

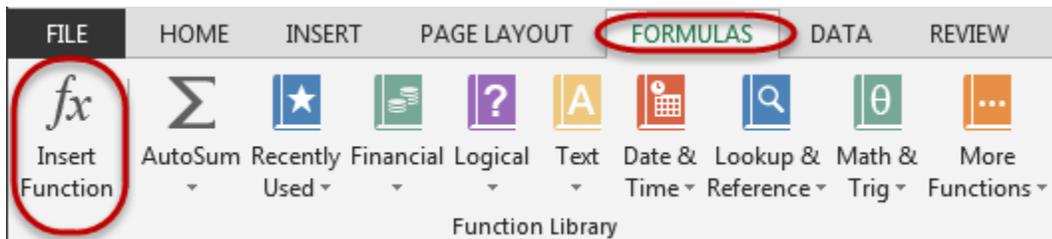
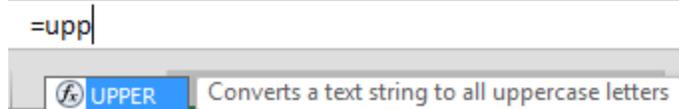
Excel 2013 Functions

What is a function

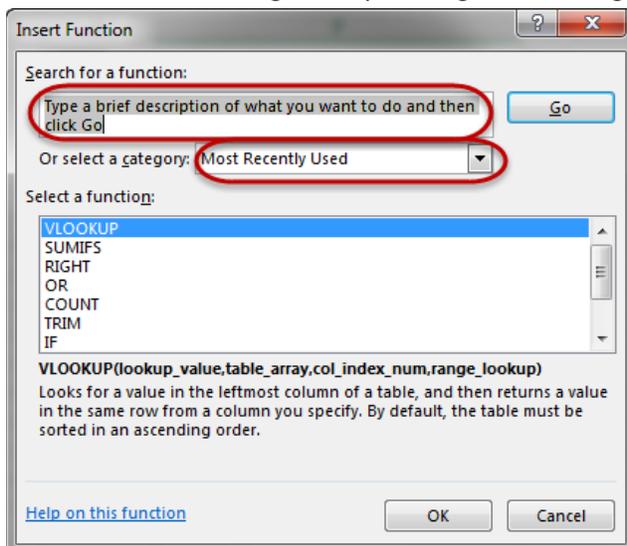
A function is a preset formula in Excel. All functions begin with an equal sign (=) followed by the function's name and its arguments. The arguments are contained inside round brackets.

Functions can be entered into Excel by typing directly into a cell, typing into the formula bar, or by navigating to the Formulas bar.

If you are entering a function into a cell or the formula, you must start the function with the = sign. As you start typing the name of the function, Excel will give you options based on what you are typing. If you navigate your mouse over the functions listed, you will see what that function will do for you. To choose a function from the list, either use your arrows to highlight the function and hit the tab key, or double click on the function.

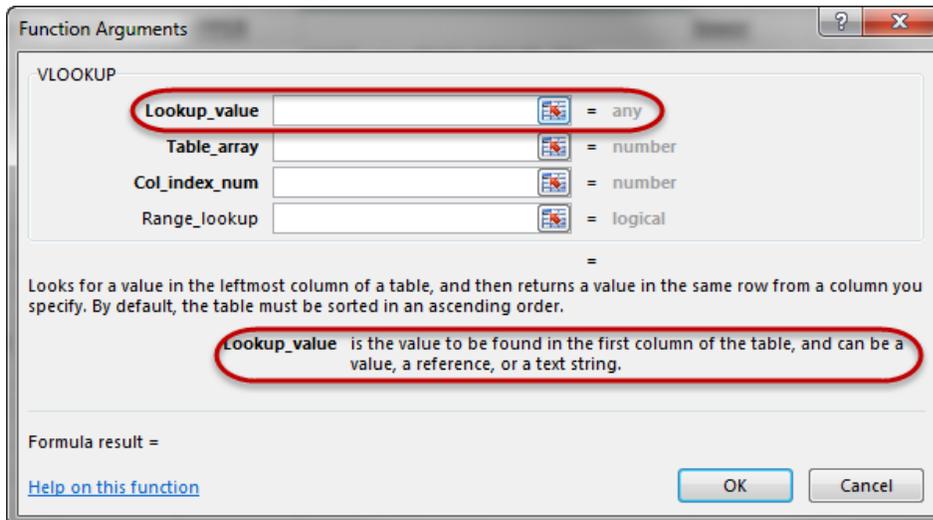


On the Formulas bar, functions are separated into different categories. If you are looking for a Text function, click on the Text icon. If you aren't sure which function you want to use, click on the Insert Function icon, this will allow you to search for a function based on what you would like it to do. You can also see all of the categories by clicking on the category dropdown.



When using the Insert Function icon, after you choose your function, Excel will step you through the arguments of the function within a window, versus in a cell or in the formula bar. As you click into each text box, you will see a description of what each argument is looking for.

Here is the VLOOKUP function as an example.



Using Functions to Format Text

In Excel, you can use a function to format text in a cell and copy the result to a range of cells. In this example, we will use text formatting functions to Upper, Lower, Proper, and Trim.

The syntax for these functions is very similar: It is the function name followed by (text). Where (text) is the text you want to convert. It can refer to a cell or a string of text.

Functions we will use:

- **=Upper(text):** changed all characters into Upper Case
- **=Proper(text):** Changed the first letter in a string of characters to Upper, while the remaining will be lower case
- **=Lower(text):** changes all characters into Lower Case
- **=Trim(text):** removes all extra characters from a string of text. Except for a single space between words

Steps to Convert Text:

1. Position the cursor in the cell to hold the formula
2. Start typing in the function =Upper. Either double click on the function name, or tab to enter into the function.
3. Click on the cell containing the text you want to convert,
4. Click Enter

Tip: Use auto fill to copy the formula to other cells

Using the Substitute Function

You can use the substitute function when you want to replace one character or set of characters with another set.

