

Tips for using Microsoft Excel

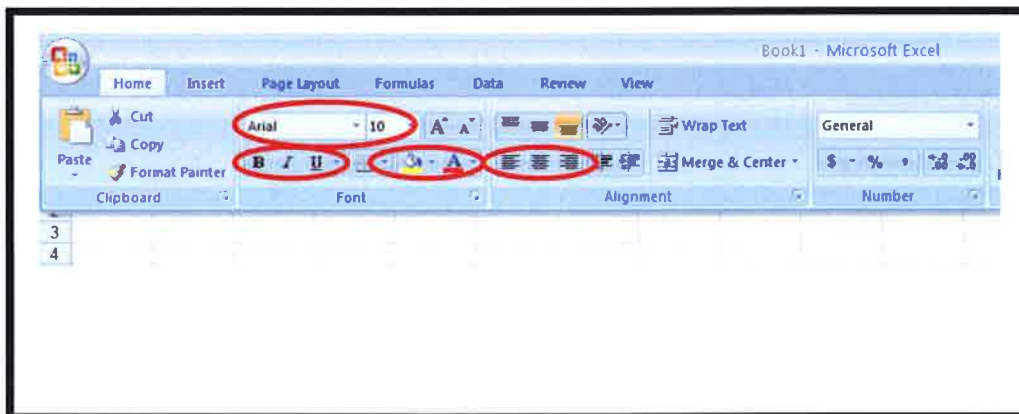
Many of the standard Microsoft shortcuts are valid in Excel, too. Here are some that can save time. These are the keystrokes for PCs. For Mac users, use the Command key instead of Control.

Ctrl+C	Copy	Ctrl+I	Italics
Ctrl+V	Paste	Ctrl+U	Underline
Ctrl+A	All	Ctrl+N	New
Ctrl+X	Cut	Ctrl+Z	Undo
Ctrl+S	Save	Ctrl+M	Minimize
Ctrl+P	Print	Ctrl+F	Find
Ctrl+O	Open file	Ctrl+H	Find and replace
Ctrl+B	Bold	Ctrl+K	Add hyperlink

Ctrl+Home	Go to Cell A1
Ctrl+End	Go to bottom of spreadsheet contents
Ctrl+Page Down	Next worksheet
Ctrl+Page Up	Previous worksheet
Ctrl+Spacebar	Selects entire column
Shift+Spacebar	Selects entire row
Right click on the mouse	This opens to a number of options
Double-clicking in a cell	Allows you to edit the contents of the cell (F2 on PCs)

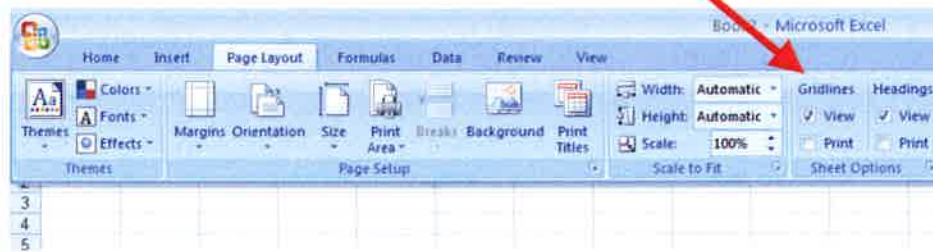
Many of these actions also have on-screen icons, and you can access some of them by right-clicking at any time. This is an example of how there is often more than one way to do something in Excel, whether it involves calculations or preferences.

You can format the appearance and general character of your spreadsheet by adjusting settings from the options along the top of the screen, known as the ribbon. Among the most commonly used options are centering the contents of a cell (say for a header), or adding a color for clarity or contrast in a spreadsheet.



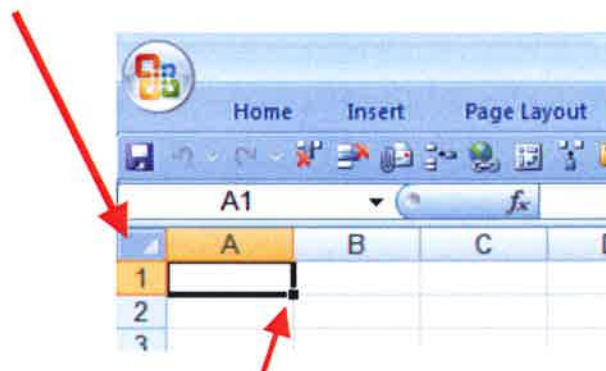
Above: From the ribbon you can change the font, point size, add boldface, add color, or center contents of cells. These are aesthetics that can make your work more readable. Maybe the most important advice for Excel: Always keep your original data. Create a copy of it and make changes to the copy. Maybe the second most important advice is to save often, but be aware if you have unwanted changes to your data.

When printing, you may want to include the gridlines in your spreadsheets to make the contents easier to follow. The easiest way to do this is by clicking on the Page Layout button of the ribbon. You'll notice an option to print gridlines.



Other tips for navigating Excel

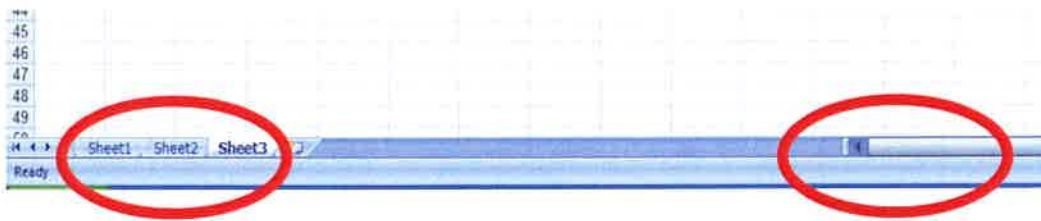
Clicking on the top left rectangle between column A and row 1 selects the entire worksheet. This is helpful if you want to copy everything in a worksheet.



