## 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 5

| Operation | Name of method | Examples |
|---|---|---|
| **Addition**<br><br>When adding decimals, use number bonds to one and to the next whole number.<br><br>$0.4 + 0.6 = 1$<br>or<br>$7.2 + 0.8 = 8$ | Expanded Column Addition | B) Use expanded column addition with several amounts of money if needed.<br>e.g. £13.33+£22.79+£40.87<br><br>  £13   30p   3p<br>  £22   70p   9p<br>  £40   80p   7p<br>   £1   10p<br>  £76   90p   9p   *(Carry here)*<br>Answer: £76.99 |
| | Compact Column Addition | C) use compact column addition<br>To add decimal numbers<br>  73·67km  (line up decimal points)<br>+51·85km<br>   1 1   *(Carry here)*<br> 125·52km |
| **Subtraction**<br><br>*Think of the best method to use depending on the numbers.*<br><br><br>Also practise using counting up subtraction with money and decimal numbers. | Compact Column Subtraction | Extend to 5 digits with exchanging.<br><br>  2 11 11<br>  73219<br>− 31243  *(Complete by using exchange)*<br>  41976<br><br>Use decimal numbers in context.<br><br> £8·45  (complete by using exchange)<br>−£3.62<br> £  · 3 |
| | Counting Up | $8.5 - 1.73 = 6.77$<br><br>+0.07   +0.2       6       0.5<br>1.73  1.8    2       8  8.5 |

| Multiplication | The Grid Method is used if pupils find the other 2 methods below too difficult | 423 x 7 = <br><br> x   400   20   3 <br> 7   2800   140   21 = 2961 |
|---|---|---|
| | Short Multiplication with carrying | 238   (Use for 2 or 3 digit numbers <br> x   7   multiplied by a single digit) <br> 2 5 <br> 1666 |
| | Long Multiplication | (Use for 2 , 3 and 4 digit numbers multiplied by a "teen" number) <br> 387 <br> X   14 <br> 3870 <br> 3 2 <br> 1548 <br> 1 1 <br> 5418 <br><br> White numbers show where to carry |
| Division | 1. Chunking <br><br> This is a written version of a mental method | 50 + 4r2 = 54r2 <br> 6 ) 326 <br> -300 <br> 26 <br> -24 <br> 2 <br><br> Make notes at the side e.g. <br> 10x6=60 <br> 50x6=300 |
| | 2. Short Division | (Short division of 3 and 4 digit numbers by a single digit number ) <br><br> 847 ÷ 5 = 169 r 2 <br><br> 169 r 2 <br> 5 ) 8⁳4⁴7 <br><br> quotient <br> divisor 5 ) 847 dividend |
| | 3. Write division sum as a multiplication sum with a "hole" in it <br><br> ? | 397÷4 = 99r1 <br> ( ? ) x 4 = 397 <br> ( 90 ) x 4 = 360 <br> 37 <br> ( 9 ) x 4 = 36 <br> 1 <br><br> Look at the circled numbers |