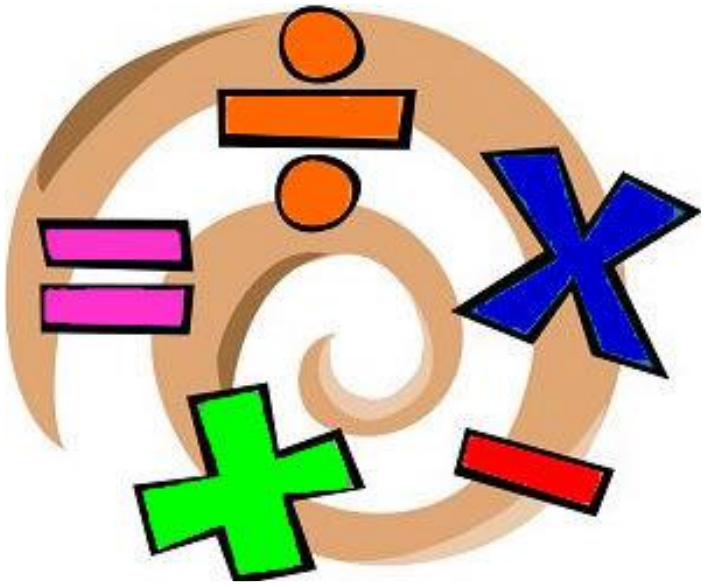
Guide To Written Calculation Strategies for Year 6 Children and Parents



Addition (+)

Standard Compact Written Method (Vertical & Compact)

21848 + 1523 = 23371

$$\begin{array}{r} 21848 \\ +\ 1523 \\ \hline 23371 \\ {\scriptstyle 1\ \ 1\ \ \ \ \ } \end{array}$$

Use the language of place value to ensure understanding. 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

£154.75 + £233.82 = £388.57

$$\begin{array}{r} 154{\cdot}75 \\ +\ 233{\cdot}82 \\ \hline 388{\cdot}57 \\ {\scriptstyle 1\ \ \ \ \ } \end{array}$$

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

137.2 + 65.894 = 203.094

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

Add 0s if needed to ensure calculation is lined up.

Subtraction (-)

Standard Compact Written method (vertical and compact)

12731 – 1367 = 11364

$$\begin{array}{r} {\scriptstyle 6\ \ 12\ 11} \\ 1\,2\,\not{7}\,\not{3}\,\not{1} \\ -\ \ 1\,3\,6\,7 \\ \hline 1\,1\,3\,6\,4 \end{array}$$

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.

£166.25 - £83.72

$$\begin{array}{r} {\scriptstyle 16\ \ 5\ \ 12} \\ \not{1}\,\not{6}\,\not{6}\cdot\not{2}\,5 \\ -\ 8\,3\cdot 7\,2 \\ \hline 8\,2\cdot 5\,3 \end{array}$$

Introduce subtraction of decimals, initially in the context of money and measures.

Ensure the decimal points line up.

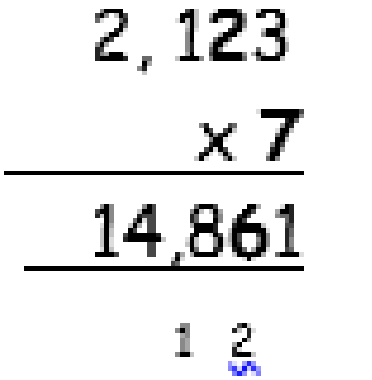
8 - 4.768= 3.232

$$\begin{array}{r} {\scriptstyle 9\ \ 9} \\ {\scriptstyle \not{1}0\ \not{1}0\ 10} \\ 8.\not{0}\not{0}0 \\ -\ 4.768 \\ \hline 3.232 \end{array}$$

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

Multiplication (x)

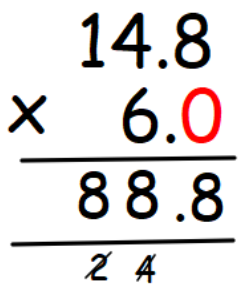
Compact Method of short multiplication



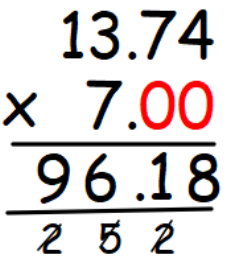
Compact method:
-Write the number you are multiplying down, with number you are multiplying by underneath.
-Multiply the digit in the ones column
-Write the number answer underneath, carrying over if necessary.
-Multiply the digit in the tens column and repeat for further digits. Remember to add up any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

Children can be extended to decimal numbers. Option to include the 0 is optional. May help children to line numbers up correctly.

