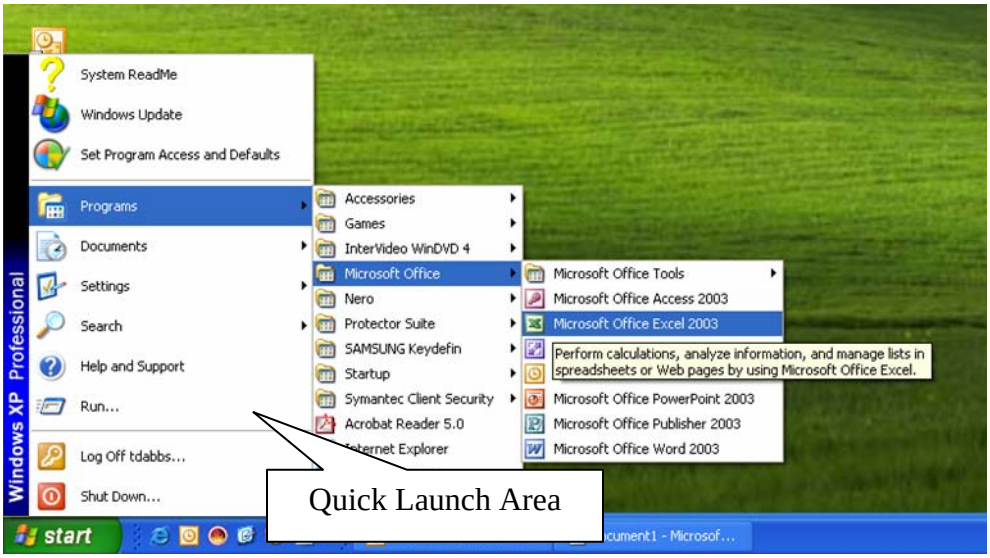
Excel

- Open Excel
- Use menus and toolbars
- Input and format data
  - Relative and absolute reference
  - Freeze panes
  - Merge cells
  - Format cells
- Sort and analyze data
  - Sorting
  - Filtering
- Use formulas and functions
- Create and edit charts
- Insert charts in a Word Document

Getting Started

Open Excel

1. Click on the Start button located on the Task Bar
2. Highlight "Programs"
3. Click on "Microsoft Excel"



Tip: You might have a shortcut on your desktop or in your quick launch area to open Excel.

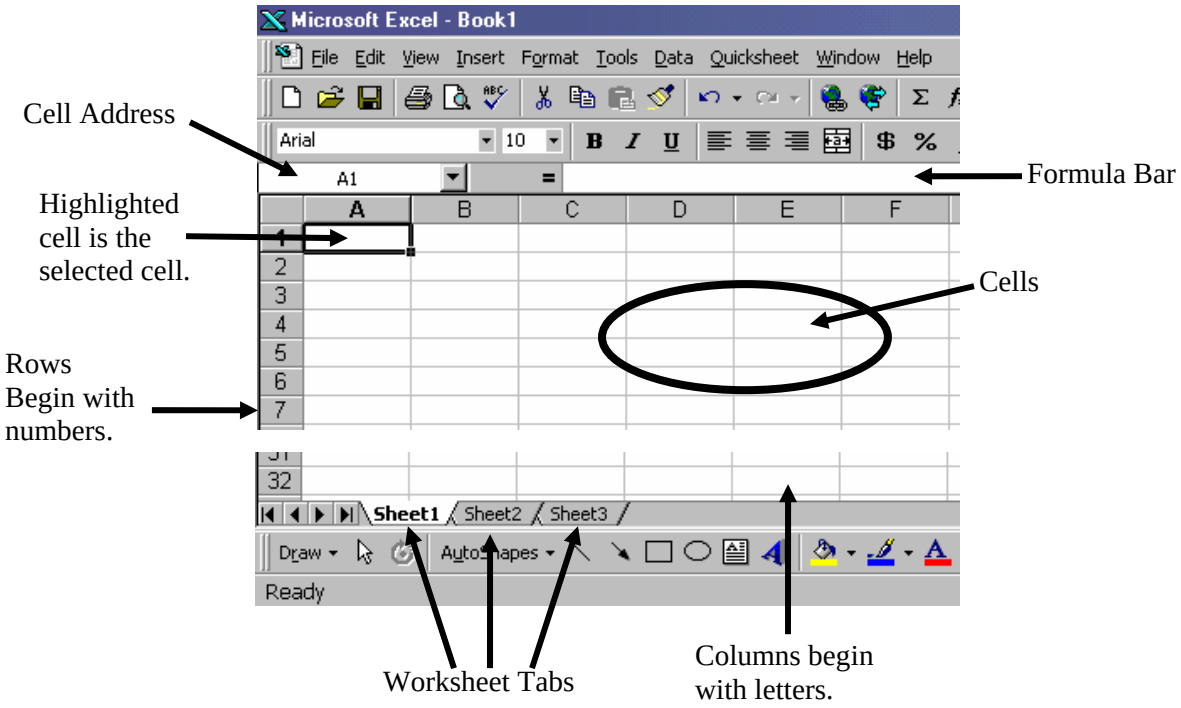
Set up toolbars

The following steps are not strictly necessary, but may be helpful.