The Syntax for Substitute

=Substitute(text, old_text), new_text, instance_num)

- **Text:** The text that you want to make the substitution in
- **Old_text:** The letter(s) that you are replacing. The letter must be in quotes. Ex. "a"
 - **Note:** These are case sensitive
- **New_text:** The new text that will be displayed
- **Instance_num:** The instance of the old_text within a string. Is it the first instance of the letter "a", is in the 3rd instance of the letter "a"?
 - **Note:** The default instance number is 1. If it is the 1st instance of a specific letter, you may leave instance_num blank.

Steps to Convert Text

1. Position the cursor in the cell to hold the formula
2. Type the formula:
3. The text in the cell is: Mcmarshall, we need the text to read McMarshall
4. The formula should read. =SUBSTITUTE(F6,"m","M",1)
 - a. We are looking in cell F6 for a lower case m. We want to replace that lower case m with an upper case M on the first occurrence of that lower case m.
5. The result of the formula should replace the lower case m to an upper case M resulting in McMarshall.

Another Example:

If the text should read "MacArthur" and it is displayed as Macarthur, then the formula would be:

```
=SUBSTITUTE(C7,"a","A",2)
```

The instance is set to "2" meaning, ignore the first letter "a" and substitute the second "a" you see in the string of text.

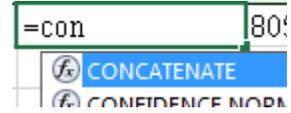
Concatenate

Concatenation will join multiple strings of text into one. Let's say that City and State are set up in two different columns. Our goal is to display the City and State together, in one cell.

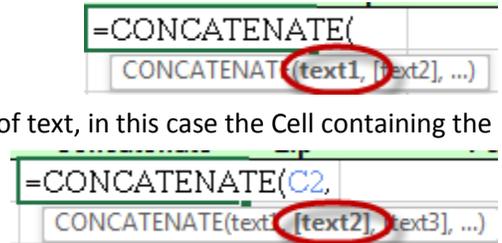
The Formula for Concatenate is =CONCATENATE(Text1, Text2, Text3, etc...)

Note: You are able to put any text within the Text areas, but anything other than text from a cell, or a number, that you want to appear in the Text1, Text2, etc. must be in Quotes. =Concatenate(A2," ",B2)

Position the cursor in the cell that will hold the data. Type the following: =con
 As you start typing, the formula smart tag will appear providing options to choose from. When Concatenate is highlighted, press tab, or double click on concatenate. Excel is now looking for the cell addresses that should be concatenated.



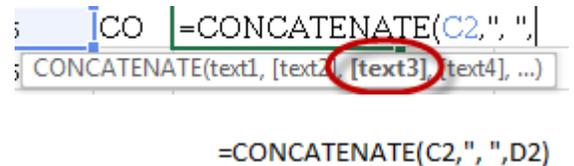
With your mouse, click on the cell that contains the first piece of text, in this case the Cell containing the City, when you have the city, hit the comma key, the formula is now asking for text2



For text2, we are looking for a comma and a space to separate the city and the state. We are unable to get this from the spreadsheet, so we will have to type this into the text2 location.

Remember, anything other text contained within a cell, or a number, must be typed inside of double quotes. For the text2 location type in ", " and then hit your comma key. The reason the comma within the quotes doesn't move us to text3 is because it is within quotes. If we didn't have quotes, we would have moved onto text3.

Now the formula is looking for text3. With your mouse, click on the cell containing the State. Since this is the last piece, we can hit the enter key to finish our formula. The resulting Formula should look like this;

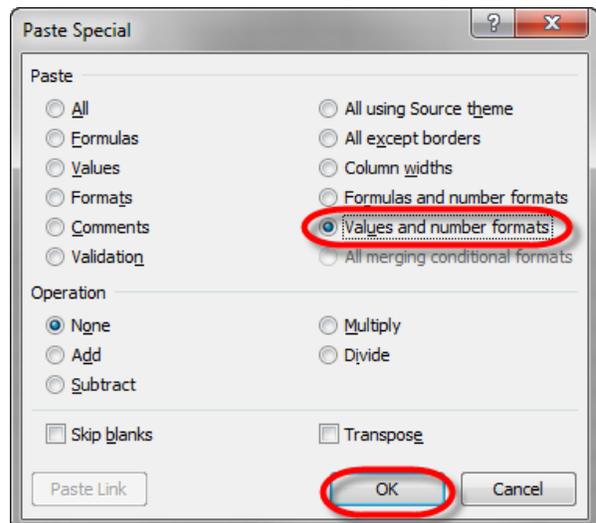
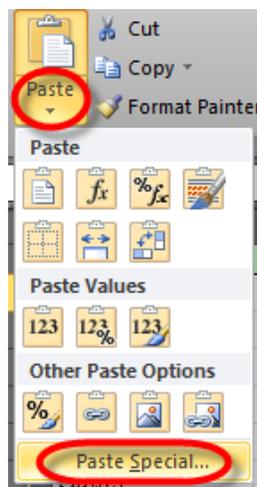


Copying and Pasting cells with Formulas

When copying and pasting cells that contain a formula, Excel makes the assumption that you are wanting to copy the formula, and not the end result. To paste the end result of a formula into a new location, you will have to use the Paste Special option.

