

excel formulas

A formula is nothing more than an equation that you write up. In Excel a typical formula might contain cells, constants, and even functions. Here is an example Excel formula that we have labeled for your understanding.

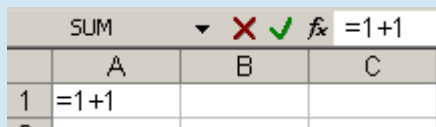
=B3 * 5 / SUM(B4:B7)

- **cell(s)**: B3 and the range of cells from B4:B7
- **constant(s)**: 5
- **function(s)**: SUM()

excel formulas: creating your first formula

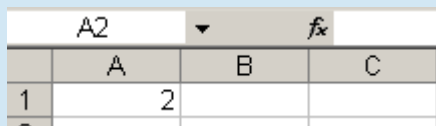
This first formula will be as simple as they come and will teach you the basic form of an Excel formula. Create a new spreadsheet and then follow these steps:

1. Select cell A1
2. Type the following basic arithmetic formula into cell A1: =1+1



	A	B	C
1	=1+1		

3. Press Enter and notice how cell A1 changes from your formula to the result!



	A	B	C
1	2		

This may seem simple, but there are some very important things you should get out of this example. When you start off a cell entry with the equal sign "=" you are telling Excel that you want it to evaluate the following formula.

In our case we had a simple "1+1" we wanted Excel to solve for us. You can do this for addition, subtraction, multiplication, division and any other operation you can think of.

Remember, if you do not start your entry with the equal sign, then Excel will not evaluate the cell!

using cells to create dynamic formulas

The most powerful aspect of Excel is not the simple calculator abilities we described in our first formula example, but rather the ability to take values from cells to be used in your formulas.

Let's set up a basic sales spreadsheet to help explain this topic.

1. In cells A1-D4 enter the following information:

D4		fx Total		
	A	B	C	D
1	Item	Quantity	Price	Revenue
2	Candy	150	0.5	
3	Vegetable	3	0.5	
4				Total

Notice: that cell D2 and D3 are blank, but should contain the amount of money from selling 150 candy items and 3 vegetables. By referencing the Quantity and Price cells we will be able to do this! Let's begin with **Candy**.

- Note:**It is very important to follow these steps exactly without interruptions! Select cell D2, candy's "revenue", and type the equal sign "=" to begin your formula.
- Left-click on cell B2, Candy's Quantity and notice your formula is now "=B2"

SUM		fx =B2		
	A	B	C	D
1	Item	Quantity	Price	Revenue
2	Candy	150	0.5	=B2
3	Vegetable	3	0.5	
4				Total

- We want to multiply Quantity(B2) by Price(B3) so enter an asterisk (*)

SUM		fx =B2*		
	A	B	C	D
1	Item	Quantity	Price	Revenue
2	Candy	150	0.5	=B2*
3	Vegetable	3	0.5	
4				Total

- Now left-click on Candy's Price (C2)to complete your formula!

SUM		fx =B2*C2		
	A	B	C	D
1	Item	Quantity	Price	Revenue
2	Candy	150	0.5	=B2*C2
3	Vegetable	3	0.5	
4				Total

- If your formula looks like ours then press Enter, otherwise you can manually enter the formula "=B2*C2". However, we really think it is easier and preferred to click on cells to reference them, instead of entering that information manually.
- After you pressed Enter your Candy Revenue cell should be functioning properly and contain the value 75.

D3		fx		
	A	B	C	D
1	Item	Quantity	Price	Revenue
2	Candy	150	0.5	75
3	Vegetable	3	0.5	
4				Total

- Using your newly gained knowledge please complete Vegetable's Revenue by repeating steps 2-7 for Vegetable

9. Your spreadsheet should now look like this:

D4		fx Total		
	A	B	C	D
1	Item	Quantity	Price	Revenue
2	Candy	150	0.5	75
3	Vegetable	3	0.5	1.5
4				Total

10. Cheatsheet: If you are having trouble creating the formula for Vegetable's Revenue it is " $=B3*C3$ "

advanced excel formulas: using formulas in formulas

Now that we have created separate revenues for both Candy and Vegetable it would be nice to somehow combine these two values to get the Total Revenue. Although both Vegetable Revenue and Candy Revenue contain formulas, we can still use these cells as we have been doing and add them together to get our total.