1. First go to **Tools → Options → View** tab. In the Show area, make sure that both the Formula bar and Status bar boxes are checked (it's okay if other things are checked). Then click on OK.
2. Second, go to **Tools → Customize → Options** tab. In the Personalized Menus and Toolbars area, make sure that the Standard and Formatting toolbars will be shown on two rows. Depending on which version of Excel you are running, this may require checking "Standard and Formatting toolbars on two rows" or unchecking "Standard and Formatting toolbars share one row." Then click Close.

Basic components of your Excel workbook

1. A new Excel document is called a workbook. The workbook may contain multiple pages or sheets, accessible through tabs at the bottom of the screen.
2. The individual squares into which data may be placed are called cells.
3. Columns of cells are identified with letters, and rows are identified with numbers.
4. Combining the column letter and row number gives each cell its own, unique identification or cell address. The cell address of the selected cell is shown on the upper left part of the screen, just below the toolbars.
5. Just to the right of the cell address bar is the formula bar, which will be discussed later.



A Quick Tour

This little tour takes you to the four corners of a Sheet in an Excel Workbook. Starting in cell A1, hold the Ctrl key down and press the Right Arrow key. This takes you to cell IV1 in Column IV. That means there are 256 columns across. Now hold the Ctrl key down and press the Down Arrow key. This takes you to cell IV65536. This means that there are 65,536 rows down the worksheet making the total number of cells 16,777,216. And that's only on Sheet 1! There are just as many cells on every sheet that a workbook contains. Now hold the Ctrl key down and press the Left Arrow key. This takes you to cell A65536. And then holding the Ctrl key down and pressing the Up Arrow key or just pressing the Home key will take you back to cell A1. Pressing Ctrl-Home will take you back to cell A1, no matter what cell is currently selected.

The Three Little Cursors

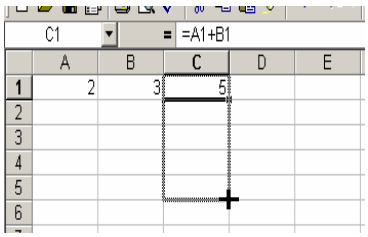
There are three different cursors in the cell area of an Excel sheet, each with a different function.

1. The first cursor is ✚, the ***Fat White Cross*** or Plus sign. This is the ***Selecting Cursor***. Clicking on a single cell will select an individual cell. Clicking and dragging on many cells will select multiple cells. If you want to select multiple cells non-adjacent to each other, click on the first cell or cells, then hold the Ctrl key down and click on the next cell or cells. As long as you hold the Ctrl key down, you may continue to select multiple cells that are not next to each other without selecting any intervening cells. To select an entire column of cells, click on the letter above the appropriate column. Likewise, if you want to select an entire row, click on the number of the appropriate row.

	A	B	C ✚	D
1	**Name**	**Quiz 1 Score**	**Quiz 2 Score**	**Unit Test Score**
2	Alvarez, Bobby	9	6	42
3	Hopkins, Alicia	8	8	45
4	Jones, Richard	7	8	38
5	Markova, Natalya	7	10	47
6	Simmons, Dan	8	7	47

2. The second cursor is the ***Skinny Black Cross*** or Plus sign (✚). If you look at the bottom right corner of a selected cell or cells, you will see a small black square. Placing the Fat White Cross on this small black square will change the cursor to the Skinny Black Cross. This is the ***Fill Down or Fill Right Cursor***. Placing the cursor on this box and clicking and dragging will continue the pattern established in the selected cells to succeeding cells below, up, to the left, or to the right of the selected cell or cells.

   Example: To fill a formula down, select cell C1 and type " =A1+B1" then press Enter. Select cell C1 again and place the Fat White Cross on the small black square so that it changes into the Skinny Black Cross. Click and Drag down to cell C5. The formula will be filled in those cells but the cell reference will change. Click on cell C2. It will read =A2+B2. Cell C3 will read =A3+B3, and so on. This is known as ***Relative Reference***. More on this later.

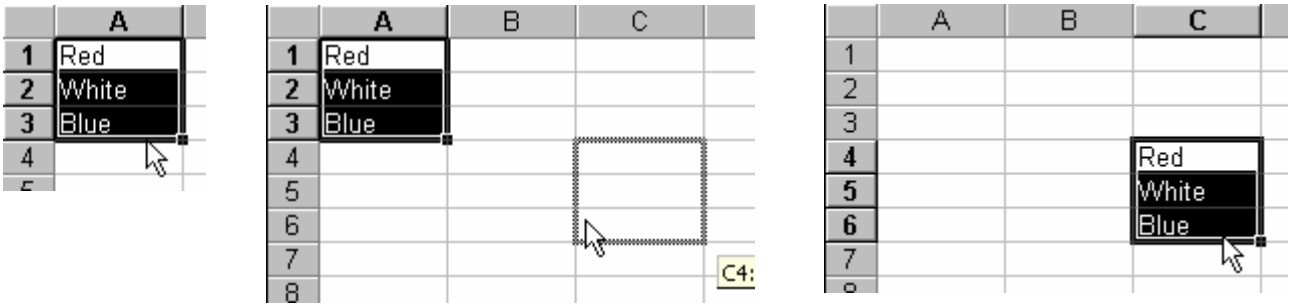


***Example**:* To fill a sequence across, select cell A1 and type "Mon", then select cell A1. Place the Fat White Cross on the small black square so that it changes into the Skinny Black Cross. Click and Drag to cell G1. The rest of the days of the week will be filled into cells B1-G1.