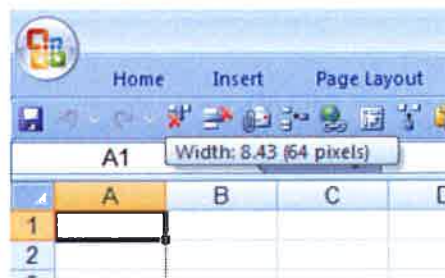
In the active cell, you'll notice a small black square in the lower right corner. When you are over that with your mouse pointer, it will change from a white pointer to a black cross. Drag the auto-fill handle, as it is known, to copy the contents or formula. Double-click the auto-fill handle to fill an entire range vertically.

New spreadsheets begin with three worksheets. They are labeled Sheet 1, Sheet 2 and Sheet 3 in the bottom left portion of the screen. You can add, delete or rename the sheets by right-clicking on the tab names.

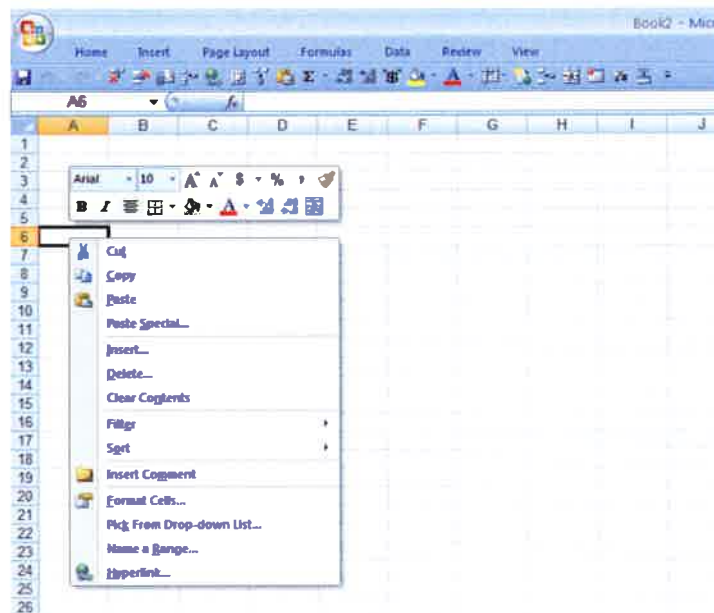
The bar in the bottom right is a quick way to slide from one side of the spreadsheet to another.



Columns and rows come in standard sizes, but they can change to fit their contents. If you want to change a cell's size, you can drag the line between the lettered columns or numbered rows to fit your needs. The pointer will change shapes when you are hovering over the border line, which is where you need to be. A quick way to make it fit is to double-click on the column header or over the row border.



Right-clicking is one of the most versatile tools you have in Excel. Much of whatever you want to do, from the appearance of your calculations to the cosmetics of the way it appears can be done with a right click. Here's what that typically looks like:



Working with numbers and data

This is one of the most basic strengths of using Excel. By using certain commands, you can have it add, subtract, multiply, divide, count and sort large amounts of data.

The SUM command is the workhorse of Excel. You will probably use this more than any other.

There are two basic uses. The first is to spell out each cell to add. The second uses a colon to note a cell range when dealing with many numbers at a time.

Here are two examples that do the same calculation in different ways:

`=SUM(cell address 1+cell address 2+cell address 3-cell address 4)`
`=SUM(cell address 1:cell address 3)-cell address 4`

There's no "right" way to do calculations like this, but the second formula is shorter, especially when you have long lists of numbers.

Notice that you aren't limited to adding when using SUM. You can add (+), subtract (-), multiply (*) or divide (/) using the command.

Use parentheses to group calculations so they do what you want them to do and in the correct order. Here's an example:

$(3+7)/5$ is not the same as $3+(7/5)$. The answer to the first calculation is 2. The answer to the second one is 4.4. Where you put your parentheses makes a difference.

Copying formulas is easy, and Excel can do a pretty good job of adjusting calculations based on what it thinks you want to do. For example:

	Column A	Column B	Column C	What appears in C
Row 1	3	5	=SUM(A1*B1)	15
Row 2	2	6		
Row 3	4	7		

Entering the formula in cell C1 gives you an answer of 15. If you want to do the same calculation for the other rows, too, you can save time by copying the formula and pasting it to the other cells, or drag the auto-fill handle over the same range. (Or double-clicking the auto-fill handle is faster still.) Either way, this is what gets placed in the cells:

	Column A	Column B	Column C	What appears in C
Row 1	3	5	=SUM(A1*B1)	15
Row 2	2	6	=SUM(A2*B2)	12
Row 3	4	7	=SUM(A3*B3)	28

This is what you want and saves you from typing it out in each cell.