1. Select cell D5 (directly below "Total")
2. Type the equal sign "="
3. Left-click cell D2
4. Type the plus sign "+"
5. Left-click cell D3. Cell D5 should now contain this formula " $=D2+D3$ ":

SUM		fx =D2+D3		
	A	B	C	D
1	Item	Quantity	Price	Revenue
2	Candy	150	0.5	75
3	Vegetable	3	0.5	1.5
4				Total
5				$=D2+D3$

6. Press Enter to complete your Total Revenue!

D6		fx		
	A	B	C	D
1	Item	Quantity	Price	Revenue
2	Candy	150	0.5	75
3	Vegetable	3	0.5	1.5
4				Total
5				76.5

excel keyboard shortcuts

When you are first getting used to Excel you will probably be focused on just getting your task done rather than learning how to work more efficiently. However, when you are ready to learn about the Excel keyboard shortcuts this lesson will teach you the most important and useful Excel shortcuts currently available.

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The benefits of using a keyboard shortcut are twofold:

- It is quicker to keep your hand on the keyboard then shift from keyboard to mouse to keyboard
- You will experience less stress on your muscles if you shift your hands less

We have divided the keyboard shortcuts into related areas. This way you can focus on learning a group of shortcuts at a time, rather than all at once!

Shortcut Help: Combination keyboard shortcuts, those that have a plus (i.e. Ctrl + S), require that you hold the first key (Control) then press the second key (S) while still holding down the first key.

excel shortcuts: files

This small group of shortcuts is useful for opening, closing and saving your Excel workbooks.

- **Ctrl+S:** Save your Excel workbook
- **Ctrl+O:** Open an existing Excel workbook
- **Ctrl+N:** Create a new Excel workbook

excel shortcuts: editing

These are common shortcuts you will use to edit your Excel workbook. Our favorite shortcut in this list is, quite obviously, Ctrl+Z.

- **Ctrl+C:** Copy the current selection to the clipboard. After you copy something, you can paste it with the paste shortcut.
- **Ctrl+V:** Paste the current item from the clipboard.
- **Ctrl+X:** Cut the current selection and place it on the clipboard, which can be pasted. The difference between cut and copy is that cut will delete your selection, while copy will not.
- **Ctrl+Z:** Undo your last change. This is can be repeated to remove again and again to undo many changes.
- **Ctrl+Y:** Redo your last Undo. This only is available if you have just issued an Undo command.
- **Backspace:** Deletes the current cell and enters edit mode for that cell. This will only delete one cell and not a selection.
- **Delete:** Deletes the current selection. Use the delete key when you want to delete more than one cell at a time.

excel shortcuts: getting around

These shortcuts will help you move around your Excel workbooks and worksheets with great ease!

- **Page Up**: Move one page up in your worksheet
- **Page Down**: Move one page down in your worksheet. **Note**: The number of rows moved in both page up and page down depend on how many rows are currently displayed. The more rows you have displayed the greater amount the row jump will be when you do a page up/down.
- **Ctrl+Home**: Move to the beginning of your worksheet
- **Ctrl+End**: Move to the end of your worksheet

- **Tab**: Move right one column
- **Shift+Tab**: Move left one column

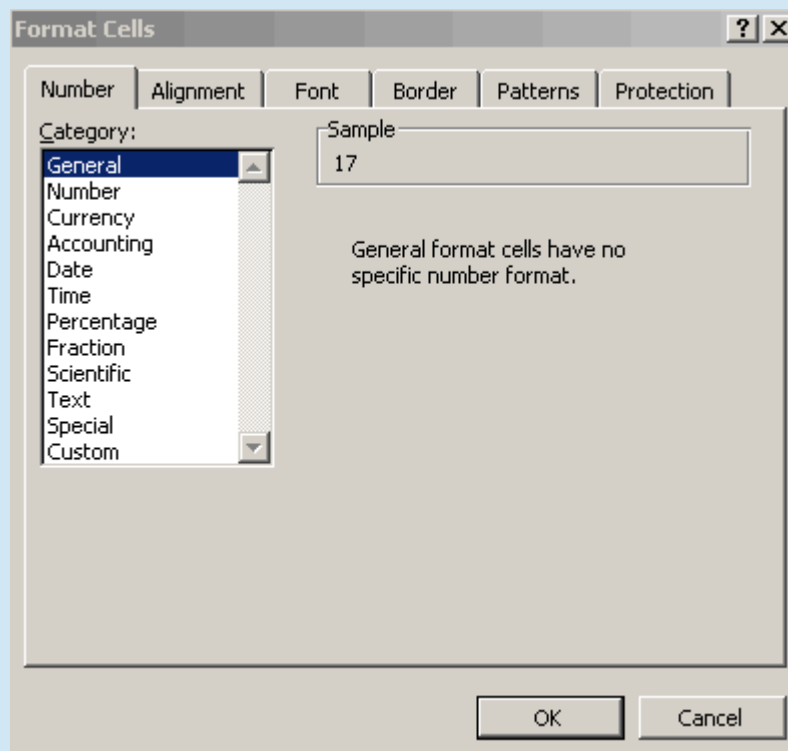
- **Ctrl+Page Up**: Go back one worksheet
- **Ctrl+Page Down**: Go forward one worksheet. **Note**: If you are not using multiple worksheets in your workbook you will probably not use this shortcut!

excel shortcuts: formatting

These shortcuts will help you quickly format your data.

