

ADVANCED EXCEL

EXCEL FUNCTIONS

Some formulas are complicated to write, even though they use basic math. For example, adding either a row or a column of numbers where many cells are included is difficult to write accurately.

Functions have the following pattern:

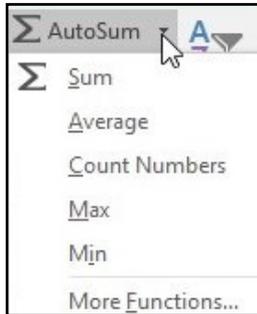
=function(*argument*)

To write a function, remember these four rules:

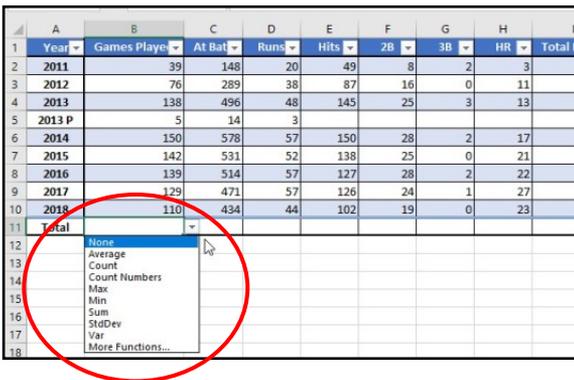
- **All functions must begin with an equals sign.** Without the equals sign, Excel understands what has been entered to be text.
- **Use cell references whenever possible.** Using cell references allows the cell contents to be edited without your needing to also edit the formula.
- **Functions are named using math terminology.** For a total of numbers, use the =SUM() function.
- **No spaces when you type.** If you add spaces in a formula, Excel makes that edit for you and removes them.

BASIC FUNCTIONS

Excel provides an easy way to find and use basic functions as an added “bonus feature” for both the **AutoSum** button and the **Total row** feature in spreadsheets formatted as tables.



AutoSum does more than just add a group of cells. Use its dropdown menu for more formulas.



A screenshot of an Excel spreadsheet showing a table with a Total row. The table has columns for Year, Games Played, At Bat, Runs, Hits, 2B, 3B, HR, and Total B. The Total row is highlighted, and a dropdown menu is open, showing options: None, Average, Count, Count Numbers, Max, Min, Sum, StDev, Var, and More Functions... The dropdown menu is circled in red.

Year	Games Played	At Bat	Runs	Hits	2B	3B	HR	Total B
2011	39	148	20	49	8	2	3	
2012	76	289	38	87	16	0	11	
2013	138	496	48	145	25	3	13	
2013 P	5	14	3					
2014	150	578	57	150	28	2	17	
2015	142	531	52	138	25	0	21	
2016	139	514	57	127	28	2	22	
2017	129	471	57	126	24	1	27	
2018	110	434	44	102	19	0	23	
Total								

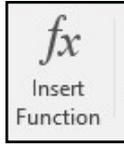
Add a **Total row** to a formatted table. Each cell in the Total row displays a dropdown arrow, which gives the option to select and use basic functions.

COMMON EXCEL FUNCTIONS

Function	Description
=AVERAGE()	Determines the sum of numbers in a range of cells, then divides that total by the count of the numbers
=COUNT()	Counts the cells containing numeric values
=COUNTA()	Counts the number of non-blank cells
=MAX()	Displays the largest number in a range
=MIN()	Displays the smallest value in a range
=SUM()	Adds the numbers in a group of cells

Tip: The **#DIV/0!** error message means that division by 0 is not allowed. Your formula may be referring to a blank cell.

INSERT FUNCTION WIZARD

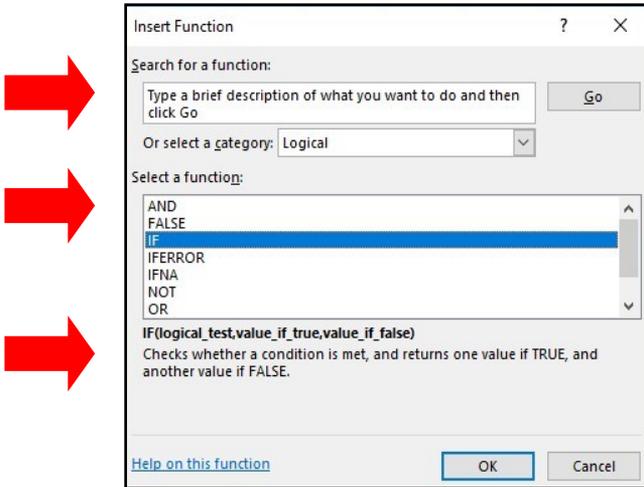


The **Insert Function** button opens a dialog box that assists in determining which function to use and then provides a form for completing the formulas.