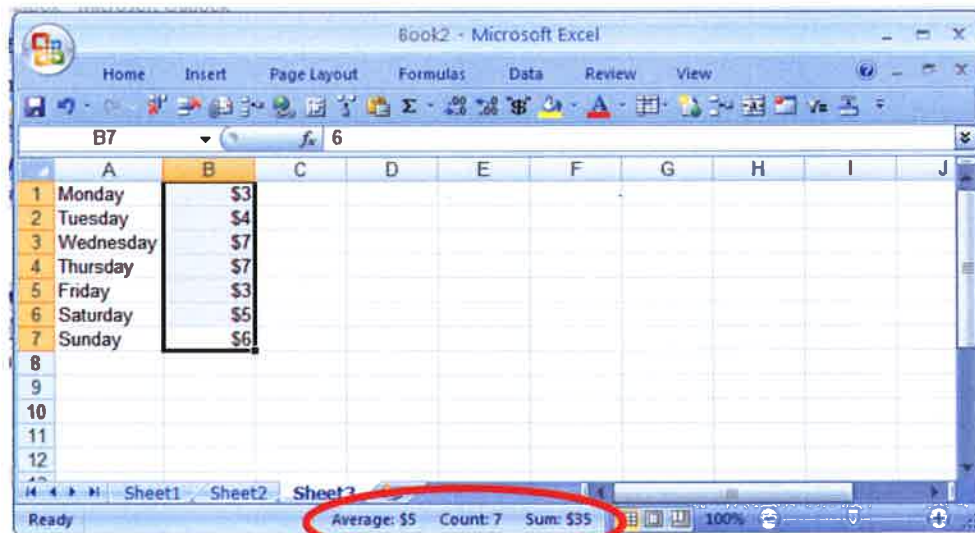
If you want to keep a cell address constant in the formula, you can do so by adding a dollar sign (\$) known as an absolute to it. Let's say we want to keep multiplying cell A1 (as opposed to A2 and A3 as well) by the various rows in column B. Here's what you would copy or auto-fill:

	Column A	Column B	Column C	What appears in C
Row 1	3	5	=SUM(\$A\$1*B1)	15
Row 2	2	6		
Row 3	4	7		

Doing so results in this:

	Column A	Column B	Column C	What appears in C
Row 1	3	5	=SUM(\$A\$1*B1)	15
Row 2	2	6	=SUM(\$A\$1*B2)	18
Row 3	4	7	=SUM(\$A\$1*B3)	21

There's another way to add things in a series quickly. Highlight the numbers in a line, then look in the bottom right of the screen. Excel gives you some handy calculations.



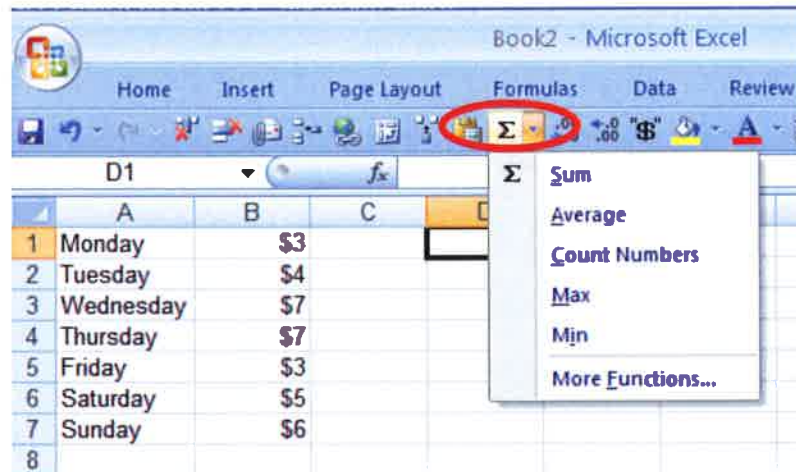
Calculating an average and median is easy.

=AVERAGE(*first cell range:last cell range*) will get you an average of the numbers.

=MEDIAN(*first cell range:last cell range*) will do the same for a median.

Note: Median is the middle number in a range, which is different than the average. Think of Steve Jobs walking into a roomful of reporters. The *average* income for everyone is in the millions because of him, but the *median* income would look like yours because of everyone else.

There's one more way to quickly perform basic math functions, like adding, averaging and counting the number of items in a list. Use the sigma key at the top of the screen. Excel will guess at the range you want to select. You can change this as needed.

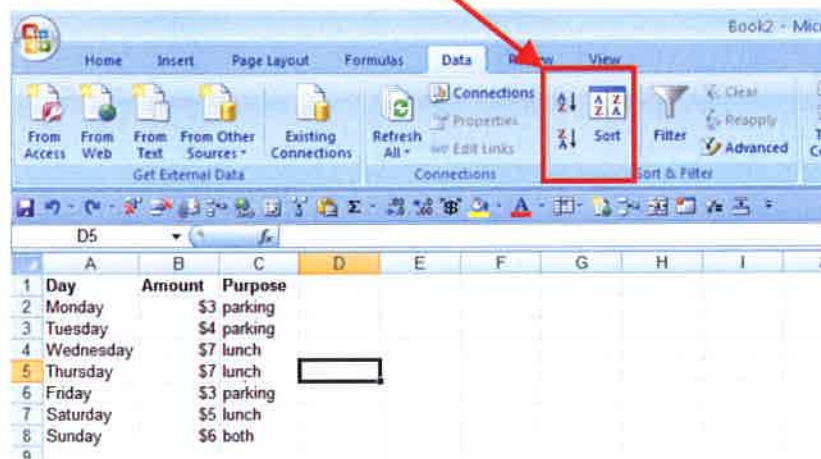


There's an easy way to clean your data of **extraneous spaces** using the TRIM command.

