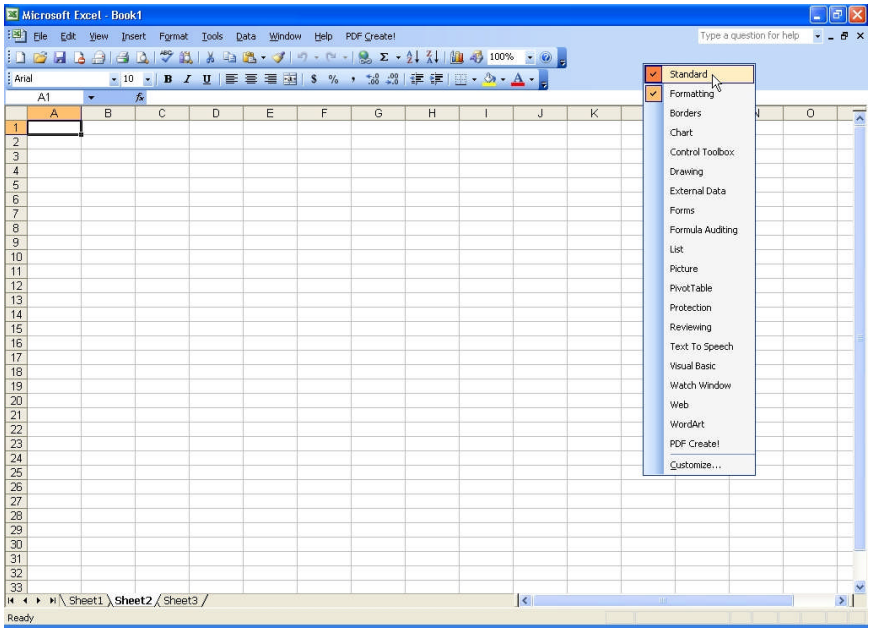
Introduction to Excel, Part I:

By Christopher Schnaars
The Morning Call

Giving Thanks
Many, many thanks to Rich Gordon, Brant Houston, Sarah Cohen and all the folks at the National Institute for Computer Assisted Reporting, whose tipsheets and training exercises for Excel I pilfered and modified for this tutorial.

Where Are We Going?
This is the first of a four-part series of handouts to teach basic and intermediate skills in Microsoft Excel. These tutorials can be used by those who want to learn to use Excel on their own. Alternatively, they can be used to develop one-hour training sessions for each handout. If you would like copies of the datasets used for the practice exercises in these tutorials, email me at christopher.schnaars@mcall.com, and I will send them.

These tutorials were developed on a PC using Microsoft Excel 2003. If you are using a different version of Excel – or a Macintosh – you should be able to use this tutorial but may have to go through slightly different steps to get the same results.



What Are We Going to Learn?
Introduction to Excel, Part I, will introduce you to Excel and some of the buttons you'll find when you open the program. We'll also look at how to enter simple formulas into Excel and copy them to other cells, the SUM() function, how to calculate percent change and sorting.

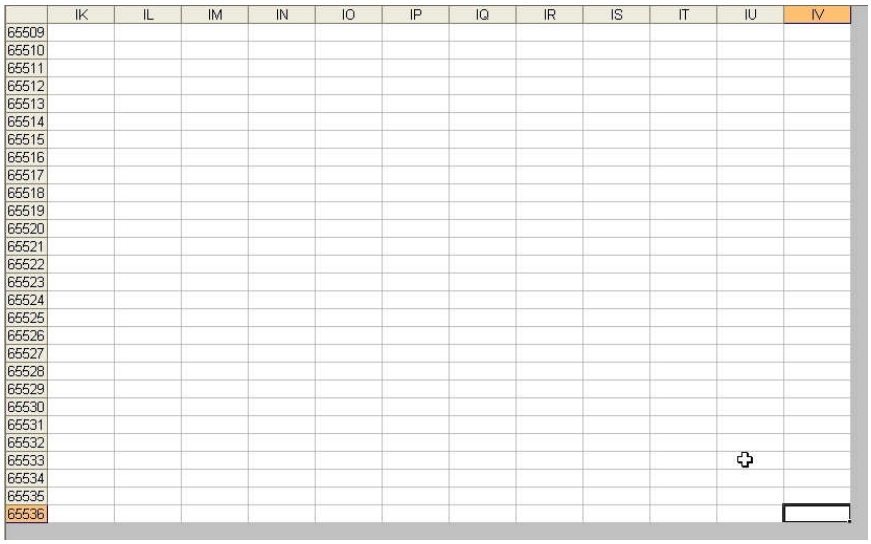
Let's Get Started
Open up Excel. If you don't have a shortcut on your desktop or in your taskbar, you most likely will find it by going to the Start menu, All Programs, Microsoft Office, Microsoft Office Excel 2003.

Your screen may look slightly different from the above screenshot depending on your settings. The screenshot shows the default of three worksheets when you open a new file (Sheet1, Sheet2 and Sheet3 tabs in the bottom-left corner) and has only the Standard and Formatting toolbars visible at the top of the screen. You can turn various toolbars on and off by right-clicking any blank area at the top of the screen. The Toolbar Menu is shown in the screenshot. You can access other settings by selecting Tools, then Options from the Menu Bar at the top of the screen.

Your screen is mostly a large, white grid called a worksheet. An Excel file has one or more worksheets, which together make up a workbook. Each worksheet has a row of letters across the top and a column of numbers along the left side of the screen. These are used to help you see what is called the address of a particular cell. The very first cell in the top-left corner, which is highlighted in the above screenshot, has an address of A1. The cell immediately below that is A2. The cell to the right of A2 is B2. You will see scroll bars along the bottom and the right side of the screen that let you move vertically and horizontally through the worksheet.

You can move from one cell to the next in a row by pressing the Tab key. You can move back one cell by pressing Shift+Tab. Similarly, you can use Enter and Shift+Enter to move down and up. Additionally, you can use your arrow keys to move in any direction.

So how big is a sheet? If you scroll to the right, Excel will go from Column Z to Column AA, Column AB and so on to column IV. This is 256 columns. If you scroll all the way to the bottom, you'll see the last row is 65,536. There is no way to increase these limits, though you can have your data on more than one worksheet.



For the Geek in us all: Believe it or not, being able to put fewer than 70,000 rows in a spreadsheet IS very limiting. To get around this limit, you have to put your data into several sheets, which makes it harder to work with, or use a database manager like Access, SQL Server or MySQL. Still, 256 columns with 65,536 cells in each translates into nearly 16.8 million cells. That's a lot of data!

Here We Go
OK, let's take Excel for a test drive.

	A	B	C
1	Description	Current	Proposed
2	EXPENDITURES		
3	Building Standards	$ 753,267.00	$ 840,000.00
4	City Attorney	$ 943,815.00	$ 950,000.00
5	City Council	$ 125,887.00	$ 150,000.00
6	Economic Development	$ 280,412.00	$ 2,000,000.00
7	EMS	$ 164,099.00	$ 168,000.00
8	Finance Department	$ 82,153.00	$ 110,000.00
9	Fire	$ 580,590.00	$ 850,000.00
10	Health Bureau	$ 23,882.00	$ 27,000.00
11	Mayor's Office	$ 800,140.00	$ 1,500,000.00
12	Parks and Recreation	$ 84,902.00	$ 85,000.00
13	Police	$ 2,304,007.00	$ 2,850,000.00
14	Public Works	$ 5,217,449.00	$ 3,800,000.00
15	Schools	$ 11,010,402.00	$ 11,800,000.00
16	Total Expenditures	$ 22,371,005.00	$ 25,130,000.00
17			
18	REVENUES		
19	Federal Funds	$ 3,800,000.00	$ 2,000,000.00
20	Personal Property Taxes	$ 5,800,000.00	$ 6,400,000.00
21	Real Estate Taxes	$ 11,643,844.00	$ 12,500,000.00
22	State Funds	$ 800,000.00	$ 800,000.00
23	User/Other Fees	$ 184,139.00	$ 212,000.00
24	Utility Fees	$ 1,143,022.00	$ 1,800,000.00
25	Total Revenues	$ 22,371,005.00	$ 25,130,000.00

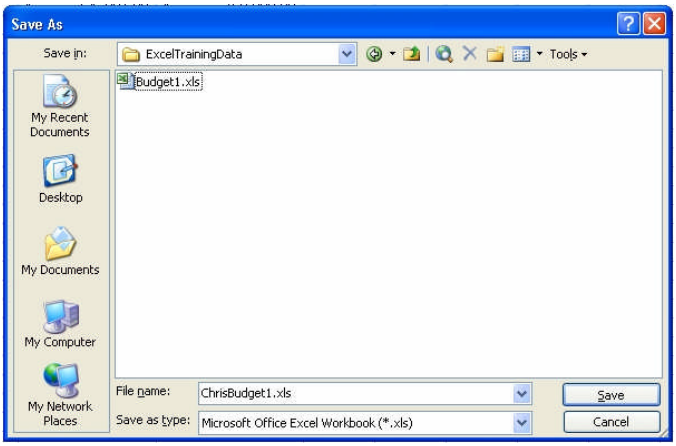
"Follow the money" is sound advice on any beat. Chances are you have to deal with money in some form or another regardless of what beat you're on. Perennial questions are: How much money does this organization I cover have? What do they spend it on? And how are they going to get more?

One way to look at the answers to these questions is to look at the organization's budget. Let's open Budget1.xls and look at a budget for a hypothetical city.

Cardinal Rule
There is one thing you ALWAYS should do whenever you open a new data file, and the first time forgetting this rule causes you to put your head through your desk or otherwise display elevated levels of frustration, you can be sure you won't forget this rule again.

The rule: Always save a backup copy of your data BEFORE you change or add anything.

Why? Because if you mess up your data, your error may be impossible to find and fix later, leaving the source file as your only recourse. Now what if you didn't save a copy of the original data, and what if you can't get another copy of the file on deadline or got it only after a Freedom of Information request and three months of legal wrangling?



Uh oh.

So go to File in the Menu Bar and select Save As. Don't select Save, which will just save the file using the same filename. You want to

give the file a new name to preserve the original file. Do this now. Just add your first or last name to the beginning of the file name and click Save. For example: ChrisBudget1.xls

Eyeballing Your Data

The first thing you should do before writing any formulas or doing any sorting is take a look at what you got. This is a summary of a proposed city budget. Actually, it's two tables on the same page. The first table is a list of expenditures for various city departments. The second table is a list of revenues.

Column B lists the expenditures and revenues for the current year. Column C lists the proposed expenditures and estimated revenues for next year. At the bottom of each section of each table is a total column that adds everything up.

You could tell as soon as you opened the file that it dealt with money because all of the numbers have dollar signs in front of them, commas to separate the thousands and decimal points to show the number of cents.

But in actuality, the dollar signs and commas aren't there. Click on Cell B3, which is the current budget for Building Standards. Now look at the top of your screen between the toolbars and your worksheet. You will see a long white textbox with 753267 in it. This white box is called the Formula Bar, and whatever you see in this box is what actually is stored in the cell without any formatting. We'll get back to this in a minute.