The Insert Function button is found on the **Home** tab to the left of the formula bar or as the first button on the **Formulas** tab.

Tip: If the cells in the columns on either side of the current column have complete data, double click the fill handle for quickly copying the new formula down the column.

INSERT FUNCTION DIALOG BOX



The **Insert Function** dialog box has three sections.

- The top section gives you two ways to find the function you want to use:
 - Enter a keyword or a description of what you want to do, then click the **Go** button.
 - Click the dropdown list of **Categories** and select one.
- The middle section is determined by your choice in the first section. You receive a list of possible functions based on the information you supplied.
- As you scroll through the list of potential functions, select one. The bottom section of the dialog box displays a definition of the function you select.

IF / COUNTIF

=IF(Logical test,True,False)

A function that is commonly used is the **IF** function. Compare the contents of a cell to criteria you have written. You then tell Excel what to do if there is a match—or not.

IF			
Logical_test	d2<=1965	=	TRUE
Value_if_true	"Classic"	=	"Classic"
Value_if_false	" "	=	" "
= "Classic"			
Checks whether a condition is met, and returns one value if TRUE, and another value if FALSE.			
Value_if_false is the value that is returned if Logical_test is FALSE. If omitted, FALSE is returned.			

=COUNTIF(Range, Criteria)

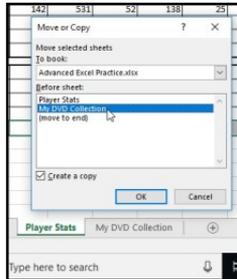
As a combination of the **IF** and **COUNT** functions, **COUNTIF** counts cells if they contain a specified value.

COUNTIF			
Range	B2:B59	=	{ "Animation "; "Animation "; "Animation
Criteria	"Drama"	=	"Drama"
= 10			
Counts the number of cells within a range that meet the given condition.			
Criteria is the condition in the form of a number, expression, or text that defines which cells will be counted.			

COPY OR MOVE A WORKSHEET

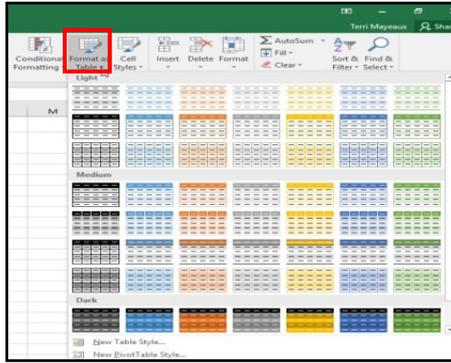
To copy a worksheet:

- Right click on the worksheet tab.
- Select **Move or Copy**.



- Check the box next to **Create a copy** for a copy; otherwise, you will move the sheet instead.
- **Move selected sheets to Book:** While you will probably move the sheet to another location within the same workbook, you have the option to move or copy the sheet to another workbook or even create a new workbook with just that one sheet.
- **Before the sheet:** Select the sheet you want to appear after the worksheet you are copying or moving.

FORMAT AS TABLE



While the **Borders** button on the **Home** tab assists you in customizing how your spreadsheet looks, it may take more time than you have to create a finished, professional-looking spreadsheet.

The **Format as a Table** button in the **Styles** group of the Home tab has a gallery of pre-created formats.

To format as a table:

- Select a cell within the spreadsheet.
- Click the **Format as Table** dropdown to choose from the gallery of options.
- Select the format of your choice.

Formats include features such as grid lines, banded rows or columns, and light, medium, and dark color schemes.

FREEZE PANES



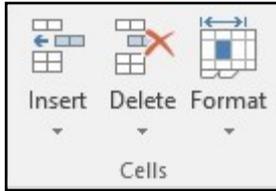
As you scroll down or to the right in a large spreadsheet, the first rows and columns begin to disappear from view. This can be a problem if a lot of the cells have similar data. To keep row and/or column headings visible, use the **Freeze Panes** button on the **View** tab.

