

5 MORE ON THE USE OF THE SPREADSHEET

Making changes to existing spreadsheets

LEARNING OUTCOMES

In Lesson 4 you created a grade sheet for a class of 4th graders based on a template you had put together at the beginning of the same lesson. You learned that you can easily adapt a template for use with other classes that you might teach. You learned about the organization of spreadsheets. You learned about rows and columns, and the cells at the intersection of those rows and columns. You learned how to select cells and how to address cells using row and column coordinates. You learned how to enter formulas into certain cells in order to have *Excel* do calculations for you--totals and percentages in particular.

You filled the rows and columns with labels and grades. You had a first introduction to the idea that a spreadsheet can be a powerful tool for handling numeric data that requires mathematical or statistical processing.

In this tutorial you will have the opportunity to reinforce what you learned in Lesson 4. At the same time you will learn how to maintain a spreadsheet. This you will do by making enhancements to the spreadsheet you created in Lesson 4.

You will also learn about some of the logical processing capabilities of spreadsheets, capabilities which enable you to give an "intelligent" flavor to the applications that you build. In particular, you will learn about the following features of the *Excel* spreadsheet.

- Recapitulation and Reinforcement
- Updating an existing spreadsheet
- More changes to the look of the spreadsheet
- Using the LOOKUP function
- Creating charts based on spreadsheet data
- Printing the updated spreadsheet
- Making a backup copy of your documents

A caveat before you begin: You'll find it easiest to use the tutorial if you follow the directions carefully. On computers there are always other ways of doing things, but if you wander off on your own be sure you know your way back!

5.1 GETTING STARTED

You're going to work with a Gradebook document very similar to the one you created in Lesson 4. If you completed Lesson 4, for the exercises that follow, **DO NOT USE** the Gradebook Template or Grade 4 2010 spreadsheet that you created in that lesson. For the sake of uniformity, and to avoid confusion, you're going to use a Grade Book template and Grade Book spreadsheet specially prepared for use with this lesson.

As an exercise at the end of the tutorial you will have the opportunity to incorporate these changes into your own Gradebook documents (Grade4 2010 and Grades Template) which you created when you completed Lesson 4.

You are going to make some improvements to the layout of the Gradebook, after which you will learn about the LOOKUP function as an introduction to the logic capability of *Excel*. At the end of the lesson you will learn how to create and modify charts of various kinds.

Open Microsoft *Excel* then make sure the media (flash drive or external disk drive or hard drive) on which you have your **Work Files for Office 2010** folder is accessible

You are going to update two documents:

- a grade book template (called *Grades Template*, and stored in the Templates folder inside the *Miscellaneous Files* folder which is in your *Work Files for Office 2010* folder);
- and an actual grade book filled with data (this document has the name *Gradebook* and is stored in the *Other* folder also inside the *Miscellaneous Files* folder in your *Work Files for Office 2010* folder).

You will work on the Gradebook document first.

By now you should know the steps to open a document, so go to your **Work Files for Office 2010 > Miscellaneous Files > Other** folder and **Open** the **Gradebook** document

5.2 RECAPITULATION AND REINFORCEMENT

Lesson 4 has Tables of the most useful *Excel* spreadsheet commands. You might like to put a marker at the relevant pages (p. 126) for easy reference while you follow along in this tutorial. Alternatively, you can use the chart that is included at the end of this text (inside back cover).

The following sections give you an opportunity to refresh your memory of the basic spreadsheet skills you learned in Lesson 4.

Moving from cell to cell in the spreadsheet

In *Excel* spreadsheet terminology the cell that is selected (surrounded by a heavier border) is called the current (or active) cell.

Take a moment now to reacquaint yourself with the methods for changing the position of the currently active cell.

The **arrow keys** move the current cell to the adjacent cell left, right, above, or below the current cell—press all four of the arrow keys a few times, and watch how the current cell moves around

The **TAB key (forward)** and the **Shift-TAB command (back)** also move the cursor to the adjacent cell, but only in a **horizontal** (right or left) direction—try these two commands now.

The **RETURN key (forward)** and the **Shift-RETURN command (back)** also move the cursor to the adjacent cell, but only in a **vertical** (up or down) direction—try these two commands now

Use the **scroll bars** when you want to move around the spreadsheet without changing the location of the current cell—try this, too

More cell selection commands

Selecting sets of cells in the spreadsheet

You often may want to highlight all the cells in the spreadsheet --in order to change a font, or copy the data to another document, for example. Here's how you do this.

Click in the **empty box** above the **Row headings** and to the left of the **Column headings** (Fig. 5.1)

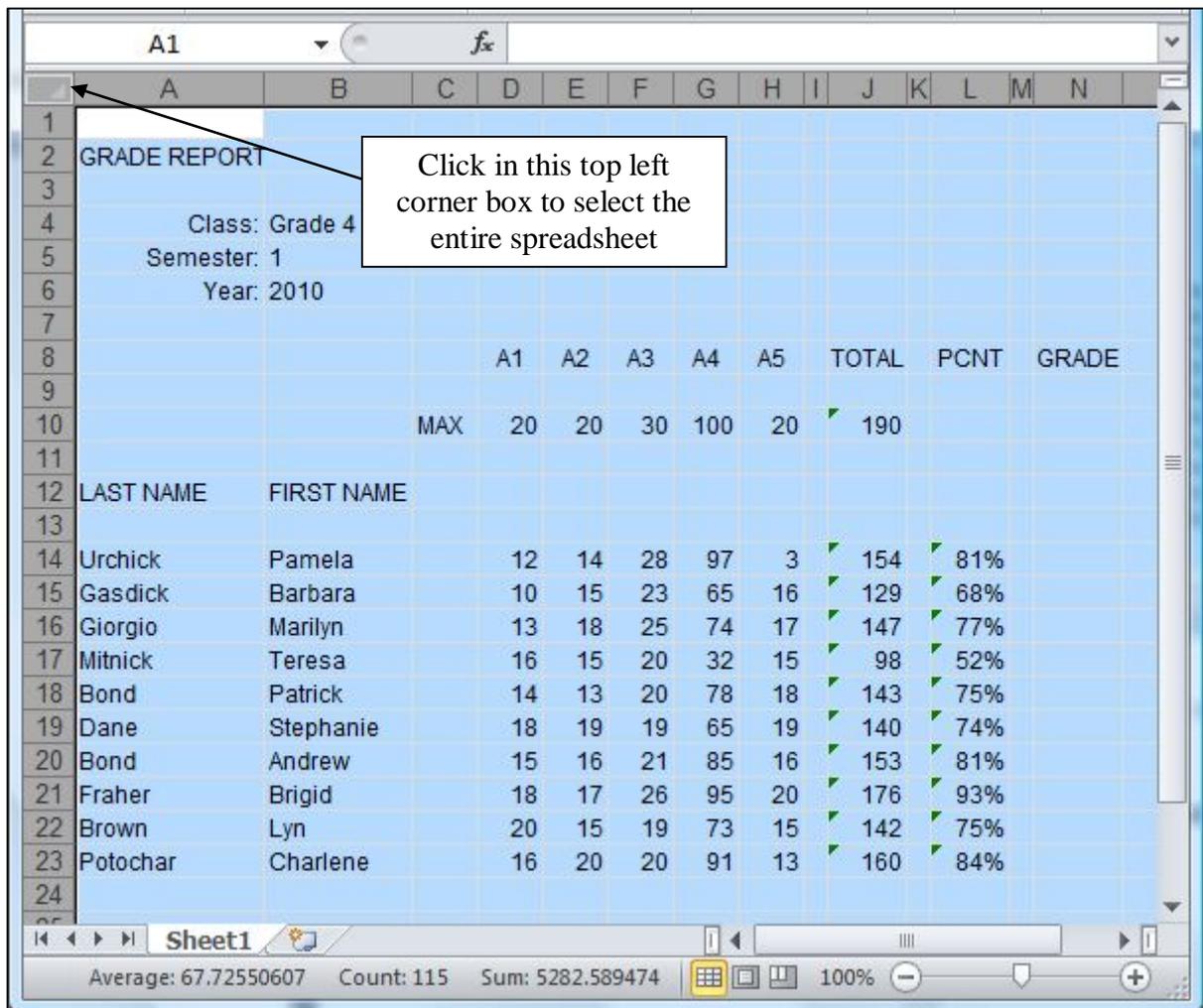


Fig. 5.1 Selecting an entire spreadsheet

The entire spreadsheet is now highlighted. However, perhaps you want to select only the cells that you're working in. There are a couple of ways to do this.

Click anywhere to **de-select** the selected cells

For example, use the mouse to drag diagonally down from cell **A1** to cell **N23**

That's one way. Here's another way of doing the same thing.

Click anywhere to **de-select** the selected cells

Now, click in cell **A1**, hold down the **Shift** key, and click in cell **N23**

The same set of cells is selected. The Shift key is very useful for selecting a range of *cells* in *Excel*, or a range of *text* in *Word*, or even a range of *slides* in *PowerPoint*, which you'll learn about soon enough.

Going to a specific cell anywhere in your spreadsheet

If you are working in a large spreadsheet (consisting of thousands of cells) and you know the approximate coordinates of a cell you want to find, it is sometimes quicker to let *Excel* find the cell for you. The following steps will make the current cell the one that intersects Column AJ and Row 423, a location deep inside the spreadsheet and a long way from the first cell, cell A1.

From the **Home Ribbon > Editing Group > Find & Select** menu click on **Go To...**, or press **Ctrl-g** to bring up the **Go To** dialog box (Fig. 5.2)



Fig. 5.2 The Go To dialog box

Type **AJ423** (you can use upper case (AJ) or lower case (aj) for the column coordinate), click on **OK**, then visually check that **cell AJ423** has been selected

Remember that the first (alphabetic) coordinate (AJ) is always the column; the second (numerical) coordinate is always the Row.