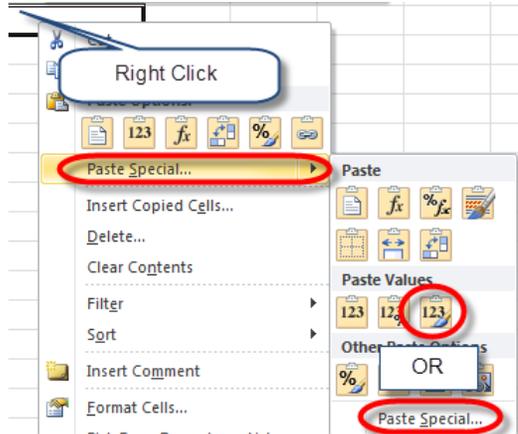
To do this, copy the cells that contain the formula which you want to paste in a new location. Make the selection of the cells, and then use the keystroke Ctrl-C.

Navigate to the new location, and either go to the Paste dropdown icon in the ribbon and select Paste Special. On the Paste Special Window, select the Values and number formats radio button, and then click OK.



You may also perform this Paste by copying the data, right click in the location where you want to paste the data, and then select Paste Special. You can use one of the Paste Special icons under Paste Values to paste your values in the new location. With live preview, when you highlight over the icons, excel will display how the data will be displayed.

You may also select Paste Special on the bottom and pick your selection from the Paste Special Window.



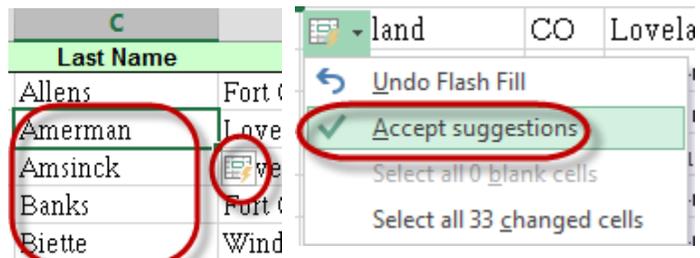
Flash Fill

New to Office 2013 is a feature called Flash fill. Flash fill will help you fill in empty cells within a spreadsheet based on patterns that already exist. You may need to provide a couple of examples before Excel picks up on the pattern of what you are doing, but it typically works really well and will save you a lot of time. In order for Flash Fill to work, you must stay within the same column, so you must hit Enter (or the down arrow) after you start typing your data to go to the cell below. If you hit Tab or navigate into another row, Flash Fill will not work. Flash fill is turned on by default and there isn't any formula to remember, all you have to do is start typing.

Flash fill can also be used to separate words from a single column into two separate columns. If you have a First and Last name in the same column and you want them in two separate columns, go to the first blank cell and start typing the first name, hit enter and start typing the second first name. Flash Fill doesn't always pick up on the pattern, so you may need to go to a third row in some instances. When flash fill picks up the pattern, you will see a preview of the remaining cells contents. If this is correct, hit Enter to fill in the remaining cells.

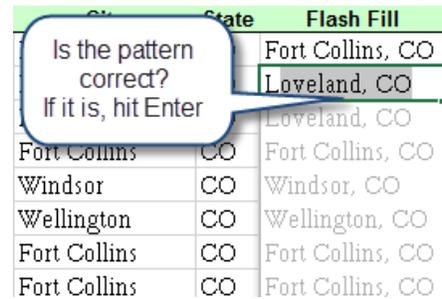
Name	First Name
Peter Allens	Peter
Cindy Amerman	Cindy
Danielle Amsinck	Danielle
Colin Banks	Colin
Peter Biette	Peter
Ann Boucher	Ann
Hans Careff	Hans

Excel will fill in the remaining cells based on what it believes is the best pattern. Depending on the type of data, this could be accurate and be what you are looking for. When you use Flash Fill this way, you will have a Flash Fill options icon that appears to the right of the active cell. Click on this icon and either Accept the Flash fill or undo the Flash Fill.



Combining Columns using Flash Fill

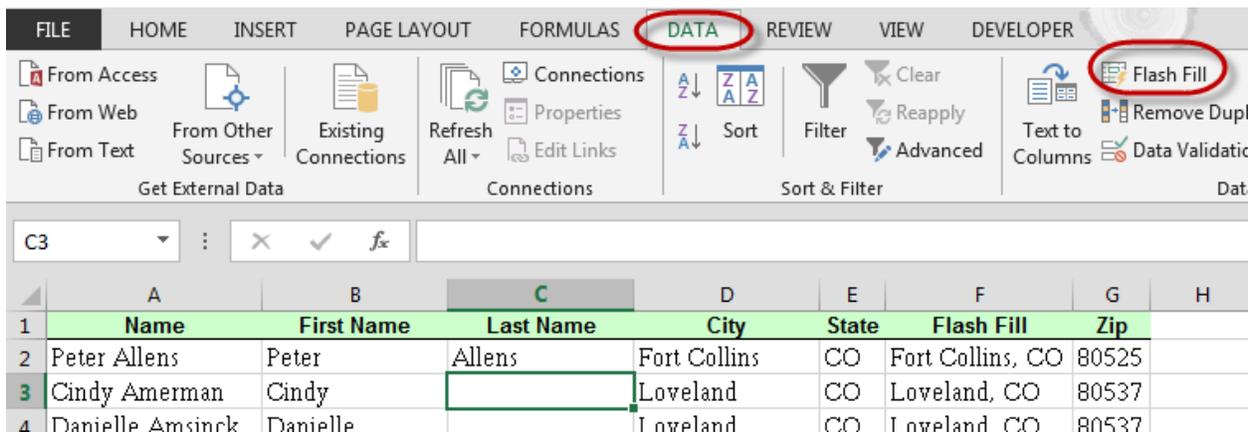
In the first empty cell, let's combine the city and the state into a single cell. Hit Enter when you have finished. Now in the second empty cell, start typing the city name, and Excel will see that pattern you are trying to duplicate. Flash fill will give you a preview of what will happen to each corresponding cell. If the pattern looks correct, hit the Enter or tab key and the column is filled in for you.