Tip: You must select all of the cells that begin your sequence before you use the Fill cursor. This will not work with all sequences but it will with a number of them. Sometimes a single cell is enough for Excel to recognize the pattern, but other times you need to give it more information. Experiment!

3. The third cursor is the ***White Arrow:***  This is the ***Moving Cursor***. Placing the Fat White Cross on the border of a selected cell or group of cells will change it into the Moving Cursor. The Moving Cursor allows you to move the contents or formulas of a cell or group of cells to another desired location. Select the desired cell or group of cells. Place the Fat White Cross on the border of the selected cell or cells. Click and Drag the cell or cells to the desired location. See example:

Step 1 ***Step 2*** ***Step 3***



Input and format data

Inputting data is as simple as selecting the cell in which you want to place the data, and typing the data in. The Skinny Black Cross can be used to speed up the entry of data that follows a pattern, and formulas (discussed below) can be used to calculate sums, averages, etc.

Referring to cells

As discussed above, each cell has a unique address, consisting of its column letter and its row number. Ranges of cells can be referred to using the following guidelines:

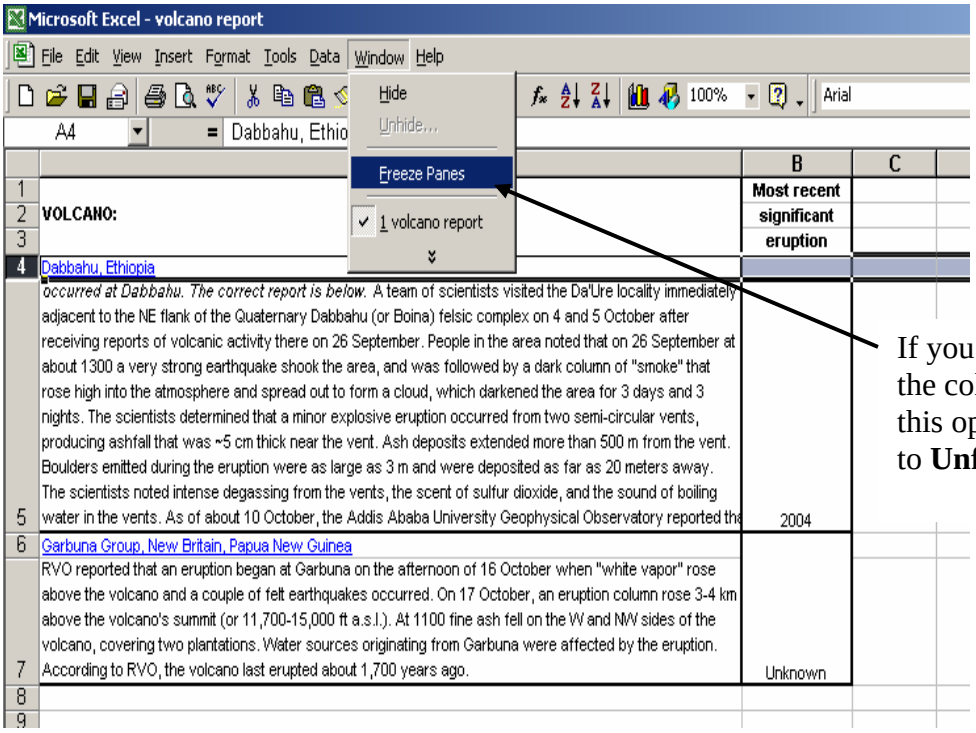
To refer to	Use
The cell in column A and row 10	A10
The range of cells in column A and rows 10 through 20	A10:A20
The range of cells in row 15 and columns B through E	B15:E15
All cells in row 5	5:5
All cells in rows 5 through 10	5:10
All cells in column H	H:H
All cells in columns H through J	H:J
The range of cells in columns A through E and rows 10 through 20	A10:E20

1. **Relative reference:** When you refer to cells as shown above, you are using what is called a relative reference. For instance, if you select cell A3 and enter "=A1+A2", you are really telling Excel to add together the values in the two cells above the one you have selected. If you copy this formula and paste it into cell B5, it will add B3+B4. Both the column letters and the row numbers have changed! The same thing happens if you use the Skinny Black Cross to fill the formula into other cells.

2. **Absolute reference:** If you instead want to copy or fill a formula into another cell but still have it refer to the original values you specified, you need to place a $ sign before each part of the cell addresses that you want to stay fixed. For instance, "=$A$1+$A$2" means "add together the values found in cell A1 and cell A2" no matter which cell this formula gets copied into. "=$A1+$A2" keeps the column fixed as an absolute reference, but allows the row number to be a relative reference. Likewise, "=A$1+A$2" keeps the row fixed, but allows the column to change.

Keeping column headings visible

If you have a lot of data to enter, you may find that you have too many rows to fit on the screen at one time, and your column headings have gotten pushed off the top of the screen. To keep the column headings visible at all times, highlight the row ***just below*** your column headings, then go to **Window → Freeze Panes**. This will "pin" the row containing your column headings so that when you scroll down the screen, the row of column headings stays put. To unpin this row, go to **Window → Unfreeze Panes**.