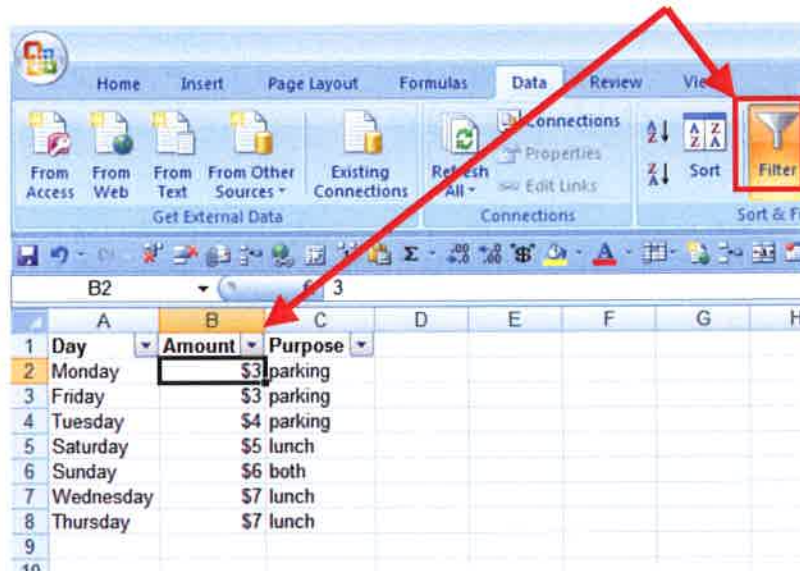
=TRIM(*cell address*)

Sometimes you get lots of fields of data together but realize you need to rearrange them to make sense of them. There are several tools to help you do this.

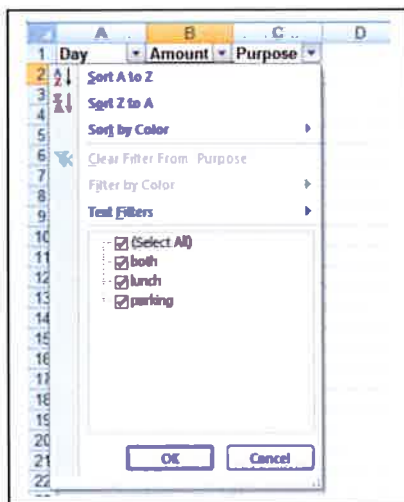
First, you can do a general sort. Go to Data, then click the icon to sort from A to Z or vice versa. (This also sorts numbers the same way.)



Another useful way to sort data is by auto-filter. This creates an easy-to-understand filter that allows you to focus on what you want to see. You activate the auto-filter by going to Data and choosing Filter (which looks like a funnel). You should see the header column with upside-down triangles. Now you can isolate the data you want to see.



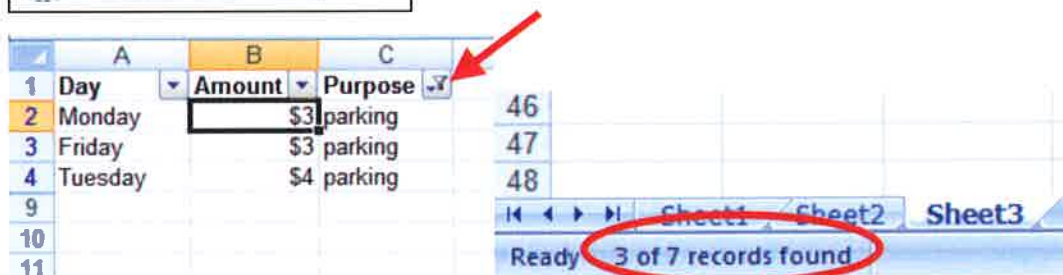
Now, if you want to see data for parking only, you can select that by clicking on the triangle for Purpose.



This opens a box where you have several options. You can sort the data from A to Z, or Z to A. Again, this also sorts numbers from smallest to largest or vice versa.

It also gives you a toggle that displays all the data, none of the data or any particular parts of it. Click the box that applies. So, to show parking only, you could click Select All to uncheck every box, then click on parking. Clicking Select All shows everything again.

Now Excel only shows the data that has parking in it. The rest of the data still exists, but you can't see it. In the bottom left corner it also tallies the records shown.



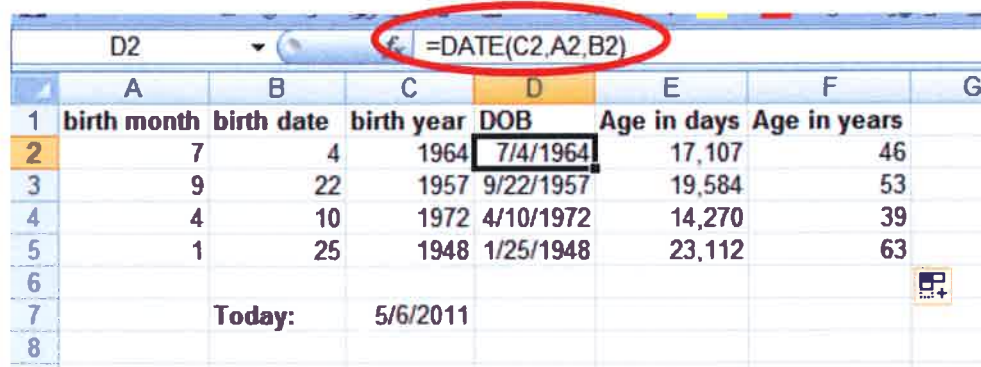
You can filter multiple columns at once. Also, you can customize your filter to show, for example, items that are greater than a certain number. To do so, select from the filter option above the Select All section.

Advanced editing functions

You can do a lot with dates and age. Here are some examples.

To merge different fields for a date, use the DATE command. Notice that the order of the formula is different than the display in the worksheet.

Use =DATE(year cell, month cell, date cell).



	A	B	C	D	E	F	G
1	birth month	birth date	birth year	DOB	Age in days	Age in years	
2	7	4	1964	7/4/1964	17,107	46	
3	9	22	1957	9/22/1957	19,584	53	
4	4	10	1972	4/10/1972	14,270	39	
5	1	25	1948	1/25/1948	23,112	63	
6							
7		Today:	5/6/2011				
8							

You can calculate the **difference between two dates** by using a couple tools. The easiest way to count days is simply to subtract one cell from another. Make sure the answer is formatted as a general number, not a date.