Press **Ctrl-g** again to bring up the **Go To** dialog box, type **A1**, and click on **OK**

You are now back at the first cell (A1) in the spreadsheet. Some of the options for moving about the spreadsheet are considerably slower than others, which is why you should take the time to familiarize yourself with *all* the different methods for moving around the spreadsheet, especially if you become a regular user of *Excel*.

5.3 UPDATING AN EXISTING SPREADSHEET

The Gradebook document would benefit from some cosmetic changes, such as the following.

1. There should be double lines to set off different parts of the spreadsheet. It is often useful, for example, to include extra space (but not too much space) between the headings above the columns of data and the data itself, and also before summary totals at the bottom of columns of data.
2. It would be useful to include more formulas to increase the information content of the spreadsheet. For example, you could add a formula that calculates an average for each of the sets of grades so that your students can see where they stand in relation to the rest of the class on any particular assignment or test. A highest score and lowest score for each set of grades would also be useful.
3. It would be a good idea to lock cells containing data that you consider especially important. Locking cells prevents you or someone else from accidentally losing or changing cell contents. It takes time to put together spreadsheet templates and other documents. Some cells will contain functions that are tricky to figure out. Locking them will make it difficult to lose your work.
4. Finally, *Excel* can do some of the thinking for you if you include a LOOKUP Table to figure out the grades for your students based on their percentage score at the end of a reporting period.

Let's deal with these problems one at a time. In this section you'll learn how to handle the first three improvements. Later in the lesson you'll have the opportunity to learn how to create and use the LOOKUP function.

Dividing up the spreadsheet to make it easier to read

After you have fixed change #1, the Gradebook document will look similar to Fig. 5.3.

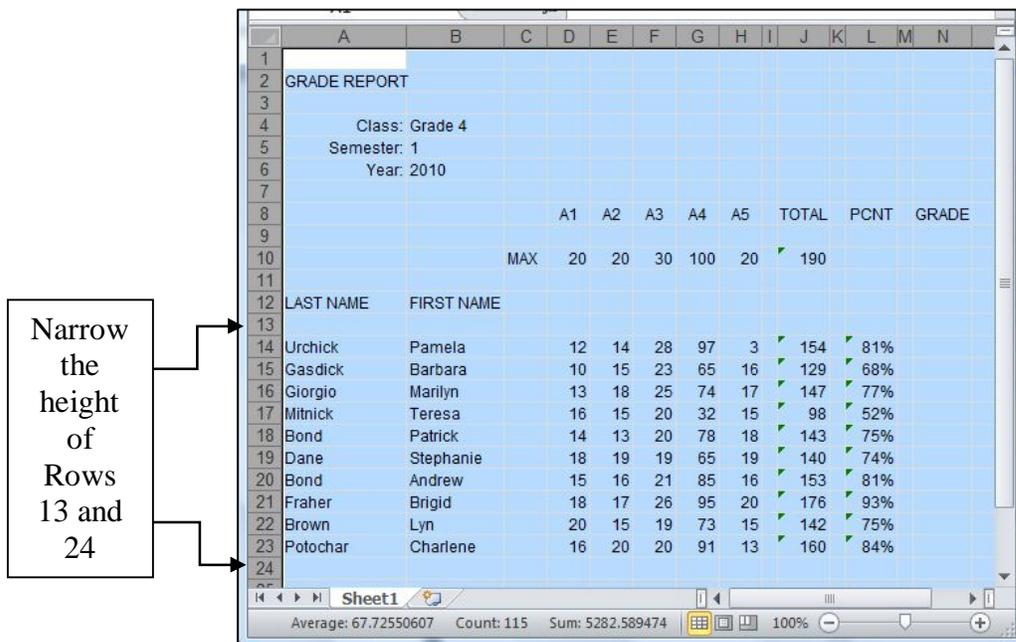


Fig. 5.3 Gradebook document after update #1

Breaks between sections of a spreadsheet help the eye locate important data when scanning the page, whether on screen or on paper. In *Excel*, the easiest way to do this is to use an extra row or column at the point where you want to create a division between different parts of the spreadsheet, and then reduce the width of the inserted row or column so it appears as a double line (Fig. 5.3). Follow these steps to update the spreadsheet along these lines.

On the left edge of the screen, in **row 13**, click on the **row number (13)** to select the entire empty row

Now you want to reduce the row height so it looks like a double line dividing Rows 12 and 14.

Right click on the number **13** and, in the context menu, select **Row Height...**, then in the **Row/Height** dialog box type the value **3** to replace the default height, and click **OK**

You need to create a similar dividing line after Row 23, which holds the data for the last student in the roster. This is because you are shortly going to include new formulas in Rows 25 thru 27.

Reduce the height of **Row 24** in the same way as you did Row 13, then **Save** the changes you have made

There are a couple of other ways to change the height of a row or the width of a column.

One way is to position the mouse on the line between the row or column headings at the point where you want to change the height or width. The mouse changes to a cross hair with arrows, as illustrated in Fig. 5.4.

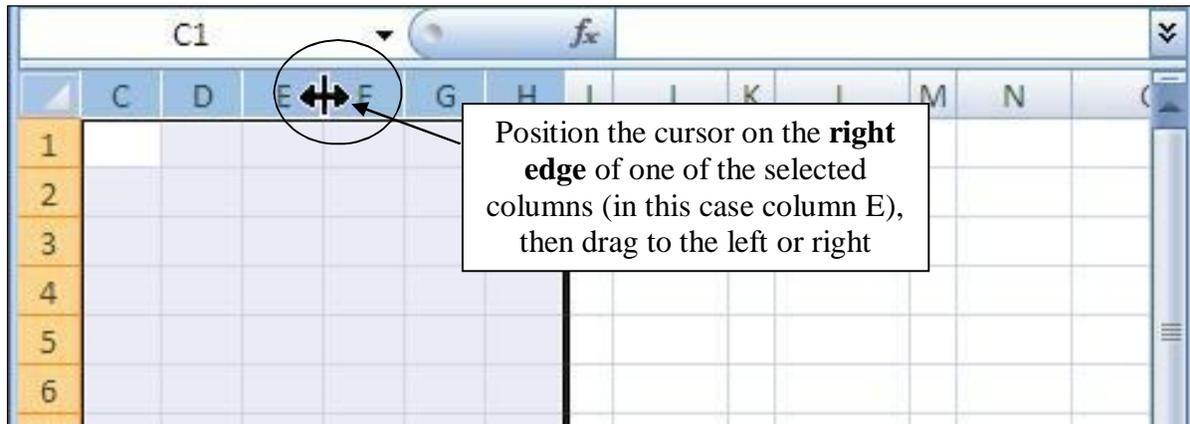


Fig. 5.4 Adjusting column width by dragging

Then you would hold down the mouse button and drag up or down (to widen rows) or left or right (to widen columns) to change the height or width of a row or column respectively. A small box appears when you do this (try it for yourself) which tells you the height or width you are selecting. You already learned in Lesson 4 how to do this for the column width.

Adding formulas to the spreadsheet

As you learned in Lesson 4, *Excel* comes with many built-in functions for the spreadsheet. You may recall that *Excel* has over 300 functions divided into 10 categories. Let's look at the built-in functions again now so that you know how to find them when you need them.

In the **Formulas Ribbon > Function Library** click on **Financial** and, in the drop down menu, check out the functions available to you there

Do the same with the **Logical, Text, Date & Time, Lookup & Reference, Math & Trig,** and, under **More Functions,** the **Statistical, Engineering, Cube,** and **Information** sets of *Excel 2010* built-in Functions

Now in the **data entry** bar click on the **Insert Function (fx)** icon (Fig. 5.5) to take a look at the functions you can use

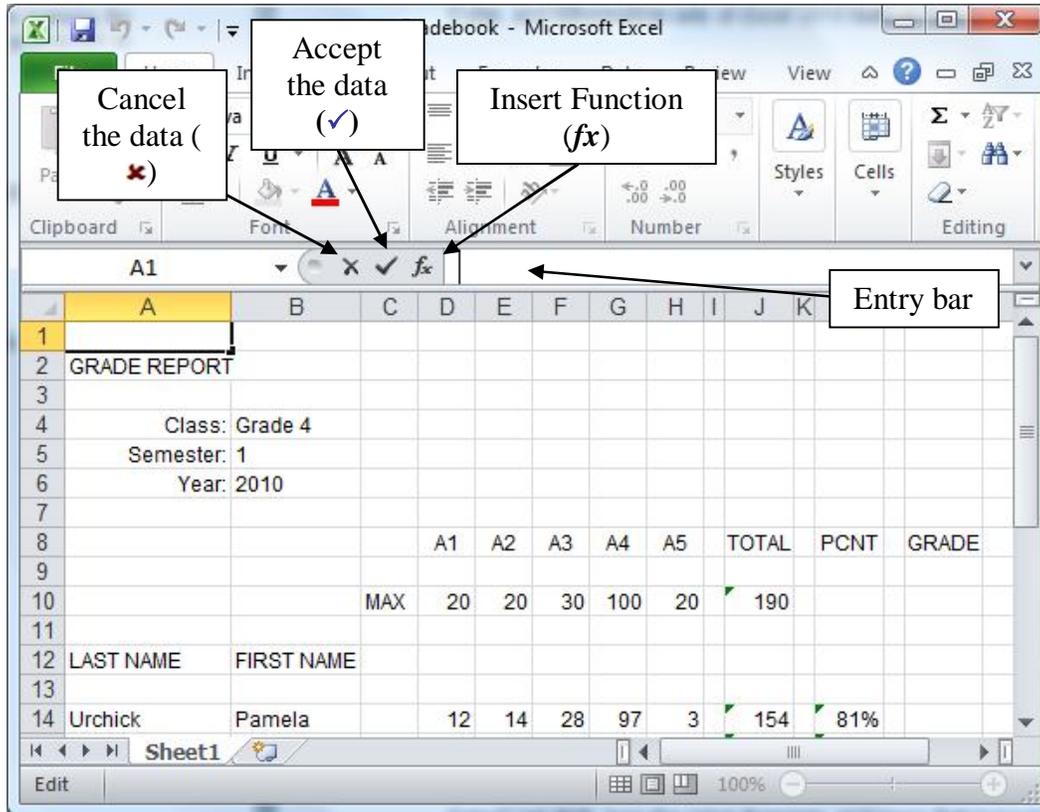


Fig. 5.5 The Insert Function (fx) icon

Excel displays a dialog box showing a listing of these functions (Fig. 5.6).