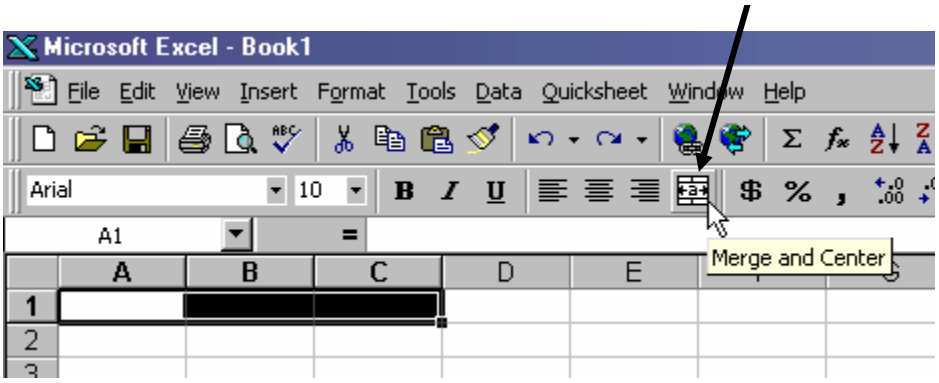


If you want to unpin the column headings, this option changes to **Unfreeze Panes**.

Merge Cells

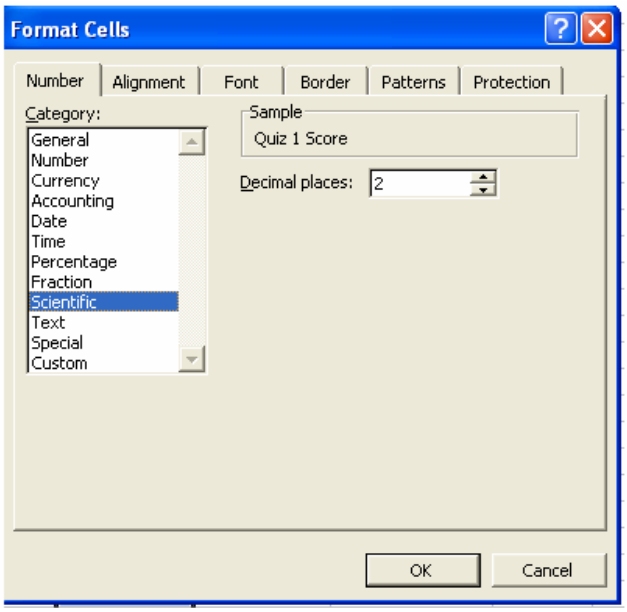
Occasionally, you may want to put a title at the top of your worksheet. This title may be considerably longer than the data in the columns below. Rather than having your title force the data column below to be wider than you want, you can select two or more adjacent cells and merge them into one large cell. Select the desired group of adjacent cells. Then on the Formatting Menu Bar, select the Merge and Center button. See picture below.

Merge and Center button



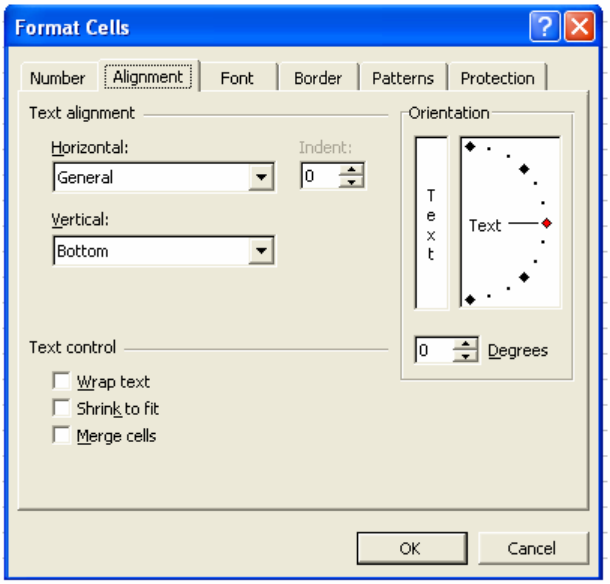
Formatting cells

Once the data has been entered, the appearance of the data can be formatted using the Format menu. Select the cells to be formatted, then go to **Format → Cells…** to open the Format Cells dialog box.



The first tab is the Number tab. This tab gives you the ability to format, among other things, how dates will be shown (05/24/2007 vs. May 24, 2007), how many decimal places will be included in numbers, or whether you want negative money balances shown with a minus sign, in parentheses, or in red. Experiment to find out other options.

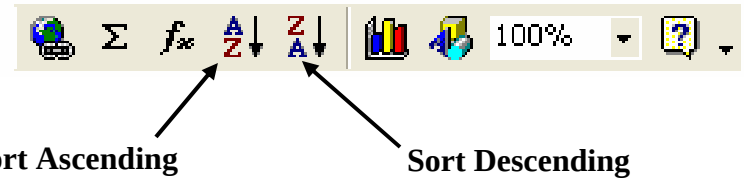
The next tab is the Alignment tab. This tab is especially useful for column headings that may be considerably longer than the data within the column. By changing the alignment, the column headings can be placed at an angle, keeping them from overlapping each other or forcing the column to be unnecessarily wide.



