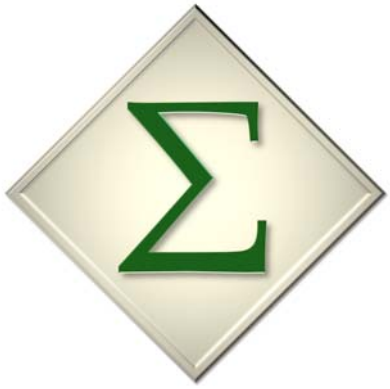


Microsoft Excel 2007

Level Two

Steve Linton-Smith
Computer Training Coordinator
Information & Telecommunication Services
slintonsmith@alachuacounty.us
(352) 338-7320

Microsoft Excel 2007

Level Two

Contents

Prepared by
Steve Linton-Smith
March 23, 2010

For Assistance
ITS Help Desk
(352) 338-7329

Course Objectives

This material is designed to assist users in understanding and applying intermediate and advanced Excel spreadsheet tasks. In this class, you will:

- Use ranges, absolute, and relative references in a formula.
- Use references to other worksheets and workbooks.
- Use statistical, financial, lookup, date, and logical functions.
- Create nested functions.
- Prevent formulas or formatting from being changed.
- Learn ways to customize the Excel environment.
- Change workbook properties and worksheet settings.
- Record and run a macro.
- Sort and filter worksheets.
- Create subtotals for worksheet data.
- Create professional-looking charts.

To begin the course, please open the exercise file **Excel Level 2 Examples**

A Review of Basic Formulas

A few key things to keep in mind when it comes to formulas:

- All formulas must begin with an equal sign (**=**)
- Use the appropriate operators to specify the type of calculation you want to perform. Basic mathematical operators include:

Operators	
^	Exponents
*****	Multiplication
/	Division
+	Addition
-	Subtraction

Excel follows a mathematical rule called **order of precedence**. Following operator precedence, Excel calculates an equation in the following order, left to right:

Order of Precedence	
1st	Parentheses
2nd	Exponents
3rd	Multiplication/Division
4th	Addition/Subtraction

Examples:

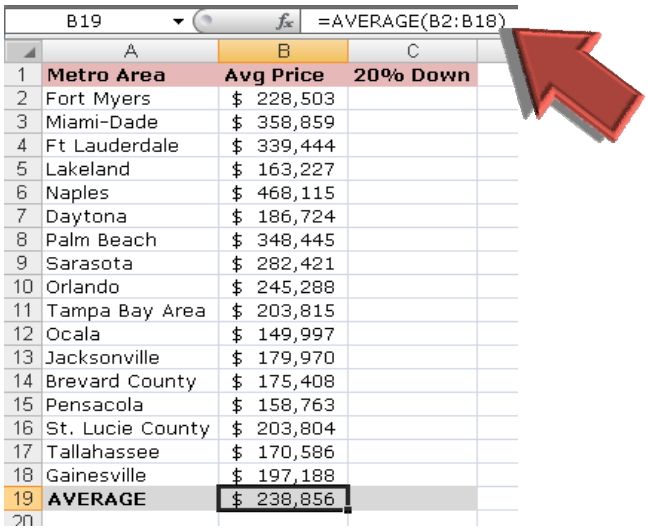
=6+3*2	Excel multiplies 3x2 then adds 6 to the result	**Result:** 12
=(6+3)*2	Excel adds 6+3 then multiplies the result by 2	**Result:** 18

You can edit a formula by clicking in the formula bar, making any necessary changes, and then pressing **ENTER** on the keyboard.

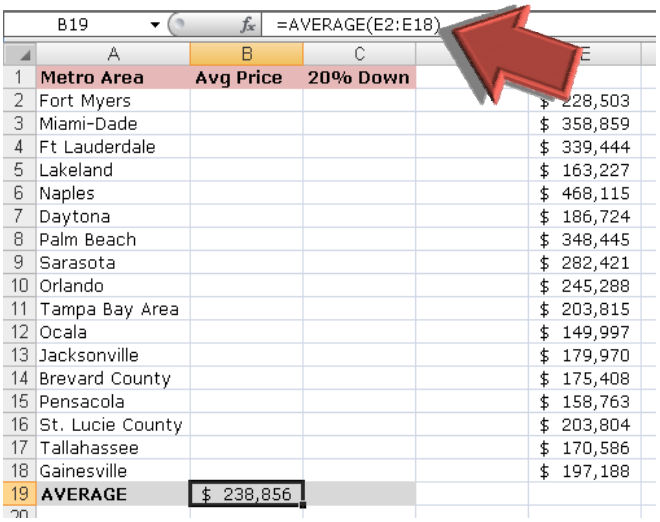
Cell References

Relative Cell References

By default, Excel interprets cell and range references within a formula as *relative references*. When you copy or move the formula, Excel automatically adjusts the references to reflect their position relative to the new location. In the below example, if the contents of cells **B2:B18** are moved elsewhere, the **AVERAGE** function's cell references will update based on the new location of the moved cells. The same also applies if additional columns or rows are added. Any formulas affected by those new columns or rows will be automatically updated.

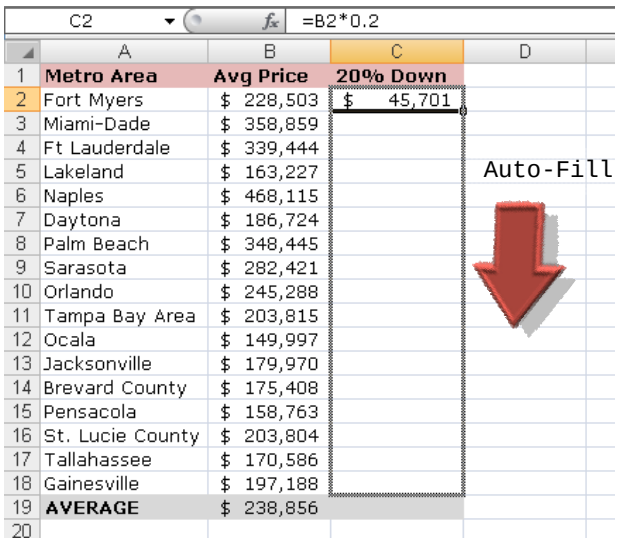


	A	B	C
1	**Metro Area**	**Avg Price**	**20% Down**
2	Fort Myers	$ 228,503	
3	Miami-Dade	$ 358,859	
4	Ft Lauderdale	$ 339,444	
5	Lakeland	$ 163,227	
6	Naples	$ 468,115	
7	Daytona	$ 186,724	
8	Palm Beach	$ 348,445	
9	Sarasota	$ 282,421	
10	Orlando	$ 245,288	
11	Tampa Bay Area	$ 203,815	
12	Ocala	$ 149,997	
13	Jacksonville	$ 179,970	
14	Brevard County	$ 175,408	
15	Pensacola	$ 158,763	
16	St. Lucie County	$ 203,804	
17	Tallahassee	$ 170,586	
18	Gainesville	$ 197,188	
19	**AVERAGE**	$ 238,856	



	A	B	C	E
1	**Metro Area**	**Avg Price**	**20% Down**	
2	Fort Myers			$ 228,503
3	Miami-Dade			$ 358,859
4	Ft Lauderdale			$ 339,444
5	Lakeland			$ 163,227
6	Naples			$ 468,115
7	Daytona			$ 186,724
8	Palm Beach			$ 348,445
9	Sarasota			$ 282,421
10	Orlando			$ 245,288
11	Tampa Bay Area			$ 203,815
12	Ocala			$ 149,997
13	Jacksonville			$ 179,970
14	Brevard County			$ 175,408
15	Pensacola			$ 158,763
16	St. Lucie County			$ 203,804
17	Tallahassee			$ 170,586
18	Gainesville			$ 197,188
19	**AVERAGE**	$ 238,856		

The principle of relative cell references is also applied to formulas when using Auto-Fill. In the below example, when the formula **=B2*02** in cell **C2** is auto-filled down, each successive cell updates the original formula relative to its new location.

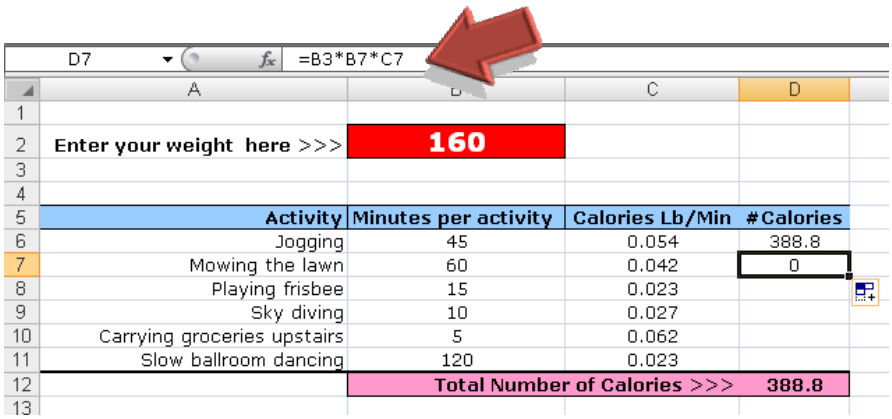


	A	B	C	D
1	**Metro Area**	**Avg Price**	**20% Down**	
2	Fort Myers	$ 228,503	$ 45,701	
3	Miami-Dade	$ 358,859		
4	Ft Lauderdale	$ 339,444		
5	Lakeland	$ 163,227		
6	Naples	$ 468,115		
7	Daytona	$ 186,724		
8	Palm Beach	$ 348,445		
9	Sarasota	$ 282,421		
10	Orlando	$ 245,288		
11	Tampa Bay Area	$ 203,815		
12	Ocala	$ 149,997		
13	Jacksonville	$ 179,970		
14	Brevard County	$ 175,408		
15	Pensacola	$ 158,763		
16	St. Lucie County	$ 203,804		
17	Tallahassee	$ 170,586		
18	Gainesville	$ 197,188		
19	**AVERAGE**	$ 238,856		
20				

To use Auto-Fill, hover over the small black square in the lower-right corner of the active cell. This is called the **fill handle**. When you hover over the fill handle, the mouse changes to a black cross hair. When it does this, click and drag in the desired direction.

Absolute Cell References

In most situations, relative cell references in formulas works out just fine. However, in the below example, if you Auto-Fill the formula **=B2*B6*C6** in cell **D6** down to **D7**, the formula will changes to **=B3*B7*C7** thus making it useless. Your weight is in cell **B2** and you don't want Excel to automatically update that reference.



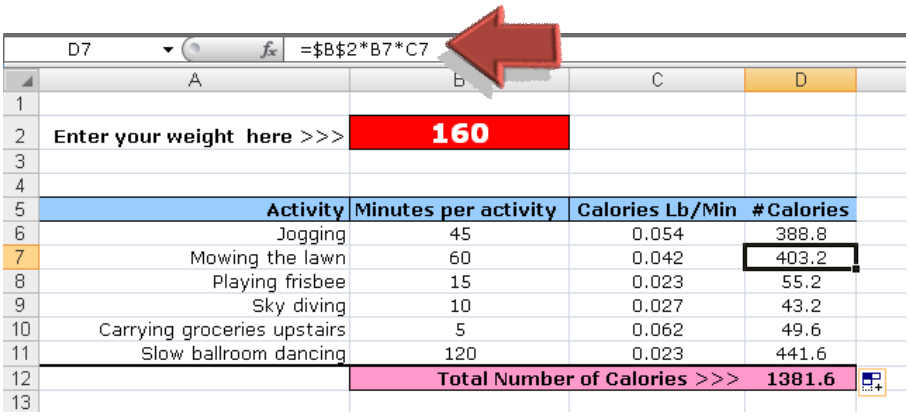
D7 | =B3*B7*C7

	A	B	C	D
1				
2	Enter your weight here >>>	160		
3				
4				
5	Activity	Minutes per activity	Calories Lb/Min	#Calories
6	Jogging	45	0.054	388.8
7	Mowing the lawn	60	0.042	0
8	Playing frisbee	15	0.023	
9	Sky diving	10	0.027	
10	Carrying groceries upstairs	5	0.062	
11	Slow ballroom dancing	120	0.023	
12		Total Number of Calories >>>		388.8
13				

This can be a problem when you want to copy a formula so that a cell reference in the formula points to the same cell or range as in the original. You can correct this problem by using an **absolute reference** in the original formula instead of a relative one. **Absolute references remain the same even when the position of the cell containing the formula changes**.