Equality for All

The most important key in Excel is = because this is ALWAYS the first key you press whenever you want to type in a formula or a function. Now = technically isn't used anywhere in your spreadsheet right now, and when you are entering data by hand, you don't have to use it. So why is it so important? Because you need to be able to do more with your data than just type it in and look at it. You need to be able to manipulate it, add it together and ask it questions. To do that, you need to use the = key.

Let's say you just got your hands on this proposed budget and need to look through the data to write a story about the proposal before a public hearing next week. What are some questions you might ask about this data? There are plenty of agencies that are getting large increases. As for revenues, some are going up, one is flat and one is going down. You might want to ask about each of those changes. Let's use Excel, though, to get some specifics.

One common thing to look at is how much a budget changes from one year to the next in terms of a percentage. The formula for this is:

(Proposed budget – Current budget) / Current budget

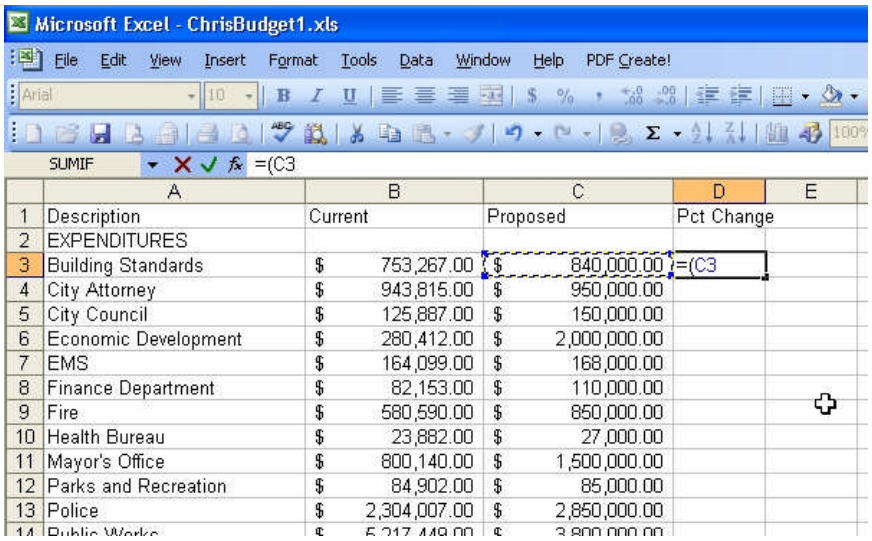
The / stands for division in Excel; multiplication is represented with *. Addition and subtraction are just + and - in Excel.

We're going to put this information in Column D because it is the first blank column in the worksheet. First, we want to give the new column a heading, so click on Cell D1 and type: Pct Change

Now skip down to Cell D3, which is where we will type our formula to compute the percent change for the Building Standards department. Do you remember the first thing we have to type? It's an = sign.

After you type = you have to type (which is an open parenthesis. This goes back to your grade-school math. Remember that you don't always work an equation from left to right. You do multiplication and division first, then addition and subtraction. You use parentheses to show that you want to do the math inside the parentheses first.

After you type =(we need to tell Excel to get the proposed budget for Building Standards. This number is in Cell C3. You could type C3, but an easier way is to just click that cell, so click C3. So far your formula should look like the screenshot below.



	A	B	C	D	E
1	Description	Current	Proposed	Pct Change	
2	EXPENDITURES				
3	Building Standards	$ 753,267.00	$ 840,000.00	=(C3	
4	City Attorney	$ 943,815.00	$ 950,000.00		
5	City Council	$ 125,887.00	$ 150,000.00		
6	Economic Development	$ 280,412.00	$ 2,000,000.00		
7	EMS	$ 164,099.00	$ 168,000.00		
8	Finance Department	$ 82,153.00	$ 110,000.00		
9	Fire	$ 580,590.00	$ 850,000.00		
10	Health Bureau	$ 23,882.00	$ 27,000.00		
11	Mayor's Office	$ 800,140.00	$ 1,500,000.00		
12	Parks and Recreation	$ 84,902.00	$ 85,000.00		
13	Police	$ 2,304,007.00	$ 2,850,000.00		

Two things to note: First, what you're typing in Cell D3 also is displayed in the Formula Bar. Second, Cell C3 has a blinking dotted line around it to show this cell is referenced in your current formula. This is very helpful to make sure you are accessing the right cells.

While you can type cell references, it's usually better to just click the cell you want because you are less likely to make a mistake.

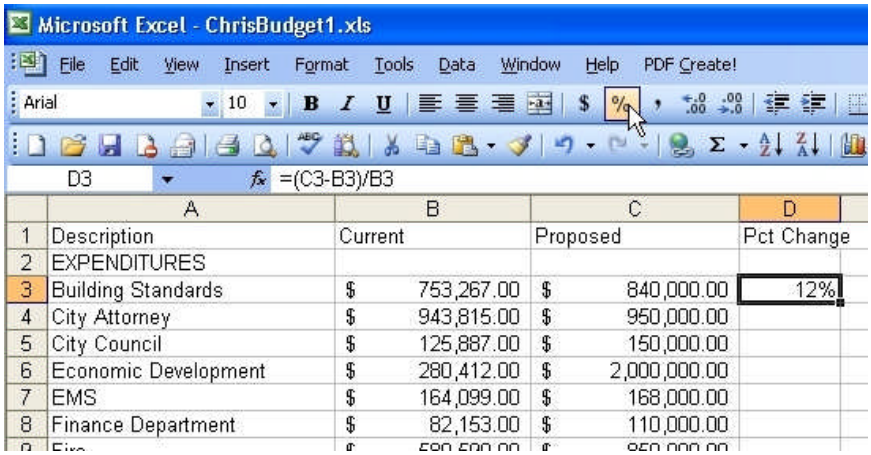
Let's continue. Next we need to subtract the current budget, so type a minus sign, then click on Cell B3. Next, close your parentheses, then type / (which, again, is computer parlance for division). Finally, click on Cell B3 again because we want to divide by the current budget. When you're done, your formula should look like this:

=(C3-B3)/B3

Press enter, and voila: The result of the formula appears in Cell D3.

But wait. It looks like 12 cents. Huh? What did we do wrong? Nothing, really. You just aren't done yet. Excel has guessed that since you are working with two columns of

currency that you want this column to be currency too. Click on Cell D3, then go up to your Formatting toolbar and click the % button. The $0.12 now shows up as 12%.



	A	B	C	D
1	Description	Current	Proposed	Pct Change
2	EXPENDITURES			
3	Building Standards	$ 753,267.00	$ 840,000.00	12%
4	City Attorney	$ 943,815.00	$ 950,000.00	
5	City Council	$ 125,887.00	$ 150,000.00	
6	Economic Development	$ 280,412.00	$ 2,000,000.00	
7	EMS	$ 164,099.00	$ 168,000.00	
8	Finance Department	$ 82,153.00	$ 110,000.00	

If you click on Cell D3, note that while 12% shows up in the cell, the formula you typed shows up in the Formula Bar.

There's one more step you might want to take: The proposed budget increase isn't exactly 12 percent. Excel just rounded it off. You might want to see tenths of a percent or even hundredths. There are two buttons on the Formatting toolbar, immediately to the right of the comma button, that let you increase and decrease the number of digits to the right of the decimal. Click the Increase Decimal button once, and cell D3 changes to 11.5 percent.

A Note About Rounding

Something you need to keep in mind about rounding is that what you see isn't what you get. Generally speaking, Excel will display rounded off numbers but will use actual numbers in calculations. What is actual? Excel can store up to 16 digits, depending on whether you have a decimal. Let's try a quick example to show what I mean. Go to Cell E3 and type the number 1 trillion, which is a 1 followed by 12 zeroes. Now go to Cell F3 and type:

=D3*E3

This doesn't give you 11.5 percent of a 1 trillion. It gives you 11.514243953339 percent of a trillion, and if you click the Increase Decimal button, you'll see there actually is another digit in there.

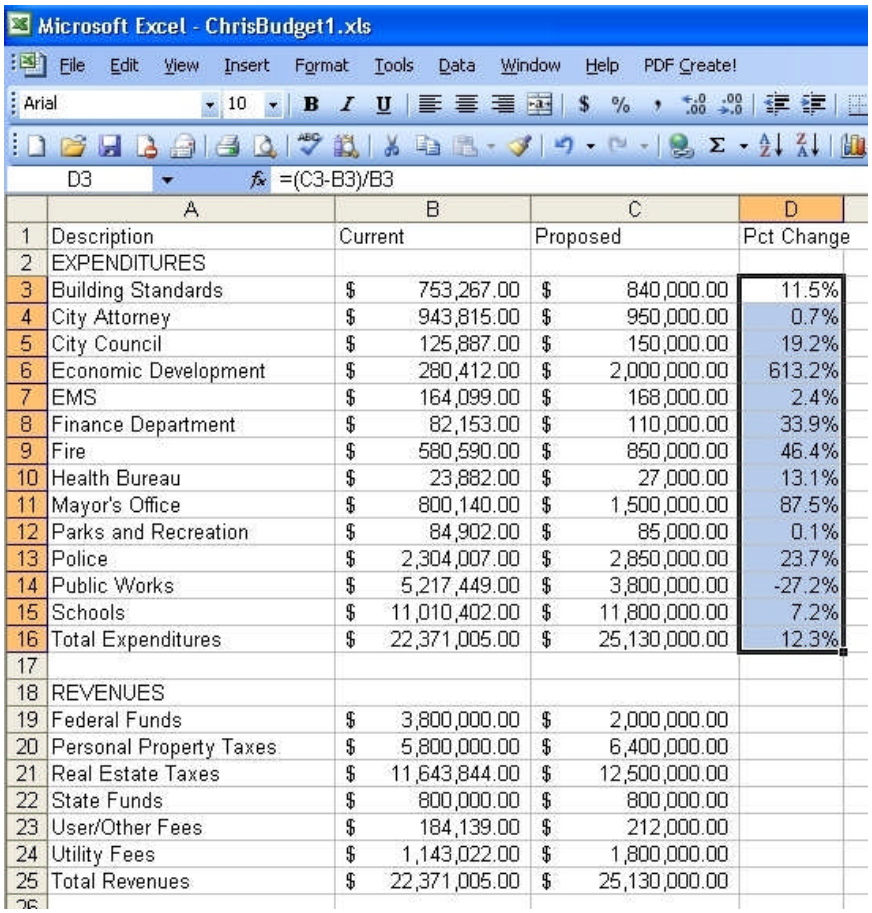
Why is this important? Precision. Excel is showing you a rounded off number because it's easier to read, but under the hood, the much uglier and accurate number is used for calculations. If you used rounded off numbers and used the result of one formula to modify another formula, then used that result to modify another and another and another, the further you got from your original numbers, the less accurate your results would be.

We want to keep the formula that calculated 11.5 percent but don't need the rest. Click the cell where you typed 1 trillion and press Delete. Then click the cell where you typed =D3*E3 and press Delete.

So Now What?

Now you want to calculate the percent change for the rest of the departments. You could just go to Cell D4 for the City Attorney and type the same formula you used before. The only difference would be you would have to change the cell references to use budget numbers for the City Attorney instead of the numbers for Building Standards. This wouldn't take long for this example, but what if you had hundreds of rows? Or thousands? Surely there must be an easier way to do this.

