

Spread sheets are a great way to display information. To be useful, they need to be clearly formatted and labeled. And to be truly useful, they should be interactive rather than static. What does that mean? Suppose your boss has asked you to put together a table displaying the cost to manufacture sunglasses where there is a fixed cost of \$100 and a variable cost of \$0.50 per item. Algebraically this would be $C = .5n + 100$, where n is the number of items manufactured. Your boss would like the table to run from $n = 0$ items to $n = 1000$ items. If you were to make such a table by hand it would be long and tedious project, fortunately with a computer such a table can be made in a few seconds. Let's go over some tricks to not only make a table quickly, but also to make a table where we could easily change the parameters of the equation, the values for the fixed cost of \$100 and the variable cost of \$0.50 and have our table update immediately—that is what makes a table interactive rather than static.

First let's go over a few more things in Excel.

Formulas

Numbers can be typed into Excel, but much more frequently we enter formulas. All formulas must begin with “=”.

Formulas may be made with numbers and arithmetic operators: $=3*(1+.05)^3$. Note, Excel does not accept implied multiplication the way your calculator does, the $*$ is required.

Formulas can also include built in function in Excel: $=SUM(2,4,16,-9)$ would add together the values 2, 4, 16 and -9.

In addition, formulas can include cell references to other values in the worksheet or workbook. These cell references are made using the column and row address of the cell: $=0.5*B4 + 100$. This formula would multiply whatever value that is in cell B\$ by 0.5 and add 100 to it, and the numerical result will be displayed in cell where we typed the formula.

Again, you can see that this topic will best be covered with a video, and that is coming up next. Let's summarize some of the topics you will see:

Fill-Drag Handle: If you look at your cursor while letting it drift over a spread sheet, you may notice that it will change shapes. Generally while going over the cells it is a white plus, and it will change to a white arrow when going over the tool icons at the top of the page. Now click on a cell, and let it float around the edges of the active cell, and you should see two other versions of the plus symbol. When the cursor is in the lower right hand corner of the cell, it should change to a black plus symbol (not the version with the arrow ends!) That plain black plus is called a fill-drag handle, and it will allow us to quickly copy contents of one cell into other cells by first selecting the cells, and then double-click to copy them.

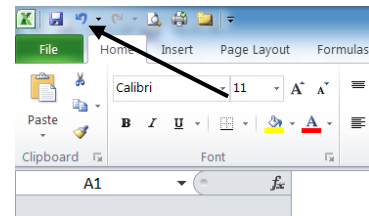
Relative vs. Absolute Addresses: If you use the fill-drag handle to copy a formula that contains a cell reference, the cell reference will change relative to the direction the formula is being dragged. If we have a formula $=0.5*B4 + 100$ in a cell, and we drag that formula down a column, the cell reference B4 will update to B5, then B6, then B7, etc. The original cell reference, B4, is what is called a **relative**

address as it changes relative to each row as it is copied down. If we were to drag the formula sideways across a row the B4 would change to C4, D4, etc.

Now, what if we want to copy a formula but want the cell reference to stay fixed? If we want the B4 in our formula to continue to refer to the cell B4 when it is dragged? We would want to make the B4 be an **absolute address**. We would need to modify the formula: $=0.5*B4 + 100$ to look like this: $=0.5*\$B\$4 + 100$. We can either type in the \$ signs by hand, or the shortcut is to type the B4, click on it, and then press the F4 function key at the top of your keyboard.

Don't panic if that did not make sense, watch the video, practice in Excel, then go back and re-read this page.

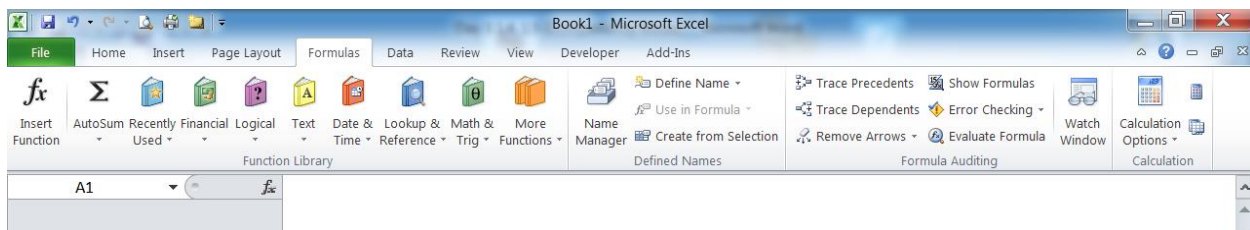
Remember; do not be shy about experimenting. You can try something and then undo it and try again. You can "undo" using the Ctrl-z combination or the undo button at the upper left edge of the tool bar.



Another time saver is the combination of "shift-click" and "Fill Down". If you need to copy a formula down hundreds of cells, dragging with the fill-drag handle can be frustrating. Instead, you can use a split screen to display the cell you wish to copy, and the last cell you wish to copy down to. Then you can select the cell you wish to copy by clicking on it, hold down the "Shift" key and click on the cell you want to copy down to. That selects the column of cells, and you can then either use the short cut: Ctrl-d to copy down, or select the fill down tool under the editing category on the Home tab. Also, Ctrl-r is the shortcut to copy to the right.

Displaying Formulas: When we type a formula into a cell, Excel will default to displaying the numerical result rather than the formula. We can click on the cell to see the formula but sometimes we want to display all of the formulas on a spreadsheet. To do, that use the Ctrl-~ combination to toggle back and forth between displaying numbers and displaying formulas.

Excel has many built in formulas under the Formula Tab:



They are grouped under different categories to search in, but if you think you know the function and start typing it into a function, Excel will pop up with suggestions you can pick from.

Some formulas to get familiar with right away are: SUM, ROUND, MAX and MIN. As you can see, Excel will give you “cheat notes” on how to enter the information needed for a function.

=SUM(will sum (add up) a series of numbers. These numbers may be typed in, but more frequently it will be a list of cell references. The list of values can be separated with commas, but we will often use a short cut to sum up a list of cells by listing the first and last cell, separated with a colon.

For example: =SUM(B1, B4) will add the values in cell B1 and B4 while =SUM(B1:B4) will add the values in cells B1, B2, B3 and B4

=ROUND(will round the value in a cell to a specified number of decimal places. This function requires to pieces of information, what number, formula, cell or combination of those to round, and then how many decimal places to round to. **Rounding** to a specified number of digits is different from **displaying** a specific number of digits. In cell A1 below, the value 24.15 is rounded to 24.2 so when it is multiplied by 100 the result is 2420. In cell A2, the display has been set to display only one decimal place, but the actual value in the cell is still 24.15. When cell A2 is multiplied by 100 the result is 2415.

	A	B
1	=ROUND(24.15,1)	=A1*100
2	24.15	=A2*100
3		

	A	B	C	D	E
1	24.2	2420			
2	24.2	2415			
3					

=MIN(and =MAX(Will locate and display the minimum (or maximum) value in a list of values. As with the SUM formula the list of values can be separated by either commas or colons, or a combination of commas and colons, to define the list of values.

=MIN(B2, B4:B6) will return the smallest value in the cells B2, B4, B5, and B6.

Function can also be nested within functions. =MIN(50, SUM(B2:B12)) will add the values in B2 through B12, and compare the result to 50. Whichever is smaller, 50 or the sum, will be displayed.