To create an absolute cell reference, enter a **dollar sign ($)** before the column and row reference. To quickly apply absolute reference to a formula, place your cursor in the center of the cell reference, then press **F4** on your keyboard.

In this example…
Change the formula in cell D6 to **=$B$2*B6*C6** and then Auto-Fill the formula to D11. Excel adjusts the 2nd and 3rd references relative to their new location, but left the 1st reference unchanged: **=$B$2*B7*C7**.



D7 | =$B$2*B7*C7

	A	B	C	D
1				
2	Enter your weight here >>>	160		
3				
4				
5	Activity	Minutes per activity	Calories Lb/Min	#Calories
6	Jogging	45	0.054	388.8
7	Mowing the lawn	60	0.042	403.2
8	Playing frisbee	15	0.023	55.2
9	Sky diving	10	0.027	43.2
10	Carrying groceries upstairs	5	0.062	49.6
11	Slow ballroom dancing	120	0.023	441.6
12		Total Number of Calories >>>		1381.6
13				

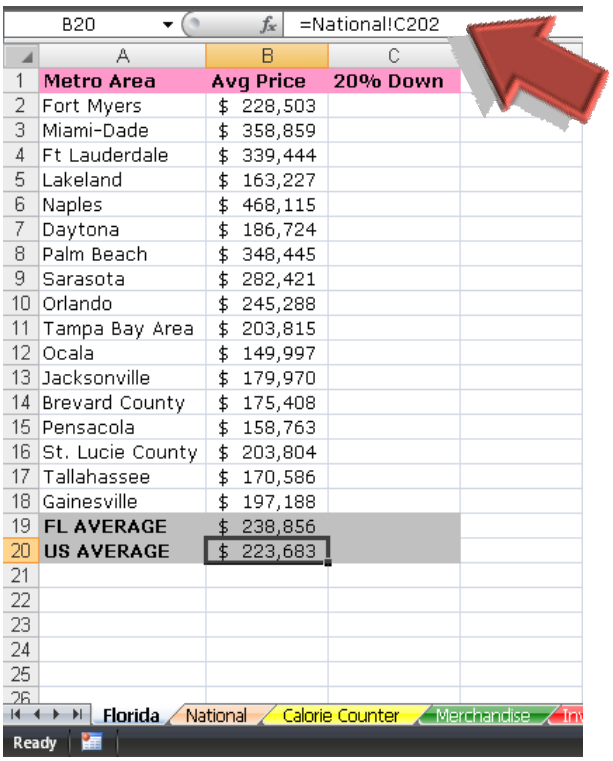
Referencing a Range of Non-Contiguous Cells

But cells in a range don't have to be contiguous. You can define a range by selecting individual cells or groups of cells, separated by commas, such as **=sum(B10,C9,D11)**. You can also mix individual cells and contiguous ranges in formula, such as **=sum(C6:D8, B7)**.

To enter a reference to an entire row or column, use the row number or column letter as both halves of the range reference, such as **B:B** or **2:2**.

Referencing Other Worksheets or Workbooks

Sometimes it's helpful to use references to cells and ranges on other worksheets or workbooks. A formula containing these **external references** allows you to use data from other worksheets or workbooks to calculate new values based on this data. In the example below, cell **B20** is referencing data on the **National** sheet.



	A	B	C
1	**Metro Area**	**Avg Price**	**20% Down**
2	Fort Myers	$ 228,503	
3	Miami-Dade	$ 358,859	
4	Ft Lauderdale	$ 339,444	
5	Lakeland	$ 163,227	
6	Naples	$ 468,115	
7	Daytona	$ 186,724	
8	Palm Beach	$ 348,445	
9	Sarasota	$ 282,421	
10	Orlando	$ 245,288	
11	Tampa Bay Area	$ 203,815	
12	Ocala	$ 149,997	
13	Jacksonville	$ 179,970	
14	Brevard County	$ 175,408	
15	Pensacola	$ 158,763	
16	St. Lucie County	$ 203,804	
17	Tallahassee	$ 170,586	
18	Gainesville	$ 197,188	
19	**FL AVERAGE**	$ 238,856	
20	**US AVERAGE**	$ 223,683	
21			
22			
23			
24			
25			
26			

The following table contains formulas with relative references to other cells within the same worksheet, workbook, and different workbooks:

Example Formula	What It Does
=C2	Uses the value in cell C2
=Sheet2!B2	Uses the value in cell B2 on *Sheet2*
=[Data]Sheet3!$E$7	Uses the value in cell E7 on *Sheet3* of the workbook named *Data*

If the worksheet or workbook name contains spaces, it must be surrounded by single quotation marks. For instance: **='Calorie Counter'!F10**

Three Dimensional (3D) References

References made to another workbook, or file, are called 3D references. The three dimensions are: **FILE NAME**, **SHEET NAME** and **CELL NAME**. Also, their cell references are **absolute**.

1. Click the cell in which you want to enter the formula.
2. In the formula bar, type an equal sign (**=**).
3. Select a cell or range of cells from another open workbook.
4. Press **Enter**.

A Review of Basic Functions

Functions are pre-written formulas that perform calculations using specific arguments in a particular order. Excel's over 200 built-in functions must follow certain rules. Each function **must**:

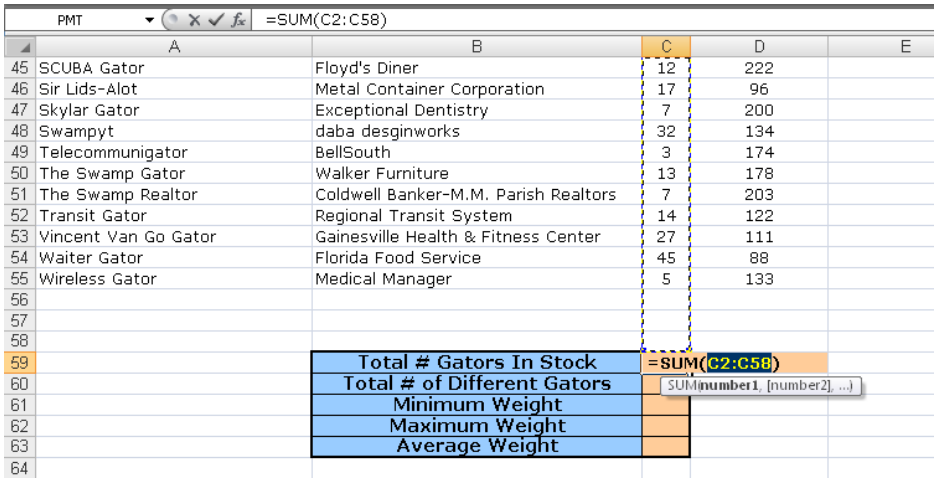
- Begin with an equal sign
- Be followed by the name of the function
- Place arguments, separated by commas, within parentheses

Arguments can be simple numerical values, text strings, cell references, and even other formulas and functions.

By using the appropriate function for any given operation, you can accurately calculate statistical information for ranges of data. In this section, we'll review the most common functions: **SUM**, **COUNT**, **MAX**, **MIN** and **AVERAGE**.

SUM Function: You can determine the total number of products in stock by using a function which adds all of the numbers in a range of cells. (Including an empty cell in the range for MOST functions will not affect the accuracy of the results returned. **Only cells containing data are calculated**.)

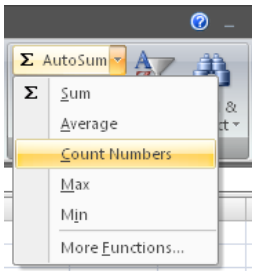
1. Click on the **Merchandise** sheet.
2. Go to cell **C59**.
3. From the **Home** tab, click the **AutoSum** button.
4. Excel correctly guesses the range on which to perform the calculation.
5. Press **Enter**.

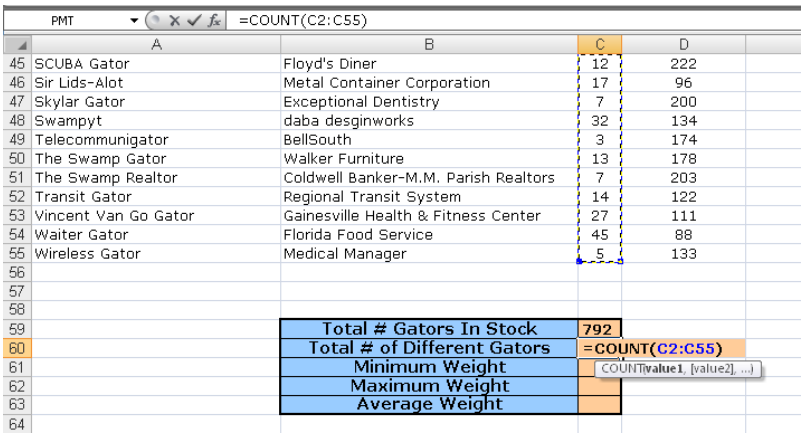


	A	B	C	D
45	SCUBA Gator	Floyd's Diner	12	222
46	Sir Lids-Alot	Metal Container Corporation	17	96
47	Skylar Gator	Exceptional Dentistry	7	200
48	Swampyt	daba desginworks	32	134
49	Telecommunigator	BellSouth	3	174
50	The Swamp Gator	Walker Furniture	13	178
51	The Swamp Realtor	Coldwell Banker-M.M. Parish Realtors	7	203
52	Transit Gator	Regional Transit System	14	122
53	Vincent Van Go Gator	Gainesville Health & Fitness Center	27	111
54	Waiter Gator	Florida Food Service	45	88
55	Wireless Gator	Medical Manager	5	133
56				
57				
58				
59		Total # Gators In Stock	=SUM(C2:C58)	
60		Total # of Different Gators		
61		Minimum Weight		
62		Maximum Weight		
63		Average Weight		
64				

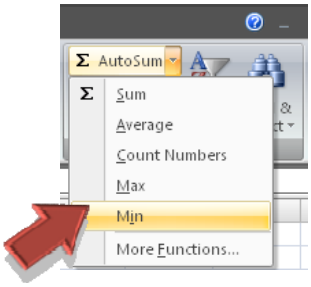
COUNT NUMBERS Function: You can calculate the total number of products listed in this table by using a function which will count the number of cells in column C that contain ***numbers***.

1. Go to cell **C60**.
2. From the **AutoSum** drop-down list, click **Count Numbers**.
3. This time, instead of accepting Excel's guess as to the cells we want to calculate, click and drag to select the range **C2:C55**.
4. Press **Enter** to insert the function.





MINIMUM (MIN) Function: You can identify the lightest product in the list using a function that returns the smallest value in a set of arguments.



1. Go to cell **C61**.
2. From the **AutoSum** drop-down list, click **Min**.
3. Click and drag to select the range **D2:D55**.
4. Press **Enter** to insert the function.

MAXIMUM (MAX) Function: You can identify the heaviest product in the list using a function that returns the largest value in a set of arguments. This time, let's use the AutoSum shortcut.

1. Go to cell **C62**.
2. From the **AutoSum** drop-down list, click **Max**.
3. Click and drag to select the range **D2:D55**.
4. Press **Enter** to insert the function.

AVERAGE Function: You can identify the average weight of the products in the list using a function that returns the average of the values in a set of arguments.

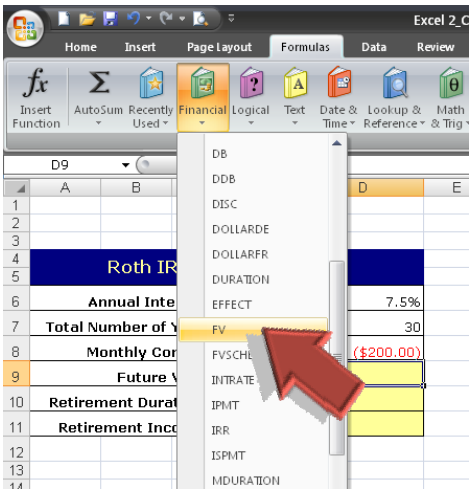
1. Go to cell **C63**.
2. From the **AutoSum** drop-down list, click **Average**.
3. Click and drag to select the range **D2:D55**.
4. Press **Enter** to insert the function.

More Functions

Financial Functions

Calculating the future value of an investment or how much time it will take to pay off a loan can be difficult and time-consuming. By taking advantage of the financial functions available with Excel, you can quickly complete common business calculations.