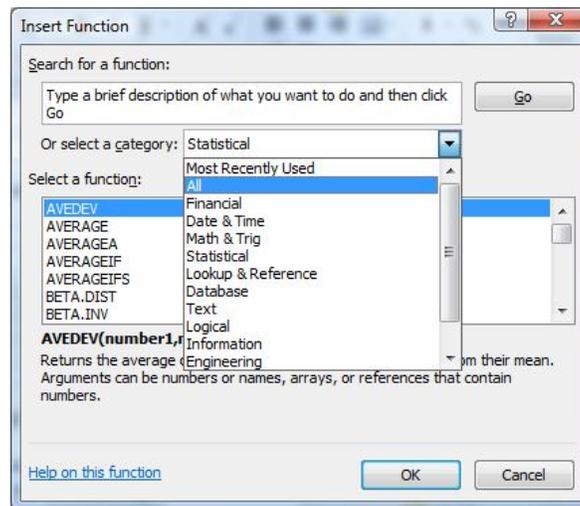


Fig. 5.6 The Insert Function dialog box

Click to pull down the **menu of categories**, then select the **All** option in the menu (Fig. 5.6 above again)

Scan through the list of over 300 built-in functions in the **Select a Function** scroll box

Depending on your math, computing, statistics, or accounting background, you might recognize many of these built-in Excel functions.

Click on the **Cancel** button to close the **Insert Function** dialog box

Experience is the best way to learn how each of these functions work. In Lesson 4 you already learned to use the *Sum* function, and also you created your own formula to calculate the *Percentage* for each student. Now let's see how to create a function to calculate the average score for a set of scores.

Calculating an average for each of the grade columns

Now you are going to add three new functions to the Gradebook document: the *Average*, the *Max*, and the *Min* functions. You want the value representing the average of the scores in a column to appear in a cell in Row 25 at the bottom of each of the columns where you want to calculate an average (Fig. 5.7).

		A1	A2	A3	A4	A5	
		MAX	20	20	30	100	20
LAST NAME	FIRST NAME						
Urchick	Pamela	12	14	28	97	3	
Gasdick	Barbara	10	15	23	65	16	
Giorgio	Marilyn	13	18	25	74	17	
Mitnick	Teresa	16	15	20	32	15	
Bond	Patrick	14	13	20	78	18	
Dane	Stephanie	18	19	19	65	19	
Bond	Andrew	15	16	21	85	16	
Fraher	Brigid	18	17	26	95	20	
Brown	Lyn	20	15	19	73	15	
Potochar	Charlene	16	20	20	91	13	
	Average	15.2	16.2	22.1	75.5	15.2	
	Max score	20	20	28	97	20	
	Min score	10	13	19	32	3	

Fig. 5.7 Average scores for each column

Notice in Fig. 5.7 that the first cell after the names in the column of first names has the row label *Average*. You need to put the same cell entry in your Gradebook document.

Select cell **B25**, type the label **Average**, and press **Tab** twice to move to cell **D25**

A word about automatic calculation

When **Automatic Calculation** is switched on, *Excel* immediately carries out any calculations that are necessary when you make any changes to the data in the spreadsheet. With automatic calculation, you don't have to remember to do this yourself. Whenever your spreadsheet is small (like the Gradebook document) you will hardly be aware that *Excel* is working for you like this.

If Automatic Calculation is not already on by default, it will be good for you to turn it on, so here's how you do it.

In the **Formulas Ribbon > Calculation Group** select **Calculation Options**, then, in the **drop down menu**, make sure the option for **Automatic Calculation** is checked (Fig. 5.8)

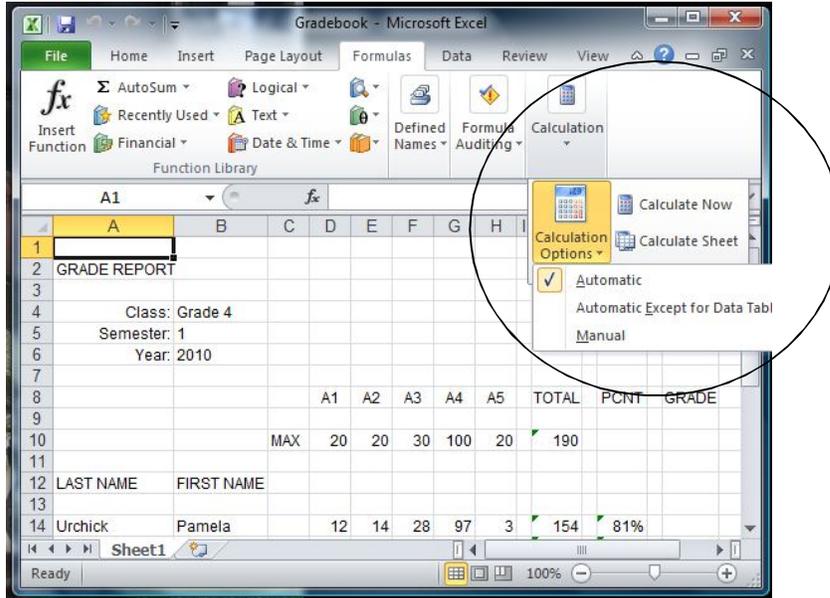


Fig. 5.8 Automatic Calculation

Back to the task at hand

An average is computed by adding (SUMming) the set of scores for an assignment or test, and then dividing the total by the number of scores in the set. You *could* put together this formula yourself, of course. If you know what the formula would be for the first column of scores, write it in the box below. Remember, a function or formula always begins with the equals (=) sign.

What you wrote should look something like this: **=SUM(D14:D23)/10**. But since *Excel* has a built in Average function, you may as well use it. Here are the steps to include the Average function in your spreadsheet.

Make sure cell **D25** is still selected (the cell under the first column of scores), then click on the **Insert Function (fx)** icon in the **data entry bar**

From the list of **Categories**, select the **Statistical** category

From the list of **Statistical functions**, click on the **AVERAGE** function to select it, then click **OK**

Excel pastes the function into the data entry bar and automatically selects the cells in the column above the cell in which you want to put the Average function. It also presents a new dialog box (Fig. 5.9) in which you can indicate the specific range of cells you want included in the function if they differ from the range selected automatically.

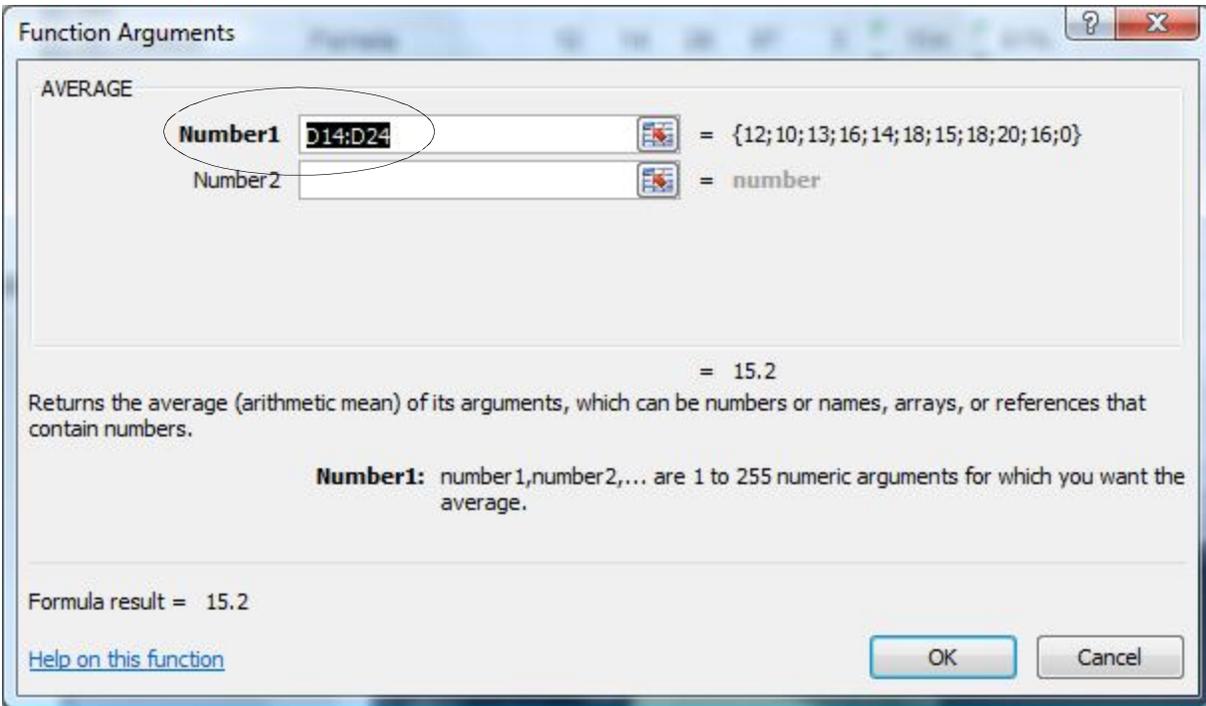


Fig. 5.8 The Function Arguments dialog box

As explained above, the *Function Arguments* dialog box automatically selects the set of cells immediately above the cell which contains the new formula. It also explains what the *Average* function does, and asks you to confirm the formula by clicking OK. At this stage, if you wanted to, you could change any of the cell addresses in the data entry boxes. However, in this case that won't be necessary.

Notice that *Excel* has included cell D24 (an empty cell) as part of the set of cells to be averaged. This will not affect the result because *Excel* assumes that an empty cell is not to be included in the calculation of the function's result.