There is, and it's called Autofill. Click Cell D3, where you typed the formula for Building Standards. There will be a thick black box drawn around this cell when you click on it. If you look at the bottom right corner of this box, you'll see a very tiny square. This is called the Fill Handle, and you use it to copy your formula down the column. There are two ways to do this. The first is to point at the handle. Your cursor will change from ✥ to +. When this happens, click and hold down your left mouse button and drag the square down just 2 or three cells. Let go of the button, and the formula will be copied.



	A	B	C	D
1	Description	Current	Proposed	Pct Change
2	EXPENDITURES			
3	Building Standards	$ 753,267.00	$ 840,000.00	11.5%
4	City Attorney	$ 943,815.00	$ 950,000.00	0.7%
5	City Council	$ 125,887.00	$ 150,000.00	19.2%
6	Economic Development	$ 280,412.00	$ 2,000,000.00	613.2%
7	EMS	$ 164,099.00	$ 168,000.00	2.4%
8	Finance Department	$ 82,153.00	$ 110,000.00	33.9%
9	Fire	$ 580,590.00	$ 850,000.00	46.4%
10	Health Bureau	$ 23,882.00	$ 27,000.00	13.1%
11	Mayor's Office	$ 800,140.00	$ 1,500,000.00	87.5%
12	Parks and Recreation	$ 84,902.00	$ 85,000.00	0.1%
13	Police	$ 2,304,007.00	$ 2,850,000.00	23.7%
14	Public Works	$ 5,217,449.00	$ 3,800,000.00	-27.2%
15	Schools	$ 11,010,402.00	$ 11,800,000.00	7.2%
16	Total Expenditures	$ 22,371,005.00	$ 25,130,000.00	12.3%
17				
18	REVENUES			
19	Federal Funds	$ 3,800,000.00	$ 2,000,000.00	
20	Personal Property Taxes	$ 5,800,000.00	$ 6,400,000.00	
21	Real Estate Taxes	$ 11,643,844.00	$ 12,500,000.00	
22	State Funds	$ 800,000.00	$ 800,000.00	
23	User/Other Fees	$ 184,139.00	$ 212,000.00	
24	Utility Fees	$ 1,143,022.00	$ 1,800,000.00	
25	Total Revenues	$ 22,371,005.00	$ 25,130,000.00	

An easier way is to just double-click the Fill Handle. Do this, and your formula will be copied down through Total Expenditures.

The formula was not copied to the Revenues section because Autofill stops when it encounters a blank cell – in this case, Cell C17.

You still can copy your formula down to revenues, but you need to do it manually. Just grab the Fill Handle in the bottom right of Cell D16 and drag it down to the bottom of the Revenues section (Cell D25).

Error Messages
When you copy the formula down to Cell D25, you'll see a couple of ugly messages in Cells D17 and D18:

#DIV/0!

This is an error message, and it means division by 0. Excel error messages start with the pound sign (#) and usually end with an exclamation point. If you see one of these, you've probably done something wrong.

The rows where we got these errors don't have any budget data, which is why we got the errors. We can ignore them or get rid of them. Just click on the two cells where you see the error messages and press Delete.

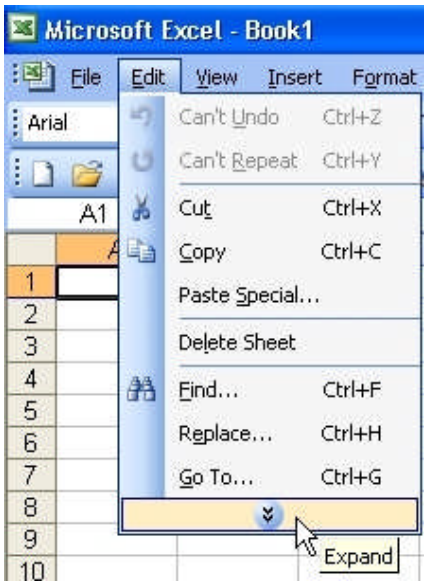
The numbers in Column D should give you fodder for some questions to ask city officials. Here are just a few you might come up with:

- Why would economic development get seven times as much as this year?
- Why is the mayor's budget nearly doubling?
- Why will federal funding be cut nearly in half?
- Why are utility fees going up more than 50 percent?

Getting Around
Excel has a ton of powerful tools to help you do your work, so let's take a quick tour of some of them that are available on your screen.

Scrolling through tens of thousands of rows can take a really, really long time. Here are a couple of shortcut keys to help you out:

- **Page Up:** Goes up one screen
- **Page Down:** Goes down one screen
- **Ctrl+Home:** Takes you to the top-left cell in your data
- **Ctrl+End:** Takes you to the bottom-right cell in your data



Note: Ctrl+Home and Ctrl+End take you to the limits of your data. They do not necessarily take you to cells A1 and IV65536. If your data is only 1,000 rows long and 10 columns wide, pressing Ctrl+End will take you to cell J1000.

Very Annoying Option
One of the more annoying functions in Excel that can trip people up is so-called Smart Menus that only show you certain options in the menus, depending on what it is Excel THINKS you want to see. To see what I mean, click on the Edit menu. Look for a small circle in the middle of the bottom row with two down arrows

in it. If you see this icon, Smart Menus are turned on and you aren't seeing the full menu.

If you click this little circle, the menu will expand to show you the entire menu. Alternatively, you can turn off this annoying feature, but Microsoft hid it. It's not under Tools, Option. Instead, go to Tools, then Customize. Click the Options tab, then put a check mark in "Always show full menus."

Menu Bar
Here's a look at some of the most important features in the main Menu Bar:

- **File:** Open; Save; Save As; Page Setup; Print.
- **Edit:** Copy (Ctrl+C), Cut (Ctrl+X) and Paste (Ctrl+V); Paste Special (one of the most important and useful features in Excel); Repeat an Action; Undo an Action; Find; Replace.
- **View:** Toolbars; Zoom.
- **Insert:** Insert Rows, Columns, Cells and Worksheets; Functions.
- **Format:** Format Cells.
- **Tools:** Spell Check; Protection; Options.
- **Data:** Sort; Filter; Subtotals; Pivot Tables; Import External Data.
- **Window:** Split; Freeze Panes.
- **Help:** Both online and offline help. You also can search for templates you can download.

Standard Toolbar
When all the buttons are displayed, the Standard toolbar looks like this:

If you don't see all the buttons on a toolbar, there are two things you can do. First, drag the toolbar to its own line so it has more room. The drag handle is the four vertical dots on the far left of the toolbar. Point to this handle, hold the left mouse button down and move the toolbar to wherever you would like it. You can "dock" toolbars not only at the top, but also along the bottom or either side of your screen. You also can drag the toolbar toward the middle of your screen to convert it to a floating toolbar that you can move around and place wherever you like.

A second thing you can do to see more buttons is click the down arrow at the far right of the toolbar. This will give you the option to add or remove buttons. Buttons that are not visible on your toolbar will be displayed here.

We won't go over each button, but the toolbar has buttons to open and save files; print your document; check your spelling; cut, copy and paste; sort your data and zoom. If you are not sure what a button does, hover your mouse over the button – but don't click the button – and a tooltip should appear. Many of these buttons are self-explanatory, and you should know what most of them do by the end of this tutorial.

Formatting Toolbar
When all the buttons are displayed, the Formatting toolbar looks like this:

Again, we won't go over each button, but you can control things here like font, font size, boldface, italics, underlining, text alignment, certain formats (such as currency and percentages), the number of decimal places, cell borders, cell fill colors and text colors.

Does It Add Up?
Let's play some more with our data. Go back to the budget worksheet we worked with earlier. Note that it shows you each expenditure and each revenue source, with totals for each table. A good rule of thumb is to not rely on anyone's math. Why rely on someone else to calculate something when you can easily do it yourself? If you click on the numbers for total expenditures and total revenues, you'll see that we got the total numbers rather than the formulas used to calculate those totals. We'll double-check that part with a function in Excel called SUM().

To make it easier to write our formula, we want to put our total row directly underneath the numbers we want to add up, but we don't want to lose the Total column the city gave us because we want to compare our numbers with theirs. So we'll insert a row.

Go to the numbers that run along the left side of your worksheet and just point to the number 16. This should be the row where the city's total numbers are for expenditures. Note that your cursor changes to a small arrow. Click the 16, and the entire row will be highlighted. Next, right-click the 16, and a small window will open. Select Insert, and a new, blank row will appear.

Microsoft Excel - ChrisBudget1.xls

File Edit View Insert Format Tools Data Window Help PDF Create!

Arial 10

A16 Total Expenditures

	A	B	C	D
1	Description	Current	Proposed	Pct Change
2	EXPENDITURES			
3	Building Standards	$ 753,267.00	$ 840,000.00	11.5%
4	City Attorney	$ 943,815.00	$ 950,000.00	0.7%
5	City Council	$ 125,887.00	$ 150,000.00	19.2%
6	Economic Development	$ 280,412.00	$ 2,000,000.00	613.2%
7	EMS	$ 164,099.00	$ 168,000.00	2.4%
8	Finance Department	$ 82,153.00	$ 110,000.00	33.9%
9	Fire	$ 580,590.00	$ 850,000.00	46.4%
10	Health Bureau	$ 23,882.00	$ 27,000.00	13.1%
11	Mayor's Office	$ 800,140.00	$ 1,500,000.00	87.5%
12	Parks and Recreation	$ 84,902.00	$ 85,000.00	0.1%
13	Police	$ 2,304,007.00	$ 2,850,000.00	23.7%
14	Public Works	$ 5,217,449.00	$ 3,800,000.00	-27.2%
15	Schools	$ 11,010,402.00	$ 11,800,000.00	7.2%
16	Total Expenditures	$ 22,371,005.00	$ 25,130,000.00	12.3%

The new row is Row 16. Everything that was in that row or below it has been pushed down a row. But what about your formulas? Check them, and you will see Excel has modified the formulas to use the new locations of the data.

Now go to the Cell A16, which should be blank now, and give this row a title. Let's use Calculated Total.

Now we want to add up all the Expenditures. We could just add everything up by hand with a formula like this:

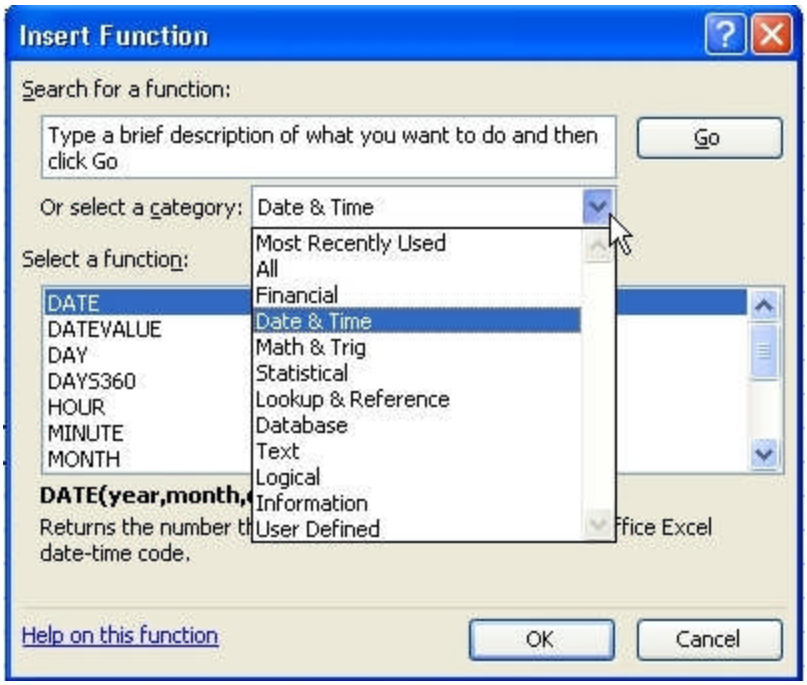
=B3+B4+…+B14+B15

But that would be a really long formula, and again, what if you had hundreds or thousands of records to add up? Typing a formula like this would be impractical and error-prone. We're going to add these numbers up a different way, and we're not going to use a formula. We're going to use a function.