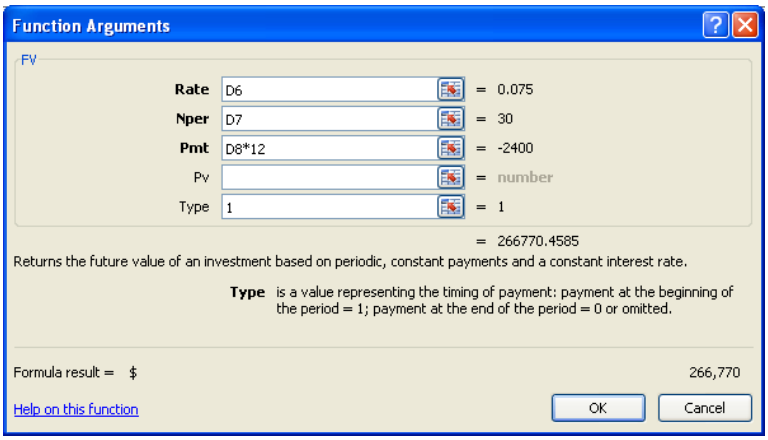
FUTURE VALUE (FV) Function: This function returns the future value of an investment based on periodic, constant payments and a constant interest rate. As part of the employee benefits package, we can invest in a Roth IRA account. Let's calculate the estimated future value of any investment made to that account.



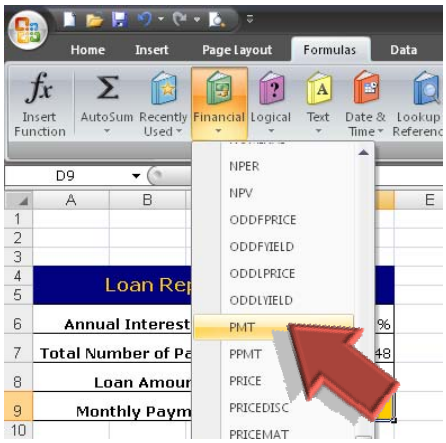
1. In our example file, click the **Investment** sheet.
2. Go to cell **D9**.
3. From the **Formulas** tab, click the **Financial** category and select **FV** from the list.

FV Function Arguments

5. **Rate**: enter the interest rate by selecting cell **D6**.
6. **Nper**: enter the total number of payment periods in the investment by selecting cell **D7**.
7. **PMT**: enter the annual contribution by selecting cell **D8**.
8. Because the contributions are *monthly*, multiply **PMT** by 12 to calculate the annual contribution. Therefore, **PMT** should read **D8*12**.
9. The last two arguments are optional, but click in the **Type** box.
10. Because the payments will be made at the beginning of each month, type **1**.
11. Click **OK**.



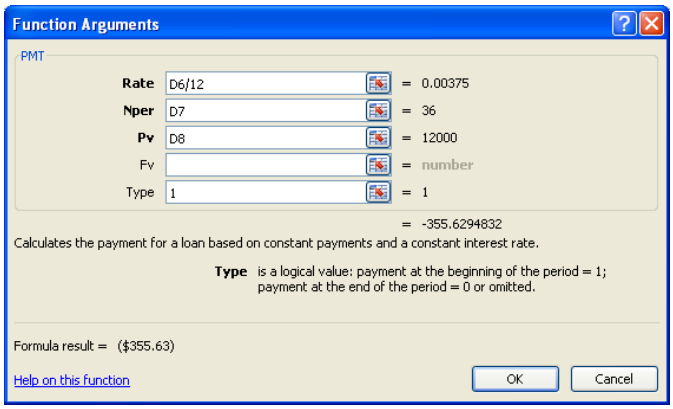
PAYMENT (PMT) Function: This function calculates the monthly payments for a loan based on constant payments and a constant interest rate. To perform the appropriate calculations, the PMT() function requires an interest rate, the number of months of payments, and the starting balance.



1. In our example file, click the **Loan** sheet.
2. Go to cell **D9**.
3. From the **Formulas** tab, click the **Financial** category and select **PMT** from the list.

PMT Function Arguments

4. **Rate**: enter the interest rate for the loan by selecting cell **D6**
5. Because the interest rate on the worksheet is an *annual rate*, you calculate monthly payments by dividing the rate by 12. Therefore, **Rate** should read **D6/12**
6. **Nper**: enter the number of monthly payments for the loan by selecting cell **D7**
7. **PV**: enter the present value of the loan by selecting cell **D8**
8. Leaving the **FV** argument blank will indicate that the final balance of the loan is zero
9. If the **Type** field is left blank, it assumes the payment is made at the end of each period. If you enter **1** in this field, it assumes the payment is made at the beginning of each period.
10. Click **OK**.



Logical Functions

Logical functions are very helpful in comparing and evaluating data. In our example file, we'll add an IF function to a table to automatically determine the price of an item.

IF Function: This function checks whether a condition is met, and returns one value if the condition is TRUE and another value if the condition is FALSE. In our example, we'll use the IF function to base the price of each item on its weight, with one price for items weighing **less than 150 pounds**, and a different price for items weighing **over than 150 pounds**.

1. In our example file, click the **Merchandise** sheet.
2. Go to cell **E2**.
3. From the **Formulas** tab, click the **Logical** category and select **IF** from the list

The IF function includes three arguments. The **Logical Test**, **Value if True** and **Value if False**. The logical test argument must be an expression that can be evaluated as true or false.

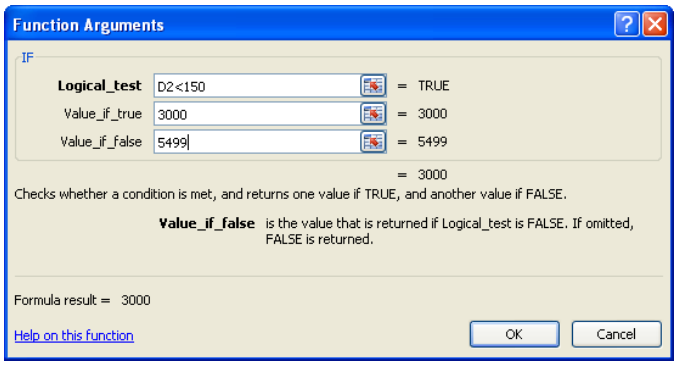
IF Function Arguments

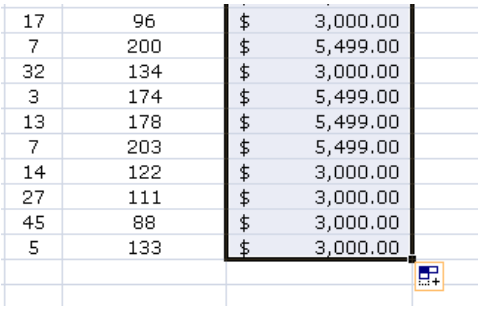
4. **Logical Test**: type **D2<150**
5. **Value if True**: type **3000**
6. **Value if False**: type **5499**

The completed function should read in the Formula Bar as: **=IF(D2<150,3000,5499)**

This function means, if the value in cell **D2** is less than **150**, Excel will return a value of **3000**. If the value in cell **D2** is more than **150**, Excel will return a value of **5499**.

7. Format the cell as **ACCOUNTING**, then drag the Auto-Fill handle to cell **E55** to copy the formula to the other cells.





17	96	$ 3,000.00
7	200	$ 5,499.00
32	134	$ 3,000.00
3	174	$ 5,499.00
13	178	$ 5,499.00
7	203	$ 5,499.00
14	122	$ 3,000.00
27	111	$ 3,000.00
45	88	$ 3,000.00
5	133	$ 3,000.00

Nesting Functions

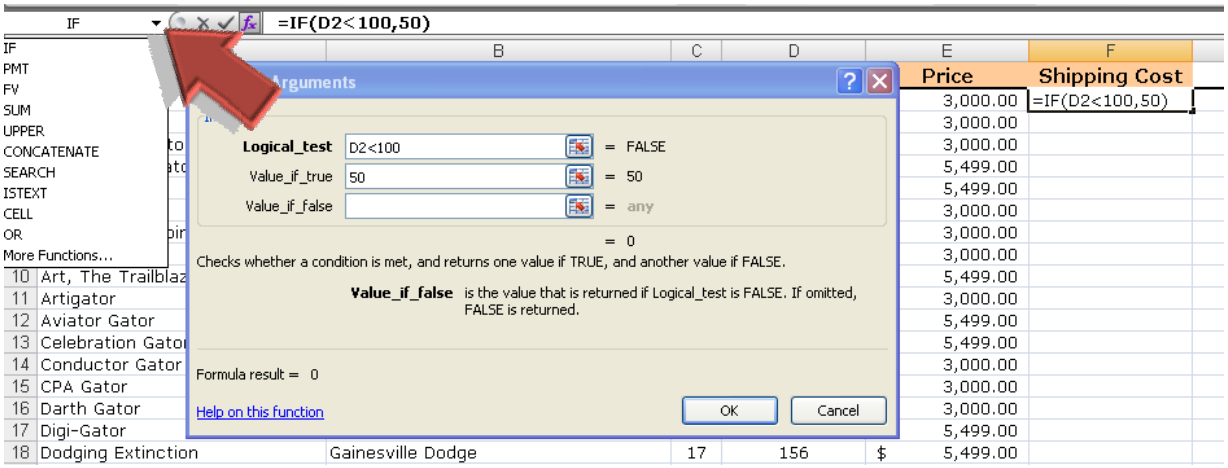
In some cases it may be necessary to use one function as the argument for another. Nesting functions within functions this way is common with logical functions such as IF. Let's create a simple nested function to calculate the shipping costs for each item based on its weight.

1. In our example file, click the **Merchandise** sheet
2. Go to cell **F2**
3. From the **Formulas** tab, click the **Logical** category and select **IF** from the list

For this example, the shipping charges are determined by the weight of each item. If the item weighs **less than 100 pounds**, the charge is **$50**. If the item weighs **between 100-149** pounds, the charge is **$75**. Finally, if the item weighs **150 pounds or greater**, the charge is **$100**.

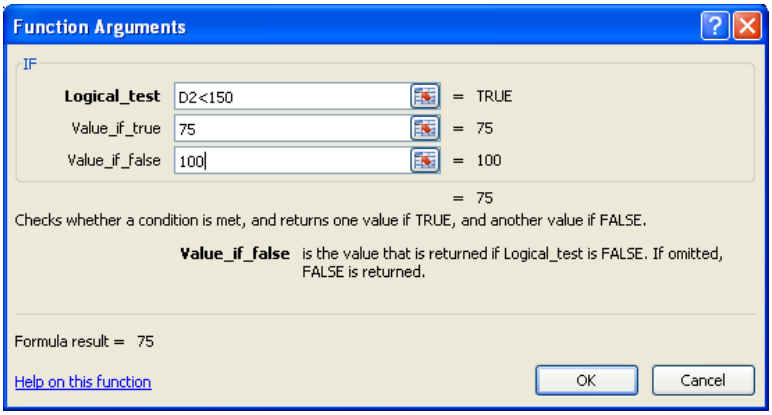
IF Function Arguments

4. **Logical Test**: type **D2<100**
5. **Value if True**: type **50**
6. **Value if False**: If the argument is false, we want to include two more options. To do this we "nest" another **IF** function within the existing function in the Value if False field.
7. Click inside the **Value if False** field, then click the **Function** arrow, located to the left of the formula bar where the **Name Box** usually appears.
8. Select **IF** from the list.



Nested IF Function Arguments

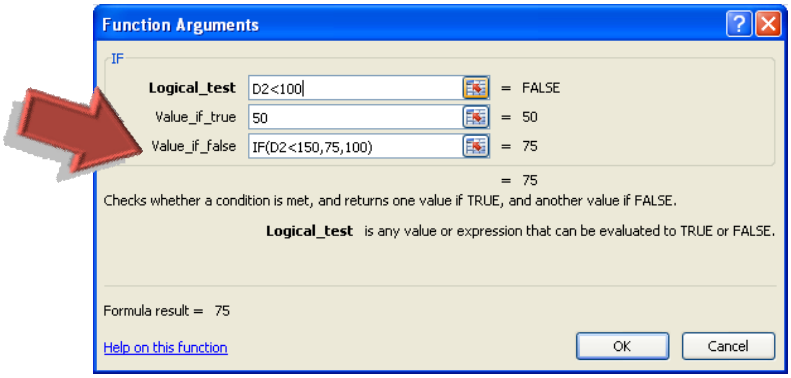
9. **Logical Test**: type **D2<150**
10. **Value if True**: type **75**
11. **Value if False**: type **100**
12. Click **OK**
13. Now drag the Auto-Fill handle to cell **E59** to copy the formula to the other cells.