First cell	Second cell	Formula	Answer
7/4/1964	5/6/2011	= <i>(second cell – first cell)</i>	17,107

To **calculate age in years**, use the DATEDIF command.

First date	Second date	Formula	Answer
7/4/1964	5/6/2011	=DATEDIF(<i>start date,end date,"y"</i>)	46

Note that there are no spaces between the cell addresses and the interval. The interval can be “m” for months or “d” for days.

To display only a portion of a date, use the **MONTH or YEAR** command. Say you have a date like 12/20/1969 and you want to display a portion, here’s how to do it:

Formula	Result
=YEAR(<i>cell address</i>)	1969
=MONTH(<i>cell address</i>)	12

To **change case** of text in cells, use the UPPER, LOWER or PROPER commands.

B3		=PROPER(A3)
	A	B
1	arizona state	ARIZONA STATE
2	test STRING	test string
3	MICHAEL CROW	Michael Crow
4		
5		

Formula:
 =UPPER(*cell address*)
 =LOWER(*cell address*)
 =PROPER(*cell address*)

To **merge contents** from different cells, use the ampersand command.

First cell: Super **Second cell:** duper **Formula:** =(first cell address&second address)

Result:
Superduper

To **separate contents**, as with a name, use quote marks with a blank space between them.

First cell: Jan **Second cell:** Brewer **Formula:** =(first cell address&" "&second cell address)

Result:
Jan Brewer

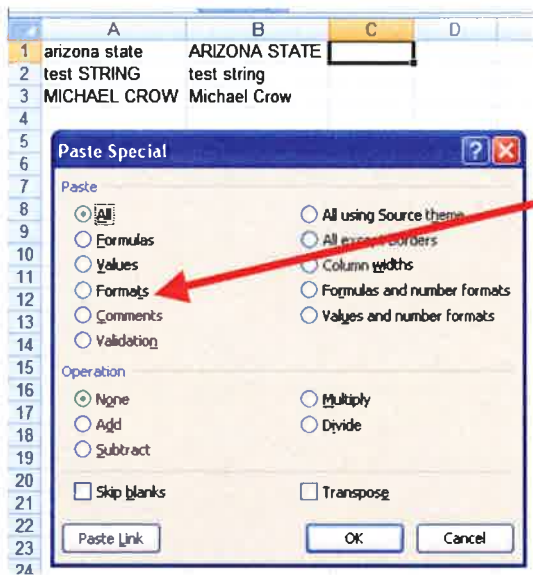
You can **add other characters** the same way. Here's how to list alphabetic by last name:

First cell: Jan **Second cell:** Brewer **Formula:** =(second cell address&" "&first cell address)

Result:
Brewer, Jan

Note the space between the comma and closed quote mark.

In the examples above, the resulting data looks like a name, but it is actually a formula. If you want to copy it somewhere else – or just change it so that it actually is the name it seems – there is an easy way to do it.



First, copy the data and select the cell you want to place it in, then right-click and select **Paste Special**.

In the dialog box that opens, choose **Values**.

The cells should appear the same, but inside them, the contents are no longer a calculation but the words you actually see. This works with numbers, too. It's a good way to change a calculation to the base data you now want to use.

For example, a cell may contain the formula $2*2$, which displays as 4. You can change this to actually be the number 4 by

copying and selecting paste special as a value. Don't forget you can paste it into the cell it originated in, too.

Paste special has one other commonly used function: It transposes data. Suppose you have data displayed horizontally and you would prefer it in a column. Copy the data range and select paste special, then click on transpose in the lower right corner. This changes the layout in a way that can make it easier to use. Here's what it looks like:

Original layout:

ABCD
1234

After copy, paste special and transpose:

A1
B2
C3
D4

This works to reorient material from vertical to horizontal, too. Be careful when doing any of this because formulas that reference distant cells can be thrown off by transposing them.

To locate or clean up data, use the Find and **Find and Replace** functions.

Ctrl+F will locate the characters you enter in the search field. Be as brief, or nonspecific, as you need to be.

For example, to find an instance of Phoenix in a spreadsheet, hit Ctrl+F, then type “pho” or “phoen” in the window. You can spell out “phoenix” but remember that it limits your search only to those instances where it is spelled correctly. It won’t find any misspelled instances, if there are any.

Find and replace is a time-saving tool to clean up numerous instances of something you want to change. Say your data says “CASE RESOLVED, NO ACTION TAKEN” and you want to change this to “case closed”.

Use the Ctrl+F or Ctrl+H shortcuts, and follow the on-screen instructions. The important thing to remember is that it can help a search by using partial terms like “phoe” instead of “phoenix.” But when you do a find and replace, you need to spell out exactly what you want replaced and spell out exactly what you want it replaced with. There are options to make case matter. If you make a mistake, remember you can undo the changes *until you save them*. Be careful because you can sometimes change more than you want! Keep originals and inspect your changes.

To extract portions of a cell, use the **LEFT**, **RIGHT** and **MID** functions.

Say you have a string of data that includes a country code, state code and ZIP plus four code sandwiched around the ZIP code that you really want. It looks like this:

1104850044378

You know that the first four digits aren’t important and the last four aren’t, either. Your formula would tell Excel to start by displaying the fifth character and continue for five characters, the length of a ZIP code. It would look like this:

=MID(*cell address*,5,5)

Starting number string	Selected string
1104850044378	85004

In our example above, the formula would isolate the 85004, which we know is the ZIP code we’re trying to identify.