The Mighty SUM function

Before we get into how to use SUM, let's clear up something else: Functions. What are they? Well, basically a function is a little program that is set up to do something, and Excel has hundreds of them. To use them, you type = followed by the name of the function. Then you put whatever information the function needs, called arguments, in parentheses.

Some are really easy. For example, **=TODAY()** will put today's date into the cell. It does not need any arguments, so you don't put any information in the parentheses.
Chances are you will never use the vast majority of Excel's functions, but if there's something you want to do that involves a long, complex formula, you should at least check to see if there's a function that can do what you want.



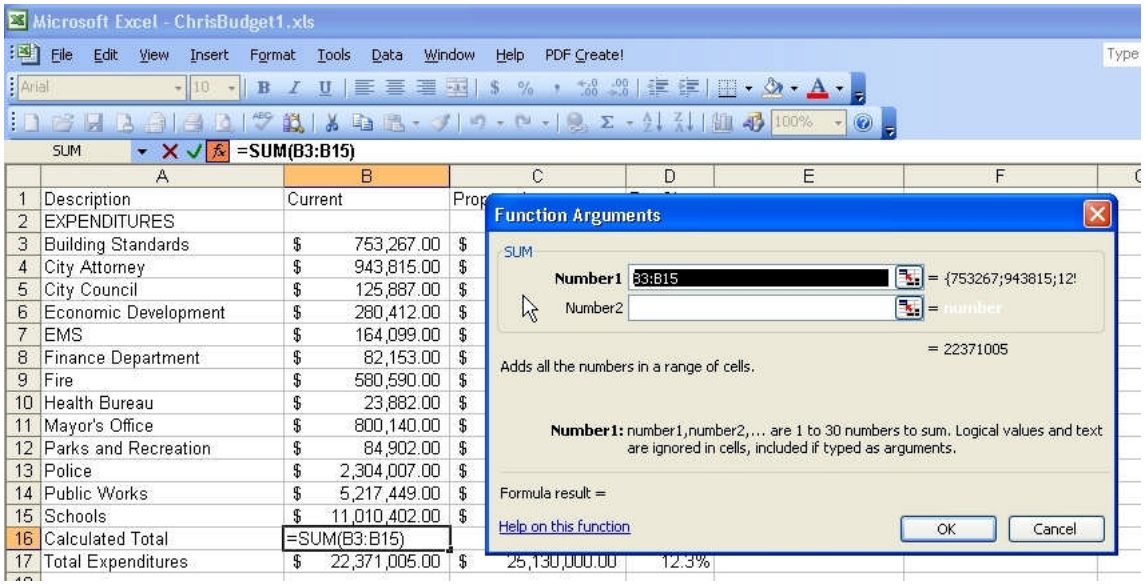
To use the SUM function, you first click the cell where you would like to insert the function. In this case, we want Cell B16. Next, go to your Menu Bar and select Insert, then Function. A dialog will open that will let you look through different types of functions, such as Financial or Date & Time. There also is a box you can use to type some search terms for what you want. When you select a function, the wizard will help you

figure out what arguments the function needs.

The SUM function is under Math & Trig, so select this, click the Select a Function window, then scroll down to SUM. (If you type the letter S, Excel will jump down to the first function that starts with S so you don't have to scroll so far.) If you click SUM, you'll see a brief explanation toward the bottom of the window of how to use this function and that you can add up to 30 numbers. You just have to type in all the numbers you want to add up separated by commas.

That doesn't sound much easier than just typing the formula, and indeed there is an easier way to enter all this information. Let's learn how to do that.

First, double-click SUM. This opens up the Function Arguments window, and you'll see that for Number 1 (the first argument), Excel has filled in B3:B15. The colon is used to specify a range of cells. In this case: All cells from B3 through B15, which is exactly what we want to add up.



	A	B	C	D	E	F
1	Description	Current	Prop			
2	EXPENDITURES					
3	Building Standards	$ 753,267.00	$			
4	City Attorney	$ 943,815.00	$			
5	City Council	$ 125,887.00	$			
6	Economic Development	$ 280,412.00	$			
7	EMS	$ 164,099.00	$			
8	Finance Department	$ 82,153.00	$			
9	Fire	$ 580,590.00	$			
10	Health Bureau	$ 23,882.00	$			
11	Mayor's Office	$ 800,140.00	$			
12	Parks and Recreation	$ 84,902.00	$			
13	Police	$ 2,304,007.00	$			
14	Public Works	$ 5,217,449.00	$			
15	Schools	$ 11,010,402.00	$			
16	Calculated Total	=SUM(B3:B15)				
17	Total Expenditures	$ 22,371,005.00	$	25,130,000.00	12.3%	

Click OK, then look at Cell B16. You'll see that all the numbers have been added up, and they match the total number the city gave you. You also will note that you can see the text of the function itself in your Formula Bar.

SUM is a really easy function to use, and if you know the syntax for a function that you want to use, you can just type it directly into the cell. You do not need to use the Function Wizard unless you need help with a particular function or don't know what function to use. Just remember that like formulas, you ALWAYS type = before a function.

Now try the same thing for the expenditures in the Proposed budget, then skip down to Revenues, insert a row called Calculated Total and use the SUM function to add up the revenues for both the current and proposed budgets. You can use the Function Wizard

again or, if you're comfortable with how to do it, you can just type the functions directly into the cells.

If you entered the functions properly, you should get the same numbers that the city gave you with two exceptions: Current Revenues and Proposed Revenues. The city's numbers are $22,371,005.00 and $25,130,000.00, but the SUM function shows you different numbers. You now have two more questions for city officials.

Did you remember that you could have used the Fill Handle instead of typing the function each time? You needed to enter the formula for Current Revenues, but you could have grabbed the Fill Handles for that cell and for Current Expenditures and dragged them to the right to copy the functions to the Proposed budget cells.

Here are the functions you should have entered:

- Proposed Expenditures: =SUM(C3:C15)
- Current Revenues: =SUM(B20:B25)
- Proposed Revenues: =SUM(C20:C25)

It Gets Even Easier

Now that we've learned how to use the SUM function, let's look at an even easier way to add up columns of numbers.

First, go to Cells B16, B26, C16 and C26 and delete the SUM functions from those cells.

Now click on Cell B16, then go to the Standard toolbar and click the button that looks like a letter M lying on its side (Sigma). This is the Autosum button. When you click this, you'll see that Excel has filled in the SUM function. It guesses correctly that you want to add up all the contiguous numbers above B16. Note that it does not highlight cells B1 or B2 because there are no numbers in those cells.

When you click the Autosum button, however, you are not done. Excel is waiting for you to check its work and make sure that it is correct. If it is, press Enter, and the function will be entered. If you don't press enter and just click somewhere else on the sheet, Excel will think that you want to use whatever cell you clicked in the SUM function. Click on each of the other three Total cells and use the Autosum function to fill in those numbers.

Other Uses for Autosum

When you click Autosum, it will add up a bunch of numbers by default, but there are other ways to use this button. If you look immediately to the right of the Autosum button, you'll see a little down arrow. If you click this, you can change which function is used:

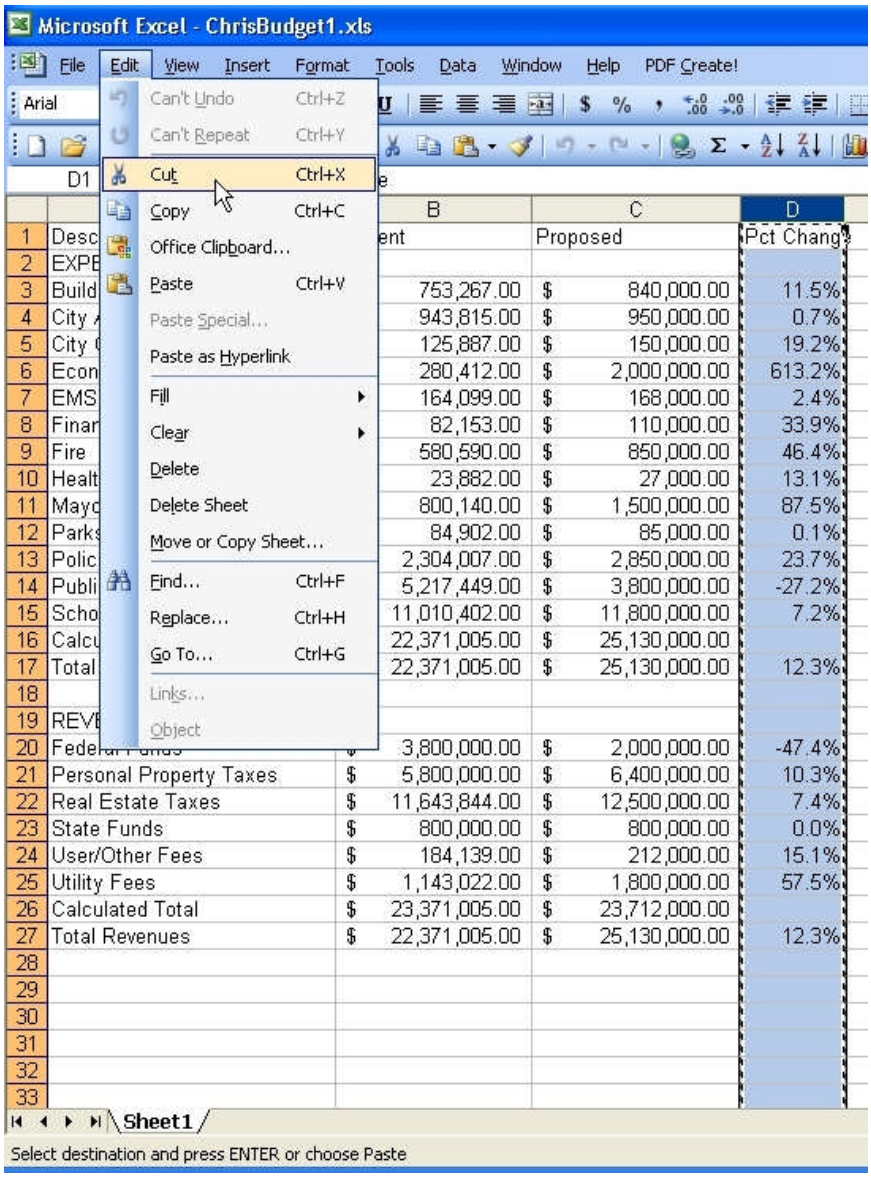
- **Average:** Calculates the arithmetic mean, which is a fancy way of saying it adds up all the numbers, then divides by the number of numbers.
- **Count:** A simple count of how many cells in the cell range highlighted contain numbers.
- **Min:** The lowest value in the highlighted range.
- **Max:** The highest value in the highlighted range.