City	State	Flash Fill
		Fort Collins, CO
		Loveland, CO
Fort Collins	CO	Fort Collins, CO
Windsor	CO	Windsor, CO
Wellington	CO	Wellington, CO
Fort Collins	CO	Fort Collins, CO
Fort Collins	CO	Fort Collins, CO

If you do notice a mistake, you can always correct it by going into a single cell to make the necessary changes. You can also undo the flash fill if you don't want to use it by either clicking on the undo icon, or using the undo shortcut, Ctrl-Z.

Another way to use flash fill is to type in the data you want in the first empty cell. Hit enter to move to the next row. Now navigate to the Data Tab and click on the Flash Fill icon.



	A	B	C	D	E	F	G	H
1	Name	First Name	Last Name	City	State	Flash Fill	Zip	
2	Peter Allens	Peter	Allens	Fort Collins	CO	Fort Collins, CO	80525	
3	Cindy Amerman	Cindy		Loveland	CO	Loveland, CO	80537	
4	Danielle Amsinck	Danielle		Loveland	CO	Loveland, CO	80537	

Note: There are some instances where this will work, but this is not the best option when using Flash Fill because Excel may not be able to find a pattern.

Counting Formulas

Excel has a couple different count Formulas that will give you various results based upon the data in the cells.

=Count()

The Count Formula will return the number of cells within a range that contain a Number. If the range contains cells that have text, Excel will not include those cells in the Formula.

=CountA()

The CountA Formula will return the number of cells within a range that are not blank. It will count both numbers and text.

=CountBlank()

The CountBlank Formula will return the number of cells within a range that are blank. If there is a space in a cell, this is considered text and that cell will not be included in the Formula.

Countif, Sumif, Averagelf

Countif, Sumif, & Averagelf will perform Formulas only if certain criteria are met.

For Example, if you are doing billing and you have multiple departments to bill to, you are able to separate out and add together only the hours billable to ACNS from an entire list of data.

=Countif()

The Countif Formula will count a range of cells that meet a certain criteria.

The syntax is: =Countif(range,criteria)

- **Range:** The range of cells that contain the specific value, text string you are wanting.
- **Criteria:** the specific number or text you are looking for.
 - **Note:** If this is text, it must be inside Quotes “ ”. Text is not case sensitive.

=Sumif()

The Sumif Formula will add the values within a range only if specific criteria are met.

The syntax is: =Sumif(range, criteria, [sum_range])

- **Range:** The range of cells that contain the specific value, text string you are wanting.
- **Criteria:** the specific number or text you are looking for.
 - **Note:** If this is text, it must be inside Quotes “ ”. Text is not case sensitive.
- **Sum_Range:** This is the range of cells that you want to be added together if your criteria are met.

=Averagelf()

The Averagelf Formula will average the values within a range only if specific criteria are met.

The syntax is: =Averagelf(range, criteria, [average_range])

- **Range:** The range of cells that contain the specific value, text string you are wanting.
- **Criteria:** the specific number or text you are looking for.
 - **Note:** If this is text, it must be inside Quotes “ ”. Text is not case sensitive.
- **Average_Range:** This is the range of cells that you want to be added together if your criteria are met.

Using the IF Formula

The IF function tests to see if a certain condition in a spreadsheet cell is true or false.

If the condition is true, the function will carry out a specific operation. If the condition is false, the function will carry out a different operation.

=If(logical_test, value_if_ture, value_if_false)

- **Logical test:** Criteria you want the Formula to evaluate
- **Value_if_true:** The value to be returned if the condition is true.
 - This can be text (must be in parenthesis), a number, or a formula/function.
- **Value_if_false:** The value to be returned if the condition is False
 - This can be text (must be in parenthesis), a number, or a formula/function.

Excel Comparison Operators

Comparison Operator

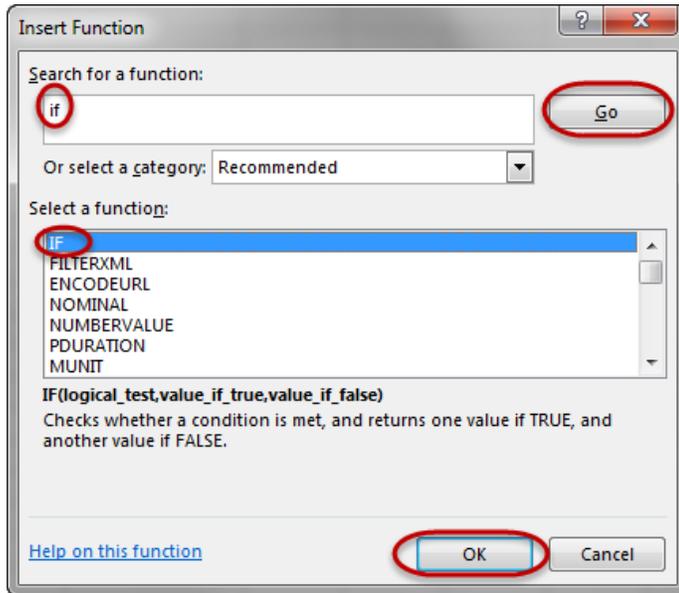
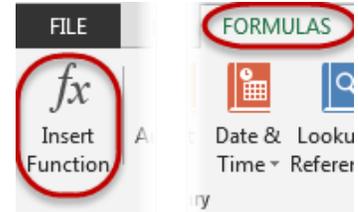
- = (equal sign)
- > (greater than sign)
- < (less than sign)
- >= (greater than or equal to sign)
- <= (less than or equal to sign)
- <> (not equal to sign)