Sort and analyze data

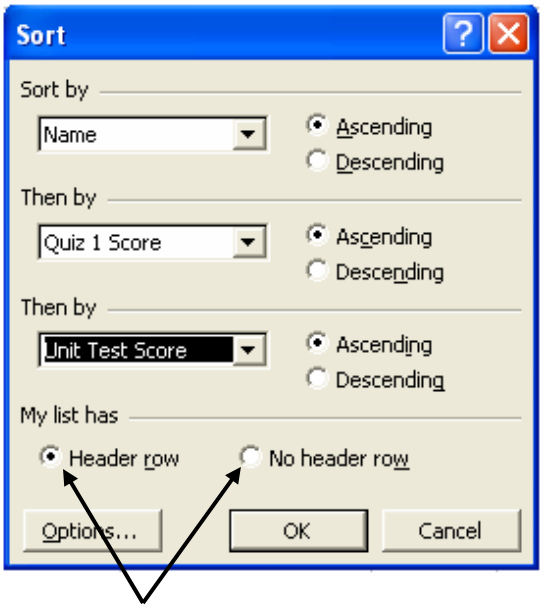
Sorting and alphabetizing

There are two ways to sort or alphabetize the data you have entered. The quick way is to use the buttons on the Standard toolbar. One sorts the data in ascending alphanumeric order (numbers 0-9 first, then A through Z), and the other sorts in reverse order. Begin by selecting either ***one*** cell of data or the first empty cell below a column of data, and then use one of these buttons. Excel will sort ***all*** of the data based on the values in the selected column. All of the cells in a given row will remain in the same row. This is important, so that last names and first names remain properly paired up.



Note: If you select more than one cell, only the selected cells will be sorted, which may result in data in one column getting separated from connected data in different columns (for instance, last names might get alphabetized, but first names would remain in the same order, so the last names and first names would no longer be paired up properly).

The other way to sort data takes a little more time, but offers more options. Again, select one cell of data or the first empty cell below a column. Then go to **Data → Sort…**. A Sort dialog box opens, which allows you to specify up to three sorting criteria. The second and third sorting criteria are only used as "tie-breakers". For instance, if you are alphabetizing a list of students by last name, you may have two students who share the same last name. You could use the second sorting criteria to tell Excel to put these students in order by their first name, or by their date of birth, or by any other criteria you set. If your data columns have column headings in the first row, check the appropriate box to ensure that the column headings don't get mixed in with the data when you sort.



Check the appropriate bullet to indicate whether your data has a header row or not.

Filtering data

Filters allow you to quickly isolate all data entries with a certain value, hiding the entries that don't match the criteria you choose. To turn on filters, go to **Data → Filter → AutoFilter.** Each column heading now has a pull down menu that lists all of the filtering options possible.

	A	B	C	D
1	**Name**	**Quiz 1 Score**	**Quiz 2 Score**	**Unit Test Score**
2	Alvarez, Bobby	9	6	42
3	Hopkins, Alicia	8	8	45
4	Jones, Richard	7	8	38
5	Markova, Natalya	7	10	47
6	Simmons, Dan	8	7	47

Pull down for filtering options

The same data, filtered to show only those students who scored 47 on the Unit Test.

	A	B	C	D
1	**Name**	**Quiz 1 Score**	**Quiz 2 Score**	**Unit Test Score**
5	Markova, Natalya	7	10	47
6	Simmons, Dan	8	7	47

Use formulas and functions

Formulas and functions allow you to fill cells with values based on the data in other cells. Some commonly used functions are Sum and Average, but there are many other options. Both formulas and functions always begin with an equal sign. They can be entered in a number of ways:

- Formulas and functions can be entered into a cell by first selecting the desired cell and typing in the formula or function. After the formula has been entered you must press enter to actually "place" the formula into the cell.

  Example: Click cell C1, type: =A1+B1 and then press enter. The formula is now in cell C1. To test it, type in different values for cells A1 & B1, pressing enter or one of the arrow keys to enter the number into the cell. The value in cell C1 will automatically change so that it is equal to the sum of the values in A1 and B1.

  Example: Click cell B2, type: =A2*3 and then press enter. The formula is now in cell B2. To test it, type in different values for cell A2, and press. The value in cell B2 will automatically change so that it is three times the value in A2.

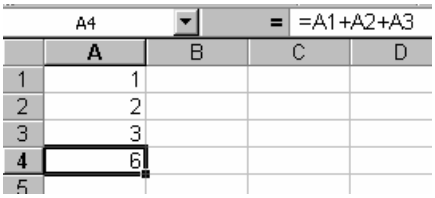
  Example: Click cell D4 and type: =average(A3:C3) and then press enter. To test it, type in different values for cells A3, B3 & C3 and press enter. The value in cell D3 will automatically change so that it is equal to the average of the values in A3 through C3.

  It is important to use the proper operator with the correct order of operations. The parentheses symbols will help you accomplish this. When entering multiplication or division operators you must use the asterisk key (*) for multiplication and the forward slash key (/) for division. Also, please remember that there is a big difference between a zero (0) and the letter O. Make sure that you use a zero in your formulas or you will get a syntax error!

  Note: To enter a range of adjacent cells, enter the first cell address, then a colon, and then the last cell address. Every cell in between will be included. A1:A3 means A1, A2 and A3. A1:C3 means A1, A2, A3, B1, B2, B3, C1, C2, and C3!

