



Microsoft 365 For Journalists Excel reference book

Supplement to the Gannett training series

How to use

This is a supplement to the multi-session Excel series offered by the [Microsoft 365 for Journalists](https://aka.ms/Microsoft365ForJournalists) program. Use it to refresh your memory of topics covered in the training or keep it by your side as you watch the session recordings.

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Functions

Functions are tools in Excel that take one or more pieces of data and turn it into another piece of data. The input of a function may be a number, a date, a text string, a cell reference, a cell range, a formula, another function, or multiples of those. There are hundreds of functions available.

You can find a list here: <https://aka.ms/M3654J/ExcelFunctions>.

Here are the functions we covered in the various sessions (and a couple bonus ones). We did not introduce new functions in Session 03.

	Session 1	Session 2	Session 3	Session 4	Session 5	Bonus
<u>SUM</u>	<input checked="" type="checkbox"/>					
<u>PRODUCT</u>						<input checked="" type="checkbox"/>
<u>RANDBETWEEN</u>		<input checked="" type="checkbox"/>				
<u>RANDARRAY</u>					<input checked="" type="checkbox"/>	
<u>UNIQUE</u>					<input checked="" type="checkbox"/>	
<u>COUNTIF</u>					<input checked="" type="checkbox"/>	
<u>COUNTIFS</u>						<input checked="" type="checkbox"/>
<u>SUMIF</u>						<input checked="" type="checkbox"/>
<u>SUMIFS</u>					<input checked="" type="checkbox"/>	
<u>XLOOKUP</u>					<input checked="" type="checkbox"/>	
<u>IF</u>					<input checked="" type="checkbox"/>	
<u>IFS</u>						<input checked="" type="checkbox"/>
<u>DOLLAR</u>					<input checked="" type="checkbox"/>	
<u>MONTH</u>				<input checked="" type="checkbox"/>		
<u>CONCATENATE</u>					<input checked="" type="checkbox"/>	
<u>AVERAGE</u>						<input checked="" type="checkbox"/>
<u>MEDIAN</u>						<input checked="" type="checkbox"/>
<u>MODE.SNGL</u>						<input checked="" type="checkbox"/>

Shortcut Keys

In Excel, like most Microsoft applications, there are a lot of shortcut keys to make navigation and frequent tasks easier. You can find a comprehensive list here: <https://aka.ms/M3654J/ExcelShortcuts>

Here is a list of some of the most useful.

Shortcut Key	Description	Notes
F4	Cycle among relative and absolute cell references	This is the F4 key in the row of function keys. It is not the letter "f" key combined with the number "4" key. On some devices (especially laptops) you may need to use the key combo Fn + F4
CNTRL+E	Flash fill	Use this key combination to tell Excel to fill in a series of cells based on a pattern it can discern from other cells.
CNTRL+T	Turn the dataset into a table	Windows only.
CNTRL+T	Cycle among relative and absolute cell references	Mac only.
CNTRL+ select	Select multiple disconnected cells and/or ranges	Works in most apps
SHIFT+ select	Highlights the range between two selected cells	Works in most apps
CNTRL+A	Select all the data on the sheet	Works in most apps
CNTRL+END	Navigate to the last cell in the worksheet	
CNTRL+HOME	Navigate to the first cell in the worksheet	
CNTRL+ arrow key	Navigate to the edge of the dataset in the direction of the arrow you selected	

Tasks

Here's a description of some of the tasks we covered in the five sessions of the Excel course.

Add a worksheet

An Excel file is called a workbook. Each workbook can have multiple worksheets that appear as tabs along the bottom of the window.

To add another worksheet, go to the bottom of the current worksheet and look for the plus icon. It will be to the right of the individual sheet tabs. Select the plus button to add a new sheet.

For more details, visit [Insert or delete a worksheet \(microsoft.com\)](https://support.microsoft.com/en-us/topic/insert-or-delete-a-worksheet-1693063d-9102-4747-9111-e0120424542d)

Rename a worksheet

You can choose a different name for each worksheet. Doing so will help you know what is on each sheet so you can keep track of your data.

To rename a sheet, find the tab at the bottom of the window with that sheet's current name, right-click on it, and choose **Rename**.

For more details, visit [Insert or delete a worksheet \(microsoft.com\)](https://support.microsoft.com/en-us/topic/insert-or-delete-a-worksheet-1693063d-9102-4747-9111-e0120424542d)

Color code a worksheet

For some people, color coding sheet tabs makes it easier to identify them at a glance. When you assign a distinct color to a sheet name tab, that applies only to that sheet name tab; the color will not bleed into the rest of the document.