You also can select More Functions, which opens the Function Wizard.

Moving Data

We have calculated the percent change between the current and the proposed budget, but we have not calculated the dollar changes between the two.

Let's say we want to put this formula between the proposed budget figures in Column C and the percent change figures in Column D. We could just right-click the letter D and select Insert, but let's use this opportunity to learn how to cut and paste data in Excel.



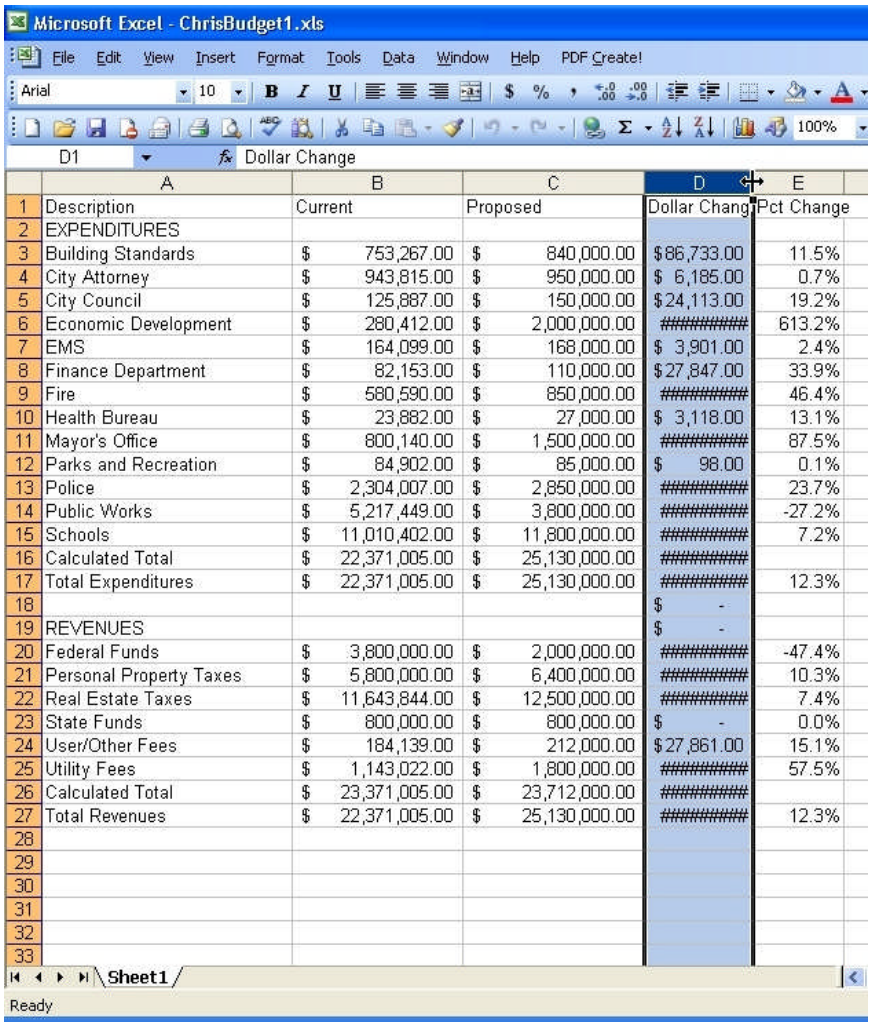
First, click the D to highlight all of Column D. Then go to your Menu Bar and select Edit, then Cut. (Alternatively, you can use the keyboard shortcut Ctrl+X.)

When you do this, you'll notice that Excel has drawn a flashing dotted line around all of Column D. Next, click on Cell E1, then go to your Menu Bar and select Edit, then Paste. (Or use the keyboard shortcut Ctrl+V.)

If it makes you more comfortable, you can use Copy rather than Cut, then go back and delete your data after you paste it. You should be safe using Cut, though, because Excel doesn't actually delete the data from the sheet until it has been pasted successfully.

Now let's go to Cell D1 and give our new column a heading: Dollar Change. Next, go to Cell D3, and see if you can guess what formula you type before you continue reading this tutorial. Go to the next paragraph after you've tried to enter this formula yourself.

Did you get it? Your answer should be $86,733.00. If you didn't get that, go back and look at your formula. Remember, you should subtract the current budget from the proposed budget. The formula you need to use is: =C3-B3



	A	B	C	D	E
1	Description	Current	Proposed	Dollar Chang	Pct Change
2	EXPENDITURES				
3	Building Standards	$ 753,267.00	$ 840,000.00	$86,733.00	11.5%
4	City Attorney	$ 943,815.00	$ 950,000.00	$ 6,185.00	0.7%
5	City Council	$ 125,887.00	$ 150,000.00	$24,113.00	19.2%
6	Economic Development	$ 280,412.00	$ 2,000,000.00	##########	613.2%
7	EMS	$ 164,099.00	$ 168,000.00	$ 3,901.00	2.4%
8	Finance Department	$ 82,153.00	$ 110,000.00	$27,847.00	33.9%
9	Fire	$ 580,590.00	$ 850,000.00	##########	46.4%
10	Health Bureau	$ 23,882.00	$ 27,000.00	$ 3,118.00	13.1%
11	Mayor's Office	$ 800,140.00	$ 1,500,000.00	##########	87.5%
12	Parks and Recreation	$ 84,902.00	$ 85,000.00	$ 98.00	0.1%
13	Police	$ 2,304,007.00	$ 2,850,000.00	##########	23.7%
14	Public Works	$ 5,217,449.00	$ 3,800,000.00	##########	-27.2%
15	Schools	$ 11,010,402.00	$ 11,800,000.00	##########	7.2%
16	Calculated Total	$ 22,371,005.00	$ 25,130,000.00	##########	
17	Total Expenditures	$ 22,371,005.00	$ 25,130,000.00	##########	12.3%
18				$ -	
19	REVENUES			$ -	
20	Federal Funds	$ 3,800,000.00	$ 2,000,000.00	##########	-47.4%
21	Personal Property Taxes	$ 5,800,000.00	$ 6,400,000.00	##########	10.3%
22	Real Estate Taxes	$ 11,643,844.00	$ 12,500,000.00	##########	7.4%
23	State Funds	$ 800,000.00	$ 800,000.00	$ -	0.0%
24	User/Other Fees	$ 184,139.00	$ 212,000.00	$27,861.00	15.1%
25	Utility Fees	$ 1,143,022.00	$ 1,800,000.00	##########	57.5%
26	Calculated Total	$ 23,371,005.00	$ 23,712,000.00	##########	
27	Total Revenues	$ 22,371,005.00	$ 25,130,000.00	##########	12.3%
28					
29					
30					
31					
32					
33					

When you're done, use the Fill Handle and Autofill to copy this formula down for all other expenditures and revenues. What happened? A bunch of your numbers looks like a bunch of pound signs. Don't worry. This isn't an error. It just means Excel does not have enough room to display the data.

There are a few ways to make a column wider. The easiest way is to go to the row of letters at the top of your worksheet and double click the line between the column you want to widen and the column after it. When you've got your cursor in the right place, it will change to look like a small vertical bar intersected by a double-headed arrow. 

In this case, you double-click the line between the D and the E. This will widen the column only as much as is needed to display all data in Column D. Alternatively, you can click on this line, hold the mouse button down and drag the column to the width that you want. Finally, you can right-click the heading for the column you want to widen – in this case, D – and select Column Width. This will let you enter the width manually. You'd think this number would be something sensible like inches, but it actually is a measure of how many characters will fit in the cell.

You also can widen multiple columns at once. To do this, highlight all the columns you want to widen and double-click any of the boundary lines between headings in the

highlighted columns. Each will be widened to the minimum amount necessary to display all data.

Percent of Total

Let's say you want to know what percent of the city's budget goes toward Police, what percent goes toward Public Works and so on. Furthermore, you want to calculate this information for both the current budget and the proposed budget.

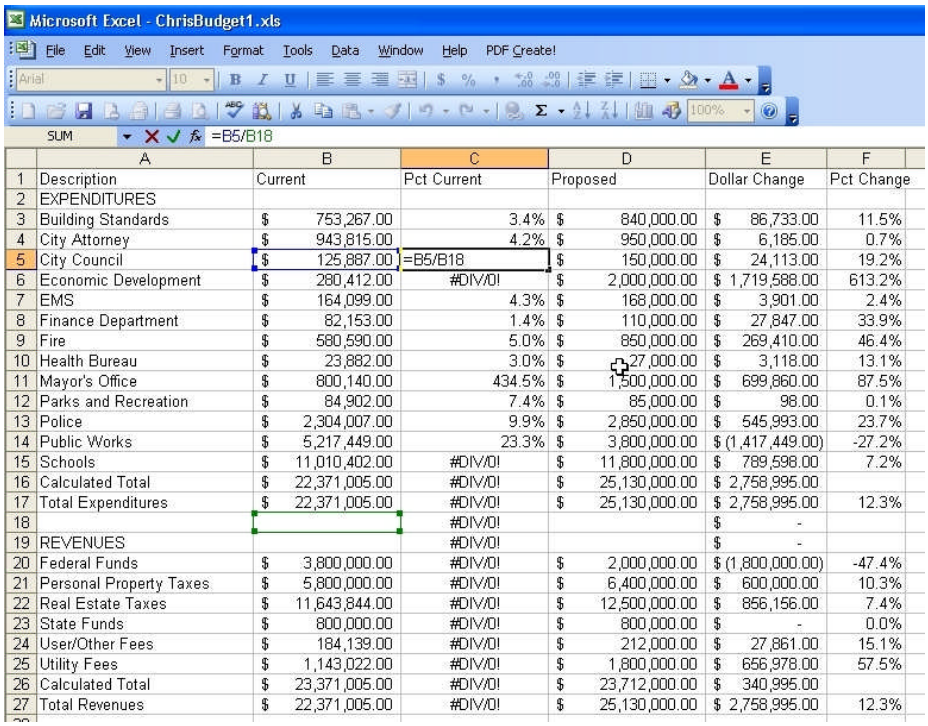
We'll start with percentages for the current budget. We could put this information in Column F, but it would be easier to read if it was closer to the actual numbers in Column B. So highlight Column C, right-click and select Insert to put a new column here. Next, click Cell C1 in the new column and enter a heading. Let's use: Pct Current

Go to Cell C3. What do you think the formula is? We want to know what percent of the total budget goes to Building Standards, so we need to take Building Standards and divide it by the total budget. That means your formula would be:

=B3/B16

Again, Excel thinks you want this number in dollars and cents, so it displays the answer as $0.03. Click the cell, then click the % button on the Formatting toolbar. Finally, click the Increase Decimal button once to show one digit to the right of the decimal. You should get 3.4 percent.

Next, copy this formula all the way down through your revenues. But something is wrong. Can you see what it is?