The function should appear in the Formula Bar as: **=IF(D2<100,50,IF(D2<150,75,100))**

This function means, if the value in cell **D2** is less than **100**, return a value of **50**. If the value in cell **D2** is more than **100**, proceed to the second **IF** function. In the second IF function, if the value in cell **D2** is less than **150**, it returns a value of 75. If **D2** is more than **150**, it returns a value of **100**.

To view the completed function within the **Function Arguments** box, click on cell F2 then click the **Insert Function** (*fx*) button. Note the **Value if False** field displays the entire **Nested** function.



Lookup Functions

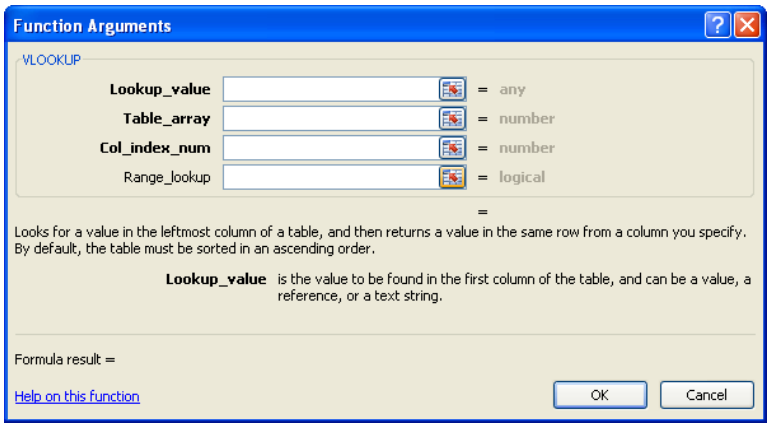
When you need to create worksheets that use information stored in other sheets, lookup functions can save you time.

VLOOKUP Function: This function looks for data stored in the leftmost column of a table, and then returns data in the same row from a column you specify. By default, the table must be sorted in ascending order.

HLOOKUP Function: This function looks for data stored in the top row of a table, and then returns the value in the same column from a row you specify.

In our example file we'll add a function to the Invoice sheet that will retrieve the product information from the Merchandise sheet.

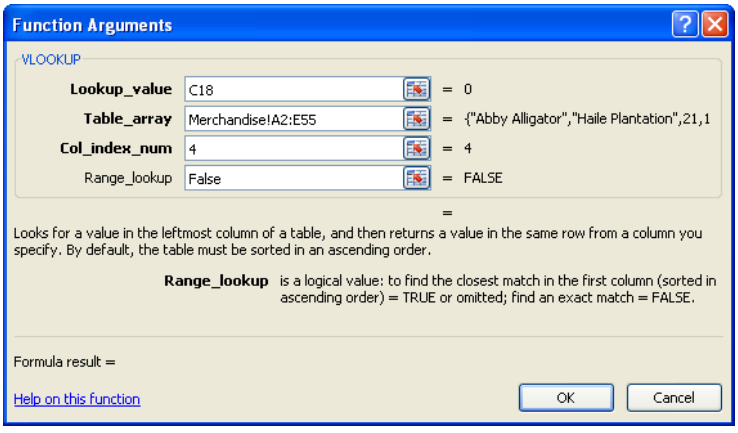
1. In our example file, click the **Invoice** sheet.
2. Go to cell **J18**.
3. From the **Formulas** tab, click the **Lookup & Reference** category and select **VLOOKUP** from the list.



Excel will match the value that you enter for the first argument to values in the leftmost column of the table. The **Lookup_value** argument can be a number, a cell reference, or text enclosed in quotation marks. When an invoice is filled out, the function will need to use the product name as the lookup value.

VLOOKUP Function Arguments

4. **Lookup_value**: click on cell **C18**.
5. **Table_array**: defines the range that contains the product weight information.
6. Click the *collapse dialog* button.
7. Click the **Merchandise** sheet.
8. On this worksheet, the 1st column contains the product names, and the 4th and 5th columns contain weight and price information.
9. Select the range **A2:E55**.
10. Click the *expand dialog* button.



The VLOOKUP function requires the use of a number instead of a letter to identify the column containing the values that need to be looked up. Product weights are listed in column D, the 4th column.

11. **Col_index_num**: type **4**.
12. **Range_lookup**: specifies whether the function will find an **exact** match or an **approximate** match.
13. To have the function find only exact matches, type **False**.

14. Click **OK**.
15. The function should appear in the Formula Bar as:

=VLOOKUP(C18,Merchandise!A2:E59,4,FALSE)

16. Test the function by going to cell **C18** and type in **Darth Gator**.
17. Press **Enter**.

Copying a VLOOKUP Function
To add a function to retrieve unit prices, you can copy the weight lookup function and make a few modifications in the formula bar.

1. **Copy** the formula in cell **J18** and Paste it to cell **K18**.
2. You will get a **#N/A** error due to several **relative cell references**. To fix this, click on the original formula in cell **J18** and do the following:
    - Change the **Lookup value** to a mixed reference **$C18**. In this **mixed reference**, the column is *absolut*e, but the row is *relative*.
    - Change the **Table_array** to an absolute reference so that it won't change when copied: **$A$2:$E$59**
3. Again, **Copy** the formula in cell **J18** and **Paste** it to cell **K18**. You won't get an error this time, but the function is exactly the same and we want to return the **Unit Price** instead of the **Weight**. Since the weight is in the 5th column of the table array do the following:
    - Change the **Col_index_num** to **5**.
4. The function in cell **J18** should read in the Formula Bar as:

=VLOOKUP($C18,Merchandise!$A$2:$E$59,5,FALSE)

	A	B	C	D	E	F	G	H	I	J	K	L
16												
17		Qty	Product Name							Weight	Unit Price ($)	Total ($)
18			Darth Gator							110	3,000	
19												
20												

Enter a formula that will add the unit price by the total number ordered.

1. Click in cell **L18** and enter **=K18*B18**
2. Click cell **B18**, and type **2**
3. Press **Enter**

Date & Time Functions

When you need to perform calculations involving date and time, you can use special functions designed just for those calculations. Two of the most common date and time functions are **TODAY** and **NOW**.

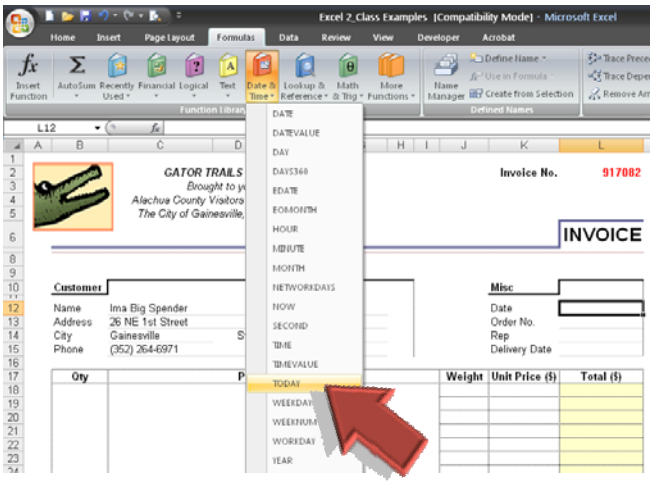
NOW Function: Returns the **date and time** the workbook was opened, so the value will change every time the workbook is opened. The NOW function is one of the few functions that doesn't have any arguments. In a NOW function, the time portion of the cell is not continually updated. The value can be updated in one of three ways:

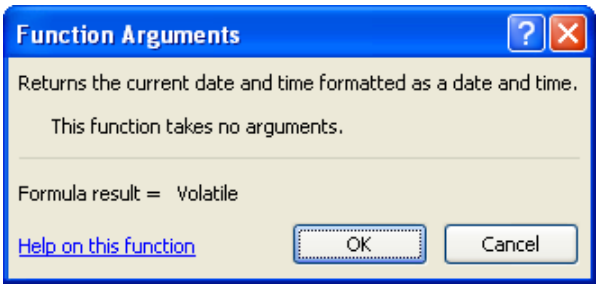
- Save and close the workbook, then reopen it
- Press **F9** on the keyboard.
- Make an entry in the spreadsheet.

TODAY Function: Returns the current **date**. The TODAY function is one of the few functions that doesn't have any arguments.

Inserting the TODAY Function

1. In our example file, click the **Invoice** sheet.
2. Go to cell **L12**.
3. From the **Formulas** tab, click the **Date & Time** category and select **TODAY** from the list.
   - The TODAY function takes no arguments.
   - The formula result is volatile.
4. To insert the function, click **OK**.





Formulas Based on Dates

In our example file, let's say it takes 5 days to deliver the product. Here we can simply create a formula that adds five to today's date.

1. Click in cell **L15**
2. Enter the formula **=L12+5**
3. Press **Enter**

Error Codes

Excel identifies errors in several ways. The first way is to fill the cell holding the formula generating the error with an **error code**.

	A	B	C	D
1				
2	Enter your weight here >>>	160		
3				
4				
5	Activity	Minutes per activity	Calories Lb/Min	#Calories
6	Jogging	45	0.054	#VALUE!
7	Mowing the lawn	60	0.042	
8	Playing frisbee	15	0.023	
9	Sky diving	10	0.027	
10	Carrying groceries upstairs	5	0.062	
11	Slow ballroom dancing	120	0.023	
12		Total Number of Calories >>>		#VALUE!
13				

When a cell with an erroneous formula is the active cell, an **Error button** appears next to it. You can click the button's down arrow to display a menu with options that provide information about the error and offer to help you fix it. The following table lists the most common error codes and what they mean.

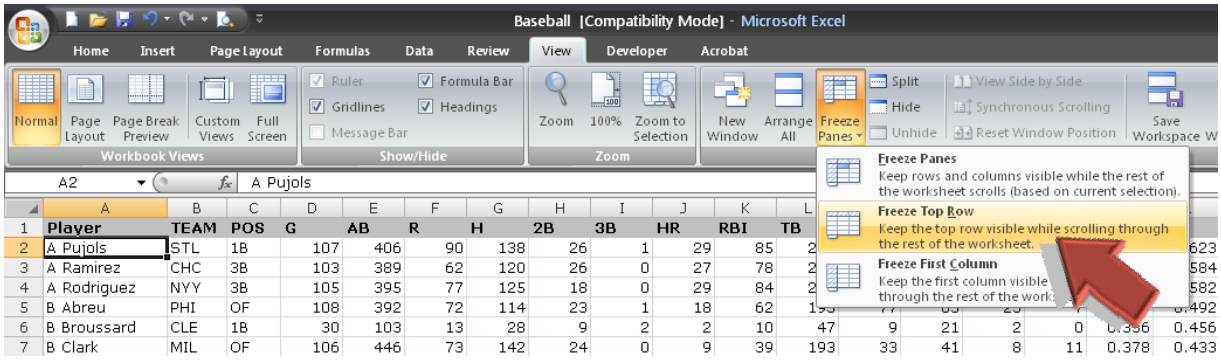
Error Code	*Description*
#####	The column isn't wide enough to display the value.
#VALUE!	The formula has the wrong type of argument (such as text where a TRUE or FALSE value is required).
#NAME?	The formula contains text that Excel doesn't recognize (such as an unknown named range).
#REF!	The formula refers to a cell that doesn't exist (which can happen whenever cells are deleted).
#DIV/0!	The formula attempts to divide by zero.
#N/A	This formula is unable to calculate due to missing data (such as a blank Lookup Value cell in VLOOKUP)

Customizing Workbooks

Using Freeze Panes

If you have a large table, the column and row labels can disappear from view when you scroll through the data. Freezing panes allows you to select data that remains visible when scrolling in a sheet.