The formula in the Data Entry bar towards the top of the spreadsheet window should read =AVERAGE(D14:D24). Is this the exact wording of the formula in the data entry box on your spreadsheet?

If it is, click **OK**; if it is not, correct it, then click **OK**

Now look at cell **D25**. It should contain the average for the scores in Column D. There are three problems that can occur:

1. If you see a series of pound signs (#####...), this indicates that there's not enough room in the column to show the value, so you need to *widen* the column a little to make enough space for the average score to appear. If this is the case (where you see ##### instead of an average score), make the column wider.
2. If a Bad Formula prompt pops up on the screen, check the formula in the entry bar again, compare it to the correct Average formula (=AVERAGE(D14:D24)), and make any corrections.
3. If the values being averaged have no decimal places, then the default number of decimal places must be zero (0). But it would be useful to show at least one decimal place. If the

average displayed in your Gradebook is rounded to a whole number (no decimal places), here are the steps to change the precision of the Average value to 1 decimal place.

In the **Home Ribbon > Cells Group** click on **Format > Format Cells...** (Fig. 5.9)

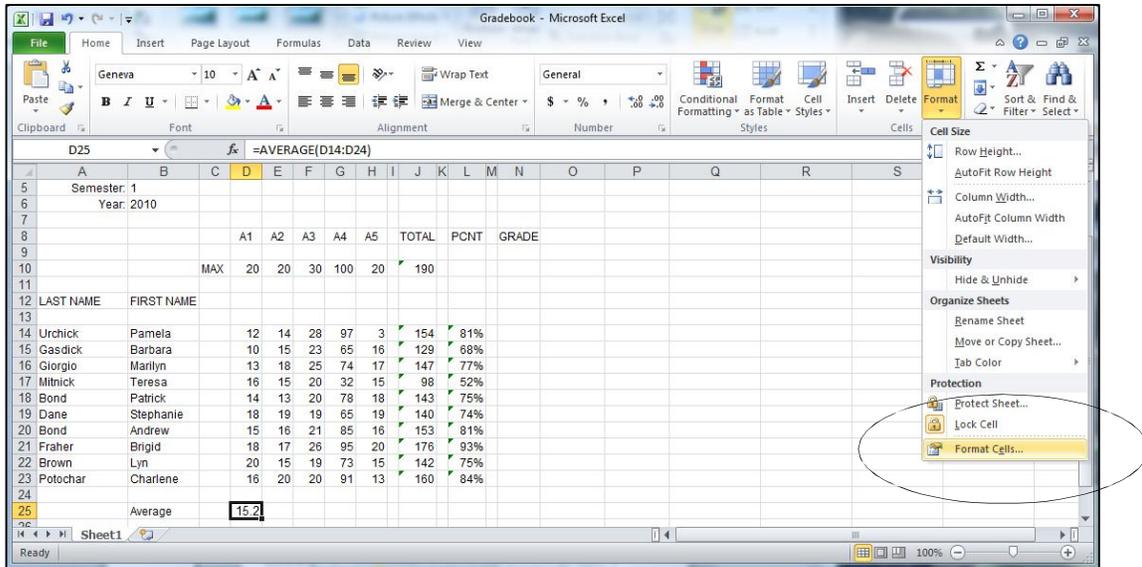


Fig. 5.9 Format Cells...

This brings up the Format Cells dialog box (Fig. 5.10).

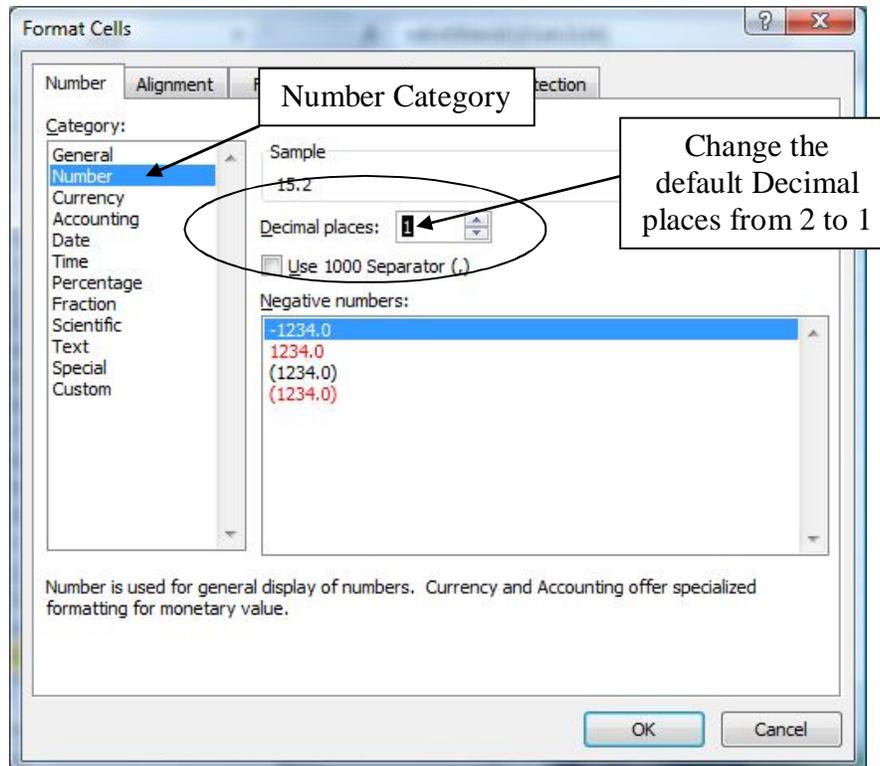


Fig. 5.10 Format Cells dialog box

In the **Format Cells** dialog box (Fig. 5.10 above) select the **Number** category, and set the number of **Decimal places** (also called precision) to **1** and click on **OK**

Assuming all is well, your next task will be to copy this Average formula into the cells immediately to the right of cell D25, so that you have an average score under the other columns of scores (cells E25 through H25).

Cell **D25** should still be selected (click on it if it is not selected)

You're going to use the mouse to grab hold of the handle in the lower right corner of cell **D25** (see Fig. 5.11—you practiced doing this in Lesson 4)

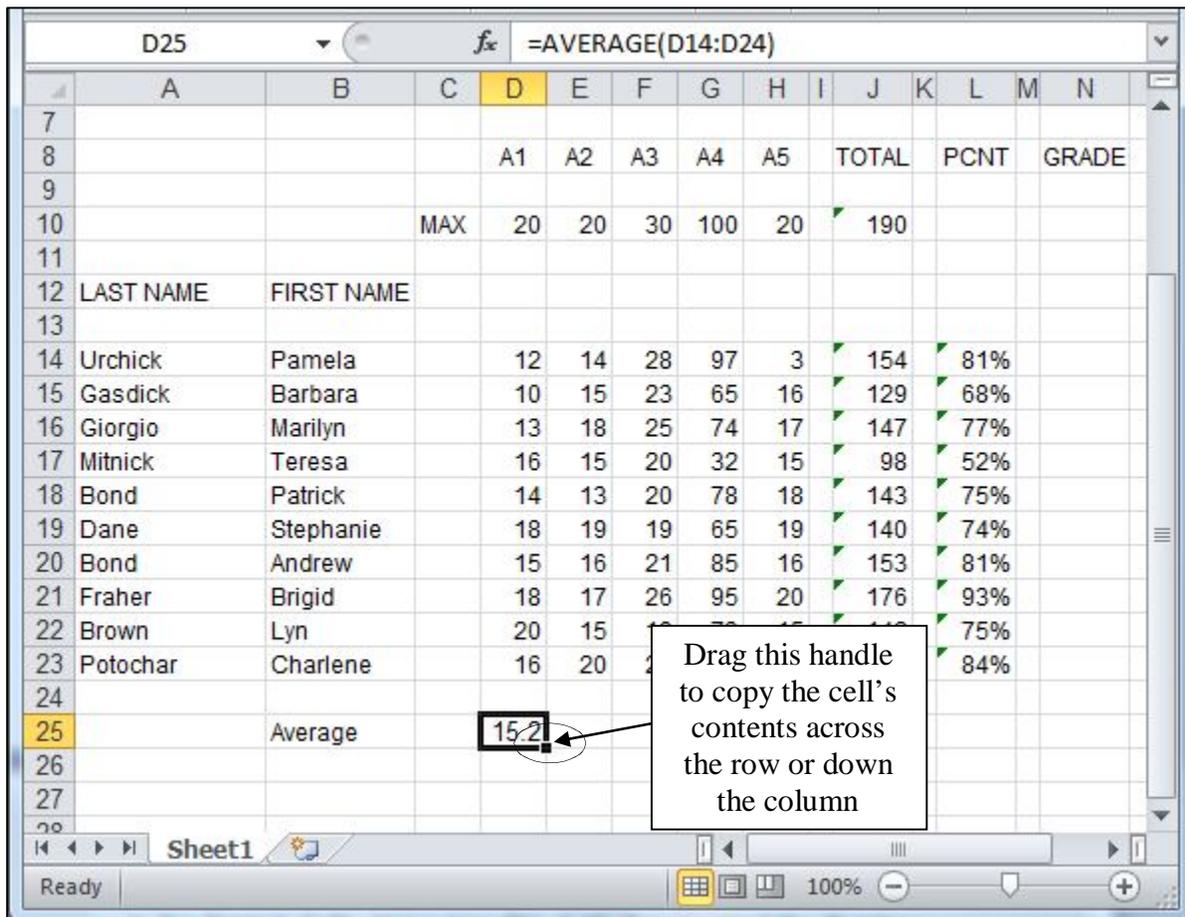


Fig. 5.11 Cell copy handle

Now use the mouse to point at the **handle** in the **lower right** corner of cell **D25** (Fig. 5.11), and drag the handle across to **Column H**—so that the formula is copied across to cells **E25, F25, G25, and H25**, which will all now have the correct Average score for their respective columns

That's all there is to it. Adjust the column widths if you see pound signs (#####) instead of averages.

