



# Long subtraction

## Study Development Worksheet

### Example

What is 4009-2021?

### Answer

We begin by stacking the numbers in the long subtraction format:

$$\begin{array}{r} 4 \ 0 \ 0 \ 9 \\ - \ 2 \ 0 \ 2 \ 1 \\ \hline \\ \hline \end{array}$$

Then, beginning with the units column, we minus the number on the bottom away from the number on the top:

$$\begin{array}{r} 4 \ 0 \ 0 \ 9 \\ - \ 2 \ 0 \ 2 \ 1 \\ \hline \phantom{0} \phantom{0} \phantom{0} \ 8 \\ \hline \end{array}$$

Then we do this to the tens column. Since the number on the bottom is larger than the number on top, we 'borrow 1' from the columns to the left:

$$\begin{array}{r} 4^3 \ 0^9 \ 0^{10} \ 9 \\ - \ 2 \ 0 \ 2 \ 1 \\ \hline \phantom{0} \phantom{0} \phantom{0} \ 8 \\ \hline \end{array}$$

We can then minus these new values:

$$\begin{array}{r} 4^3 \ 0^9 \ 0^{10} \ 9 \\ - \ 2 \ 0 \ 2 \ 1 \\ \hline \phantom{0} \phantom{0} \ 8 \ 8 \\ \hline \end{array}$$

Then the hundreds:

$$\begin{array}{r} 4^3 \quad 0^9 \quad 0^{10} \quad 9 \\ - \quad 2 \quad 0 \quad 2 \quad 1 \\ \hline \quad \quad 9 \quad 8 \quad 8 \\ \hline \end{array}$$

Then the thousands:

$$\begin{array}{r} 4^3 \quad 0^9 \quad 0^{10} \quad 9 \\ - \quad 2 \quad 0 \quad 2 \quad 1 \\ \hline \quad \quad 1 \quad 9 \quad 8 \quad 8 \\ \hline \end{array}$$

To get that  $4009 - 2021 = 1988$ .

## Questions

1. What is  $5476 - 125$ ?
2. What is  $1802 - 354$ ?
3. What is  $7431 - 1055$ ?
4. The budget for an event is £3000. One person spends £145 on invitations, and another spend £1675 on food. How much of their budget do they have left?
5. There are 175 flyers printed off for a society fair. It is expected that there will be 212 students who might want to attend. How many more flyers should be printed?

## Answers

1. We begin by stacking the numbers so that their thousands, hundreds, tens and units line up:

$$\begin{array}{r} 5 \ 4 \ 7 \ 6 \\ - \quad 1 \ 2 \ 5 \\ \hline \\ \hline \end{array}$$

Then, beginning at the right-hand side, we minus the bottom number from the number above it, column by column:

$$\begin{array}{r} 5 \ 4 \ 7 \ 6 \\ - \quad 1 \ 2 \ 5 \\ \hline \quad \quad \quad 1 \\ \hline \end{array}$$

Then the tens:

$$\begin{array}{r} 5 \ 4 \ 7 \ 6 \\ - \quad 1 \ 2 \ 5 \\ \hline \quad \quad 5 \ 1 \\ \hline \end{array}$$

Then the hundreds:

$$\begin{array}{r} 5 \ 4 \ 7 \ 6 \\ - \quad 1 \ 2 \ 5 \\ \hline \quad 3 \ 5 \ 1 \\ \hline \end{array}$$

Then the thousands:

$$\begin{array}{r}
 5 \ 4 \ 7 \ 6 \\
 - \quad 1 \ 2 \ 5 \\
 \hline
 5 \ 3 \ 5 \ 1 \\
 \hline
 \end{array}$$

To get an answer of 5351.