- **Ctrl+B**: Toggles bold on and off for your selection
- **Ctrl+I**: Toggles italic on and off for your selection
- **Ctrl+U**: Toggles underline on and off for your selection

- **Ctrl+1**: Opens up the Format Cell popup



excel shortcuts: menu

These shortcuts allow you to active the various options on the menu bar without have to mouse-click them. **Note:** These shortcuts use Alt as their combination key.

- **Alt+F:** Accesses the File menu
- **Alt+E:** Accesses the Edit menu
- **Alt+V:** Accesses the View menu
- **Alt+I:** Accesses the Insert menu
- **Alt+T:** Accesses the Tools menu
- **Alt+D:** Accesses the Data menu
- **Alt+W:** Accesses the Window menu
- **Alt+H:** Accesses the Help menu

After you have used one of these shortcuts you can use the arrow keys to navigate the menu choices and use the Enter key to select a choice.

excel shortcuts: selecting

These shortcuts help you to quickly select items in your Excel file in various ways.

- **Shift+Spacebar:** Select the current Row
- **Ctrl+Spacebar:** Select the current column
- **Ctrl+A:** Select All, will select everything on the current worksheet. This is most often used in conjunction with the copy shortcut.

excel shortcuts: miscellaneous

And the two black sheep of the shortcut essentials:

- **F1:** Opens up the quick help feature
- **Ctrl+P:** Print your worksheet

excel sort

Sorting in Excel lets you easily reorder your data based on the type of sorting that you choose. This lesson will show you how to do a normal and reverse alphabetical sort, as well as descending numerical ordering.

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raw unordered data

Imagine that you were teaching an English class and just collected the homework assignment for that day. The papers are in no special order, but you know that Excel can sort it all out for you anyways. You plough through the jumble of papers and enter the data into Excel, ending up with something that looks like...

	A	B
1	Name	Score
2	Jimmy	66
3	Bradley	100
4	Charlie	17
5	Susy	38
6	Timmy	24
7	Freddie	73
8	Billy	87
9	Tammy	99
10	Bobby	58
11		

With the data entered you are now ready to begin sorting in Excel.

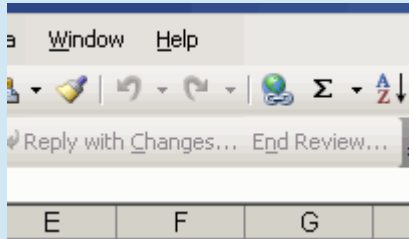
excel sorting: alphabetical order (ascending)

The most common type of sorting, and one that is applicable to our situation, is alphabetical ordering. This kind of ordering places the cells that start with the early letters of the alphabet (a, b, c...) at the top and the later letters (t, u, v...) at the bottom of the list.

1. First we need to select all the data so we can begin to sort it. Because each name has a corresponding score we need to select both columns to preserve the students' correct scores.
2. Left-click and hold on cell A1 then drag down-right to cell B10 to highlight all the data for sorting! Your spreadsheet should look like this:

	A	B
1	Name	Score
2	Jimmy	66
3	Bradley	100
4	Charlie	17
5	Susy	38
6	Timmy	24
7	Freddie	73
8	Billy	87
9	Tammy	99
10	Bobby	58

3. Left-click the "sort ascending" button, located near the top, on the shortcut bar (it has a blue A on top and a red Z on bottom with a downward pointing arrow).



4. Your spreadsheet should now be sorted.

	A	B
1	Name	Score
2	Billy	87
3	Bobby	58
4	Bradley	100
5	Charlie	17
6	Freddie	73
7	Jimmy	66
8	Susy	38
9	Tammy	99
10	Timmy	24

Notice that your column titles (Name and Score) have not been included for sorting because Excel is smart enough to know that you do not want these special cells (A1 and B1) included.

reverse alphabetical order (descending)

The steps for reverse alphabetical order are the same as above, except that you need to click the "sort descending" button instead.