Example:

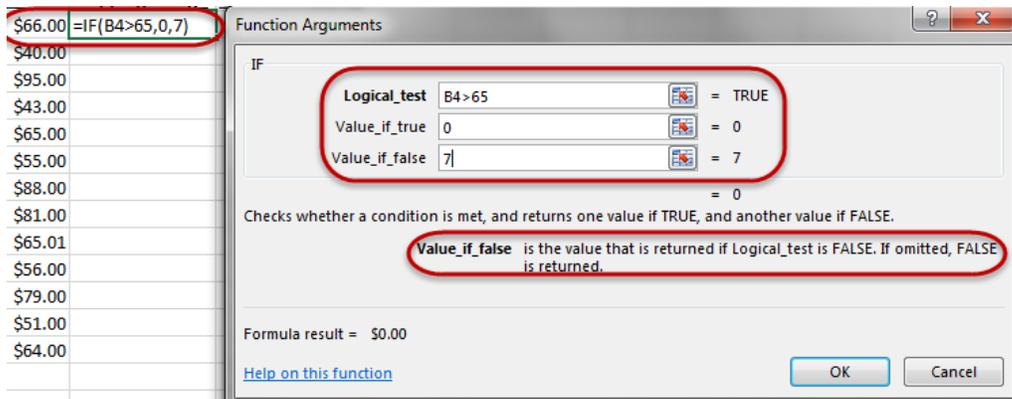
If an order Total is Greater than \$65, then there is free shipping, otherwise there is a \$7 shipping charge.

Steps:

1. Place cursor in the cell where we are putting our If Statement.
2. Navigate to the Formulas tab, and click on the Insert Function icon.
3. Within the Insert Function window, search for If in the search textbox and hit the Go Button.
4. Select the if function from the select a function box. Select it by either double clicking on it or by selecting it and clicking the OK button



5. In the Functions Argument window, we are able to see each argument of the if function. For the logical test, we want to select the Cell that we are comparing. In this case, we want to see if the Order total is greater than 65. So, either type in the cell reference of B4, or navigate with your mouse and click on cell B4. Now enter in the greater than sign > and 65.



6. Value_if_true. What do we want to happen if our order total is greater than \$65. We will offer free shipping so in this box, enter in a 0

7. Value_if_false. What do we want to happen if our order total is less than \$65. The customer will be charged a rate of \$7. Enter in a 7.
8. When we have all of our arguments filled out, click on the OK button and our function is now complete.
9. To copy this function to the remaining cells, click back on the cell that contains the original function. Move your mouse into the lower right corner until your mouse turns into a dark plus sign.
10. Click and hold with your mouse as you drag to the bottom of the rest of the data. Your function has now been copied to all of the other cells.
11. To complete our spreadsheet. We will have to add an AutoSum into the Total w/shipping column.

Order Total	Shipping Charge	Total
\$66.00	\$0.00	
\$40.00		

Relative versus Absolute Cell Addresses

It is important to understand how Excel identifies cells in formulas. By default, all cell references are relative references. As a formula is copied across multiple cells, they change based on the relative position of rows and columns.

It is always best practice to use cell references in your formula if you can versus typing in static numbers/text into a function.

Look at this sample of a Relative Reference.

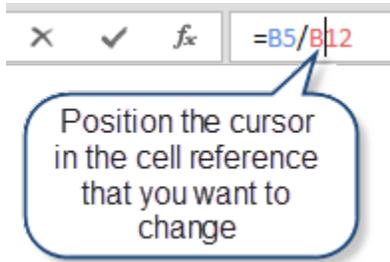
	A	B	C	
1	Dept A	Dept B	Totals	
2	100	300	400	=A2+B2
3	200	400	600	=A3+B3

Excel reads the formula in cell C3 as “take the number located two cells to the left and add that to the number in the cell located one column to the left”. Therefore, when you copy this formula (which appears as =A2+B2) to the cell below, it performs the calculation using the same pattern, but updates the formula to reflect the appropriate cell addresses. This is called a Relative Reference and is the feature that enables you to copy the same formula to a different location in a worksheet.

There will be times when you don’t want a formula to update, which is called an Absolute Reference. Unlike relative references, absolute references don’t change when copied or filled. You can use an absolute reference to keep a cell, a row or a column constant.

For example, you might want to use a single cell to calculate the percent of sales by category. Rather than doing a separate calculation for every employee, you could include a reference to that specific cell in the formula for each category. This is called an Absolute Reference.

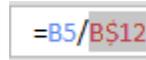
To make a cell reference absolute so that it will not adjust when a formula is copied, insert a dollar sign (\$) in the appropriate position. By navigating into the formula in the Formula bar, you can cycle through the references by hitting the F4 key on your keyboard.



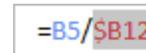
Press the F4 key one time



Two times



Three times



Example 1: \$B\$12 Both the Row and the Column are held Constant

Example 2: B\$12 The Row is held constant, the Column will move

Example 3: \$B12 The Column is constant, the Row will move.