14.8 x 6 = 88.8

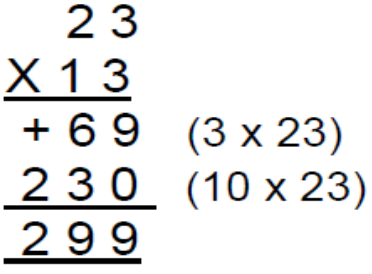


13.74 x 7 = 96.18



Long Multiplication compact

23 x 13 = 299



Use the language of place value to ensure understanding. Add the partial products (unit and then ten).

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 x 27 = 1512

$$\begin{array}{r} 56 \\ \times\ 27 \\ \hline 392 \\ +\ 1120 \\ \hline 1512 \\ \hline 1 \end{array}$$

(7x56)
(20x56)

124 x 26 = 3224

$$\begin{array}{r} 124 \\ \times\ 26 \\ \hline 744 \\ +\ 2480 \\ \hline 3224 \\ \hline 1\ 1 \end{array}$$

(6x124)
(20x124)

When children are confident with long multiplication extend with three-digit and four-digit numbers multiplied by a two-digit number. Then decimal examples.

$$\begin{array}{r} 53{\cdot}2 \\ \times\ 24{\cdot}0 \\ \hline 212{\cdot}8 \\ 1064{\cdot}0 \\ \hline 1276{\cdot}8 \\ \hline \end{array}$$

(53·2 x 4)
(53·2 x 20)

It is an option to include ·0 in this example, but not essential.

The prompts (in brackets) can be omitted if children no longer need them.

Division (÷)

The formal written method of short division

98 ÷ 7 = 14

$$7 \overline{)\,9^{2}8} \quad 1\,4$$

Use the vocabulary of place value to ensure understanding. E.g. how many groups of 7 tens can you make with 9 tens?

Progress to 3 and 4 digit numbers...

184 ÷ 8 = 23

$$8 \overline{)\,1^{1}8^{2}4} \quad 2\,3$$

Using short division with remainders

The remainder can also be expressed as a fraction, (the remainder divided by the divisor) and a decimal.

432 ÷ 5 = 86 r2 = $86\frac{2}{5} = 86.4$

$$5 \overline{)\,4^{4}3^{3}2} \quad 8\,6\,\mathrm{r}\,2$$

$$5 \overline{)\,4^{4}3^{3}2.^{2}0} \quad 8\,6.\,4$$

Formal method of short division with remainders and with two digit divisors

$$
\begin{array}{r}
45\text{ r }1 \\
11\overline{)\,49^{5}6}
\end{array}
$$

Dividing by a two-digit number using a formal method of long division

Write facts out using scaling before you begin. Use 1x, 10x, 5x derive to help calculate unknown facts.

2,412 ÷ 36 = 67

$$
\begin{array}{r}
67 \\
36\overline{)\,2412} \\
216\downarrow \\
\hline
252 \\
252 \\
\hline
000
\end{array}
$$

1 – 36
2 - 72
3 - 108
4 - 144
5 – 180
6 - 216
7 - 252
8 - 288
9 - 324
10 - 360

Long division: writing answers as a decimal.

$$
\begin{array}{r}
28\cdot8 \\
15\overline{)\,432\cdot0} \\
30\downarrow \quad\quad \\
\hline
132 \quad\quad \\
120 \quad\quad \\
\hline
120 \\
120 \\
\hline
0
\end{array}
$$

432 ÷ 15 = 28.8

If there is a remainder, this can also be written as a decimal.

Children may chose to use short division to divide by a two-digit number.