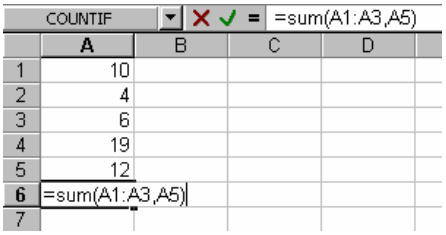
- Instead of typing in the cell addresses referenced in your function or formula, you may click on the appropriate cell.

  Example: Type numbers in cells A1, A2, and A3. In cell A4 type an "=" sign. Then with your mouse, click on cell A1, type a + sign, click on cell A2, type another + sign, and finally click in cell A3 and press Enter. The sum will be placed into cell A4. This has the exact same result as just typing "=A1+A2+A3".



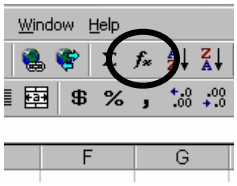
- Cell addresses can also be entered into a formula or function by Clicking and Dragging across the appropriate cells.

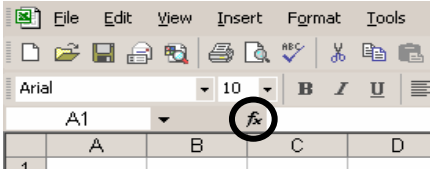
  Example: Type numbers into cells A1 through A5. Select cell A6 and type: =sum(Next, click and drag cells A1 through A3. Release the mouse button, then hold the Ctrl key down and click on cell A5. Then type a right parentheses symbol. Your screen should look like the picture below:



  When you press Enter, the function will disappear from cell A6 and be replaced with the actual sum of the selected cells. When cell A6 is selected, the function =sum(A1:A3,A5) will still appear in the Formula bar at the top of the workbook.

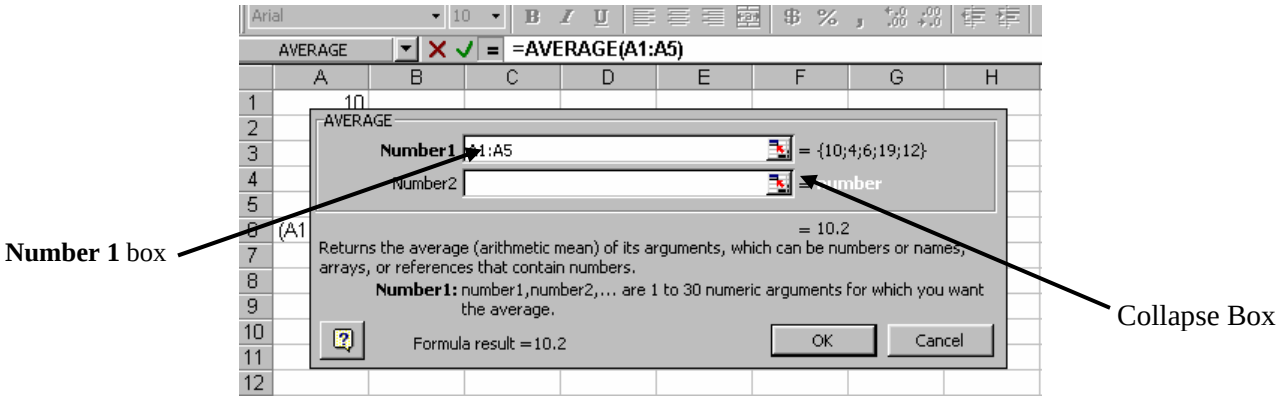
- If you do not know the function you want to use, you may find it by going to **Insert → Function…** or by clicking the ***fx*** button. Depending on which version of Windows you are using, the ***fx*** button may either be located on the Standard toolbar or to the left of the formula bar at the top of the workbook.



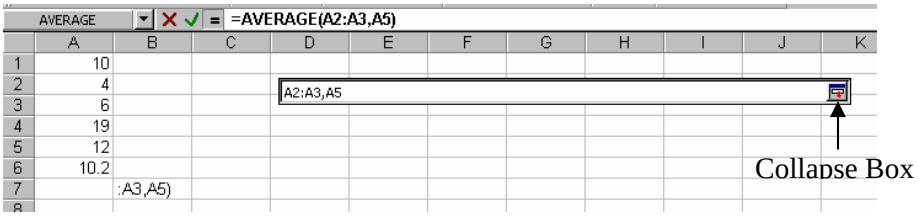


Note: The Sum button  in some versions of Windows has a carrot drop down menu that does a similar task to the ***fx*** button. At the bottom of the menu is More Functions. This will bring up the same window as clicking on the ***fx*** button does.)

