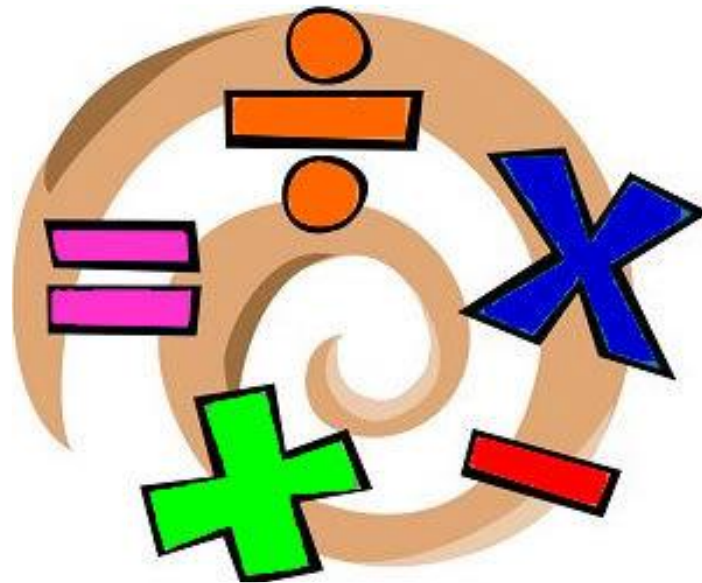




Guide to Written Calculation Strategies for Year 5 Children and Parents



Addition (+)

Standard Compact Written Method (Vertical & Compact)

$$21848 + 1523 = 23371$$

$$\begin{array}{r} 21848 \\ + 1523 \\ \hline 23371 \end{array}$$

Use the language of place value to ensure understanding. E.g. 8 ones add 3 ones. 4 tens add 2 tens. Ensure that the digits that have been 'carried' are recorded under the line in the correct column.

Formal written method for the addition of decimal numbers (up to 2 decimal places)

$$£154.75 + £233.82 = £388.57$$

$$\begin{array}{r} 154.75 \\ + 233.82 \\ \hline 388.57 \\ 1 \end{array}$$

Continue to use the language of place value to ensure understanding. Ensure that the decimal points line up.

$$137.2 + 65.894 = 203.094$$

Use 0 as a place value holder to help line up the numbers when necessary.

$$\begin{array}{r} 137.200 \\ + 65.894 \\ \hline 203.094 \end{array}$$

Subtraction (-)

Expanded Method for up to 4 digit numbers

$$2343 - 1124 = 1219$$

$$\begin{array}{r}
 \text{30} \\
 2000 \quad 300 \quad 40 \quad 3 \\
 1000 \quad 100 \quad 20 \quad 4 \\
 \hline
 1000 \quad 200 \quad 10 \quad 9 = 1,219
 \end{array}$$

- Partition each number into thousands, hundreds, tens and ones
- Write the first number down, with the second number beneath it. Remember to line up the place value columns accurately.
- Subtract the units from the units column
- **If there is a red alert:** exchange from the next column
- Subtract the tens from the tens
- Subtract the hundreds from the hundreds
- Subtract the thousands from the thousands
- Write the answers underneath each column.
- Add together (recombine) the values.

Standard Compact Written Method (Vertical & Compact)

$$12731 - 1367 = 11364$$

$$\begin{array}{r}
 ^6 ^{12} ^{11} \\
 1 \ 2 \ 7 \ 3 \ 1 \\
 - \ 1 \ 3 \ 6 \ 7 \\
 \hline
 1 \ 1 \ 3 \ 6 \ 4
 \end{array}$$

In this example it has been necessary to exchange from the tens and the hundreds columns. If children are making significant errors, provide calculations where only one exchange is required.

$$\begin{array}{r}
 8 - 4.768 = 3.232 \\
 ^9 ^9 \\
 ^{10} ^{10} ^{10} \\
 8. \cancel{000} \\
 - 4.768 \\
 \hline
 3.232
 \end{array}$$

Use 0 as a place value holder to help line up the numbers correctly when appropriate.