It’s the same for LEFT and RIGHT functions.

Cell:	Formula:	Result:
3/7/2005	=RIGHT(<i>cell address</i> , 4)	2005

Note: Dates are actually the number of days since the beginning of 1900, but they are formatted to appear like something meaningful to you. If you are working with dates and see some large number that doesn’t seem to correspond to what you were trying to do, it may be a formatting issue that you can fix with a right click, format cells command.

To **split contents** of a cell, you can also use a Data tool.

Suppose we have a cell with two pieces of information that we would rather have in one:

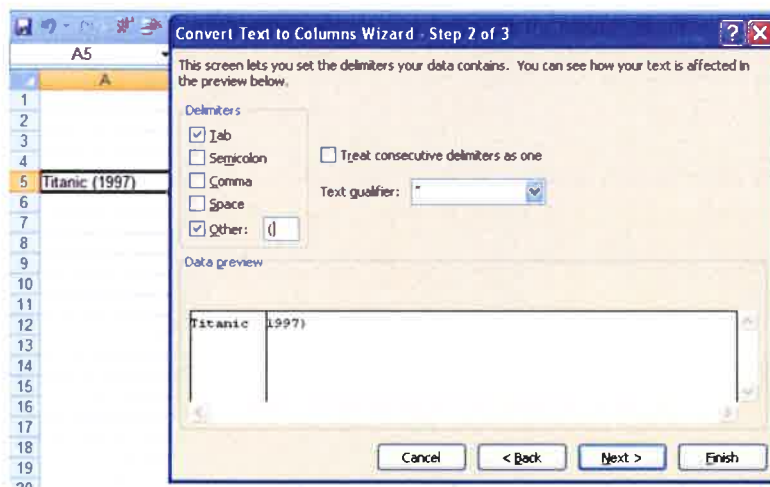
Titanic (1997)

We want to separate the name of the movie, Titanic, and the year of its release, 1997.

First, highlight the area we want to change, then click on Data and go to Text to Columns. A new dialog box should appear and give you a choice of whether the data is delimited or fixed width.

Fixed width is, as the name suggests, a certain number of characters or spaces wide. Choose this if all your data is the same width. Define the width in the next screen and you should have a clean dataset. If the data isn't all the same width, choose delimited.

Delimited data is data that is separated by certain characteristics, say, a comma, a pipe (|), an underscore (_) or a parenthesis. Click on the appropriate box (comma, for example) or enter the appropriate character in the box labeled Other. In our example, it's the opening parenthesis.



Click Finish and it splits the contents so that Titanic is in one cell and 1997) is in the one next to it. You'll want to get rid of the closing parenthesis. You could edit that one cell (by hitting the F2 key). If you have plenty of rows, you'll want to do a Find and Replace and use a backspace stroke to replace the parenthesis.

Using pivot tables

Pivot tables sound scary and, truth be told, aren't especially intuitive. But don't be intimidated. They are one of the most powerful tools in Excel, and once you figure out how they work, you won't want to do things any other way.

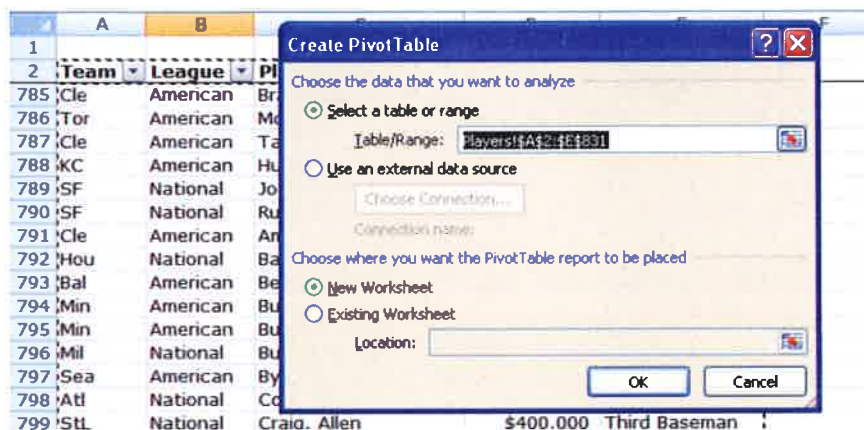
Essentially pivot tables provide an instant database overview based on criteria that you choose. Let's use an example.

Say we have a database of baseball teams, player names, position and salaries for each man. We want to know what the payroll of each team is.