1. Select the data you wish to sort (left-click in cell A1 and drag down-right to B10)

	A	B
1	Name	Score
2	Billy	87
3	Bobby	58
4	Bradley	100
5	Charlie	17
6	Freddie	73
7	Jimmy	66
8	Susy	38
9	Tammy	99
10	Timmy	24

2. Left-click the "sort descending" button, located near the top, on the shortcut bar (it has a red Z on top and a blue A on bottom downward pointing arrow).



3. Your spreadsheet should now be sorted in reverse alphabetical order.

	A	B
1	Name	Score
2	Timmy	24
3	Tammy	99
4	Susy	38
5	Jimmy	66
6	Freddie	73
7	Charlie	17
8	Bradley	100
9	Bobby	58
10	Billy	87
11		

numerical ordering

If you wanted to instead sort the homework assignments by highest to lowest score you would follow these steps to use Excel's numeric sorting. The only difference between this example and our previous examples is which column you start your selection from, so **pay close attention to the first step!**

1. Left-click cell **B1** and drag down-left to cell **A10**

	A	B
1	Name	Score
2	Billy	87
3	Bobby	58
4	Bradley	100
5	Charlie	17
6	Freddie	73
7	Jimmy	66
8	Susy	38
9	Tammy	99
10	Timmy	24
11		

2. Left-click the "sort descending" button, located near the top, on the shortcut bar (it has a red Z on top and a blue A on bottom with a downward pointing arrow).



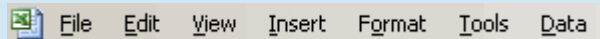
3. Your Excel data should now look like:

	A	B
1	Name	Score
2	Bradley	100
3	Tammy	99
4	Billy	87
5	Freddie	73
6	Jimmy	66
7	Bobby	58
8	Susy	38
9	Timmy	24
10	Charlie	17
11		

Congratulations, you now know how to sort columns of both numbers and words in Excel!

generic formatting in excel

Sometimes you don't have the data set up nice and orderly like our above examples, which might make using Excel's quick sort buttons to fall flat on their face when attempting to sort your data. If you would like to access Excel's manual, and much more powerful, sorting option simply select "Data < Sort..." from the menu bar.



Note: Be sure that you select your data before going to the manual sorting feature. This will let Excel know which data you want to sort.

excel - if statement

An If Statement is used in Excel to do certain actions only if something is true. For example, you might want to print out the message "We are losing money" **if** total sales for the quarter are below some amount. Otherwise, you'd just want to print out "We're making money!"

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The *IF function* lets you do these kinds of value based decisions. This lesson will show you a couple basic examples of how you can make use of the *IF function*.

excel - if function

The *IF function* needs to have some sort of comparison to operate properly. A very common type of comparison is greater/less than (>/<). These math symbols can be used to form logical expressions like "A2 < 40000", which in English means "Cell A2 is less than 40000".

Now that logical expression can be either *true* or *false* and the *IF function* lets you do something for each result. In this little example we will be making our IF function print out something our boss might say.

Your excel spreadsheet should look like this:

	A	B	C	D
1	Sales		Boss Says	
2	30,000			

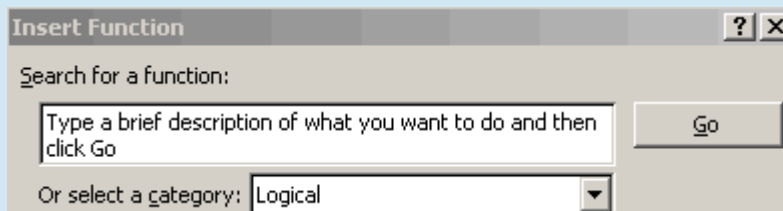
excel - if function's 3 parts

The IF function has three parts:

1. The comparison you will be doing. We are using A2 < 40000
2. What to do if the If statement is true
3. What to do if the If statement is false

If all that information is confusing to you, don't worry, Excel has a built in wizard to help you make your own If functions.

1. Go to the Insert menu and choose Function
2. Select the Logical functions from the drop down selector



3. Choose the IF function and click OK

4.

Function Arguments

IF

Logical_test = logical

Value_if_true = any

Value_if_false = any

5. Put "A2<40000" as the logical expression
6. Put "We are losing money?" as the true value
7. Put "We are making money!" as the false value

Function Arguments

IF

Logical_test = TRUE

Value_if_true = "We are losing money?"

Value_if_false = "We are making money!"

8. Press OK

Because our sales were only \$30,000 the if statement should be printing out "We are losing money?"