Multiplication (x)

Expanded Method of short multiplication

$$\begin{array}{r} 1,232 \times 6 \\ 1,232 \\ \hline \quad \times 6 \\ 12 \quad (6 \times 2) \\ 180 \quad (6 \times 30) \\ 1,200 \quad (6 \times 200) \\ \hline 6,000 \quad (6 \times 1,000) \\ \hline 7,392 \end{array}$$

- Write the number you are multiplying down, with number you are multiplying by underneath.
- Partition the number you are multiplying and multiply each part by the number you are multiplying by, recording this in brackets next to the method.
- Line up the digits accurately
- Multiply the ones digit
- Multiply the tens digit
- Multiply the hundreds digit
- Multiply the thousands digit
- Add up the values to reach your answer.

Compact Method of short multiplication

$$\begin{array}{r} 2,123 \\ \times 7 \\ \hline 14,861 \\ \hline \end{array}$$

Compact method:

- Write the number you are multiplying down, with number you are multiplying by underneath.
- Multiply the digit in the ones column
- Write the number answer underneath, carrying over if necessary.
- Multiply the digit in the tens column and repeat for further digits. Remember to add up any of the digits you **carried over**.

Expanded Long multiplication

$$23 \times 13 = 299$$

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

- Write down the number you are multiplying, with the number you are multiplying be underneath
- Ensure the columns are lined up accurately.
- Record each step in brackets at the side to keep track of what you are multiplying:
- Multiply the ones by the ones digit
- Multiply the tens by the ones digit
- Multiply the ones by the tens digit
- Multiply the tens by the tens digit
- Add up the values to reach your answer, writing this beneath the columns

Compact Long multiplication

$$23 \times 13 = 299$$

$$\begin{array}{r} 23 \\ \times 13 \\ \hline + 69 \quad (3 \times 23) \\ \hline 230 \quad (10 \times 23) \\ \hline 299 \end{array}$$

Compact long multiplication method:

- Write down the number you are multiplying, with the number you are multiplying be underneath
- Ensure the columns are lined up accurately.
- Multiply the top number by the units
- Carry over to the next column when necessary
- Multiply the top number by the tens
- Carry over to the next column when necessary
- Add up the values to reach your answer, writing this beneath the columns

Extend to larger two digit numbers whereby digits are carried over in the partial products. Use the language of place value to ensure understanding.

$$56 \times 27 = 1512$$

$$\begin{array}{r} 56 \\ \times 27 \\ \hline 39^42 \quad (7 \times 56) \\ + 11^120 \quad (20 \times 56) \\ \hline 1512 \\ 1 \end{array}$$

$$124 \times 26 = 3224$$

$$\begin{array}{r} 124 \\ \times 26 \\ \hline 7^14^24 \quad (6 \times 124) \\ + 2480 \quad (20 \times 124) \\ \hline 3224 \\ 1 \quad 1 \end{array}$$

Division (÷)

Expanded Short division method

$$515 \div 5 = 103$$

$$\begin{array}{r} 100 \quad 3 = 103 \\ 5 \overline{) 500} \quad 15 \end{array}$$

- Write the number you are dividing by next to the "bus stop"
- Use times tables knowledge to partition the number you are dividing into multiples of the number you are dividing by e.g. 98 can be partitioned into 70 + 28 when dividing by 7 (10 lots of 7, 4 lots of 7)
- Write how many lots of that number goes into the partitioned values
- Repeat until you have fully divided the starting number and you can't chunk away any more
- Add up how many lots of the number fit into the partitioned value
- This is your answer.

The formal written method of short division

$$98 \div 7 = 14$$

$$\begin{array}{r} 14 \\ 7 \overline{) 98} \end{array}$$

Use the vocabulary of place value to ensure understanding. E.g. how many groups of 7 tens can you make with 9 tens? The answer is 1 and 2 tens are exchanged to the ones column.

Progress to 3 and 4 digit numbers, including examples with remainders...

$$\begin{array}{r} 23 \\ 8 \overline{) 184} \end{array}$$

$$\begin{array}{r} 0341 \\ 8 \overline{) 2728} \end{array}$$

$$\begin{array}{r} 86r2 \\ 5 \overline{) 432} \end{array}$$