While the button offers two tools, **freeze the first column** and **freeze the first row**, you may find that you want to freeze more columns or rows than these options offer.

Just remember that you freeze the cells to the left and/or above where you click. For example, to freeze Row 1 AND Column A, select **B2**, then click the **Freeze Panes** button.

Once rows/columns are “frozen”, simply click the button again to select **Unfreeze**.

INSERT ROWS/COLUMNS



The **Cells** group on the **Home** tab provides easy ways for you to insert or delete rows, columns, or worksheets. Some people prefer to right click and then choose either **Insert** or **Delete** from the shortcut menu.

When you select a cell, be sure the cell is within the spreadsheet's data.

After you insert a row or column, the existing information moves down or to the right.

Insert Rows or Columns

- Select a cell within the row or column where you want to insert the new row or column.
- For example, if you want to insert a new row between the data in Rows 6 and 7, you will select a cell in Row 7 (where the new row will be inserted.)
- Click the **Insert** button's dropdown and select **Row**.
- When the new row is inserted, the data that was in Row 7 moves down.

DELETE ROWS/COLUMNS

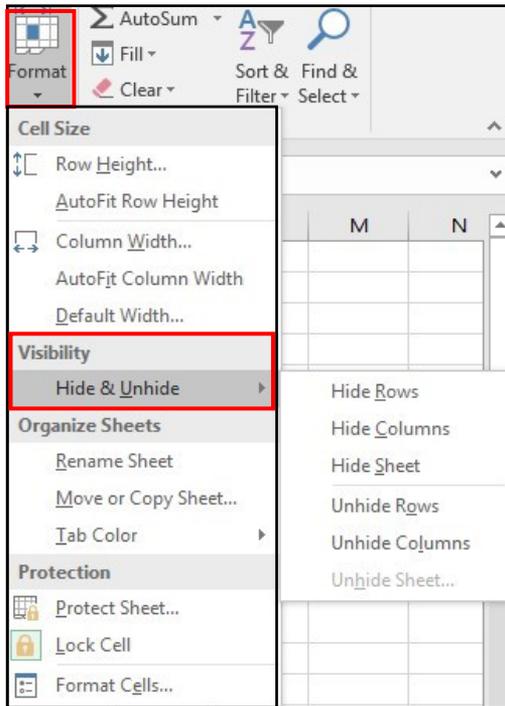
If you select a row or column and press the **Delete** key on your keyboard, only the cell contents are removed. To remove the cells, along with their data, use the **Delete** button.

Delete Rows or Columns

- Select a cell within the row or column that needs to be deleted.
- Click the **Delete** button's dropdown to select either row or column.
- The spreadsheet automatically adjusts.

Notes

HIDE ROWS/COLUMNS



The **Format** button has four distinct areas of formatting: **Cell Size**, **Visibility**, **Organization**, and **Protection**.

To hide rows/columns:

- Click the **Format** button dropdown.
- From the **Visibility** category, select **Hide & Unhide > Hide Rows** or **Hide Columns**.

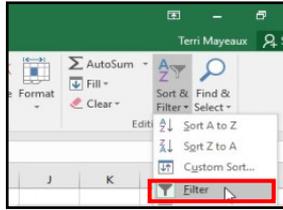
UNHIDE ROWS/COLUMNS

To unhide rows/columns:

- Click the **Format** button dropdown.
- From the **Visibility** category, select **Hide & Unhide > Unhide Rows** or **Unhide Columns**.

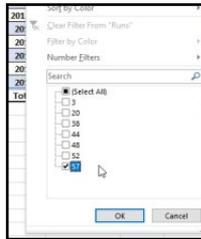
Notes

FILTER A LIST



Unlike **Sort**, which simply rearranges data in ascending or descending order, **Filter** displays rows that match specific criteria and hides the rest of the spreadsheet.

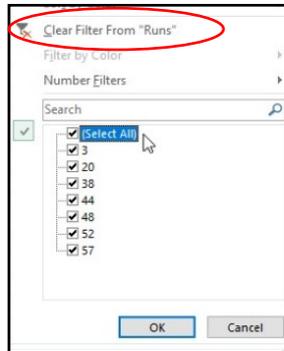
To add filters, click the **Sort & Filter** button in the Editing group, and then select **Filter**.