	A	B	C	D
1	Sales		Boss Says	
2	30,000		We are losing money?	

This isn't good at all, we're going to get fired!

make some accounting adjustments

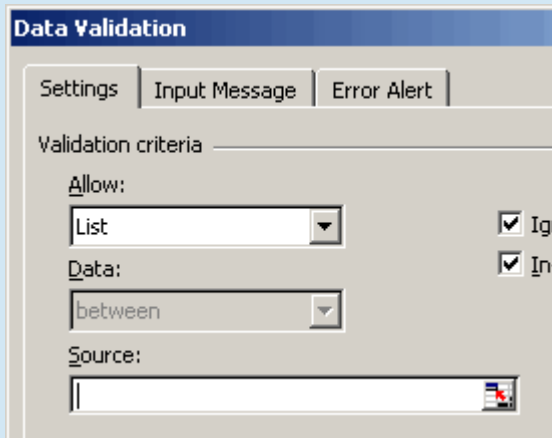
Let's make some small accounting changes and up that sales figure to \$50,000 and see what the IF function prints out.

	A	B	C	D
1	Sales		Boss Says	
2	50,000		We are making money!	

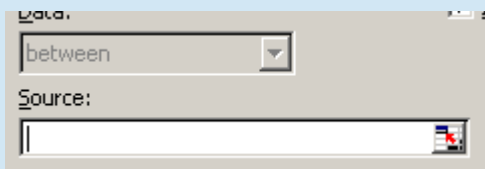
Ah that is much better, now we're making money!

Notice that when the value of A2 was \$30,000 it was less than \$40,000 and our IF function was set to print out "We are losing money?" when A2 was less than 40,000. However, when we changed the value of A2 to \$50,000 the IF statement was now false and it printed out "We are making money!"

2. Click the Data menu and select Validation
3. Choose **List** from the Allow drop down menu



4. Click the **Source** button that appears to the right of the textfield



5. Select our **source** cells A1 though A7

	Food	Type
Meat		
Vegetable		
Fruit		
Bread		
Poultry		
Spice		
Other		

6. Press Enter and Click OK

testing your drop down

All of your cells in the **Type** column should now have a drop down list. To test to see if your drop down works, click on cell D2 and then click on the downward facing arrow and see if all the types of food are available.

	C	D
Food		Type

excel linking

At times you may want to use information that exists in a different Excel file. This use of external information is referred to as "linking" in Excel. This lesson will show you the basics of creating workbook links in Excel.

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creating two files

This example will require that you create two files *link1.xls* and *link2.xls*. Let's start with creating *link1.xls*.

	A	B	C
1	This workbook		
2			

This is a very simple file and only contains the text "this workbook" in cell A1. Save this file as *link1.xls*.

Now let's make *link2.xls*.

	A	B	C
1			has a link
2			

This worksheet only has one data entry in C1 with the value "has a link". Save this file as *link2.xls* in the **same** directory as *link1.xls*.

excel linking: the reference

As you can probably tell, we are going to link to the information in our second file so that our first file has the line "this workbook has a link". The actual link reference is quite complicated looking, so please take your time to understand each component of the Excel Link.

There are three major parts that a link must have to be valid:

1. **Workbook:** This is the filename of your Excel document.
2. **Worksheet:** This is the worksheet name of your Excel sheet. The default name would be *Sheet1*.
3. **Cells:** The cell(s) which are going to be linked to.

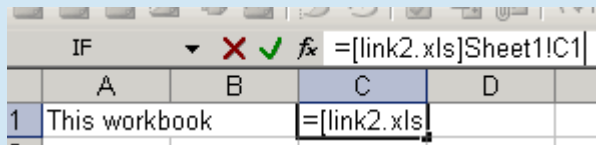
These three parts combine to make a pretty ugly looking blob of text. Using the general terms from above, this is how a generic link would look.

- =[Workbook.xls]Worksheet!Cells

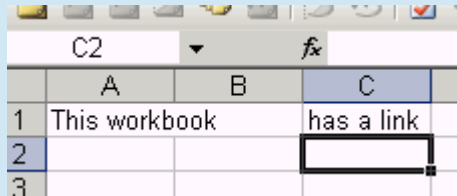
For our example, the Workbook is *link2.xls*, the Worksheet is *Sheet1* and the cell is *C1*. Our link would then be:

1. =[link2.xls]Sheet1!C1

2. Enter this link into cell C1 of *link1.xls* and hit Return.



3. Your *link1.xls* file should now properly link to your second file to display "this workbook has a link".



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