

# Calculation Booklet

Formal written methods used

Addition	Subtraction	Short multiplication	Long multiplication	Short division	Long division
$\begin{array}{r} 9768 \\ + 4153 \\ \hline 13921 \\ \hline 11 \end{array}$ <p>or</p> $\begin{array}{r} 97'6'8 \\ + 4153 \\ \hline 13921 \end{array}$	$\begin{array}{r} 69 \quad 14 \quad 1 \\ 7 \quad 0 \quad 8 \quad 1 \\ - 1268 \\ \hline 5783 \end{array}$	$\begin{array}{r} 35 \\ \times 7 \\ \hline 245 \\ 3 \end{array}$	$\begin{array}{r} 7534 \\ \times 57 \\ \hline 52738 \\ \phantom{52738} 322 \\ + 376700 \\ \hline 429438 \\ 1 \quad 1 \end{array}$ <p>or</p> $\begin{array}{r} 322 \\ 7534 \\ \times 57 \\ \hline 52738 \\ + 376700 \\ \hline 429438 \end{array}$	$3 \overline{) 82971} \begin{array}{l} 2990 \text{ r } 1 \\ \underline{6} \\ 299 \\ \underline{27} \\ 27 \\ \underline{27} \\ 0 \end{array}$	$31 \overline{) 546} \begin{array}{l} 017 \text{ r } 19 \\ \underline{31} \downarrow \\ 276 \\ \underline{217} \\ 019 \end{array}$ <p>With decimal remainder:</p> $25 \overline{) 3435.0} \begin{array}{l} 017.4 \\ \underline{25} \downarrow \\ 185 \\ \underline{175} \downarrow \\ 0100 \\ \underline{100} \\ 0 \end{array}$

Although we record the sign to the left children may be exposed to the sign on the right in print/tests etc.

## Addition

<p>The compact column method (formal written):</p>	$\begin{array}{r} 9768 \\ + 4153 \\ \hline 13921 \\ \hline 11 \end{array}$ <p>or</p> $\begin{array}{r} 97'6'8 \\ + 4153 \\ \hline 13921 \end{array}$
<p><b>Addition with decimals:</b></p> <p>This process can also be applied when adding money or measurements together.</p> <p>Example: £2.67 + 85p =</p> <p>Decimal point has its own box.</p>	$\begin{array}{r} £2.67 \\ + £0.85 \\ \hline £3.52 \\ \hline 11 \end{array}$ <p>or</p> $\begin{array}{r} £2'6'7 \\ + £0.85 \\ \hline £3.52 \end{array}$

## Subtraction

<p><b>Formal written method:</b></p>	$\begin{array}{r} 671081 \\ - 1268 \\ \hline 5783 \end{array}$
<p><b>Subtraction with decimals:</b> This can include measurement and money.</p> <p>Example: <math>72.5 - 45.7 =</math></p>	$\begin{array}{r} 672.5 \\ - 45.7 \\ \hline 26.8 \end{array}$

## Multiplication

<p><b>Short multiplication:</b></p>	$\begin{array}{r} 35 \\ \times 7 \\ \hline 245 \\ 3 \end{array}$
<p><b>Grid method TU X TU:</b></p> <p>If children are ready and confident, move them onto the expanded method.</p>	$\begin{array}{r} 35 \times 73 = \\ \begin{array}{c c c} \times & 70 & 3 \\ \hline 30 & 2100 & 90 \\ \hline 5 & 350 & 15 \end{array} \\ \\ \begin{array}{r} 2100 \\ + 350 \\ + 90 \\ + 15 \\ \hline 2555 \\ \hline \end{array} \end{array}$

Formal column multiplication - Expanded method with HTU x TU:

$$\begin{array}{r}
 128 \\
 \times 27 \\
 \hline
 56 \quad (7 \times 8) \\
 140 \quad (7 \times 20) \\
 700 \quad (7 \times 100) \\
 + 160 \quad (20 \times 8) \\
 400 \quad (20 \times 20) \\
 \hline
 2000 \quad (20 \times 100) \\
 \hline
 3456 \\
 \hline
 11
 \end{array}$$

Formal column multiplication:

$$\begin{array}{r}
 7534 \\
 \times 57 \\
 \hline
 52738 \\
 + \quad 376700 \\
 \hline
 429438 \\
 \hline
 11
 \end{array}$$

or

$$\begin{array}{r}
 \phantom{0}^3 \phantom{0}^2 \phantom{0}^2 \\
 7534 \\
 \times 57 \\
 \hline
 52738 \\
 + 376700 \\
 \hline
 429438
 \end{array}$$

# Division

<p><b>Short division - bus stop/compact format</b> HTU ÷ U:</p>	$\begin{array}{r} 2990 \text{ r } 1 \\ 3 \overline{) 8971} \end{array}$
<p><b>Long division HTU ÷ TU:</b></p> <p style="text-align: center;">‘HMS BRING DOWN’</p> <p style="text-align: center;">How many? Multiply Subtract Bring Down</p> <ol style="list-style-type: none"> <li>1. How many 31s in 54?</li> <li>2. Once answer is given, subtract it from the original number and ‘bring it down’ and record it below.</li> <li>3. Repeat the process.</li> <li>4. Any remainders should be recorded as r__</li> </ol>	<p>How many packs of 31 can we make from 546 biscuits?</p> <p>546 ÷ 31 =</p> $\begin{array}{r} 017 \text{ r } 19 \\ 31 \overline{) 546} \\ \underline{-31} \downarrow \\ 236 \\ \underline{-217} \\ 019 \end{array}$ <p>Multiples:</p> <ol style="list-style-type: none"> <li>1. 31</li> <li>2. 62</li> <li>3. 93</li> <li>4. 124</li> <li>5. 155</li> <li>6. 186</li> <li>7. 217</li> <li>8. 248</li> <li>9. 279</li> </ol> <p>Record multiples to support division.</p>
<p><b>Long division HTU ÷ TU with a decimal remainder</b></p>	$\begin{array}{r} 017.4 \\ 25 \overline{) 343.0} \\ \underline{-25} \downarrow \\ 185 \\ \underline{-175} \downarrow \\ 0100 \\ \underline{100} \\ 0 \end{array}$