Example 2: Using Absolute cell referencing in an If Statement

Create a formula in Total Sales for each record. The formula should sum Qtr1-Qtr4

- Position the cursor in the cell that will hold the formula.
- We need to AutoSum the Total Sales column. Use the AutoSum icon on the Home Tab.
- Auto Fill the AutoSum function.
 - Position the cursor at the bottom right border of the cell that holds the formula, left-click the mouse, hold, and drag down the column for all records

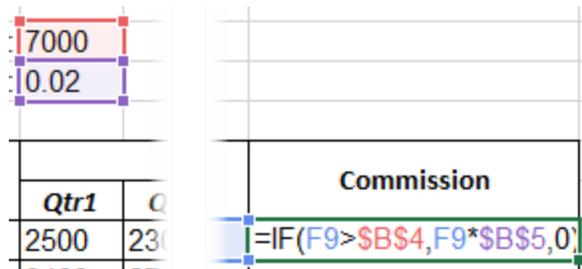
	Total sales	Con
Qtr4		
\$3,400	\$8,500	
\$1,800	\$9,400	

Tip: To display a formula in a cell, press the shortcut keys `ctrl ~`

Once Total Sales has been calculated, then the IF statement can be applied to the Commission column.

Steps:

- Position the cursor in the cell that will hold the formula.
- If total sales is > (greater) than \$7000 (cell B4), then individual will receive a 2% (Cell B5) bonus of Total Sales. If not, then no bonus
- Start the formula with an = sign and type the IF Formula as follows:
 - `=IF(F8>B4,F8*B5,0)`
- Use AutoFill to copy the formula for the rest of the column



Tip: To see the formula color coded to the cells that are used, press the F2 key while in the cell containing the Formula.

Using the OR & AND Formula

Using the previous example, we can expand our worksheet to see if our employee completed training, should receive a yearend bonus, if they are above average, or if they should require further training.

- **OR Formula:** only one of the conditions needs to be true to return a True Value
- **AND Formula:** all conditions need to be met to return a True Value

Tip: The OR, AND, Formula can be used alone. However, nesting the OR, AND Formula within an IF statement is more useful.

Steps for a nested IF(OR) Formula:

- To receive a yearend bonus, the employee must either have completed the Training or received a commission. If they meet 1 of these requirements, then will receive a 1.5% yearend bonus.
- Position the cursor in the cell to hold the formula.
- The formula will start with an = sign and use a combination of the If(or) statement.
`=IF(OR(H9="yes",G9>0),F9*B5,"No Bonus")`
- Use Auto fill to copy the formula for the rest of the columns

Steps for nested IF(AND) Formula:

In this example, we are trying to determine if the employee is “above average” with their sales. When using the AND statement, all conditions must be true in order to return the value.

If the employee completed training AND if total sales >\$10,000, then the employee is considered “above average”.

- Position the cursor in the cell to hold the formula
- The formula will start with an = sign and use a combination of the IF(AND) statement.
- `=IF(AND(H9="yes",F9>B4),"Great Job", "")`
- Use Auto fill to copy the formula for the rest of the column

	A	B	F	G	H	I	J
4	Sales goal:	\$10,000					
5	Bonus	1.50%					
6							
7	Salesperson		Total sales	Commission	Training completed	Year-end bonus	Above Average
8		<i>Qtr1</i>					
9	Annie Apple	\$2,500	\$8,500	\$0	No	No Bonus	
10	Berry Bluberry	\$3,400	\$9,400	\$0	No	No Bonus	
11	Cole Carrot	\$4,000	\$13,500	\$270	No	\$203	
12	Elli Eggplant	\$3,150	\$10,825	\$217	Yes	\$162	Great Job
13	Fred Fajita	\$2,578	\$10,063	\$201	Yes	\$151	Great Job
14	Gillian Gilligan	\$1,200	\$6,400	\$0	No	No Bonus	
15	Harry Helper	\$4,000	\$16,590	\$332	No	\$249	
16	Jackie Jaguar	\$3,460	\$11,110	\$222	Yes	\$167	Great Job
17	Kalvin Kline	\$1,500	\$7,300	\$0	Yes	\$110	
18	Lisa Lazy	\$1,500	\$8,500	\$0	No	No Bonus	
19	Mary Merchant	\$1,450	\$6,650	\$0	No	No Bonus	
20	Pam Personal	\$2,350	\$10,950	\$219	Yes	\$164	Great Job
21	Randy Ricearoni	\$3,400	\$15,300	\$306	Yes	\$230	Great Job
22	Syndey Silly	\$4,000	\$14,500	\$290	No	\$218	
23	Zach Zoe	\$1,500	\$6,000	\$0	Yes	\$90	

Using Nested IF Statement

Nested IF statements can evaluate multiple conditions. In this example, we look at the total sales and determine what the commission should be for the employee.

Scale for Commission

	Sales	Commission
Below	7000	None
Between	7000-13000	1%
Between	13000-14000	2%
Above	14001	3%

Tip: When you are working with a scale, you should have the scale in either increasing order, or decreasing order to help make your if statements easier to assemble. If your scale is in Increasing order you will use the less than < sign in your arguments. If your scale is in decreasing order, you will use the greater than > sign in your arguments.