To color code a sheet, find the tab at the bottom of the window with that sheet's current name, right-click on it, choose **Tab color**, and then select a color. Select a different tab to see the color you just assigned

For more details, visit [Add a background color to a sheet tab \(microsoft.com\)](https://support.microsoft.com/en-us/topic/add-a-background-color-to-a-sheet-tab-1693063d-9102-4747-9111-e0120424542d)

Add two numbers

To perform math in Excel, you start the opposite way we usually write math statements. Most of the time when we write out the formula to add 5 and 8, we would write "5 + 8 =" because in the US, we read from left to right.

In Excel, it's the opposite. We start with the **equals** sign. Once we type the equals sign, we are telling Excel, "Get ready. I'm about to ask you to do math, execute a formula, or calculate an instruction." Unlike data we just put in Excel to look at, the equals sign tells Excel to do some work and not to show what we typed once we finish typing. Instead, Excel should show us the result of the task we asked it to do when we began with the equals sign.

To add two numbers, like 5 and 8, together, choose a blank cell and type “=5+8”. Once you hit enter, Excel will show “13” in that cell.

This is the basis of all the fancy stuff Excel can do.

Add two cells

Adding two cells, or rather, adding the values in two cells is a common task. If cell **B2** has a 5 and cell **B3** has an 8, we can add them together.

In cell **B5**, you can type =b2+B3. In **B5**, Excel will show the result of adding those numbers together. It will show “13”.

If later you change the value in cell **B2** to “11”, then Excel will update the value in cell **B5** to “19”.

Basic math

To add cells in Excel, you can use the + character.

To subtract cells in Excel, you can use the – character.

To multiply cells in Excel, you can use the * character.

To divide cells in Excel, you can use the / character.

For more details, visit [Use Excel as your calculator \(microsoft.com\)](https://aka.ms/ExcelCalculator)

Resize a column

Sometimes the data doesn’t fit in a column in Excel. Fortunately, you can resize one or multiple columns. There are several ways to do this.

The simplest way is to select the column label in the column that’s the wrong size. So, if column B is too narrow, select the B that labels the column. Next, move your pointer to the boundary between that column and the one to the right. Your cursor will change to a vertical bar with arrows extending right and left. That tells you you’re in the right place. Then, double-click on that space. Excel will resize the column.

For more details, visit [Change the column width or row height in Excel \(microsoft.com\)](https://aka.ms/ExcelResize)

Resize all columns

You don’t have to resize columns one at a time. You can do them all at once.

Select a cell anywhere in the sheet. Then use the shortcut **CNTRL+A** which will select all the data. Next, go to the boundary between any two columns at the top of the worksheet and double-click on that boundary.

For more details, visit [Change the column width or row height in Excel \(microsoft.com\)](https://aka.ms/ExcelResize)

Change to currency

You can tell Excel how to display data in your documents by telling Excel more about your data. You could put some numbers in a cell and just have Excel guess about what those numbers are, or you can refine it. You can tell Excel if those numbers are a date or currency, for example. Maybe they're scientific notation. Or a percentage.

To change a cell to a currency format, select the cell. Then go to the **Home** tab at the top of the screen. In the **Number** group, you'll see a drop-down menu that says **General**. Select the drop down and choose **Currency**. Now you should see it in dollars, if you have your localization settings set for the US.

If you want to see pennies, too, then you're done. If you're dealing with large amounts and the decimals don't matter, you can make them go away. Look for the button below that drop down menu. It will have a .00 on the top of the button, and below that, you'll see an arrow pointing to the right and a .0. When you hover over that button, the tool tip will say **Decrease decimal**. Select that twice to make first the pennies and then the dimes disappear.

There is also a format called **Accounting**. That's similar to **Currency** but defaults to accounting standards. For example, it will put the currency symbol at the far left of the cell instead of to the immediate left of the number. Try both to see what works best for you.

For more details, visit [Available number formats in Excel \(microsoft.com\)](https://aka.ms/AvailableNumberFormatsInExcel)

Toggle Absolute vs relative references

Cell references are cell names that appear in other cells. For example, if you are in cell B3 and the formula in there is **=A6+A10** then the cell references are **A6** and **A10**.

If you copy the formula in **B3** to cell **B4**, Excel thinks, "Oh, you made a copy of this formula one row down. You must want the formula in the new place to refer to other places that are also one row down."

So now, the formula in **B4** will be **=B6+B10**. If that's what you wanted, great. You're done. You used a relative cell reference and when pasted, Excel updated the references to a new location relative to where you pasted it.

Another way to look at it is that in the original formula, Excel didn't see the cell references as **A6** and **A10**. It understood them relative to the location where the formula lived in **B3**. So, Excel saw the formula as "=(one row up, 3 columns to the right)+(one row up, 7 columns to the right)" and that's what Excel pasted when you copied and pasted the formula to cell B4. Excel grabbed the relative reference.

If you don't want Excel to do that, and instead you want Excel to keep those cell references referring to the original cells when you copy and paste the formula, you need to use an absolute cell reference.