Time to save all your hard work (**Ctrl-s**)

Displaying the Highest (MAX) and Lowest (MIN) scores for each column of scores

Now that you know how to use the Insert Function icon (*fx*) next to the Data Entry bar, and in particular since you just used it to put the Average function in your spreadsheet, you should be able to complete the exercise that follow without much help.

Put a heading in cell **B26 (Max score)** and in cell **B27 (Min score)**

Put the **Max** function in cell **D26** (listed as **Max()** in the **Statistical** category in the **Insert Function** dialog box)—this function is used to find the highest score for each set of scores

Drag across with the mouse to select cells **D14 through D23**, the cells you want included as arguments in the Max function (**D14:D23**), and click **OK**

In cell **D27** put the **Min** function (listed as **Min()** in the **Statistical** category in the **Insert Function** dialog box) and drag with the mouse to select cells **D14** thru **D23** once again, then click **OK**

Just as you did when you worked on the Average function, copy the new **Max** and **Min functions** across to the corresponding cells under columns **E thru H** using the **Fill/Right...** option in the **Edit** menu

When you're done, your spreadsheet should resemble Fig. 5.12.

	A	B	C	D	E	F	G	H	I	J	K	L	M	N
2	GRADE REPORT													
3														
4	Class: Grade 4													
5	Semester: 1													
6	Year: 2010													
7														
8				A1	A2	A3	A4	A5	TOTAL	PCNT	GRADE			
9														
10			MAX	20	20	30	100	20	190					
11														
12	LAST NAME	FIRST NAME												
13														
14	Urchick	Pamela		12	14	28	97	3	154	81%				
15	Gasdick	Barbara		10	15	23	65	16	129	68%				
16	Giorgio	Marilyn		13	18	25	74	17	147	77%				
17	Mitnick	Teresa		16	15	20	32	15	98	52%				
18	Bond	Patrick		14	13	20	78	18	143	75%				
19	Dane	Stephanie		18	19	19	65	19	140	74%				
20	Bond	Andrew		15	16	21	85	16	153	81%				
21	Fraher	Brigid		18	17	26	95	20	176	93%				
22	Brown	Lyn		20	15	19	73	15	142	75%				
23	Potochar	Charlene		16	20	20	91	13	160	84%				
24														
25		Average		15.2	16.2	22.1	75.5	15.2						
26		MAX		20	20	28	97	20						
27		MIN		10	13	19	32	3						

Fig. 5.12 The Gradebook document after adding the functions (your data may be different)

Locking (protecting) important cells

Excel allows you to protect the contents of a cell or cells by locking or protecting them. This means that neither you nor anyone else will be able to change the contents unless you remove the protection. This feature is useful to prevent accidental loss of data, and will also help prevent others from interfering with the data you have collected.

Since all the data in a Grade book are important, it would be a good idea to protect everything. The process to do this is the same as if you were protecting a single cell, or a few cells, except that you select every cell.

Press **Ctrl-a** to **Select All** the cells in the spreadsheet (or click in the small box in the top left corner of the row and column headings)

From the **Home Ribbon > Cells Group** select **Format** and, in the **Protection Section** towards the bottom of the **Format Menu**, select the option to **Lock Cell**

This will lock all the cells in your spreadsheet, but they are not yet protected against changes. You have one more thing to do.

From the **Home Ribbon > Cells Group** select **Format** and, in the **Protection Section** towards the bottom of the **Format Menu**, select the option to **Protect Sheet...**

This brings up the Protect Sheet dialog box (Fig. 5.13).

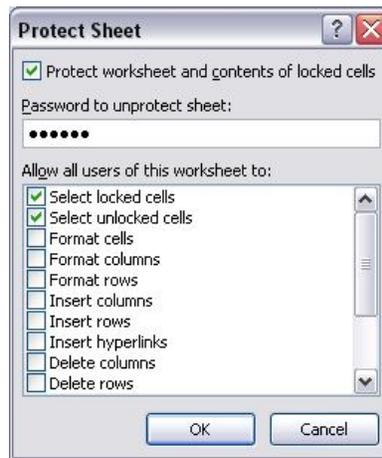


Fig. 5.13 Protect Sheet dialog box

Take a look at this dialog box. Notice that you have the option to include a password to remove protection (unlock the locked cells). This is a necessary feature if you want to lock the cells in your spreadsheet to prevent others (such as your future students, for example,) from changing the scores or grades. You would choose a password that would be difficult to guess, of course, but also one that you would be sure to remember!

There's no need to use a password in this exercise, however, unless you want to, of course. Just make sure you remember the password so you can unprotect the worksheet when you need to make changes.

Click on **OK** in the Protect Sheet dialog box

Now all the cells in the Gradebook spreadsheet are unable to be changed unless you select Unlock Cells from the Option menu. If you wanted to lock just certain cells you would first select the cell or cells and turn on the Protection tool for just that cell or those cells.

If you try to change a locked cell, you will get a warning dialog box (Fig. 5.14) telling you that you can't change anything unless you first remove the protection.



Fig. 5.14 Protection warning dialog box

Try this now.

Click on **cell A2** and try to type anything at all

No dice. The spreadsheet is protected so you can't change a thing unless you Unprotect the spreadsheet first. You'll practice doing this a couple of times later when you come to make further changes to the spreadsheet.

Time to **save** the changes to the Gradebook document (**Ctrl-s**)

Dividing the spreadsheet into panes

Often a spreadsheet, or an *Office Word 2010* document for that matter, will be too long or too wide to view all at once on the screen. *Excel* has a useful feature called *panes*.

You can split any window horizontally or vertically into sections. This will allow you, while working or scrolling in one section, to keep the other section(s) fixed in place.

To see how this works, in the **View Ribbon > Window Group** select **Split**

Excel immediately divides up the worksheet into four sections, using a vertical and a horizontal split bar (Fig. 5.15).

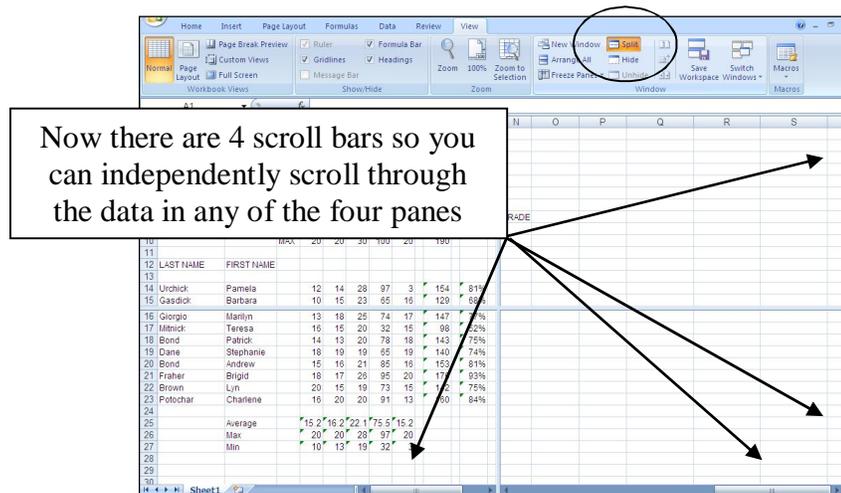


Fig. 5.15 *Excel's* vertical and horizontal split bars

You can change the position of the split bars by positioning the mouse arrow on a split bar and drag across or down the screen.

Try this for practice—position the mouse arrow on either the vertical or horizontal **split bar** (you'll get a **cross-hair cursor**) and hold down the button while you drag across or down the screen

Now grab each of the scroll bars and check out the data in any of the four panes in the spreadsheet window

Notice how easy it is to compare different parts of a spreadsheet in this way. The pane or splitting screen feature is available in *Office Word 2010*, too, but you probably will find that you use it most frequently while working with spreadsheets, especially large ones.

Removing panes

This is easy enough to do.

In the **View Ribbon > Window Group** select **Split** again to turn off this “switch”

Your spreadsheet should now be restored to its original format.

5.4 MAKING MORE CHANGES TO THE LOOK OF THE SPREADSHEET

In Lesson 4 you learned how to change the width of columns and the height of rows. You also practiced doing this earlier in this lesson. Now you are going to learn how to put borders around some cells and how to remove the grid lines and Column and Row headings.

Putting a border around a cell or set of cells

Before you can make any changes, you need to Unprotect the worksheet. Let's do that before proceeding with the tutorial.

From the **Home Ribbon > Cells Group** select **Format** and, in the **Protection Section** towards the bottom of the **Format Menu**, select the option to **Unprotect Sheet...**

Next you need to Unlock the cells.

Press **Ctrl-a** to **Select All** the cells in the spreadsheet (or click in the small box in the top left corner of the row and column headings)

From the **Home Ribbon > Cells Group** select **Format** again and, in the **Protection Section** towards the bottom of the **Format Menu**, select the option to **Lock Cell**, which reverses the Lock, like flipping a switch

Notice that you are now able to see a small green flash in the top left corner of all the cells that contain a formula.

Let's make some more changes to the Gradebook document. You may want to put a box around certain sections of your spreadsheet, such as the Class info in cells A4 through B6. This will make the information stand out in a report. Try this now.

Drag across **cells A4 through B6** to select the set of **Class info**

In the **Home Ribbon > Font Group** click on the arrow next to the Border tool to show the menu of border options (Fig. 5.16)

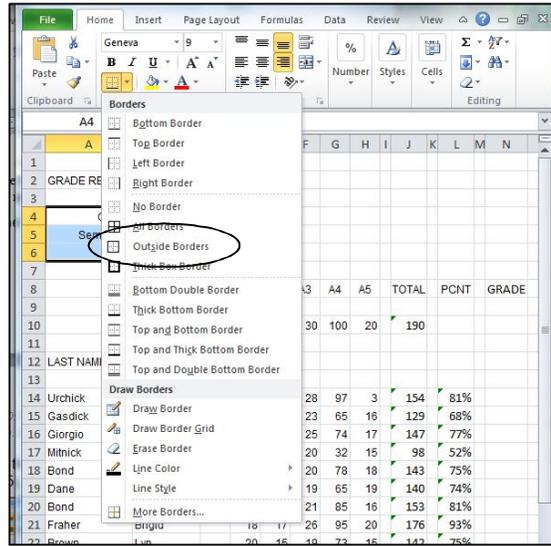


Fig. 5.16 Excel's Borders options for cells or groups of cells

As you can see, the Borders menu gives you various options.