Steps for a Nested IF statement:

- Position the cursor in the cell that will contain the formula.
- The Formula must start with an =if then hit tab.
- When you are working with nested if statements, you will see several parenthesis that will show you which if statement you are in. You second, third, fourth, etc. if statement can be in either the Value_if_true, of the Value_if_false argument of the if statement.
- Start our first if statement to compare the Total Sales to the smallest number on our commission scale

- =if(F6<\$L\$3,\$M\$3,

- If our argument is true, we will multiple the Total Sales by the commission in cell M3
 - **Remember to use absolute references.**
 - If this value is false, we want to start a new if statement, so after the comma in the Value_if_true argument, type if and hit tab to get into the new if statement.

```
=IF(F6<$L$3,F6*M3,IF(
IF(logical_test, [value_if_true], [value_if_false])
```

- The if will become all caps (IF), and your will now see the new arguments for the new If statement.
 - Continue this if statement comparing the Total Sales to the next number in the Scale, if that value is true, multiply by the associated Commission.

```
=IF(F6<$L$3,F6*M3,IF(F6<$L$4,F6*M4,
IF(logical_test, [value_if_true], [value_if_false])
```

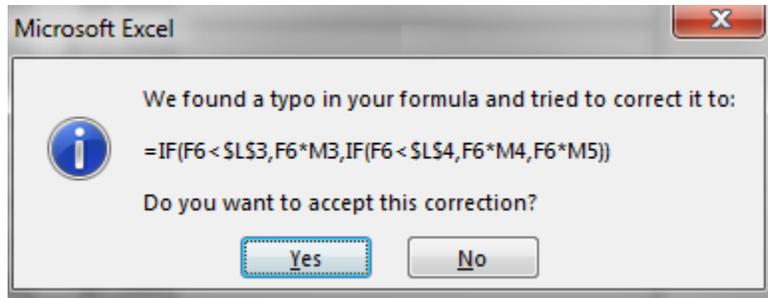
- Since our scale only has 3 levels, we will only need 2 If statements. The reason for this is if our sales are over \$14,000, we don't have to compare our sales to that number since anything over \$14,000 will get 3%, even if we sell \$100,000. If our second if statement, if we don't meet the

Value_if_true, that will mean we had sales of over \$14,000, so in the Value_if_false argument, we can enter in the Total Sales by the 3% commission in cell M5.

```
=IF(F6<$L$3,F6*M3,IF(F6<$L$4,F6*M4,F6*$M$5))
```

IF(logical_test, [value_if_true], [value if false])

- When our formula is complete, you can either enter in all of the closed parenthesis that are needed, or you can simply hit the Enter key. If you don't have enough closed parenthesis, Excel will show an error and a correction. Click the Yes button and Excel will enter in the missing closed parenthesis.



Here is a color coded result of the formula.

report		Sales	Commission
		Below	\$7,000.00
			\$14,000.00
		Above	\$14,000.00
Total sales	Commission		
\$8,500	=IF(F6<\$L\$3,F6*M3,IF(F6<\$L\$4,F6*M4,F6*\$M\$5))		

VLOOKUP

The Vlookup function is a list of data in a worksheet that is used to populate data within another worksheet, workbook etc. They are a basic form of a database. The V stands for Vertical. The Vlookup function searches for the left most column in a table array and returns the value in the same row, based on the index_number.

For example, you need to translate a number grade into a letter grade. The VLOOKUP Formula can help with this task.

Creating a Lookup Table

A lookup table includes the values you wish to "lookup" such as our Rating Code and the translation of the rating. You can place this table on the same worksheet, but for this Excel example, we'll add a worksheet called "codes"

How to Create a Lookup Table

**** Note:** I already created the worksheet with the codes and their translation.

1. Right-click your spreadsheet's tab and select **Insert, Worksheet...**
2. Rename this new worksheet tab with a meaningful name such as "Letter Grade"
****Note:** I already did this for you.
3. In Column A, enter the unique values that exist on your main worksheet. In our example, these were the codes that showed in the Grade column in the image above. These values **MUST BE IN ASCENDING** order.
4. In Column B, enter the translated value. You can have more values in column A than appear on your main spreadsheet.
Note: This doesn't have to be in column B, it can be in any column after column A, but for simplicity, let's use column B.

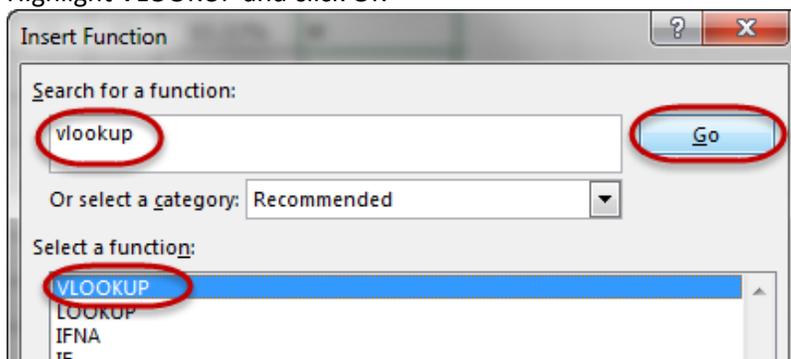
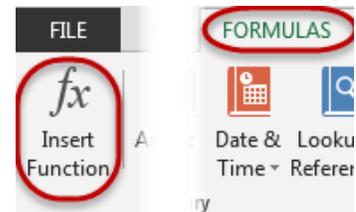
	A	B
1	Score	Grade
2	0.00%	F
3	60.00%	D
4	70.00%	C
5	80.00%	B
6	90.00%	A

Using the VLOOKUP Formula

Excel's VLOOKUP Formula uses 4 pieces of information. The Formula panel may seem intimidating with the terms, but it's simpler than it looks.

To lookup a value using VLOOKUP,

- The new column on the original worksheet will display the info retrieved from the lookup table. In this example column J is where we will insert the Excel Formula.
- Place your cursor in the first blank cell in the column. In our example, this is cell J2
- From the Formula tab on the ribbon, select the Insert Formula icon. The Insert Formula dialog will appear.
- In the Search for a Formula: text box, type "vlookup" and click Go.
- Highlight VLOOKUP and click OK



Defining the VLOOKUP Values

After you click **OK**, Excel's **Formula Arguments** dialog appears and allows you to define the four values. You'll see that your starting cell and the formula bar show the beginning part of the Formula **=VLOOKUP()**. The Formula Arguments dialog adds the needed data elements that will display between **()**.