1. Open the file **Baseball.xls**
2. On the **View** tab, click the **Freeze Panes** button and select **Freeze Top Row**
   - Notice that columns can also be frozen with the **Freeze First Column** option
3. Scroll down and notice row 1 is always displayed
4. To remove the frozen panes, go back to the **View** tab, click the **Freeze Panes** button and select **Unfreeze Panes**

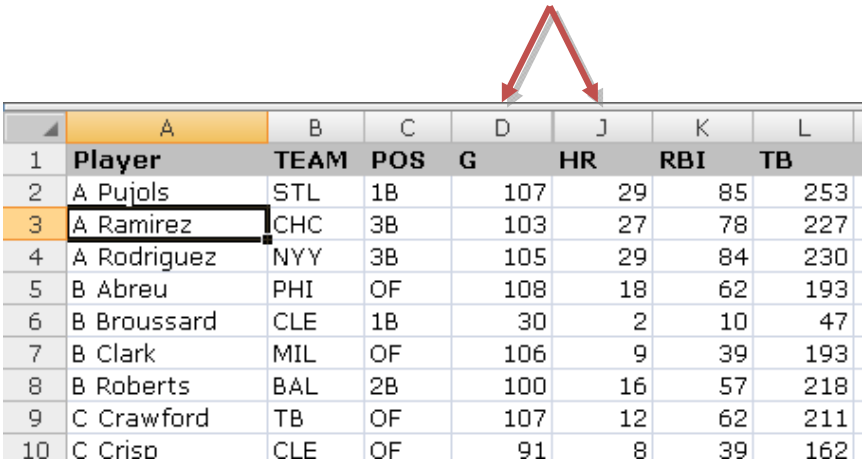


Hiding Rows and Columns

If you have rows or columns with data that doesn't need to be displayed, you can hide them from view without deleting them. When you need to view or manipulate hidden rows or columns, you can display them again.

1. Select columns **E** thru **I**
2. Right-click on one of those column headers and select **Hide** on the shortcut menu
3. To unhide the columns, select columns **D** thru **J**

4. Right-click the selection, and click **Unhide** on the shortcut menu

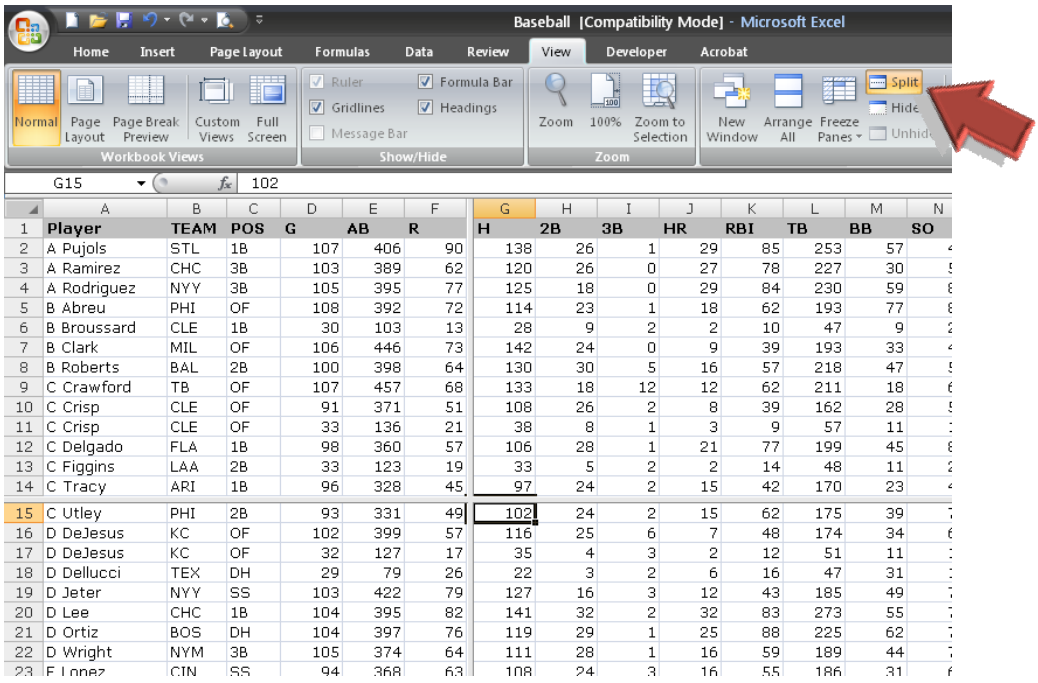


	A	B	C	D	J	K	L
1	Player	TEAM	POS	G	HR	RBI	TB
2	A Pujols	STL	1B	107	29	85	253
3	A Ramirez	CHC	3B	103	27	78	227
4	A Rodriguez	NYY	3B	105	29	84	230
5	B Abreu	PHI	OF	108	18	62	193
6	B Broussard	CLE	1B	30	2	10	47
7	B Clark	MIL	OF	106	9	39	193
8	B Roberts	BAL	2B	100	16	57	218
9	C Crawford	TB	OF	107	12	62	211
10	C Crisp	CLE	OF	91	8	39	162

Using Split Screens

You can divide your worksheet view into four sections, and then manipulate your view of a large worksheet by scrolling within each pane. To do that:

1. Click cell **G15** to specify where the split dividers should appear.
2. On the **View** tab, click **Split**.
3. Drag the divider to a new location to see more or less of a pane, and scroll to view the data.
4. To return to normal, go to the **View** tab and click **Split**.



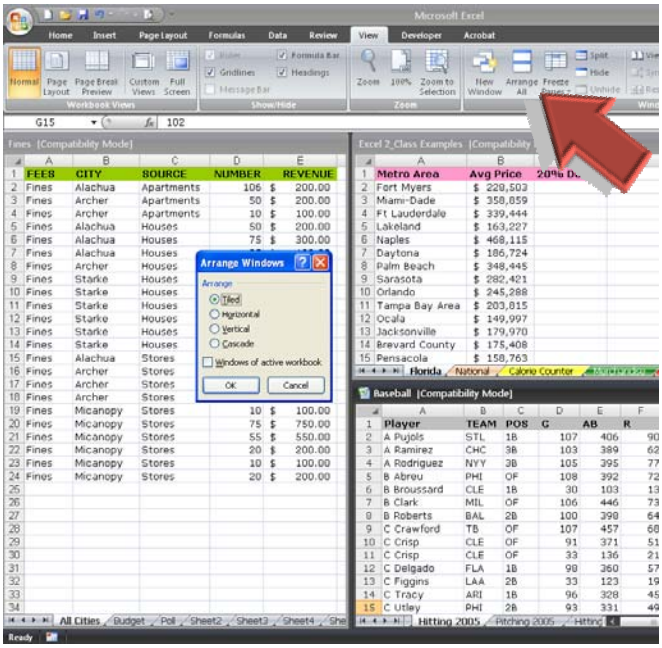
	A	B	C	D	E	F	G	H	I	J	K	L	M	N
1	Player	TEAM	POS	G	AB	R	H	2B	3B	HR	RBI	TB	BB	SO
2	A Pujols	STL	1B	107	406	90	138	26	1	29	85	253	57	
3	A Ramirez	CHC	3B	103	389	62	120	26	0	27	78	227	30	
4	A Rodriguez	NYY	3B	105	395	77	125	18	0	29	84	230	59	
5	B Abreu	PHI	OF	108	392	72	114	23	1	18	62	193	77	
6	B Broussard	CLE	1B	30	103	13	28	9	2	2	10	47	9	
7	B Clark	MIL	OF	106	446	73	142	24	0	9	39	193	33	
8	B Roberts	BAL	2B	100	398	64	130	30	5	16	57	218	47	
9	C Crawford	TB	OF	107	457	68	133	18	12	12	62	211	18	
10	C Crisp	CLE	OF	91	371	51	108	26	2	8	39	162	28	
11	C Crisp	CLE	OF	33	136	21	38	8	1	3	9	57	11	
12	C Delgado	FLA	1B	98	360	57	106	28	1	21	77	199	45	
13	C Figgins	LAA	2B	33	123	19	33	5	2	2	14	48	11	
14	C Tracy	ARI	1B	96	328	45	97	24	2	15	42	170	23	
15	C Utley	PHI	2B	93	331	49	102	24	2	15	62	175	39	
16	D DeJesus	KC	OF	102	399	57	116	25	6	7	48	174	34	
17	D DeJesus	KC	OF	32	127	17	35	4	3	2	12	51	11	
18	D Dellucci	TEX	DH	29	79	26	22	3	2	6	16	47	31	
19	D Jeter	NYY	SS	103	422	79	127	16	3	12	43	185	49	
20	D Lee	CHC	1B	104	395	82	141	32	2	32	83	273	55	
21	D Ortiz	BOS	DH	104	397	76	119	29	1	25	88	225	62	
22	D Wright	NYM	3B	105	374	64	111	28	1	16	59	189	44	
23	E Lopez	CIN	SS	94	368	63	108	24	3	16	55	186	31	

NOTE: You can also split the screen into two sections by dragging the split box (located at the top of the vertical scroll bar or at the right end of the horizontal scroll bar) to the position you want.

Arranging Multiple Windows

If you want to compare or enter data on several workbooks at one time, you can open each workbook and then arrange the windows.

1. Open several files.
2. On the **View** tab, click **Arrange All**.
3. Select **Tiled**.
4. To return to normal view, **maximize** any workbook.

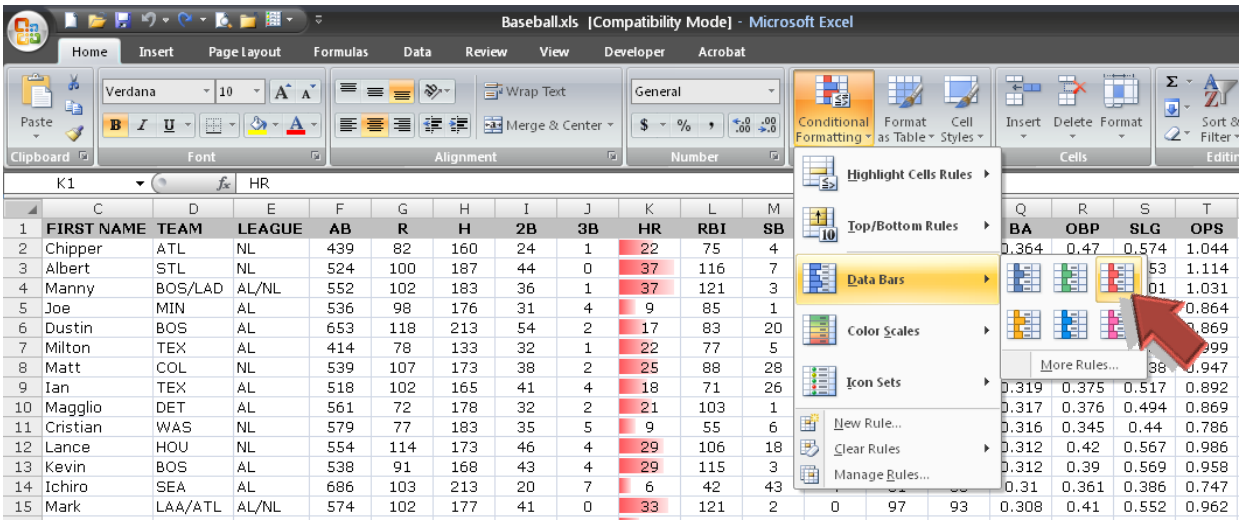


Conditional Formatting

When you need to quickly identify items in a spreadsheet that meet a defined criterion, you can use conditional formatting. If the cell meets the criteria, the formatting you chose will automatically be applied.

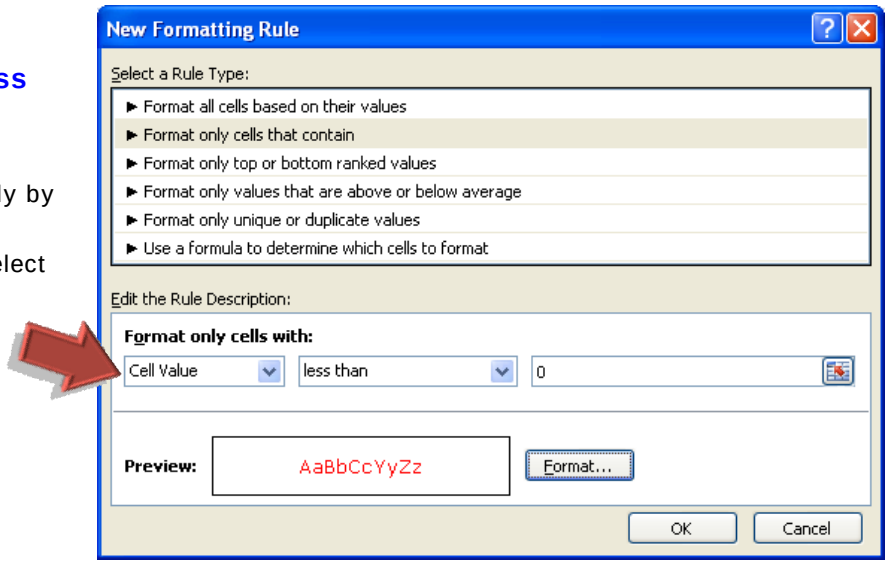
Conditional Formatting Templates

1. In the **Baseball.xls** file, open the **2008 Batting** sheet.
2. Select column K.
3. On the **Home** tab click **Conditional Formatting** then **Data Bars** and select one of the six colors.