	A	B	C	D	E	F
1	Description	Current	Pct Current	Proposed	Dollar Change	Pct Change
2	EXPENDITURES					
3	Building Standards	$ 753,267.00	3.4%	$ 840,000.00	$ 86,733.00	11.5%
4	City Attorney	$ 943,815.00	4.2%	$ 950,000.00	$ 6,185.00	0.7%
5	City Council	$ 125,887.00	=B5/B18	$ 150,000.00	$ 24,113.00	19.2%
6	Economic Development	$ 280,412.00	#DIV/0!	$ 2,000,000.00	$ 1,719,588.00	613.2%
7	EMS	$ 164,099.00	4.3%	$ 168,000.00	$ 3,901.00	2.4%
8	Finance Department	$ 82,153.00	1.4%	$ 110,000.00	$ 27,847.00	33.9%
9	Fire	$ 580,590.00	5.0%	$ 850,000.00	$ 269,410.00	46.4%
10	Health Bureau	$ 23,882.00	3.0%	$ 27,000.00	$ 3,118.00	13.1%
11	Mayor's Office	$ 800,140.00	434.5%	$ 1,500,000.00	$ 699,860.00	87.5%
12	Parks and Recreation	$ 84,902.00	7.4%	$ 85,000.00	$ 98.00	0.1%
13	Police	$ 2,304,007.00	9.9%	$ 2,850,000.00	$ 545,993.00	23.7%
14	Public Works	$ 5,217,449.00	23.3%	$ 3,800,000.00	$ (1,417,449.00)	-27.2%
15	Schools	$ 11,010,402.00	#DIV/0!	$ 11,800,000.00	$ 789,598.00	7.2%
16	Calculated Total	$ 22,371,005.00	#DIV/0!	$ 25,130,000.00	$ 2,758,995.00	
17	Total Expenditures	$ 22,371,005.00	#DIV/0!	$ 25,130,000.00	$ 2,758,995.00	12.3%
18			#DIV/0!		$ -	
19	REVENUES		#DIV/0!		$ -	
20	Federal Funds	$ 3,800,000.00	#DIV/0!	$ 2,000,000.00	$ (1,800,000.00)	-47.4%
21	Personal Property Taxes	$ 5,800,000.00	#DIV/0!	$ 6,400,000.00	$ 600,000.00	10.3%
22	Real Estate Taxes	$ 11,643,844.00	#DIV/0!	$ 12,500,000.00	$ 856,156.00	7.4%
23	State Funds	$ 800,000.00	#DIV/0!	$ 800,000.00	$ -	0.0%
24	User/Other Fees	$ 184,139.00	#DIV/0!	$ 212,000.00	$ 27,861.00	15.1%
25	Utility Fees	$ 1,143,022.00	#DIV/0!	$ 1,800,000.00	$ 656,978.00	57.5%
26	Calculated Total	$ 23,371,005.00	#DIV/0!	$ 23,712,000.00	$ 340,995.00	
27	Total Revenues	$ 22,371,005.00	#DIV/0!	$ 25,130,000.00	$ 2,758,995.00	12.3%

You got 16 error messages, and your spreadsheet says the Mayor's Office will get more than four times the entire budget. Since everything can't add up to more than 100 percent, we know we've made a mistake somewhere.

Do you have any ideas? Let's see if you can figure it out. First, look at the formula for Building Standards again, then look at the formula immediately below it for the City Attorney. The formula here is:

=B4/B17

If you click that cell, then click the formula bar, you'll see that Excel has highlighted the two cells used in the formula and is not using the cell with the total we calculated. The program is using the cell underneath it. Now in this case, that is correct because we actually have the total numbers in two rows. (We have the totals provided by the city and the totals we calculated ourselves.) The problem shows up in the next row, where Excel is dividing by zero. This generates an error.

Why did this happen? When you copy a formula, Excel has to guess what you mean. It doesn't know that one number is a total versus just any other number on the sheet, so when you move down a row, Excel generally adds one row to each cell in a formula. It's just trying to guess what you mean, and it guessed wrong. Here's why:

Ecsel Iz Dumm

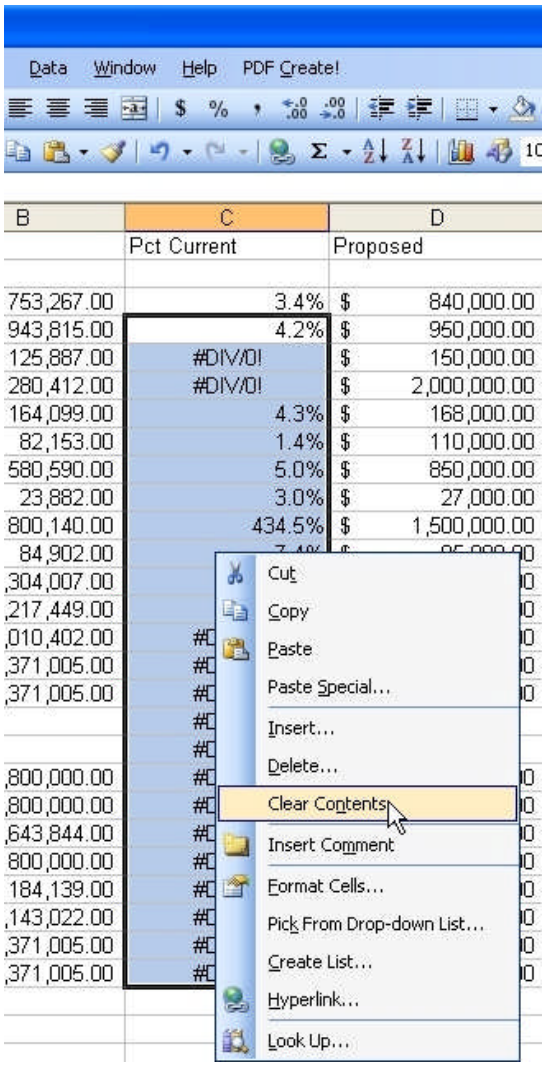
Never rely on Excel to correctly guess anything for you. Whenever you copy formulas or do some kind of data manipulation, Excel often will try to help you by selecting cells and altering formulas based on what it thinks you are trying to do. The majority of the time, it guesses correctly, but it often is wrong. In this case, the error jumps out at you. Many times it won't, and if you don't catch it right away, hours or days could pass before you do. When that happens, guess what: It's back to that raw source file I KNOW you saved a copy of before you started working.

But relax. Most of the time you can copy formulas without any problem. After you do, just go back and eyeball at least one or two of them to make sure they were copied correctly. Excel will copy all formulas the same way, so if those first couple copies are correct, the rest should be OK too.

Our Friend the $

The problem we just had with the formula does not mean we have to type all the formulas by hand. We just have to tell Excel to always use the cells with the total numbers in them. For this, we will use the $.

But first we need to get rid of the bad formulas. Leave the formula in Cell C3 in place, but highlight Cells C4 through the last formula you copied (which should be in Cell C27). Once this is done, right-click anywhere in the highlighted area and select Clear Contents. This is a handy way to clear a lot of bad data very quickly.



Once this is done, click Cell C3, then click in the Formula Bar. We want to make sure that when we copy the formula, Excel will change the first number to reflect the department in that row but always divide by the Total Budget figure. To do this, we insert two dollar signs to make our formula look like this:

=B3/$B$16

We use two dollar signs because the first is used to make sure Column B does not change and the second makes sure Row 16 does not change. Technically we do not need the first dollar sign because Excel will not attempt to use a different column anyway. But generally speaking, it's good practice to put them both in.

Once you enter the correct formula, you can copy it down to the rest of the expenditures, and it will copy correctly. In fact, copy it all the way down to the first row in revenues (Cell C20).

Next, delete the contents of the two cells for Rows 18 and 19. (These will show up as 0 percent rather than an error because you are not dividing by zero.) Next, click on Cell C20, then click in the formula bar. The formula here should be:

=B20/$B$16

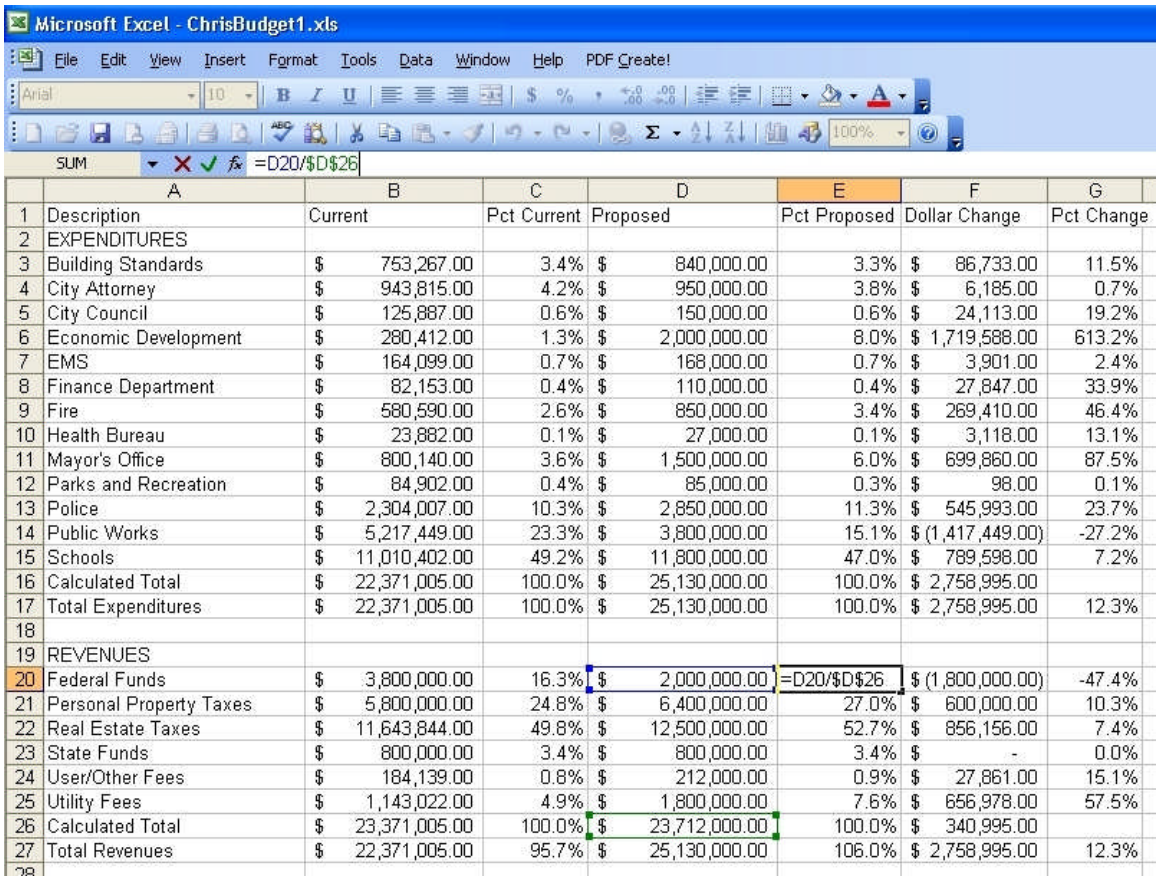
We are accessing Total Expenditures instead of Total Revenues. They should be the same, but we already have discovered they are not. Change $B$16 to $B$26, then copy the formula down to the bottom of the current revenues column.