For illustration purposes, I have overlaid the LetterGrade worksheet on top to show the relationships.

The screenshot shows an Excel worksheet with columns I through R. Column I is labeled 'Final Grade' and column J is labeled 'Letter Grade'. The formula bar shows '=VLOOKUP()'. The 'Function Arguments' dialog box is open, showing the following arguments:

- Lookup_value: [Empty field]
- Table_array: [Empty field]
- Col_index_num: [Empty field]
- Range_lookup: [Empty field]

Below the arguments, the dialog box provides a description of the VLOOKUP function: "Looks for a value in the leftmost column of a table, and then returns a value in the same row from a column you specify. By default, the table must be sorted in an ascending order." It also states: "Lookup_value is the value to be found in the first column of the table, and can be a value, a reference, or a text string."

Red arrows indicate the following relationships:

- From the 'Lookup_value' field to cell J1 (85.57%)
- From the 'Table_array' field to the range J2:K7
- From the 'Col_index_num' field to cell J2 (Letter Grade)
- From the 'Range_lookup' field to cell J2 (Letter Grade)

The table of Score vs. Grade is shown below:

Score	Grade
0.00%	F
60.00%	D
70.00%	C
80.00%	B
90.00%	A

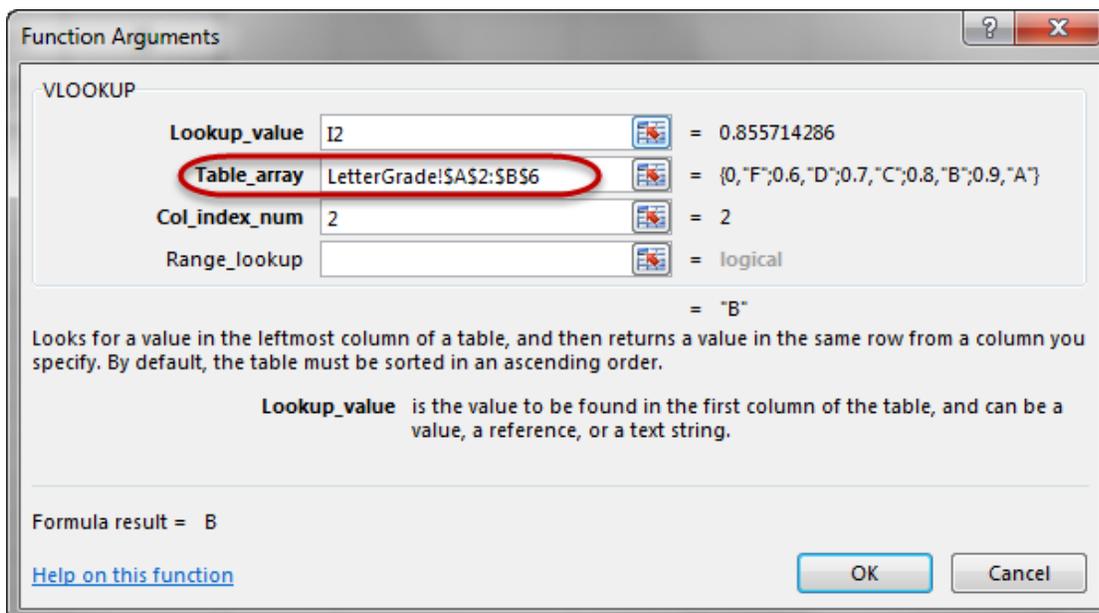
The Syntax for Vlookup formula

=VLOOKUP(Lookup_value,Table_array,Col_index_num,Range_Lookup)

- **Lookup_value** – This is the value that you are searching for in the Table_Array.
- **Table_array** – This is a table with two or more columns.
 - There are several rules to remember about this table array.
 - **Rule 1** - The left column must contain the values being referenced. In other words, the first column must equal a value associated with our Lookup_Value.
 - **Rule 2** - You can't have duplicate values in the leftmost column of the lookup range.
 - **Rule 3** – This list must be sorted in ascending order based on the leftmost column.
 - **Note:** When referencing a lookup table, you don't want your cell references to change when you drag and fill to populate the other cells with the VLOOKUP Formula. I need the cell references to be the same in all instances. After you define your range, you need to press **F4** one time which will give you an absolute reference to this table array. Your table array should look similar to this
LetterGrade!\$A\$2:\$B\$6

Remember: Make sure you absolute reference your Table_array.

- **Col_index_num** – This is the number of the column on your lookup table that has the information you want to return.
- **Range-lookup** – This is an optional field. The default value is TRUE.
 - If the value is TRUE(or blank), an approximate match is returned (if an exact match is not found, the next largest value that is less than the Lookup_Value is returned)
 - If the value is False, VLOOKUP will search for an exact match. If VLOOKUP can't find an exact match, the Formula returns #N/A.



Copying the VLOOKUP Formula to Other Cells

It doesn't make sense to use VLOOKUP for one cell in your Excel spreadsheet. Instead, you want to copy the Formula to other cells in the same column.

To copy VLOOKUP to other column cells,

1. Click the cell containing the VLOOKUP arguments. In our example, this would be J2.
2. Grab the cell handle that displays in the lower right corner.
3. Left-click and drag down the cell handle to cover your column range.

Note: If we hadn't changed to absolute reference as mentioned in Rule 3, we would've seen our table array entry shift by one cell as we dragged down through the other cells.

VLOOKUP is a powerful Excel Formula that can leverage spreadsheet data from other sources. There are many ways you can benefit from this Formula. In this example, we simply used a 1:1 code translation.