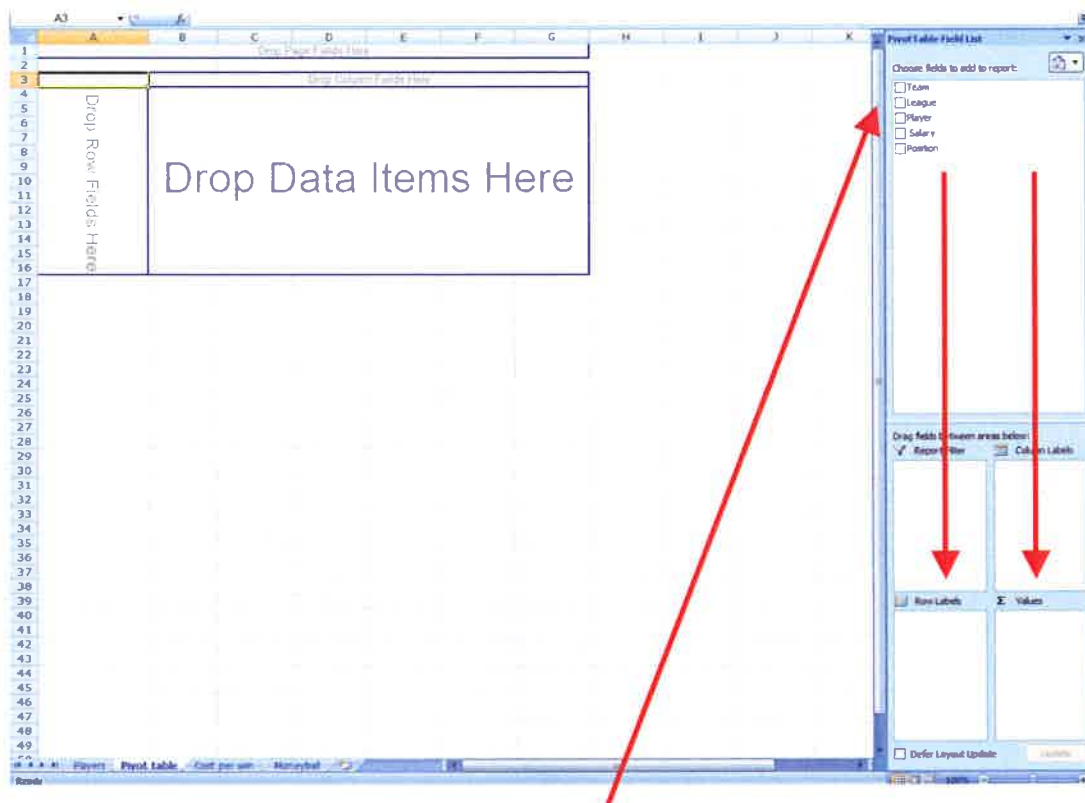
Without a pivot table, we would have to isolate the data for each team and add the salary data. This can be done using an auto-filter, but it is tedious.

Here's how the pivot table makes short work of it:

Click on any part of the database, then go to Insert and select Pivot Table. Excel guesses at the data range you're trying to examine. As long as every column and row are touching and have a header, it will probably guess correctly. Putting something extra alongside any part of the database could confuse Excel. A dialog box opens and shows you the range to be examined. If it looks correct, hit OK and it creates a blank pivot table in a new worksheet.



Now you'll see an empty table with a dialog box that shows buttons for each of the data fields. It should look something like this:



Let's sort the salaries by team. Drag the word Team to the Row Label located in the lower left corner of the Pivot Table Field List. Now drag the word Salary over to the area labeled Values. The totals for each team appear instantly.

3	Sum of Salary	
4	Team	Total
5	Arz	60718166
6	Atl	84423666
7	Bal	81612500
8	Bos	162447333
9	ChC	146609000
10	Cin	71761542
11	Cle	61203966
12	Col	84227000
13	CWS	105530000
14	Det	122864928
15	Fla	57029719
16	Hou	92355500
17	KC	71405210
18	LAA	104963866
19	LAD	95358016
20	Mil	81108278
21	Min	97559166
22	NYM	134422942
23	NYJ	206333389
24	Oak	51654900
25	Phi	141928379
26	Pit	34943000
27	SD	37799300
28	Sea	86510000
29	SF	98641333
30	StL	93540751
31	TB	71923471
32	Tex	55250544
33	Tor	62234000
34	Was	61400000
35	Grand Total	2717759865

In this case, we're totaling dollars, but they first appear as numbers without the dollar sign.

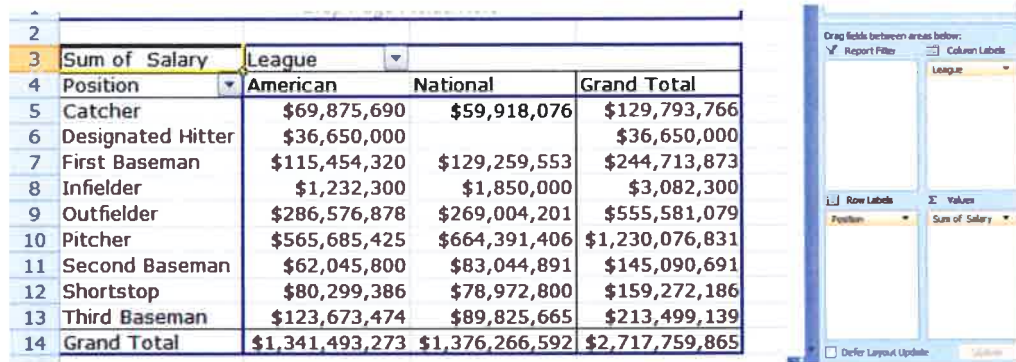
You can change that by right-clicking and selecting Value Field Settings. This opens a dialog box. In the lower left corner it gives you a box to format the numbers. Click that and select currency.

Doing so, formats all the totals properly.

2	Sum of Salary	
3	Team	Total
5	Arz	\$60,718,166
6	Atl	\$84,423,666
7	Bal	\$81,612,500
8	Bos	\$162,447,333
9	ChC	\$146,609,000
10	Cin	\$71,761,542
11	Cle	\$61,203,966
12	Col	\$84,227,000
13	CWS	\$105,530,000
14	Det	\$122,864,928
15	Fla	\$57,029,719
16	Hou	\$92,355,500
17	KC	\$71,405,210
18	LAA	\$104,963,866
19	LAD	\$95,358,016
20	Mil	\$81,108,278
21	Min	\$97,559,166
22	NYM	\$134,422,942
23	NYJ	\$206,333,389
24	Oak	\$51,654,900
25	Phi	\$141,928,379
26	Pit	\$34,943,000
27	SD	\$37,799,300
28	Sea	\$86,510,000
29	SF	\$98,641,333
30	StL	\$93,540,751
31	TB	\$71,923,471
32	Tex	\$55,250,544
33	Tor	\$62,234,000
34	Was	\$61,400,000
35	Grand Total	\$2,717,759,865

You can modify your tables endlessly. Dragging the Player word below Team in the Row Labels allows you to see all the players within each team.