Now it's time to practice and see what you remember:

1. We want to calculate the percent of the total proposed budget for each expenditure and revenue line item. You want to put this immediately to the right of the "Proposed" column, so you'll have to make room here. Name this new column: Pct Proposed
2. Write formulas for proposed revenues and expenditures to calculate the percent of total expenditures or revenues for each line item. Remember to make sure you are displaying percentages rather than monetary figures.

3. Both of the Pct columns (Columns C and E) are too wide. Make them only as wide as they need to be to display the data.

When you're done, your sheet should look like this:



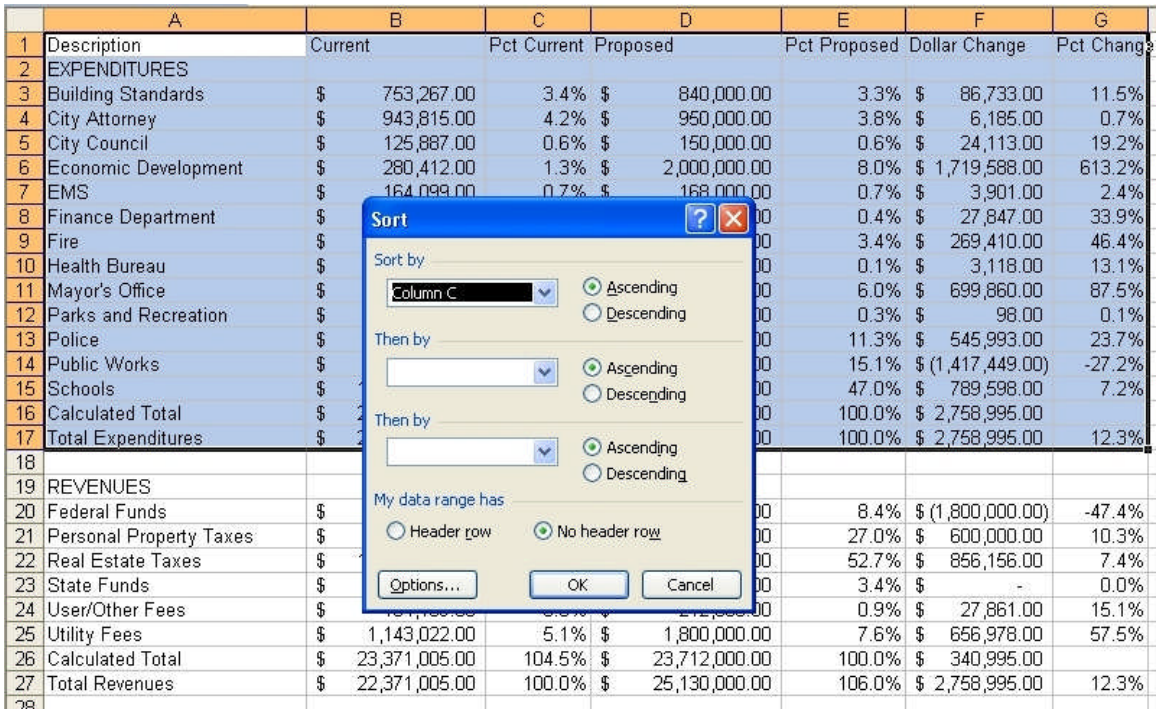
	A	B	C	D	E	F	G
1	Description	Current	Pct Current	Proposed	Pct Proposed	Dollar Change	Pct Change
2	EXPENDITURES						
3	Building Standards	$ 753,267.00	3.4%	$ 840,000.00	3.3%	$ 86,733.00	11.5%
4	City Attorney	$ 943,815.00	4.2%	$ 950,000.00	3.8%	$ 6,185.00	0.7%
5	City Council	$ 125,887.00	0.6%	$ 150,000.00	0.6%	$ 24,113.00	19.2%
6	Economic Development	$ 280,412.00	1.3%	$ 2,000,000.00	8.0%	$ 1,719,588.00	613.2%
7	EMS	$ 164,099.00	0.7%	$ 168,000.00	0.7%	$ 3,901.00	2.4%
8	Finance Department	$ 82,153.00	0.4%	$ 110,000.00	0.4%	$ 27,847.00	33.9%
9	Fire	$ 580,590.00	2.6%	$ 850,000.00	3.4%	$ 269,410.00	46.4%
10	Health Bureau	$ 23,882.00	0.1%	$ 27,000.00	0.1%	$ 3,118.00	13.1%
11	Mayor's Office	$ 800,140.00	3.6%	$ 1,500,000.00	6.0%	$ 699,860.00	87.5%
12	Parks and Recreation	$ 84,902.00	0.4%	$ 85,000.00	0.3%	$ 98.00	0.1%
13	Police	$ 2,304,007.00	10.3%	$ 2,850,000.00	11.3%	$ 545,993.00	23.7%
14	Public Works	$ 5,217,449.00	23.3%	$ 3,800,000.00	15.1%	$ (1,417,449.00)	-27.2%
15	Schools	$ 11,010,402.00	49.2%	$ 11,800,000.00	47.0%	$ 789,598.00	7.2%
16	Calculated Total	$ 22,371,005.00	100.0%	$ 25,130,000.00	100.0%	$ 2,758,995.00	
17	Total Expenditures	$ 22,371,005.00	100.0%	$ 25,130,000.00	100.0%	$ 2,758,995.00	12.3%
18							
19	REVENUES						
20	Federal Funds	$ 3,800,000.00	16.3%	$ 2,000,000.00	=D20/$D$26	$ (1,800,000.00)	-47.4%
21	Personal Property Taxes	$ 5,800,000.00	24.8%	$ 6,400,000.00	27.0%	$ 600,000.00	10.3%
22	Real Estate Taxes	$ 11,643,844.00	49.8%	$ 12,500,000.00	52.7%	$ 856,156.00	7.4%
23	State Funds	$ 800,000.00	3.4%	$ 800,000.00	3.4%	$ -	0.0%
24	User/Other Fees	$ 184,139.00	0.8%	$ 212,000.00	0.9%	$ 27,861.00	15.1%
25	Utility Fees	$ 1,143,022.00	4.9%	$ 1,800,000.00	7.6%	$ 656,978.00	57.5%
26	Calculated Total	$ 23,371,005.00	100.0%	$ 23,712,000.00	100.0%	$ 340,995.00	
27	Total Revenues	$ 22,371,005.00	95.7%	$ 25,130,000.00	106.0%	$ 2,758,995.00	12.3%

All the Sorted Details

You're almost done with the city budget before you interview the mayor and city council. But there's one more tool we can use to help us see the highs and lows in our budget. We could accomplish the same thing by just eyeballing the budget because it's so small, but this would be more difficult if not impossible for much larger files.

We want to sort our data to find out which departments will reap the greatest percent increases in their budgets. To do this, click anywhere in your Expenditures data, go to the Menu Bar and select Data, then Sort.

When you do this, Excel should highlight all of the data in the first 17 rows but none of the revenue data. (See the screenshot on the next page.) Again, this is because Excel interprets the blank Row 18 as a boundary and excludes everything below it.



	A	B	C	D	E	F	G
1	Description	Current	Pct Current	Proposed	Pct Proposed	Dollar Change	Pct Chang
2	EXPENDITURES						
3	Building Standards	$ 753,267.00	3.4%	$ 840,000.00	3.3%	$ 86,733.00	11.5%
4	City Attorney	$ 943,815.00	4.2%	$ 950,000.00	3.8%	$ 6,185.00	0.7%
5	City Council	$ 125,887.00	0.6%	$ 150,000.00	0.6%	$ 24,113.00	19.2%
6	Economic Development	$ 280,412.00	1.3%	$ 2,000,000.00	8.0%	$ 1,719,588.00	613.2%
7	EMS	$ 164,099.00	0.7%	$ 168,000.00	0.7%	$ 3,901.00	2.4%
8	Finance Department	$			0.4%	$ 27,847.00	33.9%
9	Fire	$			3.4%	$ 269,410.00	46.4%
10	Health Bureau	$			0.1%	$ 3,118.00	13.1%
11	Mayor's Office	$			6.0%	$ 699,860.00	87.5%
12	Parks and Recreation	$			0.3%	$ 98.00	0.1%
13	Police	$			11.3%	$ 545,993.00	23.7%
14	Public Works	$			15.1%	$ (1,417,449.00)	-27.2%
15	Schools	$			47.0%	$ 789,598.00	7.2%
16	Calculated Total	$			100.0%	$ 2,758,995.00	
17	Total Expenditures	$			100.0%	$ 2,758,995.00	12.3%
18							
19	REVENUES						
20	Federal Funds	$			8.4%	$ (1,800,000.00)	-47.4%
21	Personal Property Taxes	$			27.0%	$ 600,000.00	10.3%
22	Real Estate Taxes	$			52.7%	$ 856,156.00	7.4%
23	State Funds	$			3.4%	$ -	0.0%
24	User/Other Fees	$			0.9%	$ 27,861.00	15.1%
25	Utility Fees	$ 1,143,022.00	5.1%	$ 1,800,000.00	7.6%	$ 656,978.00	57.5%
26	Calculated Total	$ 23,371,005.00	104.5%	$ 23,712,000.00	100.0%	$ 340,995.00	
27	Total Revenues	$ 22,371,005.00	100.0%	$ 25,130,000.00	106.0%	$ 2,758,995.00	12.3%

There are two reasons this won't work. See if you can figure out why, but we'll go ahead and try it anyway. You'll notice that you can sort by up to three columns. What this means is that Excel will sort the first column. If more than one row has the same value in that column, it will sort those rows by the second column and so on. You also will note that each column has radio buttons indicating whether it should sort in Ascending (lowest to highest) or Descending (highest to lowest) order.

You also see two radio buttons at the bottom to indicate whether there is a Header Row. This simply asks you to indicate whether the first row in the highlighted data includes column headings that should stay at the top when the data is sorted. We do have a header row (Row 1), so we need to click the Header Row button. When you do this, you'll see that Row 1 no longer is highlighted. You'll also see that in the dropdown lists for the Sort By columns, you no longer see Column A, Column B and so on. Now you see the actual column headings. This can make it much easier to sort your data.

Have you figured out the two reasons why this won't work yet? Let's find out. Just sort by Pct Change in Descending order and click OK. What happened? All our nice formulas in Columns C and E display errors now. (See screenshot on next page.) Also, the row that only had the word Expenditures in the first cell has been moved almost to the bottom of the table.

First, let's undo what we did. Go to the Menu Bar and select Edit, then Undo. Alternatively click the Undo button on the Standard toolbar.