When you click on an **Autofilter** arrow to the right of the column heading, you see a list of all possible unique entries in the column.

- Click the **Select All** checkbox to remove that filter.
- Select the boxes for the filters that match the criteria you want to view.
- When you click OK, you see only the rows that match the criteria.

REMOVE FILTERS



To clear filters, click the **AutoFilter** dropdown arrow. There are two choices:

- Select “Clear Filter from...”
- Click the checkbox for Select All.

To remove the AutoFilter from the spreadsheet, click the **Sort & Filter** button.

- Select **Filter**.

HEADERS AND FOOTERS



Movie Title	Genre	Starring Actors	Year Made
101 Dalmations	Animation		1961 Classic
A Bug's Life	Animation		1998
Aladdin	Animation		1992
Alice in Wonderland	Animation		1951 Classic
Anastasia	Animation	Meg Ryan, John Cusack	1997
Apple Dumpling Gang	Family		1975



Pretty Woman	Romantic Comedy		1990
		John Travolta, Samuel L. Jackson	
Pulp Fiction	Drama		1994
School of Rock	Comedy		2003
Shrek	Animation	Michael Meyers, Eddie Murphy	2001
Sneakers	Action	Robert Redford	1992
Terms of Endearment	Drama		1983

Headers and footers contain information that needs to be added to each printed page of the spreadsheet.

Page numbers and dates are examples of what might be found in either the header (top margin) or the footer (bottom margin).

While headers and footers can be added to a spreadsheet using the Insert tab, you may want to use the **Page Layout View**.

The Page Layout View in Excel is similar to the Page Layout View in Word. It displays each page as it will print. Besides the spreadsheet data, it shows the edges of the pages, the margins, and any headers or footers. The **Normal View**, which is commonly used in Excel, only shows the spreadsheet data.

HEADERS AND FOOTERS



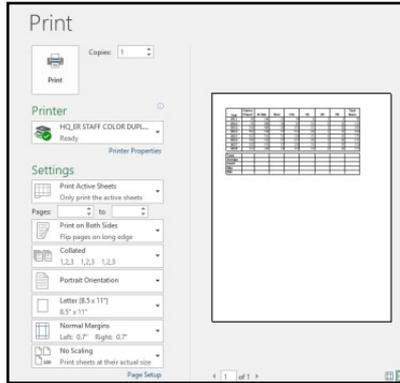
Headers and footers are divided into three text boxes: Left, Middle, Right. When you click in one of those sections, a contextual tab for Headers/Footers also appears.

You can type any content you need, but you will also want to use the provided buttons for inserting some of the information.

Select items from the **Header & Footer** group first, as these options overwrite anything else. Then add to your headers and footers from the **Header & Footer Elements** group if they are needed.

Notes

PRINT PREVIEW



Print Preview is used to determine how the spreadsheet will look when it is printed. This is absolutely important with Excel, as the data may print on more pages than you anticipate.

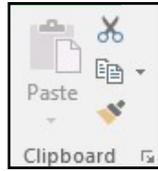
Each worksheet prints independently of the others within the same workbook, so you need to preview each worksheet individually.

- To see a print preview, click the **File** tab, then select **Print**.

A preview of the spreadsheet appears to the right of the Print options. Use the navigation arrows at the bottom to move from page to page.

Tip: The lower far right button named **Show Margins** adds boxes to the previewed sheet page. Click and drag the squares to adjust margins “on the fly.”

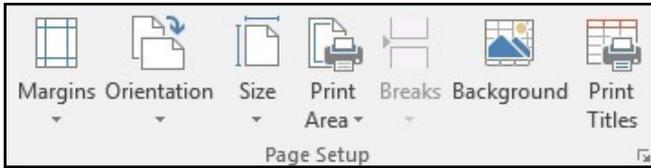
HOME TAB: CLIPBOARD GROUP



The **Clipboard** buttons are used to cut or copy cell contents and then paste them somewhere else.

	Select text or a cell's contents. Click this button to copy what you have selected.
	Using the cut button, in combination with the Paste button, allows you to move a cell's contents to another location.
	Paste places a copy (copy button) or the original (cut button) in a new location.
	The Format Painter copies the formatting of one cell to another.

