maths frog to hop along the line</div>
	Counting up- (find the difference)	<p>e.g. $\text{£}10 - \text{£}7.39 = \text{£}2.61$</p>  <div data-bbox="140 1899 703 2114" style="border: 1px solid black; border-radius: 50%; padding: 10px; width: fit-content;">Develop "counting up" subtraction to find change from £1 and £10</div>

<p>Multiplication</p>	<p>Repeated Addition</p>	<p>$3 \times 5 = 15$</p>  <p>0 5 10 15</p>						
	<p>The Grid Method</p>	<p>$35 \times 3 = 105$</p> <table border="1" data-bbox="750 414 997 526"> <tr> <td>x</td> <td>30</td> <td>5</td> </tr> <tr> <td>3</td> <td>90</td> <td>15</td> </tr> </table> <p>$90 + 15 = 105$</p> <p>Build on partitioning to develop grid multiplication</p>	x	30	5	3	90	15
x	30	5						
3	90	15						
<p>Division</p>	<p>Division using grouping and a number line.</p>	<p>$18 \div 3 =$ How many 3's make eighteen?</p>  <p>0 3 6 9 12 15 18</p> <p>Calculate division sums with remainders. $19 \div 3 = 6 \text{ r } 1$</p>						
<p>Division</p>	<p>Relate division to multiplication "with blanks in..."</p>	<p>For example $30 \div 5$</p> <p><input type="text"/> $\times 5 = 30$</p> <p>Count in 5's to find the answer</p> <p>(This leads on to a more formal written method in Yr 4)</p>						

Use hops along the line or colour the multiples on a 1-100 grid