	A	B	C	D	E	F	G
1	Description	Current	Pct Current	Proposed	Pct Proposed	Dollar Change	Pct Change
2	Economic Development	$ 280,412.00	#DIV/0!	$ 2,000,000.00	#DIV/0!	$ 1,719,588.00	613.2%
3	Mayor's Office	$ 800,140.00	#DIV/0!	$ 1,500,000.00	#DIV/0!	$ 699,860.00	87.5%
4	Fire	$ 580,590.00	#DIV/0!	$ 850,000.00	#DIV/0!	$ 269,410.00	46.4%
5	Finance Department	$ 82,153.00	#DIV/0!	$ 110,000.00	#DIV/0!	$ 27,847.00	33.9%
6	Police	$ 2,304,007.00	#DIV/0!	$ 2,850,000.00	#DIV/0!	$ 545,993.00	23.7%
7	City Council	$ 125,887.00	#DIV/0!	$ 150,000.00	#DIV/0!	$ 24,113.00	19.2%
8	Health Bureau	$ 23,882.00	#DIV/0!	$ 27,000.00	#DIV/0!	$ 3,118.00	13.1%
9	Total Expenditures	$ 22,371,005.00	#DIV/0!	$ 25,130,000.00	#DIV/0!	$ 2,758,995.00	12.3%
10	Building Standards	$ 753,267.00	#DIV/0!	$ 840,000.00	#DIV/0!	$ 86,733.00	11.5%
11	Schools	$ 11,010,402.00	#DIV/0!	$ 11,800,000.00	#DIV/0!	$ 789,598.00	7.2%
12	EMS	$ 164,099.00	#DIV/0!	$ 168,000.00	#DIV/0!	$ 3,901.00	2.4%
13	City Attorney	$ 943,815.00	#DIV/0!	$ 950,000.00	#DIV/0!	$ 6,185.00	0.7%
14	Parks and Recreation	$ 84,902.00	#DIV/0!	$ 85,000.00	#DIV/0!	$ 98.00	0.1%
15	Public Works	$ 5,217,449.00	#DIV/0!	$ 3,800,000.00	#DIV/0!	$ (1,417,449.00)	-27.2%
16	EXPENDITURES						
17	Calculated Total	$ 43,661,458.00	#DIV/0!	$ 46,760,000.00	#DIV/0!	$ 3,098,542.00	

So what happened? First, we didn't want to sort the row with just the word Expenditures in it. Unfortunately there was no way to avoid this unless we chose to not use Column headings.

But what happened to our formulas? Do you remember the $? It prevents Excel from modifying the formulas, even when the data is sorted. This scrambled all of our values because Excel was dividing by whatever values were in row 16. After we sorted our data, that row was blank.

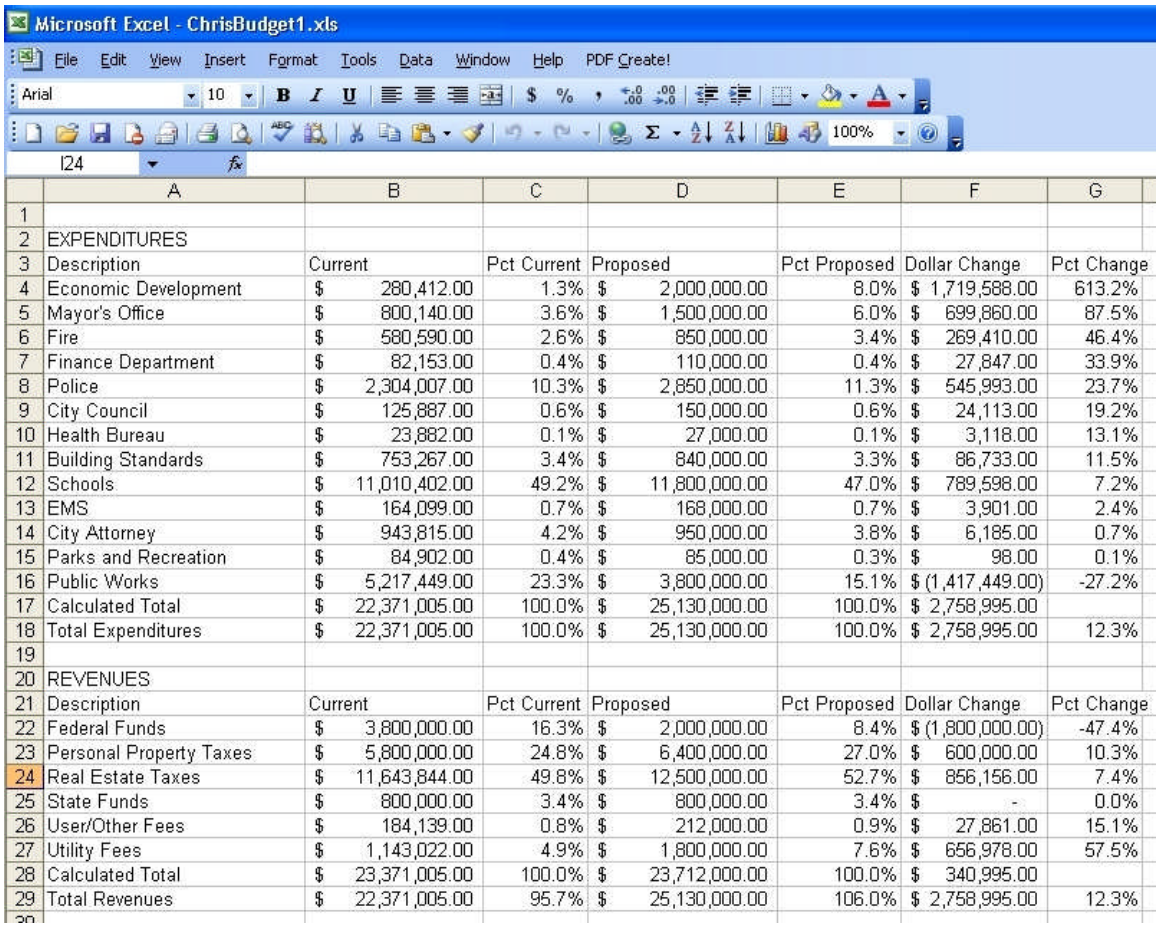
So let's clean up our sheet a little bit to make sorting easier. First, highlight Row 3 and insert a new Row here. Next, highlight Row 1, go to Edit, then Cut (or Ctrl+X), then click Cell A3 and go to Edit, then Paste (or Ctrl+V). This will move the column headings from Row 1 to the third row and below the label Expenditures.

For revenues, highlight Row 21, insert a row, then Copy (Ctrl+C) Row 3 and paste it into the new, blank Row 21. Now you have a copy of the column headings for both Expenditures and Revenues.

As for our formulas, we need the dollar signs, so to fix the second problem, we'll just highlight our data manually and skip the two rows that show our total numbers and the city's totals. Click on Cell G16, hold the mouse button down and highlight all of your data between that Cell and Cell A3, which has the word Description in it.

Now we will go to Data in the Menu Bar and select Sort to re-open the Sort dialog box. Again, click the radio button for Header Row. This will de-select Row 3 and allow us to choose the column headings we want to sort by rather than the column letters. We want to sort by Pct Change in Descending order.

When you're done, your screen should look similar to the screenshot on the next page. You'll see Economic Development is at the top and Public Works is at the bottom. This gives us a quick summary of the biggest gainers and the biggest losers in the proposed budget.



	A	B	C	D	E	F	G
1							
2	EXPENDITURES						
3	Description	Current	Pct Current	Proposed	Pct Proposed	Dollar Change	Pct Change
4	Economic Development	$ 280,412.00	1.3%	$ 2,000,000.00	8.0%	$ 1,719,588.00	613.2%
5	Mayor's Office	$ 800,140.00	3.6%	$ 1,500,000.00	6.0%	$ 699,860.00	87.5%
6	Fire	$ 580,590.00	2.6%	$ 850,000.00	3.4%	$ 269,410.00	46.4%
7	Finance Department	$ 82,153.00	0.4%	$ 110,000.00	0.4%	$ 27,847.00	33.9%
8	Police	$ 2,304,007.00	10.3%	$ 2,850,000.00	11.3%	$ 545,993.00	23.7%
9	City Council	$ 125,887.00	0.6%	$ 150,000.00	0.6%	$ 24,113.00	19.2%
10	Health Bureau	$ 23,882.00	0.1%	$ 27,000.00	0.1%	$ 3,118.00	13.1%
11	Building Standards	$ 753,267.00	3.4%	$ 840,000.00	3.3%	$ 86,733.00	11.5%
12	Schools	$ 11,010,402.00	49.2%	$ 11,800,000.00	47.0%	$ 789,598.00	7.2%
13	EMS	$ 164,099.00	0.7%	$ 168,000.00	0.7%	$ 3,901.00	2.4%
14	City Attorney	$ 943,815.00	4.2%	$ 950,000.00	3.8%	$ 6,185.00	0.7%
15	Parks and Recreation	$ 84,902.00	0.4%	$ 85,000.00	0.3%	$ 98.00	0.1%
16	Public Works	$ 5,217,449.00	23.3%	$ 3,800,000.00	15.1%	$ (1,417,449.00)	-27.2%
17	Calculated Total	$ 22,371,005.00	100.0%	$ 25,130,000.00	100.0%	$ 2,758,995.00	
18	Total Expenditures	$ 22,371,005.00	100.0%	$ 25,130,000.00	100.0%	$ 2,758,995.00	12.3%
19							
20	REVENUES						
21	Description	Current	Pct Current	Proposed	Pct Proposed	Dollar Change	Pct Change
22	Federal Funds	$ 3,800,000.00	16.3%	$ 2,000,000.00	8.4%	$ (1,800,000.00)	-47.4%
23	Personal Property Taxes	$ 5,800,000.00	24.8%	$ 6,400,000.00	27.0%	$ 600,000.00	10.3%
24	Real Estate Taxes	$ 11,643,844.00	49.8%	$ 12,500,000.00	52.7%	$ 856,156.00	7.4%
25	State Funds	$ 800,000.00	3.4%	$ 800,000.00	3.4%	$ -	0.0%
26	User/Other Fees	$ 184,139.00	0.8%	$ 212,000.00	0.9%	$ 27,861.00	15.1%
27	Utility Fees	$ 1,143,022.00	4.9%	$ 1,800,000.00	7.6%	$ 656,978.00	57.5%
28	Calculated Total	$ 23,371,005.00	100.0%	$ 23,712,000.00	100.0%	$ 340,995.00	
29	Total Revenues	$ 22,371,005.00	95.7%	$ 25,130,000.00	106.0%	$ 2,758,995.00	12.3%

Sort at Your Own Risk

To sort your data, you can click somewhere in your data, go to the Menu Bar and select Data, then Sort. Excel will highlight all the data to be sorted, and you're on your way.

This can be risky, however, because if Excel doesn't highlight all of your data, columns that are not highlighted won't be sorted. This will hopelessly scramble your data, and you might not ever be aware of it. Blank rows and columns in particular can throw Excel off.

The safest bet is to highlight the data you want to sort yourself. (Holding down the Shift key and using keyboard shortcuts like Ctrl+End and Ctrl+Home can speed up this process.) If for some reason you do not highlight all of your data, Excel will warn you of this before sorting any of your data. Highlighting data manually also allows you to leave out rows at the top and bottom of your data, such as Totals and Column Headings, that you don't want sorted.

Take a Break

We covered a lot of ground, but you already should see that Excel can help you analyze numbers a lot more quickly and accurately than you could with a calculator or with pen and paper, particularly when you're dealing with hundreds or thousands of records. It also lets you sort your data so you can spot highs and lows quickly.