Setting Up Your Own Conditional Formatting Options

1. In the **Excel Level 2 Examples** file, open the **Budget** sheet.
2. Select the range **E5:F8**.
3. On the **Home** tab click **Conditional Formatting** then select **New Rule**.
4. From the **New Formatting Rule** dialog box, select **Format only cells that contain**.
5. In the first field, select **Cell Value**.
6. In the second field, select **Less than**.
7. In the last field, type **0**.
8. Specify the formatting to apply by clicking **Format**.
9. Click the **Color** arrow and select **Red**.
10. Click **OK**.

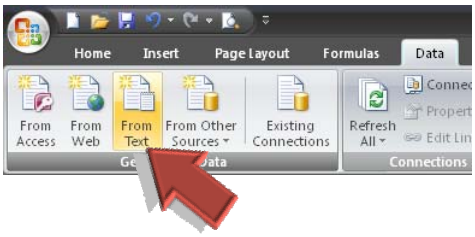


	B	C	D	E	F
1					
2	2008 Budget Overview				
3					
4	Category	Expenses	Budget	Difference	% Difference
5	Projects	$ 25,000.00	$ 27,500.00	$ 2,500.00	9.09%
6	Publications	$ 1,500.00	$ 1,250.00	$ (250.00)	-20.00%
7	Travel	$ 1,290.00	$ 1,059.39	$ (230.61)	-21.77%
8	Supplies	$ 2,000.00	$ 1,775.00	$ (225.00)	-12.68%
9					

Importing Data

Importing Data From a Text File

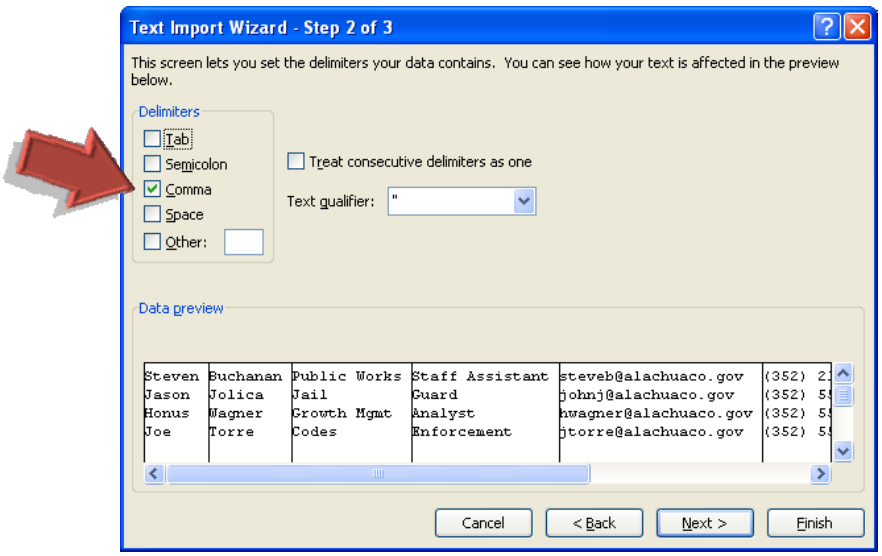
By importing data, you don't have to retype the data you want to analyze in Excel, saving you time, energy, and potential frustration. To import data from a text file:



1. Open the file **Employees.xls** and click in cell **A6**
2. On the **Data** tab, click **From Text**
3. Browse for and double-click on the **New Employees** text file
4. The Text Import Wizard begins, and usually guesses the correct information:
   - On **Step 1** click **Next**
   - On **Step 2** make sure the **Delimiter** is set to **Comma** then click **Next**
   - On **Step 3** click **Finish**
5. Click **OK**

The data is brought into the Excel spreadsheet, placed into the proper columns. However, the columns widths have been modified, so we'll need to specify their widths again. One fast way to do this is to use the AutoFit option.

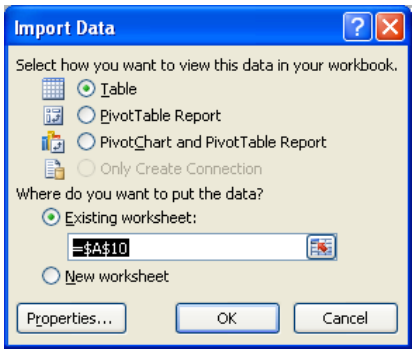
6. Select columns **A** thru **H**
7. On the **Home** tab and click **Format** > **Autofit Column Width**

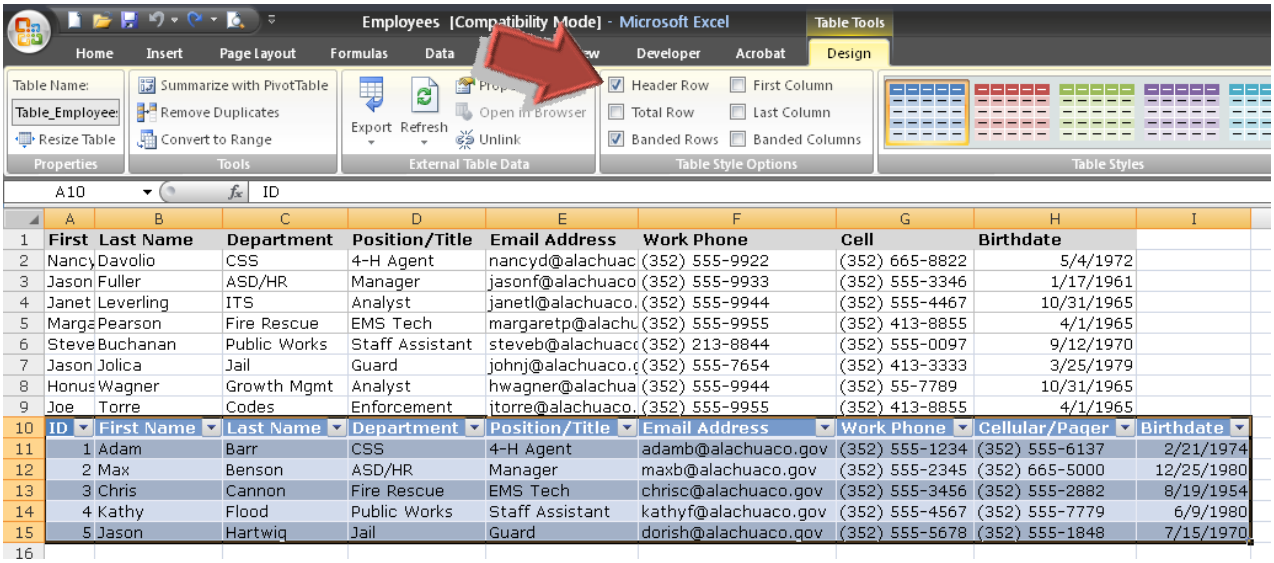


Importing Data from a Database

In a similar fashion as Text File imports, data can be imported from a database. In this example, however you will not need to step through the **Wizard** process.

1. In the same **Employees.xls** file, click in cell **A10**.
2. On the **Data** tab select **From Access**.
3. Browse for and double-click the **Emlployees.mdb** file
4. This time there is no Wizard, simply click **OK** to import the data.
5. The header row that Access imports with the data cannot be deleted in by right-clicking and selecting delete. Select the imported data from Access and click the **Design** tab and deselect **Header Row**.



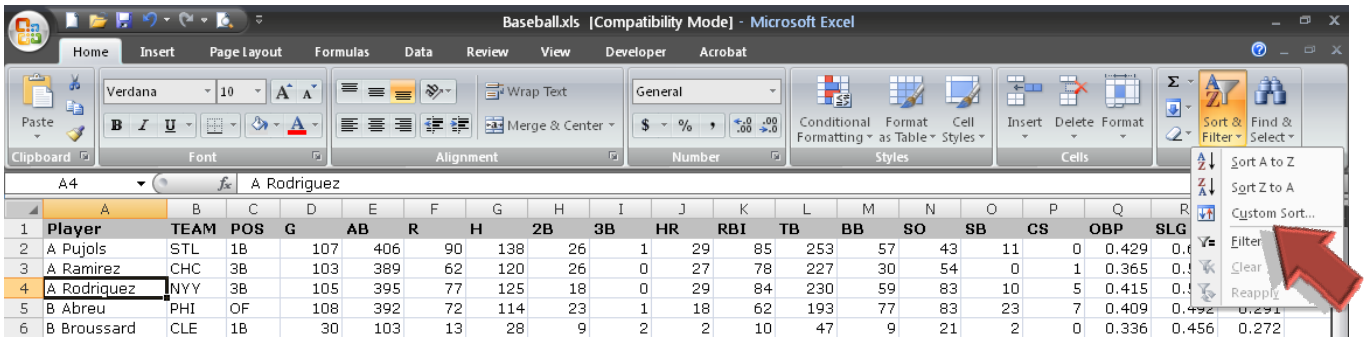


Summarizing Spreadsheet Information

Sorting Data

Because data is often added to a list in no particular order, you can use Excel to sort a list alphabetically or numerically. A quick way to sort a list is to use the Sort Ascending and Sort Descending buttons.

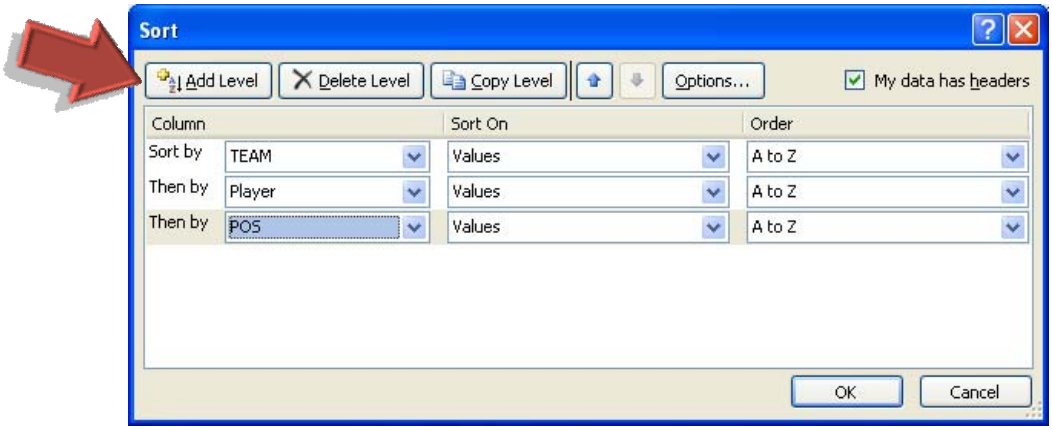
1. Click in the column you wish to sort by
2. On the **Home** tab, click the **Sort & Filter** button
3. Select the **A-Z**or **Z-A** button



Custom Sort

You can also sort by more than one column.

1. On the **Home** tab, click the **Custom Sort** button
2. Select your desired **Column**, **Sort On** and **Order**
3. Click the **Add Level** button to sort by another level
4. You can add as many levels as you like
5. Click **OK**



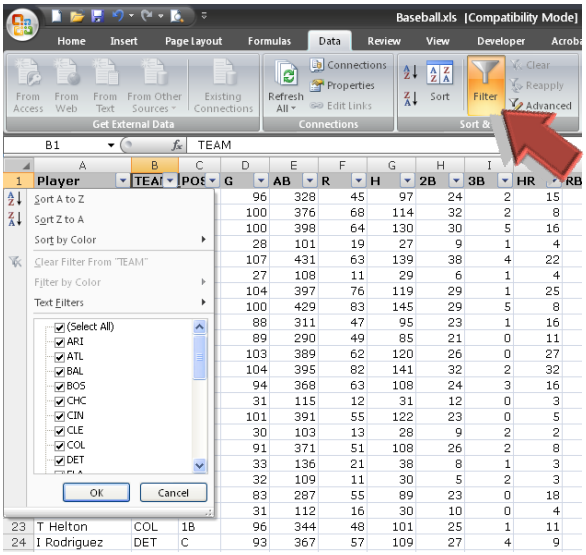
Filtering Information

To view and work with specific data in a list, you can filter the list, rather than rearrange it, enabling you to temporarily hide rows that you don't want displayed.