In the menu, click on the **Outline Borders** option and click on **OK**

The Class Info now has a border around it, setting it off from the rest of the data in the Gradebook document (Fig. 5.17).

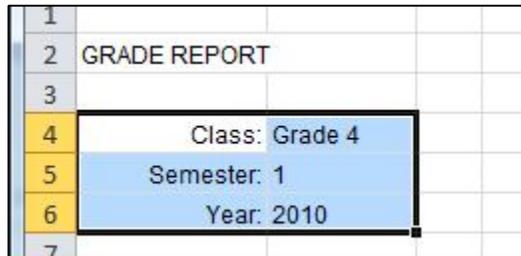


Fig. 5.17 Spreadsheet cell with border

Removing grid lines and column and row headings

Grid lines and column and row headings are essential when developing a spreadsheet or when one is updating the data. But for reporting purposes it may look better, perhaps even easier to read, if they are removed. You may recall doing this in Lesson 4. Try this again now for reinforcement.

In the **View Ribbon > Show Group** remove the **check mark** from the box next to **Gridlines** and the box next to **Headings**

The spreadsheet now looks quite different, as you can see. For the next exercise, however, it will be best to have the Gridlines and Headers showing in the Gradebook document.

In the **View Ribbon > Show Group** put back the **check mark** in the box next to **Gridlines** and the box next to **Headings**

You also need to lock the cells and protect the worksheet again.

Press **Ctrl-a** to **Select All** the cells in the spreadsheet (or click in the small box in the top left corner of the row and column headings)

From the **Home Ribbon > Cells Group** select **Format** and, in the **Protection Section** towards the bottom of the **Format Menu**, select the option to **Lock Cell**

This locks all the cells in your spreadsheet, but they are not yet protected against changes. You have one more thing to do.

From the **Home Ribbon > Cells Group** select **Format** and, in the **Protection Section** towards the bottom of the **Format Menu**, select the option to **Protect Sheet...**

In the **Protect Sheet dialog box** click on **OK**, then **Save** your work

You are now going to make the same changes to the Grades template that you just made to the Gradebook document. To do this, it will be easiest if you have both spreadsheets side-by-side on your screen.

Go to the **Work Files for Office 2010 > Miscellaneous Files > Templates** folder on your disk drive and open the **Grades Template** document

Maximize the spreadsheet window so that it fills the screen and use the **Zoom tool** in the lower right of the spreadsheet window to **reduce** the size of the documents to **75%**

Next, in the **View Ribbon > Window Group**, click on the tool to **View Side-by-Side**, adjust the size of the two windows so they will fit side-by-side in the *Excel* window, and move them around till they are aligned next to each other on the screen, the **Gradebook** on the left and the **Grades Template** on the right, as illustrated in Fig. 5.18

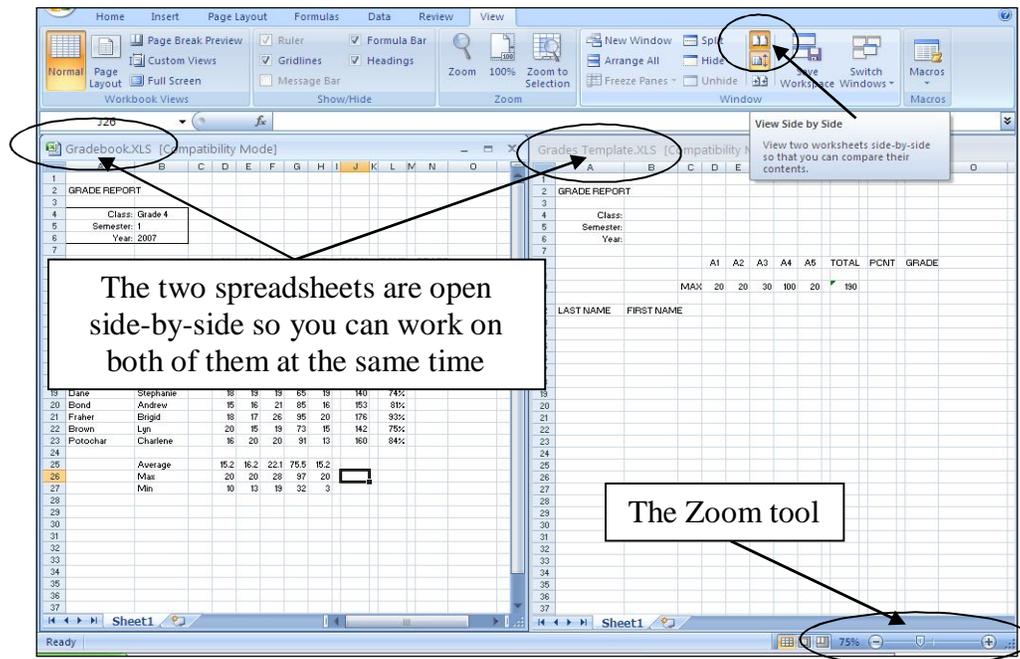


Fig. 5.18 Arranging worksheets side-by-side

What you're doing is updating the Grades Template spreadsheet with the same format and functions as the Gradebook document so that you can use the template with other classes you may have in the future. Hint: Use *Copy* and *Paste* to complete many of the tasks.

Go ahead now and update the **Grades Template**, but you **DON'T** need to transfer any of the actual data from the **Gradebook** to the **Grades Template**—only update the **functions** and other **formatting** features you added to the Gradebook document (Fig. 5.19 illustrates what you need to do—read the directions carefully before you proceed)

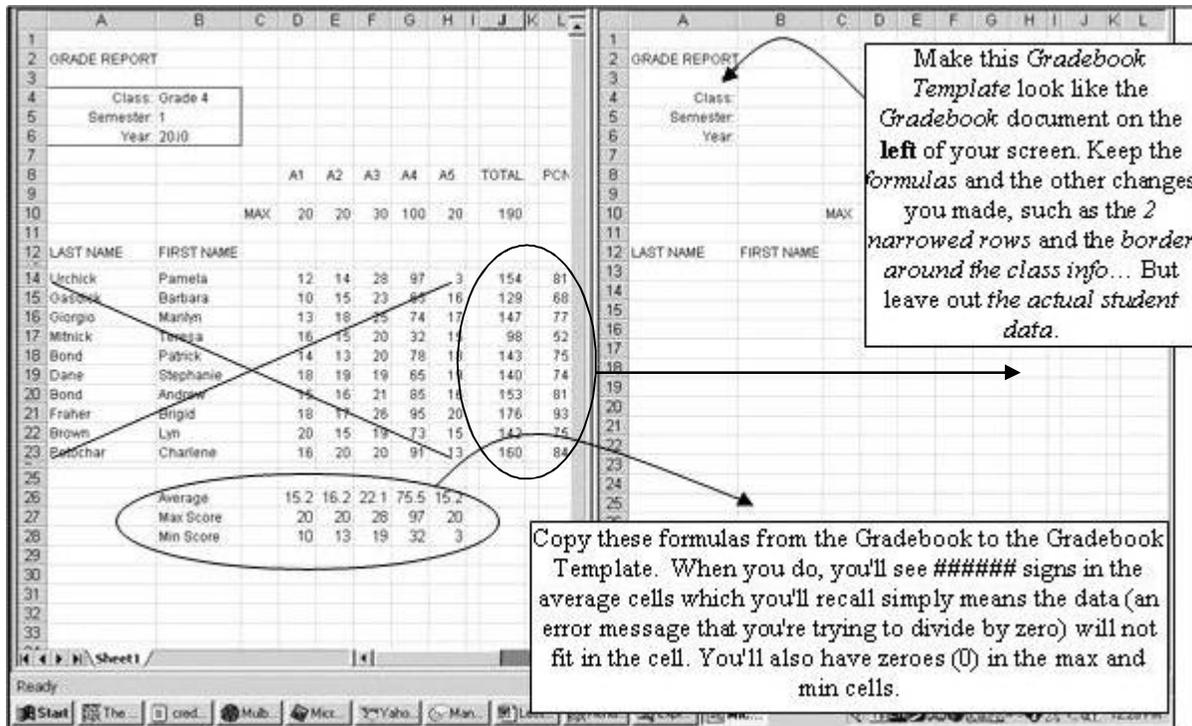


Fig. 5.19 Tiling the spreadsheet windows to make changes to the Template

Save the **Grades Template** when you have finished making the changes.

When you have finished updating the **Grades Template**, in the **View Ribbon > Window Group**, click on the tool to **View Side-by-Side** to switch back to viewing just one of the two spreadsheets

In the **View Ribbon > Window Group**, click on the tool to **Switch Windows** and select the document **Gradebook** so as to make this the current spreadsheet on the Desktop

It might be a good idea to take a break at this point in the tutorial.

TIME FOR A BREAK?
FEEL FREE TO TAKE ONE...
THIS MIGHT BE ENOUGH FOR ONE DAY!

5.5 USING THE LOOKUP FUNCTION

The concept of the LOOKUP function

The spreadsheet LOOKUP function is a little tricky to understand, so stand up, step back from the keyboard for a while and stretch some of those muscles that are stiff from sitting through the first part of this tutorial. When you are ready, read quietly through this section to understand how the LOOKUP function works.

The LOOKUP function is a simple logic tool that you can use to automatically assign grades to your students based on the numbers in the Percentage column of your spreadsheet (column L).

You are probably aware by now that if you have the automatic calculation option selected, *Excel* carries out function-based calculations as you make changes in a spreadsheet. Thus, once you have programmed *Excel* to LOOKUP the grades, the system will automatically update each student's Letter Grade, along with Totals and Percentages, even as you enter new scores for assignments, homework, tests, and so forth.

