

# Quick reference: Functions in spreadsheets

As a quick refresher, a function is a preset command that automatically performs a specific process or task using the data in a spreadsheet. Functions give data analysts the ability to do calculations, which can be anything from simple arithmetic to complex equations. Use this reading to help you keep track of some of the most useful options.

## Functions

### The basics

- Just like formulas, start all of your functions with an equal sign; for example =SUM. The equal sign tells the spreadsheet that what follows is part of a function, not just a word or number in a cell.
- After you type the equal sign, most spreadsheet applications will display an autocomplete menu that lists valid functions, names, and text strings. This is a great way to create and edit functions while avoiding typing and syntax errors.
- A fun way to learn new functions is by simply typing an equal sign and a single letter of the alphabet. Choose one of the options that pops up and learn what that function does.

### Difference between formulas and functions

- A formula is a set of instructions used to perform a calculation using the data in a spreadsheet.
- A function is a preset command that automatically performs a specific process or task using the data in a spreadsheet.

### Popular functions

A lot of people don't realize that keyboard shortcuts like cut, save, and find are actually functions. These functions are built into an application and are amazing time-savers. Using shortcuts lets you do more with less effort. They can make you more efficient and productive because you are not constantly reaching for the mouse and navigating menus. Use these links to discover the most popular shortcuts, for [Chromebook](#), [PC](#), and [Mac](#).

### Auto-filling

The lower-right corner of each cell has a fill handle. It is a small green square in Microsoft Excel and a small blue square in Google Sheets.

- Click the fill handle for a cell and drag it down a column to auto-fill other cells in the column with the same formula or function used in that cell.
- Click the fill handle for a cell and drag it across a row to auto-fill other cells in the row with the same formula or function used in that cell.

## Relative, absolute, and mixed references

- Relative references (cells referenced without a dollar sign, like A2) will change when you copy and paste the function into a different cell. With relative references, the location of the cell that contains the function determines the cells used by the function.
- Absolute references (cells fully referenced with a dollar sign, like \$A\$2) will not change when you copy and paste the function into a different cell. With absolute references, the cells referenced always remain the same.
- Mixed references (cells partially referenced with a dollar sign, like \$A2 or A\$2) will change when you copy and paste the function into a different cell. With mixed references, the location of the cell that contains the function determines the cells used by the function, but only the row or column is relative (not both).
- In spreadsheets, you can press the F4 key to toggle between relative, absolute, and mixed references in a function. Click the cell containing the function, highlight the referenced cells in the formula bar, and then press F4 to toggle between and select relative, absolute, or mixed referencing.

## Data ranges

- When you click a cell that contains a function, colored data ranges in the formula bar indicate which cells are being used in the spreadsheet. There are different colors for each unique range in a function.
- Colored data ranges help prevent you from getting lost in complex functions.
- In spreadsheets, you can press the F2 key to highlight the range of data used by a function. Click the cell containing the function, highlight the range of data used by the function in the formula bar, and then press F2. The spreadsheet will go to and highlight the cells specified by the range.

## Data ranges evaluated for a condition

**COUNTIF** is an example of a function that returns a value based on a condition that the data range is evaluated for. The function counts the number of cells that meet the criteria. For example, in an expense spreadsheet, use COUNTIF to count the number of cells that contain a reimbursement for "airfare."

For more information, refer to:

- [Microsoft Support's page for COUNTIF](#)
- [Google Help Center's documentation for COUNTIF](#) where you can copy a sheet with [COUNTIF examples](#) (click "Use Template" if you click the COUNTIF link provided on this page)

## Conclusion

There are a lot more functions that can help you make the most of your data. This is just the start. You can keep learning how to use functions to help you solve complex problems efficiently and accurately throughout your entire career.