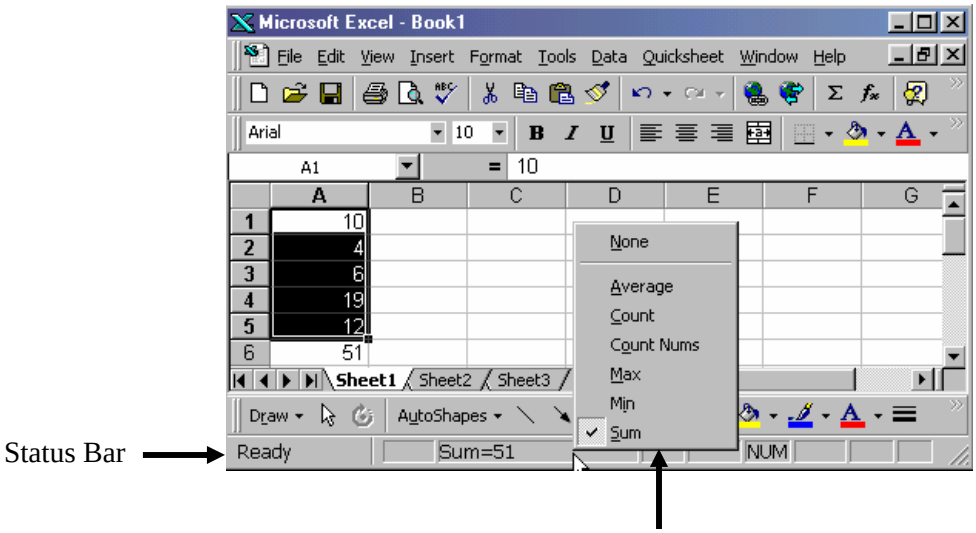
Inserting a function using either the ***fx*** button or the Insert menu will open a dialog box for the function you have selected.



The example shown above is for the AVERAGE function. The cells to be averaged are automatically by Excel entered into the Number 1 box. Check to make sure that Excel included the cells you want. If you wished to include non-adjacent cells, you can enter these in the Number 2 box. The Collapse Box shrinks the dialog box down so that you can see your Excel workbook. This allows you to click and drag the cells you want, holding the Ctrl key to select non-adjacent cells if desired. When you are done, click on the Collapse Box again to re-expand the function dialog box.



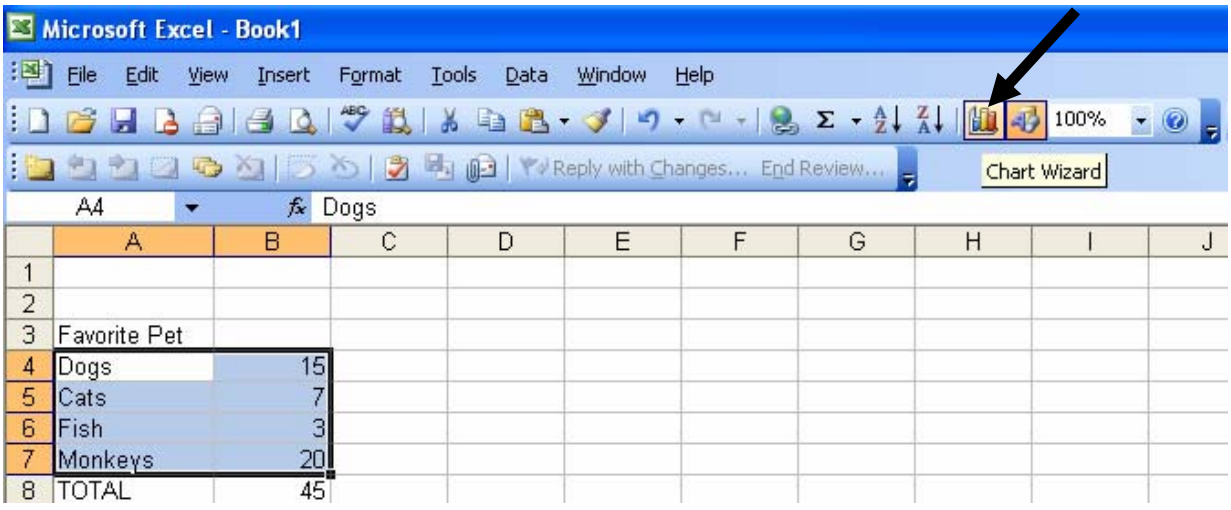
- One other cool thing about Excel is on the Status bar at the bottom of the Workbook, just above the Taskbar. If you select two or more cells with numerical data in them, you can Right-click anywhere on the Status bar and it will give you a number of options. Those options include Average, Count, Count Nums, Max, Min, and Sum without having to enter a formula. See picture below:



Charts and graphs

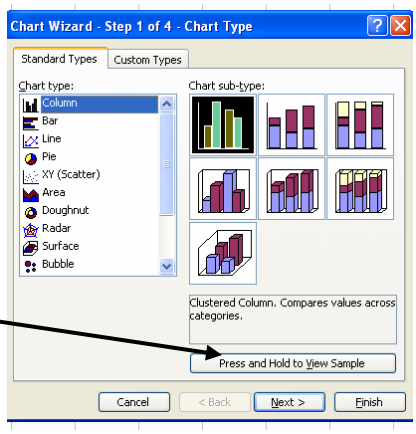
Creating a chart

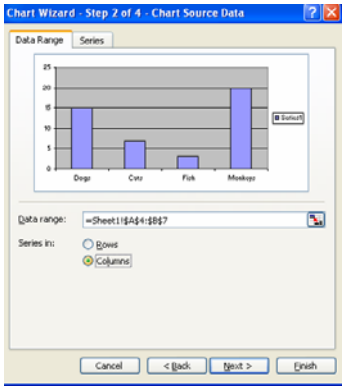
To create graphs, first highlight the data you want to use for your graph. Next, find the Chart Wizard button on the menu bar and click it:



The Chart Wizard will walk you through creating a graph/chart. Your first choice is chart type. For each general type, there are usually several sub-types. Select the type that will best display the data you are presenting, and then click Next >.