1. On the **Data** tab, click **Filter**

The AutoFilter command displays arrows next to the column labels in the list. When you click the AutoFilter arrow next to a column label, you'll see a list that includes one entry for each category in the column.

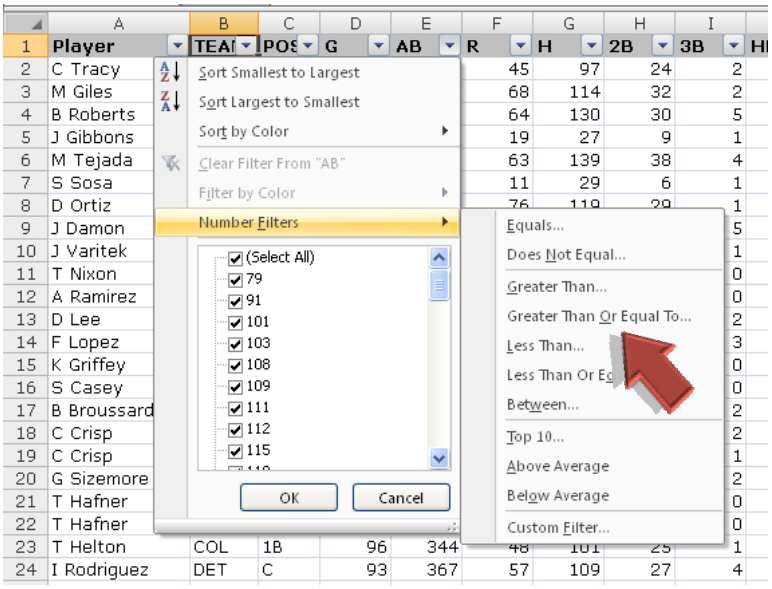
2. Click the **AutoFilter** arrow next to the desired column and choose **Select All** to remove all check marks
3. Place a check mark next to the value you want to filter by
4. To remove the applied filter, click the **Filter** button on the **Home** tab

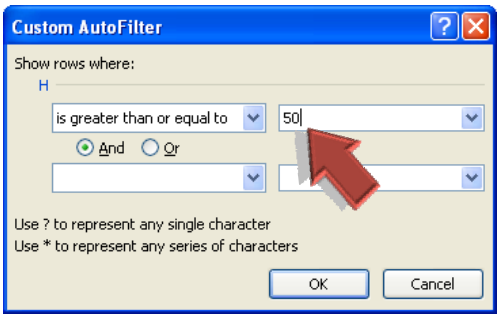


Custom Filters

Another way to view a specific set of data is with a custom filter. In the Custom AutoFilter dialog box, you can select a filtering operation and enter a value from the worksheet.

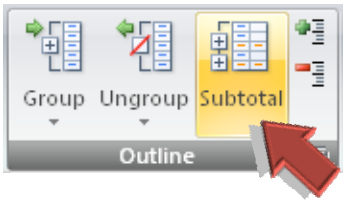
1. Click the **AutoFilter** arrow next to a column containing numbers and select Number Filters
2. From the menu, click **Greater Than Or Equal To**
3. Enter your desired number
4. Click **OK**





Using Subtotals

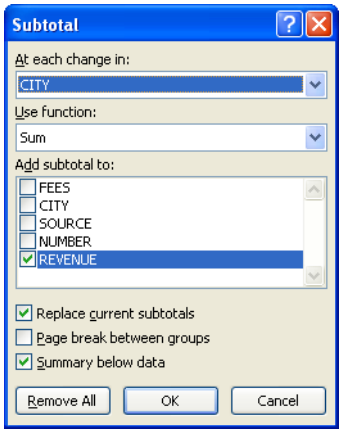
Using Excel, you can summarize data in a list by calculating subtotals and grand totals.



1. Open the **Fines.xls** file and click in cell **A1**
2. On the **Data** tab, click **Subtotals**

Now you must specify the column that contains the items or groups by which you want to subtotal values in other columns and which function to use.

3. Click the **At Each Change In** arrow, and click **City**
4. Leave the default **Use Function** item to calculate the total
5. In the **Add subtotal to** list, select **Revenue**
6. Leave the **Summary below data** check box selected to calculate subtotals and a grand total
7. Click **OK**



The list now contains a subtotal for each city. When you insert subtotals, Excel outlines the list by grouping detail rows with an associated subtotal row. You can click the outline headers to view specific sections of the worksheet. To view just the subtotals for each city, along with the grand total:

- Click the **2** outline header.

	A	B	C	D	E
1	FEES	CITY	SOURCE	NUMBER	REVENUE
2	Fines	Alachua	Apartments	106	$ 200.00
3		**Alachua Total**			$ 200.00
4	Fines	Archer	Apartments	50	$ 200.00
5	Fines	Archer	Apartments	10	$ 100.00
6		**Archer Total**			$ 300.00
7	Fines	Alachua	Houses	50	$ 200.00
8	Fines	Alachua	Houses	75	$ 300.00
9	Fines	Alachua	Houses	25	$ 100.00
10		**Alachua Total**			$ 600.00
11	Fines	Archer	Houses	40	$ 400.00
12		**Archer Total**			$ 400.00
13	Fines	Starke	Houses	30	$ 300.00
14	Fines	Starke	Houses	20	$ 200.00
15	Fines	Starke	Houses	40	$ 400.00
16	Fines	Starke	Houses	56	$ 560.00
17	Fines	Starke	Houses	40	$ 400.00
18	Fines	Starke	Houses	20	$ 200.00
19		**Starke Total**			$ 2,060.00
20	Fines	Alachua	Stores	200	$ 2,000.00
21		**Alachua Total**			$ 2,000.00
22	Fines	Archer	Stores	10	$ 100.00
23	Fines	Archer	Stores	55	$ 550.00
24	Fines	Archer	Stores	20	$ 200.00
25		**Archer Total**			$ 850.00
26	Fines	Micanopy	Stores	10	$ 100.00
27	Fines	Micanopy	Stores	75	$ 750.00
28	Fines	Micanopy	Stores	55	$ 550.00
29	Fines	Micanopy	Stores	20	$ 200.00
30	Fines	Micanopy	Stores	10	$ 100.00
31	Fines	Micanopy	Stores	20	$ 200.00
32		**Micanopy Total**			$ 1,900.00
33		**Grand Total**			$ 8,310.00
34					

	A	B	C	D	E	F
1	FEES	CITY	SOURCE	NUMBER	REVENUE	
3		**Alachua Total**			$ 200.00	
6		**Archer Total**			$ 300.00	
10		**Alachua Total**			$ 600.00	
12		**Archer Total**			$ 400.00	
19		**Starke Total**			$ 2,060.00	
21		**Alachua Total**			$ 2,000.00	
25		**Archer Total**			$ 850.00	
32		**Micanopy Total**			$ 1,900.00	
33		**Grand Total**			$ 8,310.00	
34						

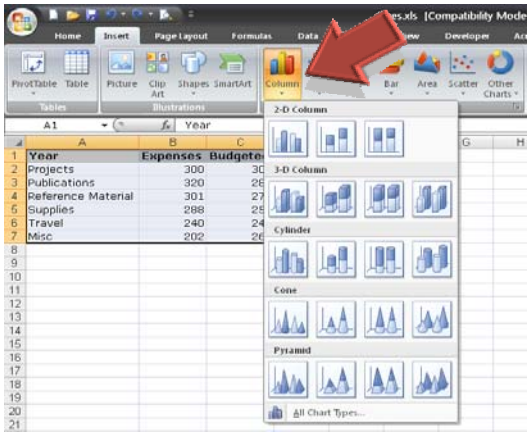
Charts & Graphs

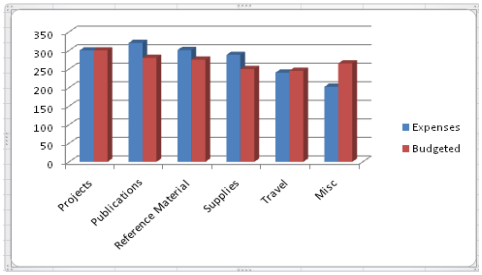
Charts are designed to help users more easily see comparisons, patterns, and trends in data. Choosing the right chart can make a big difference when it comes to presenting and analyzing information. Excel includes 14 basic chart types, each of which includes sub-types or variations. You can browse through the available types and subtypes to find the chart type that will represent your data most effectively. The most common types of charts used for business purposes are Column charts, Bar charts, Line charts, and Pie charts.

Create a Chart

When you want to get a quick start on illustrating the data stored in a worksheet, you can use the Chart Wizard. Let's create a chart using the subtotals on this worksheet. To begin, you need to select the range of cells containing the data series you want to present as a chart.

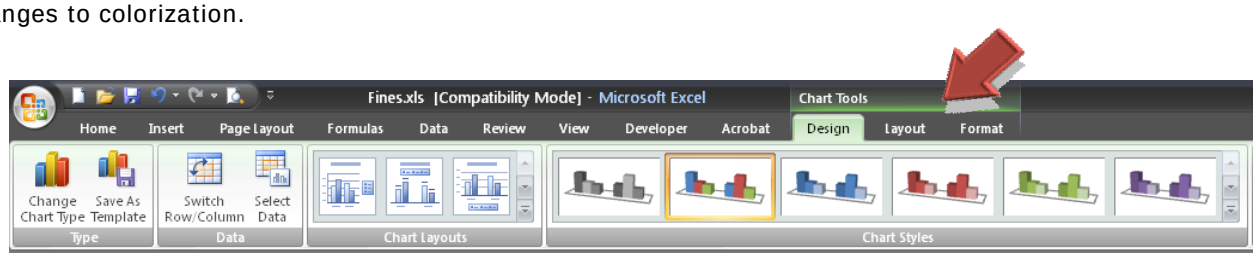
1. In the **Fines.xls** file, click the **Budget** tab
2. Select the range **A1:C7**
3. On the **Insert** tab, select the **Column** category then one of the 3-D types

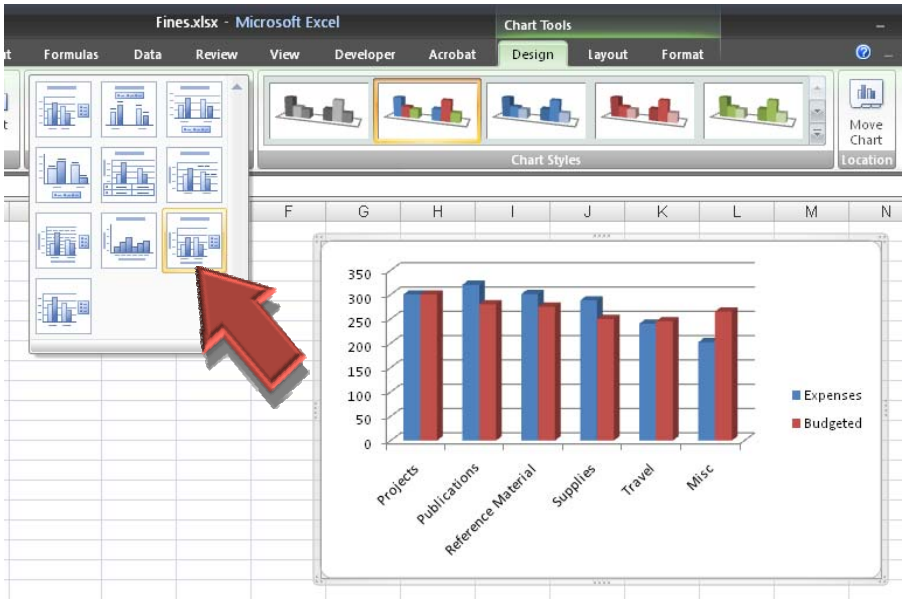




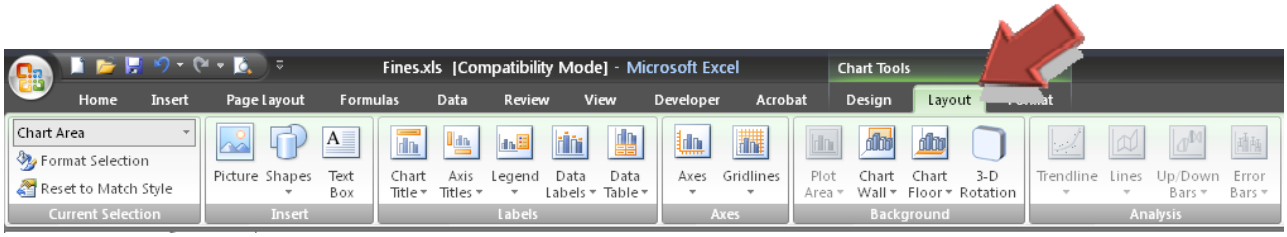
The Chart Tools Contextual Tab

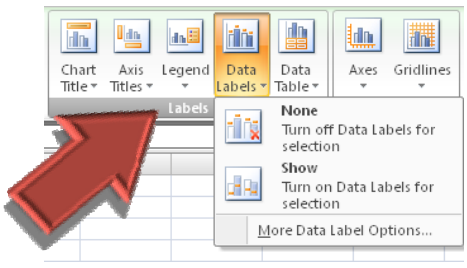
Use the **Chart Tools** contextual tab to modify the style of your chart. From the **Design** sub-tab the **Chart Layouts** gallery provides 10 different layout options. The **Chart Styles** gallery helps you make quick changes to colorization.