Thus, with no effort on your part, you will be able to keep students informed at any time during the semester as to exactly what grade they currently carry for the class.

Such information is invaluable. *Knowledge is power*. When a student is aware of an inadequate grade early on, extra effort can be applied to improve the situation before it is too late. It is surprising how often students are unaware of how they stand with regard to their progress through a course. The teacher who fails to provide adequate feedback when directing students in their pursuit of academic objectives deserves at least some of the blame if students do not progress as well as they should. When students are kept apprised at all times of where they stand they tend to take more responsibility for the outcomes of their efforts--or lack of them.

Fig. 5.20 illustrates the LOOKUP Table that will be the outcome of this exercise.

O	P
Range (%)	Grade (A-E)
0%	E
60%	D
70%	C
80%	B
90%	A
100%	A

Fig. 5.20 LOOKUP table

You are going to tell *Excel* to compare a student's percentage with the range of values in the first column of the table. These are control percentages. *Excel* will search through this first column, looking for the highest value (percentage) that is *less than or equal to* the student's percentage. Once that value is located in the first column, the function will assign the student the letter grade that is adjacent to it in the second column.

Does that make sense? An example will help. Suppose the student's percentage is 87%. Well, in the table above the *highest* value in the first column that is still *less than or equal to* 87% is 80%, is it not? 70%, 60%, and 0% are less than or equal to 87%, but they are not the *highest* value that is less than or equal to 87%. So 80% is the value that *Excel* will select from the Range column in its LOOKUP of the table. The letter grade from the corresponding cell in the second column--in this case a "B"--will then be posted to the **GRADE** column of the Gradebook document proper.

Once you understand the concept of "the highest value less than or equal to another number", the rest is easy. Here are a few student percentages to try for yourself. Complete the exercise that follows.

From Fig. 5.19, column 1,

what is the highest value less than or equal to 45%? _____

what is the highest value less than or equal to 67%? _____

what is the highest value less than or equal to 59%? _____

what is the highest value less than or equal to 100%? _____

The answers are in the footnote at the bottom of the page.¹

There are two parts to incorporating the *Excel* LOOKUP function into your Gradebook document. First you must build the LOOKUP Table into the spreadsheet. Second you must enter into the appropriate cells the LOOKUP function that will instruct *Excel* to carry out the LOOKUP operation.

Building the LOOKUP Table

You'll need both the **Gradebook document** (which you saved in the **Other** folder in the **Miscellaneous Files** folder) and the **Grades Template** (which you saved in the **Templates** folder in your **Miscellaneous Files** folder) to complete the remainder of this tutorial, so if these documents are not already open, open them both from your **Work Files for Office 2010** folder before proceeding

Next, in the **View Ribbon > Window Group > Switch Windows** icon, select the **Gradebook** document, if it is not already the active window on the screen

Since all the cells are protected in the Gradebook document, you'll need to unlock them first in order to make changes.

From the **Home Ribbon > Cells Group** select **Format** and, in the **Protection Section** towards the bottom of the **Format Menu**, select the option to **Unprotect Sheet...**

Next you need to Unlock the cells.

Press **Ctrl-a** to **Select All** the cells in the spreadsheet (or click in the small box in the top left corner of the row and column headings)

¹ 0%, 60%, 0%, 100%

From the **Home Ribbon > Cells Group** select **Format** again and, in the **Protection Section** towards the bottom of the **Format Menu**, select the option to **Lock Cell**, which reverses the Lock, like flipping a switch

Notice that the cells with formulas in them have the small green flash again in the top left corner of the cell.

Now, let's build the Lookup table that's illustrated in Fig. 5.19 above. The first column of the LOOKUP Table (the lookup vector) has a set of numbers which *Excel* calls the *lookup_vector*.

A vector is just another name for a single column of numbers. This is the set of values against which *Excel* compares the data from a selected cell in the Gradebook document.

Let's create this column (vector) of the LOOKUP table first.

Select cell **O1** and type the column header **Range (%)** then press **Enter** to move down to cell **O2**

Type **0** (the number zero (0) that is) in cell **O2** and press **Enter** to move down to cell **O3**

Type **0.6** (this is equivalent to 60% in mathematical terms) and press **Enter** again to select cell **O4**

Type **0.7** and press **Enter** to make **O5** the current cell, then type **0.8** and press **Enter** once more

Type **0.9** in cell **O6** and press **Enter** to make **O7** the current cell, then type **1** (this is equivalent to 100% in mathematical terms) and click on the **Accept** () button

Now you must change the cell attributes of this first column of the table so as to display the numbers in percent form (with the percent (%) symbol). You did this before in Lesson 4, so the following is just a reminder of how to do this.

Drag down to highlight **all 6** of the scale values from cell **O2** to cell **O7**

In the **Home Ribbon > Number Group** click on the **% (Percent)** symbol to change the format of the decimal numbers to percentages

That completes the first column of the table. Now for the second column with the letter grades-- what *Excel* calls the result vector. These are the values which *Excel* returns to the Gradebook cell in which is the formula which calls the LOOKUP function.

Select cell **P1** and type the header **Grade (A-E)**, then press **Enter** to move down to cell **P2**

Type the letter **E** (or whatever you would use for a failing grade) and press **Enter** to go to cell **P3**

Type a **D** and move down to cell **P4**, then type a **C** and move down to cell **P5**

Type a **B** and move on down to cell **P6**, then type an **A** and move down to cell **P7**

Finally type an **A** again in cell **P7** and click on the **Accept** () button

The table is now almost ready for use. A couple of cosmetic adjustments will improve its appearance.

Select columns **O** and **P** by dragging across the letters **O** and **P** at the top of the columns

In the **Format toolbar** select **Center** alignment, then in the **Format menu** select **Column/Width** and make the width **10**

Your LOOKUP Table should now look like Fig. 5.19 above.

Save all your hard work before proceeding with the tutorial

Using the clipboard to copy cells from one document to another

Now that you have completed the task of building the LOOKUP Table in the Gradebook document you should update the Grades Template along the same lines. The easiest way to do this is to copy the relevant cells from the Gradebook document into the Grades Template document using Copy and Paste.

First you must copy the relevant cells (those used for the LOOKUP Table) from the Gradebook document to the clipboard. Here are the steps.

Select cell **O1** and drag down diagonally across the **LOOKUP Table** to cell **P7**

Press **Ctrl-c** to copy the **LOOKUP Table** to the clipboard

Now switch to the **Grades Template** document by **switching windows** in the **View Ribbon > Window Group**

In the **Grades Template**, click on cell **O1** to make it the current cell

Press **Ctrl-v** to paste the **LOOKUP Table** from the clipboard to the **Grades Template**

Notice that the width of columns O and P in the **Grades Template** is 13, which is wider than you need for the table.

In the **Grades Template** window, change the width of columns **O** and **P** to **9**, then save your work (**Ctrl-s**) once more

Entering the LOOKUP function into the Grade column of the spreadsheet

Recall that the LOOKUP function instructs *Excel* to look up a table that you have built and come back with a corresponding result to store in the spreadsheet proper. Still confused? Maybe the following will help you figure it out.

The LOOKUP function has the following parts to it:

=LOOKUP(lookup_value,lookup_vector,result_vector)

Let's examine each part of this function in order to understand how it works.

- As you know by now, the "=" symbol at the start of the function simply tells *Excel* that a function or formula is in the cell, as opposed to ordinary data such as numbers or labels.
- The word **LOOKUP** tells *Excel* what task it has to carry out (**look** something **up** in a list).
- **lookup_value**, **lookup_vector**, and **result_vector** are variables (control values) that *Excel* uses when it is looking up the table:

- the **lookup_value** is either a number or text (such as a person's name); this **value** will be the "key" that *Excel* will use as it searches through the cells in the **lookup_vector** or column;
- the **lookup_vector** is the column of cells that *Excel* has to check in its lookup of the table (column O in Fig. 5.18);
- the **result_vector** is the column of cells in which *Excel* will find the result of the LOOKUP operation.

Still confused? Don't feel bad; this is definitely tricky stuff. Maybe an example will help you understand how the Lookup function works. It will be easiest for you to follow the next exercise if you have an actual grade book to work with.

Begin by switching back to the **Gradebook document** on the Desktop (use the **View Ribbon > Window Group > Switch Windows** icon for this or click on the **Gradebook** document in the **Task Bar** at the bottom of your screen)

As you follow along, make sure you have at least the LOOKUP Table (columns **O** and **P**) showing on the screen, as well as the last three columns of the Gradebook document (columns **L** thru **N**) containing the PCNT and GRADE data.

Scroll over if necessary until you have columns **L through P** showing on the screen, with the LOOKUP Table at the top of the screen Fig. 5.21

	B	C	D	E	F	G	H	I	J	K	L	M	N	O	P	Q	R
1														Range (%)	Grade (A-E)		
2														0%	E		
3														60%	D		
4	Grade 4													70%	C		
5	1													80%	B		
6	2010													90%	A		
7														100%	A		
8			A1	A2	A3	A4	A5	TOTAL	PCNT	GRADE							
9																	
10		MAX	20	20	30	100	20	190									
11																	
12	FIRST NAME																
13																	
14	Pamela		12	14	28	97	3	154	81%								
15	Barbara		10	15	23	65	16	129	68%								
16	Marilyn		13	18	25	74	17	147	77%								
17	Teresa		16	15	20	32	15	98	52%								
18	Patrick		14	13	20	78	18	143	75%								
19	Stephanie		18	19	19	65	19	140	74%								
20	Andrew		15	16	21	85	16	153	81%								
21	Brigid		18	17	26	95	20	176	93%								
22	Lyn		20	15	19	73	15	142	75%								
23	Charlene		16	20	20	91	13	160	84%								

Fig. 5.21 Spreadsheet showing the Lookup Table

Select cell **N14** (Fig. 5.21 above)

This is the first cell in the **GRADE** column. You want *Excel* to use the **LOOKUP** function to figure out the letter grades for each student and display it in this column (Column N). So this is where the **LOOKUP** function must go.