The easy way to do that is to select the cell reference and press the **F4** key to toggle to Absolute mode. When you do that, Excel will change **A6** to **\$A\$6**. Do that for all the cell references you want to be absolute.

You can make the entire cell reference absolute, just the row reference, or just the column reference.

For more details, visit [Switch between relative, absolute, and mixed references \(microsoft.com\)](https://support.office.com/en-us/article/switch-between-relative-absolute-and-mixed-references)

Insert as a table

During the training sessions, we frequently converted a data set into a table. When you convert a data set to a table, you get a few advantages. Excel formats the table to make it easier to read. It adds filter options at the top of the columns. When you add another row or column, Excel will expand the formatting. If you add a formula, Excel will copy it to the other rows.

To make a data set into a table, select a cell within the data set, go to the Insert tab at the top of the window, and choose **Table**.

Excel will ask you to confirm the range of the table, which is defined as the upper left cell by the lower right cell in the data set. You can adjust that if Excel guesses wrong (most likely due to blank columns or rows). Excel will also ask you to check a box if your dataset has headers (AKA labels) for the columns in your data.

For more details, visit [Overview of Excel tables \(microsoft.com\)](https://support.office.com/en-us/article/overview-of-excel-tables)

Sort in a table

To sort data within a table, select the drop-down menu in the header label for the column you want to sort by. Excel will know you want to sort all the rows together, so it doesn't break your dataset. From there, you can sort ascending/descending, oldest/newest, A-Z, etc. based on the type of data in those columns.

Filter in a table

Filtering hides rows within a table without deleting them.

To filter within a table, select the drop-down menu in the header label for the column you want to filter by. Then clear the check mark from the item you want to hide. Or, if you only want to see one or two of the items in the list, remove the check mark from the "Select all" box and then just select the ones you want to see.

For more details, visit [Filter data in a range or table \(microsoft.com\)](https://support.office.com/en-us/article/filter-data-in-a-range-or-table)

Insert a PivotTable

To insert a PivotTable, select a cell within the data set, go to the **Insert** tab at the top of the window, and choose **PivotTable**. Confirm the table, data set, or range of cells you want to be used for your PivotTable, and then choose whether you want your PivotTable in the current worksheet or a new worksheet.

For more details, visit [Insert a PivotTable \(microsoft.com\)](https://support.office.com/en-us/article/insert-a-pivottable)

Drag to copy

You don't always have to copy and paste when you want to copy and paste. You can select a cell or a group of cells and drag to copy | paste or extend.

Select the cell, and look at the lower right of the black frame around the cell you selected. You should see a square. That square is the selection handle. Select and drag in a direction to copy the formulas in that cell to the other cells or to tell Excel to repeat the pattern evident from the selected cells.

Use Auto Fill

With Auto Fill, Excel will put data into cells based on a sequential or a repeating pattern. Patterns might include things like:

- 1, 2, 3, 4
- 3, 6, 9, 12
- Monday, Tuesday, Wednesday

To use it, select a cell or cell that have the seed of the sequence, then grab the selection handle. Drag the selection handle in the direction you want Excel to fill.

For more details, visit [Fill data automatically in worksheet cells \(microsoft.com\)](https://support.microsoft.com/en-us/topic/automatic-fill-in-excel-16930032-9102-4747-80e3-000123004273)

Use Flash Fill

Flash Fill lets Excel fill in data based on a pattern it sees in your data. For example, if you have a list of names in column A in First Name Last name format, and you want to convert that to Last Name, First Name in Column B you can use Flash Fill

Select a cell in column B next to one of the names in column A. Type the name from column A in the format you want in column B. Hit enter, and then hit **CNTRL+E**. Excel will identify the pattern and convert the rest of the data in column A.

For more details, visit [Using Flash Fill in Excel \(microsoft.com\)](https://support.microsoft.com/en-us/topic/using-flash-fill-in-excel-16930032-9102-4747-80e3-000123004273)

Enable Data Validation

Data validation lets you restrict the information someone puts in a cell. You can restrict it to text, dates, integers, specific lists, and more. When you choose to restrict a cell to a specific list, Excel creates a drop-down menu for that list in that cell. That's what we did in our training session.

To use data validation, select the cells you want to restrict. Then, go to the **Data** tab at the top of the window. Go to the **Data Tools** group along the tab and look for the button that has a drawing of two boxes, one above the other. On top of the top box, you'll see a green check mark. On top of the bottom box, you'll see a do not enter symbol. It should be labeled **Data Validation**. Select that button.

Find the drop down under "Allow" and choose "List." In the box that says source, type the address or range for where your list appears in the spreadsheet. In our example, we pointed it to an array function with its spill area.

For more details, visit [Apply data validation to cells \(microsoft.com\)](https://aka.ms/ApplyDataValidation)

Apply conditional formatting

Conditional Formatting applies fonts, styles, colors, and fills to cells based on their values or the values of other cells in the workbook.