If none of the options from the **Chart Layouts** group are satisfactory, you can make your own modifications by using the **Layout** sub-tab; especially the **Labels** group.

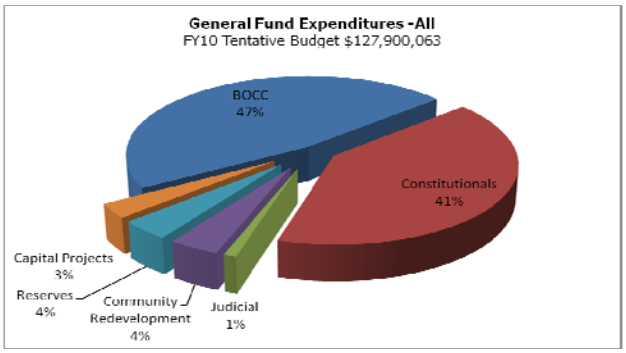




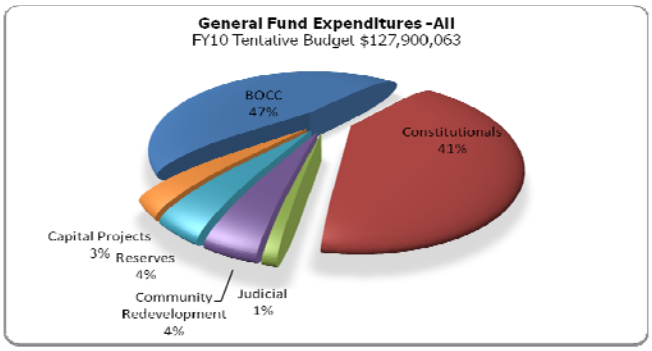
Advanced Chart Customization

The overall appearance of a chart can be changed via the **CHANGE CHART TYPE** button on the **CHART TOOLS – DESIGN** tab. With this you can change from a flat chart style to a 3-D style or convert, say, a pie chart to a bar chart. More subtle, but visually appealing, changes can be made to a chart from the **FORMAT DATA SERIES** dialog box. The example below illustrates several of these subtle changes.

Standard Pie Chart
Standard 3-D, Exploded Pie Chart

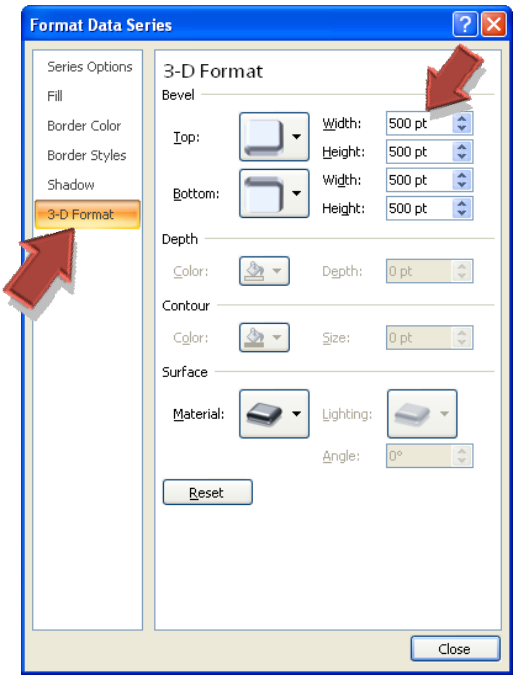


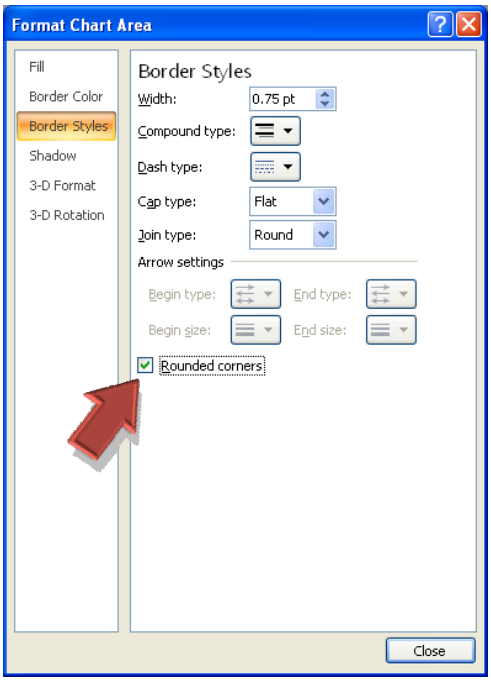
Customized Pie Chart
Shadow, Beveled Edge, Rounded & Shadowed Border, Surface Shine



To apply the changes found on the customized chart, follow the directions below:

1. Begin by right-clicking on a pie piece and select **FORMAT DATA SERIES**.
2. Choose the **3-D FORMAT** category.
3. In the **BEVEL** area, choose a bevel style for the **TOP** and **BOTTOM**
4. Apply a point size to the **WIDTH** and **HEIGHT** for the **TOP** and **BOTTOM** bevel (while the example below uses a **500 POINT** size, enter your own desired point size.)
5. To add a surface effect, select a style from the **SURFACE MATERIAL** area.
6. To modify the chart border, right click on the chart border and select **FORMAT CHART AREA**.
7. From the **BORDER STYLES** category, choose rounded corners
8. From the **SHADOW** category, you can choose a shadow style from the **PRESETS** list





Individual Practice

1. Open the **Excel Level 2 Practice.xls** file to the **Merchandise** tab.
2. In cell **B18**, calculate the total number of items using the COUNT NUMBERS function.
3. In cell **B19**, calculate the total number of items in stock using SUM function.
4. In cell **B20**, calculate the average price of items using the AVERAGE function.
5. In cell **B21**, calculate the maximum price of items using the MAX function.
6. In cell **B22**, calculate the minimum price of items using the MIN function.
7. In cell **E2**, create a nested IF function to calculate the shipping cost so that items weighing **less than 50 pounds** costs **$15** to ship, items weighing **between 50-99 pounds** costs **$25** to ship, and items weighing **100 pounds or more** costs **$35** to ship.
8. Using the AutoFill handle, copy the formula in cell **E2** to cells **E3:E16**.
9. Click the **Invoice** tab.
10. In cell **M12**, insert the NOW function so that the date is updated each time the worksheet is opened or refreshed.
11. In cell **M15**, enter a formula which will calculate the payment due date of 14 days from today.
12. In cell **K18**, insert a VLOOKUP function to display the weight of an item entered into cell C18. Change the range for the table to absolute references. Using the AutoFill handle, copy the formula to cell **K24**.
13. In cell **L18**, insert a VLOOKUP function to display the price of an item entered into cell C18. Change the range for the table to absolute references. Using the AutoFill handle, copy the formula to cell **L24**.
14. Test your formulas: Enter a QTY and ITEM into cells **B18** and **C18**. Press ENTER. If the weight and price appear in cells K18 and L18, your formulas are correct.
15. Click the **Investment** tab. In cell **D9**, insert a FV function to determine the future value of the investment.
16. Click the **Loan** tab. In cell **D9**, insert a PMT function to determine the monthly payment of the loan.

Worksheet Function Categories

You can add functions to your formulas to perform more advanced numerical and text processing operations in worksheets. A function is a predefined equation that operates on one or more values and returns a single value. Excel includes more than 200 built-in functions organized in 11 categories. The table below lists each category and describes its general use.

Category	Functions Used For
Database	Working with external databases and lists
Date and Time	Calculations involving date and time
External	Converting euro currency, and connecting to external data sources
Engineering	Performing common engineering calculations
Financial	Determining appreciation, depreciation, interest, payments, and other common calculations
Information	Determining if an error has occurred in a calculation
Logical	Calculations that produce a result of TRUE or FALSE
Lookup and Reference	Calculations involving tables of data
Math and Trigonometry	Mathematical and trigonometric calculations similar to those found on a scientific calculator
Statistical	Determining average, standard deviation, sum, variance, and other common calculations
Text and Data	Comparing, converting, and reformatting text within cells

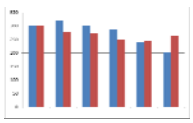
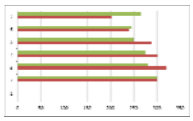
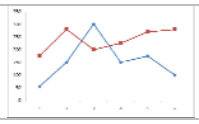
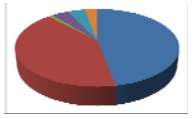
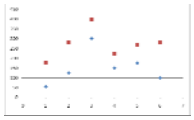
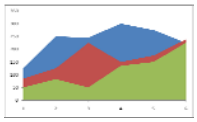
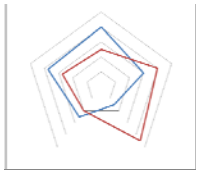
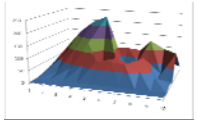
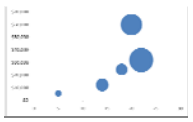
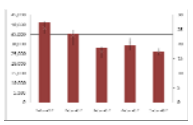
Formula and Function Shortcuts

When you're working with formulas and functions, there are many useful keyboard shortcuts you can use to increase your efficiency. Some of the more helpful shortcuts are listed in the table below. For additional information about keyboard shortcuts, you can type **shortcuts** in the Office Assistant or on the **Answer Wizard** tab in the Excel Help window, and click **Search**.

To do this:	Press this:
Open the **Insert Function** dialog box to insert a function	Shift + F3
Insert an AutoSum formula	Alt + = (equal sign)
Insert the argument names and parentheses for a function after you type a function name in a formula	Ctrl + Shift + A
Open the **Function Arguments** dialog box after you type a function name in a formula	Ctrl + A
Create names from row and column labels	Ctrl + Shift + F3
Paste a defined name into a formula	F3
Switch between displaying cell values and cell formulas	Ctrl + ` (Single left quotation mark)
Calculate all sheets in all open workbooks, *or* Calculate the selected portion of a formula	F9
Calculate the active worksheet	Shift + F9

Chart Types

The types of charts available in Excel are described in the table below.

Chart Type	Example	Description
Column		Column charts display categories on the horizontal axis and the category data on the vertical axis. Column charts are commonly used to show financial data over time. You can also show the relationship of your data to totals by using a stacked column chart.
Bar		Bar graphs compare data across categories. The categories are shown along the vertical axis while the data is shown along the horizontal axis.
Line		A line graph is similar to a bar graph, the only difference is that a line is drawn from value to value instead of bars. Line charts are best used to show trends over time or by category.
Pie		Pie charts show what percentage each data value contributes to the whole. Pie charts are best suited for datasheets with only one row or column.
Scatter		A scatter chart is used for comparing pairs of values. A scatter chart is particularly useful to draw relationships between the numerical data presented in both the categories and the series.
Area		An area chart displays the trend of values over time or categories. Area charts are plotted like line charts, with the area under the lines filled in. Because of the fill, area charts are best particularly suited for slides.
Doughnut		A doughnut chart is similar to a pie chart, and has the advantage of being able to be used for data with more than one series.
Radar		A radar chart compares the values of several data series relative to a center point using a radar chart. Each category has its own value axis radiating out from the center, and lines connect all the values in a series. This type of chart is usually used for scientific data.
Surface		A surface chart can be used when you have two series of data. The data is plotted like a line graph and then connected to create a ribbon-like surface.
Bubble		A bubble chart enables you to plot three series of data. The data is represented by values on the horizontal axis, the vertical axis, and by the size of each bubble.
Stock		A stock chart is designed specifically to plot stock prices. The simplest version plots high, low, and closing prices.