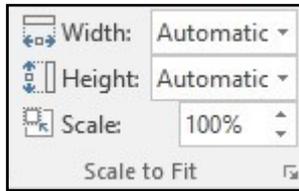
PAGE LAYOUT TAB: SETUP



Most of these settings can be also be adjusted with **File > Print**.

- **Margins** – Set margins. Select from preset options or create your own customized margins.
- **Orientation** – Select Portrait or Landscape.
- **Size** – Select the correct paper size.
- **Print Area** – Set or clear a print area. Print areas determine which cells will be printed.
- **Print Titles** – Spreadsheets that are at least two pages in length will require that you repeat the column titles for each page. This option should always be used instead of trying to add the column titles manually.

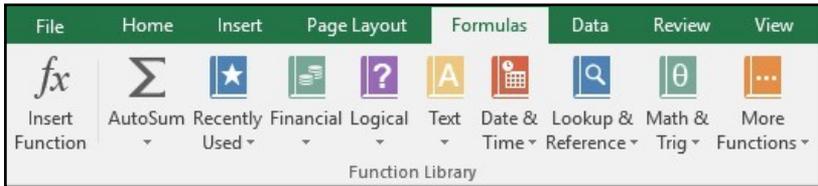
PAGE LAYOUT TAB: SCALE



Adjust the final appearance of a spreadsheet by editing its Page Layout. You may choose to change the width/height or by scaling the information to save paper or to provide better readability. Width/height settings and scale settings are mutually exclusive.

- **Width** – Determine how many columns will fit on a predetermined number of pages. For example, a width of 1 page places all columns across one page.
- **Height** – Determine how many rows will fit on the predetermined number of pages. For example, a height of 1 page places all rows on one page.
- **Scale** – Reduce the size of the cell contents by a percentage. Pages usually print at 100%. Scaled pages can become unreadable if you select too small of a number.

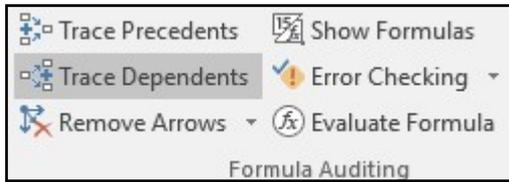
FORMULAS TAB: LIBRARY



The **Formulas** tab displays the most commonly used buttons and categories of functions.

- **Insert Function** – Opens the Insert Function Wizard.
- **AutoSum** – Same as the AutoSum button on the Home tab.
- **Recently Used** – A list of functions you have used recently.
- **Financial** – Financial functions used in accounting.
- **Logical** – Answers to these functions tend to be True or False.
- **Text** – Used to clean up and edit text in cells.
- **Date & Time** – Use dates and times to calculate payroll and similar reports.
- **Lookup & Reference** – Advanced formulas for working with large amounts of data.
- **Math & Trig** – Used in math equations.

FORMULAS TAB: AUDITING



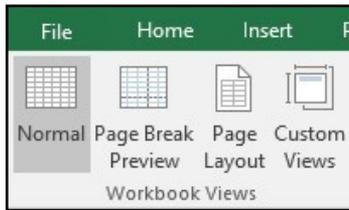
The buttons on the left of this ribbon group can be helpful, no matter your experience level! The buttons on the right are for more advanced users.

To use the “trace” buttons, select a cell, then click one of the buttons.

A circle shows the first cell in a range, while the arrowhead points to the cell with the formula that uses the values in that range. A blue box appears around the entire range of cells included in the formula.

- **Trace Precedents** – Displays the cells that contribute to the formula.
- **Trace Dependents** – Displays the formulas the cell contributes to.
- **Remove Arrows** – Removes precedent, dependent, or all arrows.

VIEW TAB



View your spreadsheet in several ways.

- **Normal View** – The Normal view is the one traditionally used by Excel users. It displays cell contents and formatting, but not a true page layout. It also does not show headers/footers or repeated column/row headings.
- **Page Break Preview** – Used by more advanced users, the Page Break Preview shows where one page ends and another begins. The page breaks can be adjusted by dragging the boundary lines.
- **Page Layout View** – Page Layout shows the entire page as it will appear when printed. Pages, margins, headers/footers, and repeated column/row headings are displayed in this view.

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