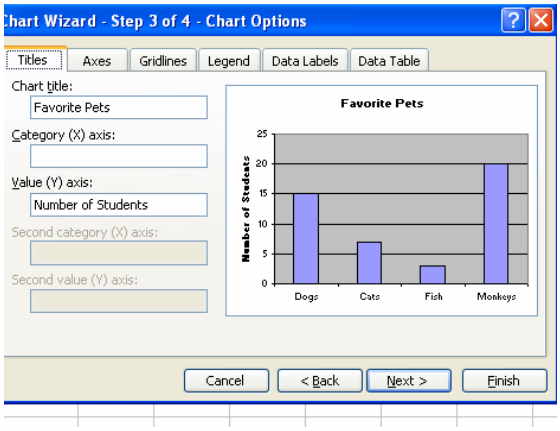
This button allows you to see a preview of what your chart will look like

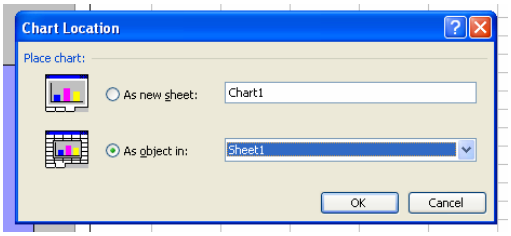




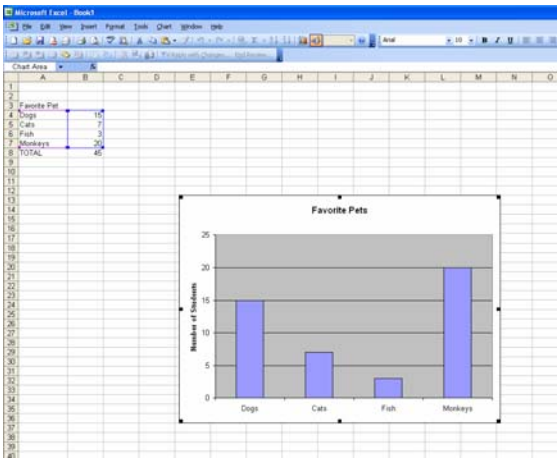
The next page of the Wizard shows you a sample of what your graph looks like, and you can begin to make changes. If you need to change the range of your data, you may do that here. Check the difference between rows or columns. Pick the options that work best for you and then click Next. If you decide that you don't like one of your earlier choices, notice that there is a Back button that allows you to return to an earlier page of the Wizard.

The third page of the Wizard allows you to add a chart title, name the X and Y-axes and remove the legend if it doesn't work with your graph. Check out the various tabs for other options. Taking out the legend is under the legend tab. Again, if you need to return to an earlier step in the Wizard, use the Back button.





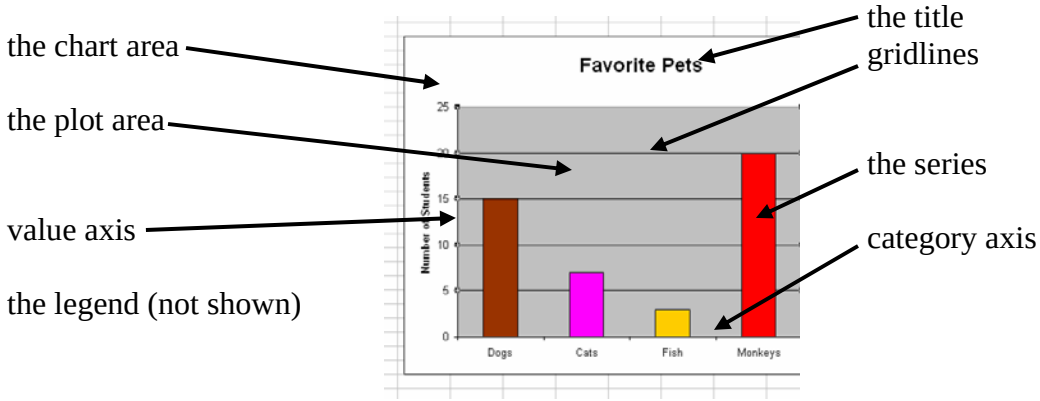
The final page of the Chart Wizard allows you to select where you will place your chart. You can choose to have it on its own sheet in your Excel workbook (on a separate tab at the bottom of the workbook), or as an object in the current worksheet. This choice doesn't really lock you into anything you can't change.



Example of a chart placed as an object in the current page

Making changes to your chart

Once you have made your chart, you may decide that you want to make changes. Right clicking on different areas of the chart will bring up menus of changes you can make. Among the things you can click are:



If you have a bar or column graph, clicking on the middle of a column will allow you to modify the entire series of data. Clicking on the border of a single column will allow you to modify just that data point (this way you can change the color of a single column, for instance).

Chart Options…, accessible when you right click on the Chart Area or Plot Area, essentially lets you go back through the Wizard.

Copy and Paste a chart

You can copy and paste your chart wherever you wish (for example into a new Excel sheet, a word document, a Power Point, or an email message). To do this, right click on the Chart Area (the white space around the outside of the chart), and select Copy.

Once you have pasted the chart into a new location, you may not be able to make changes to the chart, so it's a good idea to make any desired changes first.