To apply conditional formatting, select the cell to which it should apply. Next, go to the **Home** tab at the top of the window, go to the **Styles** group, and look for the button that looks like a grid with some red rectangles and a blue rectangle on top of it. It should be labeled **Conditional Formatting**.

Choose the type of formatting you would like to apply.

For more details, visit [Use conditional formatting to highlight information \(microsoft.com\)](https://aka.ms/UseConditionalFormatting)

Manage Conditional formatting rules

You can customize your conditional formatting further, and even apply multiple rules to the same cells.

Select the **Conditional Formatting** button on the **Home** tab, and choose **Manage Rules**.

In the box that opens you'll see a drop-down menu labeled **Show formatting rules for**.

From here, you can look at the rules that apply to the current selection or a specific table or worksheet. Or you can look at the rules for the entire workbook and duplicate, edit, delete, or create as appropriate.

For more details, visit [Use conditional formatting to highlight information \(microsoft.com\)](https://aka.ms/UseConditionalFormatting)

Access Charts

To access charts in Excel, first select the data you want to be part of the chart. Then, go to the **Insert** tab at the top of the window, find the **Charts** group in the middle of the window, and choose **Recommended Charts** or pick a specific type of chart,

For more details, visit [Create a chart from start to finish \(microsoft.com\)](https://aka.ms/CreateChart)

Formulas from Training Session

Over the course of the five sessions, we used a variety of functions and formulas

Session	Formula	What it does
1	=D4+D5	Adds the value of cell D4 to the value of cell D5
1	=SUM(C2,C3,C4,C5,C6,C7,C8)	Adds the value of C2, C3, C4, C5, C6, C7, and C8
1	=SUM(C2:C8)	Adds the value of cells C2 through C8 together. It's a simplified version of the previous formula.
1	=C2*I2	Multiplies the value of C2 and I2
2	=F2/E2	Divides the value of F2 by the value of E2
2	=D2/K2	Divides the value of D2 by the value of K2
2	=L2*C2	Multiplies the value of C2 and L2
3	=RANDBETWEEN(1,2000)	Generates a random integer between 1 and 2,000
4	=MONTH(E2)	Extracts the month of the year from the date in cell E2
5	=COUNTIF(B:B,"Dem")	Counts the number of times the string "Dem" appears in column B.
5	=SUMIFS(C:C,B:B,"REP")	Adds the values in column C if the same line row in column B contains the string "Rep"
5	=DOLLAR(K4,0)	Takes the number in K4 and converts it to dollar currency with zero decimal places.
5	=DOLLAR(SUMIFS(C:C,B:B,"REP"),0)	Adds the values in column c if the same line row in column B contains the string "Rep" and converts it to dollar currency with zero decimal places.

Session	Formula	What it does
5	=If(E2>=270,"Won","Lost")	If the value in E2 is 270 or higher, it returns the string "Won". If it's not 270 or higher, it returns the string "Lost"
5	=IF(E2>=\$L\$8,"Won","Lost")	If the value in E2 is equal to or higher than the value in L8, it returns the string "Won". If it's not 270 or higher, it returns the string "Lost"
5	=XLOOKUP(D2,'Inflation Calculator'!\$A\$2:\$A\$10,'Inflation Calculator'!\$B\$2:\$B\$10)	Looks up the value in D2 in column A on the Inflation Calculator tab. If it finds it, it returns the equivalent value from column B on the Inflation Calculator tab
5	=C2*H2	Multiplies the value in C2 by the value in H2
5	=C2*XLOOKUP(D2,'Inflation Calculator'!\$A\$2:\$A\$10,'Inflation Calculator'!\$B\$2:\$B\$10)	Looks up the value in D2 in column a on the Inflation Calculator tab. If it finds it, it returns the equivalent value from column B on the Inflation Calculator tab and multiplies that by the value in C2
5	=RANDBETWEEN(12,20)	Generates a random integer between 12 and 20
5	=RANDARRAY(5,3,12,20,1)	Generates five rows and three columns of random integers between 12 and 20
5	=UNIQUE(B:B)	Lists all the unique values in column B
5	=UNIQUE(D:D)	Lists all the unique values in column D
5	=K10#	Used in data validation, this pulls in all the data in K10 and its spill area
5	=J10#	Used in data validation, this pulls in all the data in J10 and its spill area

Session	Formula	What it does
5	=CONCATENATE("Candidates from the ",N11," party spent ",DOLLAR(SUMIFS(H:H,B:B,N11,D:D,N10),0)," adjusted for inflation on the ",N10," Presidential Election.")	This takes the party in N11 and the election year in N10 and adds up all the spending amounts in column H where the row matches the party and year. It then converts that number to dollar currency and puts the whole answer into a sentence.

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