To start a new sort, drag the words out of the box they are in. Let go of the mouse button when it's outside the box. Drag and drop the new sort to do another one. For example, dragging Position into the Row Label and Position into the Column Labels (with Salary still in the Values box) gives you a sort that looks like this:



	League		
Position	American	National	Grand Total
Catcher	\$69,875,690	\$59,918,076	\$129,793,766
Designated Hitter	\$36,650,000		\$36,650,000
First Baseman	\$115,454,320	\$129,259,553	\$244,713,873
Infielder	\$1,232,300	\$1,850,000	\$3,082,300
Outfielder	\$286,576,878	\$269,004,201	\$555,581,079
Pitcher	\$565,685,425	\$664,391,406	\$1,230,076,831
Second Baseman	\$62,045,800	\$83,044,891	\$145,090,691
Shortstop	\$80,299,386	\$78,972,800	\$159,272,186
Third Baseman	\$123,673,474	\$89,825,665	\$213,499,139
Grand Total	\$1,341,493,273	\$1,376,266,592	\$2,717,759,865

There are times when you need Excel to evaluate data and do something if certain conditions exist. This requires the use of **IF statements**. Here's an example: Suppose we have a list of quiz scores and want to determine whether someone passed based on a score greater than 10. Our formula would look something like this:

=IF(cell address>=10,"Pass","Fail")

Score	Result
12	Pass
9	Fail
10	Pass

Notice that we define the criteria, then give instructions. In this case, if a quiz score is greater than or equal to 10, note that the student passed. If not, they failed.

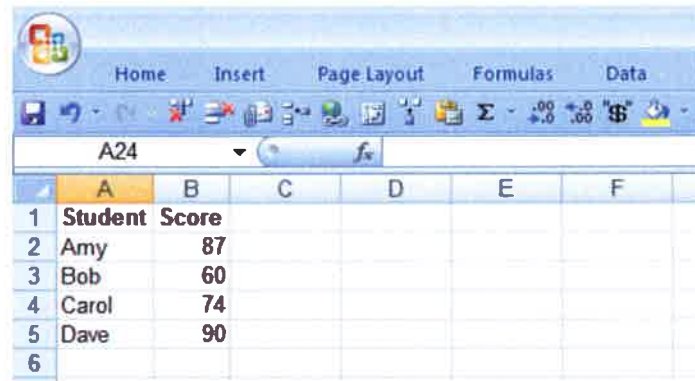
You can have more than one condition with the IF statement. This is known as nesting. The rules are the same, but these multiple conditions, called arguments, are all set off with their own IF statement and are within the first one. Structurally, it looks like this:

=IF(1st argument,IF(2nd argument,IF(3rd argument)))

Notice how the arguments are placed within the parentheses for the argument preceding it. Be careful in closing each argument with parenthesis in the right spot. It's easy to get lost in the maze of a long IF statement.

Closely related to the IF statement is the **lookup table**. This is a handy tool to calculate where data falls within a defined range.

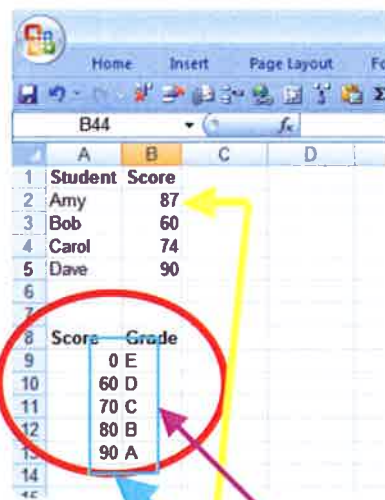
Think of assigning grades to student scores. Here's an example:



The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E	F
1	Student	Score				
2	Amy	87				
3	Bob	60				
4	Carol	74				
5	Dave	90				
6						

We create a lookup table that outlines how to assign grades to those scores. Put the table in alphabetic or numerical order, depending on what type of data you're using.



The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D
1	Student	Score		
2	Amy	87		
3	Bob	60		
4	Carol	74		
5	Dave	90		
6				
7				
8	Score	Grade		
9	0	E		
10	60	D		
11	70	C		
12	80	B		
13	90	A		
14				

Arrows in the image indicate the lookup process: a yellow arrow points from the score 87 in cell B2 to the score 80 in cell A12; a blue arrow points from cell A12 to cell B13; a purple arrow points from cell B13 to cell C13.

We've put a table (in numerical order) that runs through the grade possibilities. Now we write a formula to tell Excel to look at this table and assign grades based on how scores fit into this range.

Lookup tables use either a VLOOKUP command or HLOOKUP depending on whether the data is oriented vertically (V) or horizontally (H). The formula is structured this way:

=VLOOKUP(cell address of the value to assess,lookup table range,column number to display the answer)

Because you'll probably want to refer multiple cells, you'll need to use absolutes (\$) to define the lookup

table and copy the formula to your entire range. In our example, the first formula looks like this:

=VLOOKUP(B2,\$A\$9:\$B\$13,2)

Excel looks at cell B2 and finds where that score (87) falls within the lookup table range. The table range is from A9 down to B13.

Excel skips 0, 60 and 70. It determines that 87 falls within the 80 score range, which stops before 90. The last part of the formula tells Excel to display the second column of the corresponding table. In this case, that means an 87 equals a B grade. Now copy the formula to the other cells.