2. We begin by stacking the numbers:

$$\begin{array}{r}
 1 \ 8 \ 0 \ 2 \\
 - \quad 3 \ 5 \ 4 \\
 \hline
 \\
 \hline
 \end{array}$$

Then, we minus the numbers on the bottom from the numbers above them beginning with the column that is the furthest on the right. Since the number on the bottom is larger than the number above it, we 'borrow' from the two columns next to it:

$$\begin{array}{r}
 1 \ 8^7 \ 0^9 \ 12 \\
 - \quad 3 \ 5 \ 4 \\
 \hline
 \qquad \qquad \qquad 8 \\
 \hline
 \end{array}$$

We then continue moving from right to left along the columns:

$$\begin{array}{r}
 1 \ 8^7 \ 0^9 \ 12 \\
 - \quad 3 \ 5 \ 4 \\
 \hline
 1 \ 4 \ 4 \ 8 \\
 \hline
 \end{array}$$

To get a final answer of 1448.

3. We stack the numbers:

$$\begin{array}{r} 7 \ 4 \ 3 \ 1 \\ - 1 \ 0 \ 5 \ 5 \\ \hline \\ \hline \end{array}$$

Then, working from right to left we subtract the number on the bottom away from the number on the top:

$$\begin{array}{r} 7 \ 4 \ 3^2 \ 11 \\ - 1 \ 0 \ 5 \ 5 \\ \hline \phantom{7 \ 4 \ 3} 6 \\ \hline \end{array}$$

Then, we move to the tens:

$$\begin{array}{r} 7 \ 4^3 \ 3^{12} \ 11 \\ - 1 \ 0 \ 5 \ 5 \\ \hline \phantom{7 \ 4} 7 \ 6 \\ \hline \end{array}$$

Then, the hundreds:

$$\begin{array}{r} 7 \ 4^3 \ 3^{12} \ 11 \\ - 1 \ 0 \ 5 \ 5 \\ \hline \phantom{7} 3 \ 7 \ 6 \\ \hline \end{array}$$

Finally, the thousands:

$$\begin{array}{r} 7 \ 4^3 \ 3^{12} \ 11 \\ - 1 \ 0 \ 5 \ 5 \\ \hline 6 \ 3 \ 7 \ 6 \\ \hline \end{array}$$

4. We begin by stacking the first two numbers:

$$\begin{array}{r} 3 \ 0 \ 0 \ 0 \\ - \quad 1 \ 4 \ 5 \\ \hline \\ \hline \end{array}$$

We follow the process to minus the bottom value from the top:

$$\begin{array}{r} 3^2 \ 0^9 \ 0^9 \ 1^0 \\ - \quad 1 \ 4 \ 5 \\ \hline \quad \quad \quad 5 \\ \hline \end{array}$$

Then the tens, hundreds and thousands:

$$\begin{array}{r} 3^2 \ 0^9 \ 0^9 \ 1^0 \\ - \quad 1 \ 4 \ 5 \\ \hline 2 \ 8 \ 5 \ 5 \\ \hline \end{array}$$

We then minus the other amount that was spent from this new value:

$$\begin{array}{r} 2 \ 8 \ 5 \ 5 \\ - \ 1 \ 6 \ 7 \ 5 \\ \hline \\ \hline \end{array}$$

Beginning at the right and moving to the left:

$$\begin{array}{r} 2 \ 8^7 \ 15 \ 5 \\ - \ 1 \ 6 \ 7 \ 5 \\ \hline 1 \ 1 \ 8 \ 0 \\ \hline \end{array}$$

To give us that there is £1180 of the budget left.

5. We need 212 flyers, and 175 have already been printed, so we calculate  $212-175$ :

$$\begin{array}{r} 212 \\ - 175 \\ \hline \\ \hline \end{array}$$

We work right to left:

$$\begin{array}{r} 2 \quad 4^0 \quad 12 \\ - 1 \quad 7 \quad 5 \\ \hline \quad \quad 7 \\ \hline \end{array}$$

Then the tens:

$$\begin{array}{r} 2^1 \quad 4^{10} \quad 12 \\ - 1 \quad 7 \quad 5 \\ \hline \quad 3 \quad 7 \\ \hline \end{array}$$

Then the hundreds:

$$\begin{array}{r} 2^1 \quad 4^{10} \quad 12 \\ - 1 \quad 7 \quad 5 \\ \hline 0 \quad 3 \quad 7 \\ \hline \end{array}$$

So, we need to print 37 more flyers.



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