Click on the **Insert Function** icon (**fx**) in the **data entry** bar towards the top of the spreadsheet window

In the **Insert Function** dialog box select the category **Lookup & Reference** (Fig. 5.22)

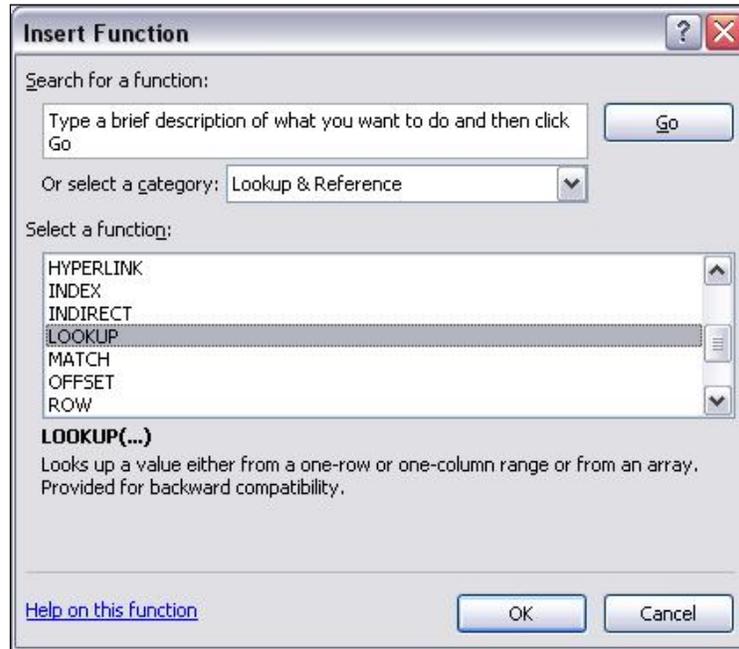


Fig. 5.22 Insert Function dialog box showing Lookup & Reference category

In the **Select a Function:** scroll box scroll down and click on **LOOKUP**, then click on **OK**

This brings up the *Select Arguments* dialog box (Fig. 5.23).

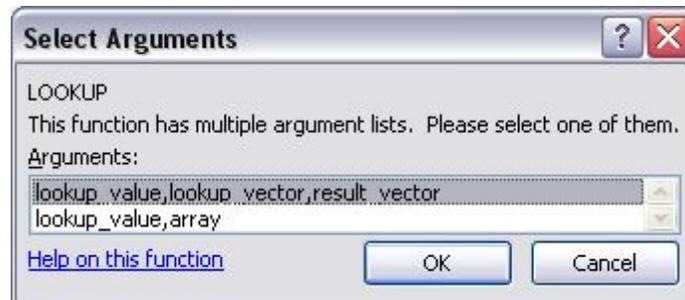


Fig. 5.23 The Select Arguments dialog box

The first set of arguments (**lookup_value, lookup_vector, result_vector**) are what we want, and they are already selected by default, so click on **OK**

The entry bar at the top of the spreadsheet now contains the basic LOOKUP function, ready for you to add the three (3) arguments for the LOOKUP function—the lookup_value, the lookup_vector, and the result_vector.

Excel also presents a dialog box for you to enter these arguments (Fig. 5.24).

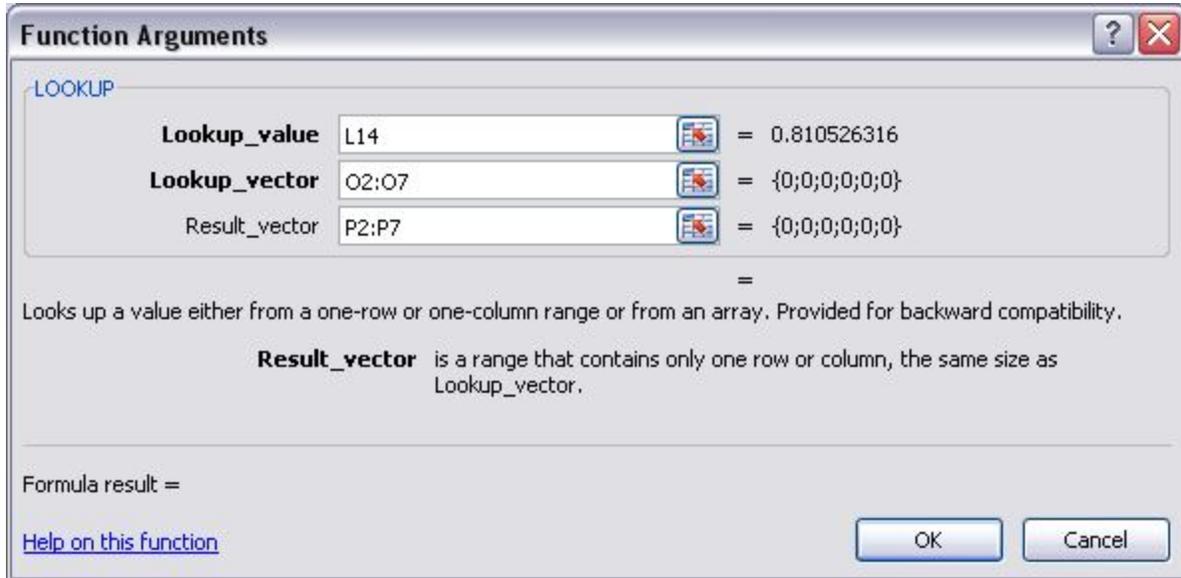


Fig. 5.24 The Function Arguments dialog box for the LOOKUP function

Slide the **Function Arguments dialog box** down and off to the right or left on the screen so that the dialog box is not covering the cells you need to work with (**column L** and the **Lookup Table** in **columns O and P**)

Entering the lookup_value in the dialog box

Notice that the cursor is positioned for you to enter the first parameter of the LOOKUP function (the lookup_value). You must enter here the coordinates of the cell which contains this lookup_value (the Percentage). Cell L14 contains the Percentage for the first student. Well, each student's Percentage will determine the grade, so the percentage is what we want Excel to use to find the letter grade from the Lookup Table.

Click on cell **L14**

Excel enters this cell's coordinates as the first of the LOOKUP parameters, the *lookup_value*. You are telling Excel that it must use this first student's percentage as the value to check against the first column of the LOOKUP Table (O2 through O7).

Entering in the lookup_vector

Cells O2 through O7 are the lookup_vector for the LOOKUP Table.

Click in the **second** data entry box in the **Function Arguments dialog box**, the **lookup_vector** entry area, so you can enter the cells which contain the **lookup_vector**

Use the mouse to drag down **from cell O2 to cell O7** in the spreadsheet

Notice that in the data entry bar Excel fills in the second of the LOOKUP parameters for the LOOKUP function, namely the *lookup_vector*. Check this in the Data entry bar, too.

Entering the result_vector

Cells P2 through P7 are the result_vector for the LOOKUP Table.

Click in the **third** data entry box in the **Function Arguments dialog box** so you can specify the cells that contain the **result_vector**

Drag down **from cell P2 to cell P7** in the spreadsheet

Notice, once again, that *Excel* fills in the third of the LOOKUP parameters, the result_vector.

Check the data entry bar to see that the LOOKUP function is now complete— at this stage it should read **=LOOKUP(L14,O2:O7,P2:P7)**

Finally, click on **OK**

Applying the function

Excel will look for "the highest value in cells O2 through O7 that is less than or equal to the student's percentage".

Take a look at cell **N14** now and **verify** that it contains the correct letter grade according to the value in cell **L14** (the percentage for this first student)

As you see, once the LOOKUP function has located the correct cell in column 1 of the Lookup Table (the Range column), all that remains is for *Excel* to make a note of the letter grade that is in the corresponding cell in column 2 of the table (the Grade column), and copy that grade into cell N14.

Copying the LOOKUP function into the rest of the GRADE column

The first student's grade is taken care of. The next task would be to copy this function from cell N14 down to the other cells in the GRADE column (column N), but this is not as simple as it seems because we have to consider the problem of *Absolute* and *Relative* cell references..

If you want to try and do this on your own (you will need to understand the concept of Absolute and Relative references!), go ahead. If you are successful you can skip the rest of this sub-section and go to the *Practice makes perfect* section on the next page.

If you need help completing the LOOKUP function, read on to follow the steps to *correctly* Fill down the LOOKUP function to the remaining cells in column N.

First you must make a small change to the function itself. You also need to put your thinking cap on, because if this is the first time you've used a LOOKUP function, it can get mighty confusing.

You may recall learning about Relative and Absolute cell references in Lesson 4. The function `=LOOKUP(L14,O2:O7,P2:P7)` will work fine for the first student, but if you copy it to the other cells as is, *Excel* will assume that *all* the cell references in the function are relative to the cell into which they are being copied, and will adjust them accordingly, resulting in the wrong letter grades.

What you have to bear in mind is that the references to the LOOKUP Table (cells O2:O7 and P2:P7) must be *absolute* references--they must not change--because the data for the LOOKUP Table will *always* be found in these specific cells.

So you need to tell *Excel* to leave these LOOKUP Table references unchanged when copying the LOOKUP function into the other cells in column N. You do this by surrounding the LOOKUP Table's cell coordinates with \$ (dollar) signs. Like this:

=LOOKUP(L14,\$O\$2:\$O\$7,\$P\$2:\$P\$7)

The reference to the lookup value (cell L14 for the first student) is *relative*, and will be different for each student (L15, L16, and so on), so it doesn't need to have dollar signs around it.

Here is a reminder of the steps to tell *Excel* to treat references as Absolute References when referring to the LOOKUP Table.

Click on cell **N14**

Take a look at the Data Entry bar at the top of the screen and you'll see that the LOOKUP function is spelled out in full.

In the **LOOKUP** formula in the **Data entry bar**, click to put the cursor immediately before the reference to **cell O2**

Now put a dollar (\$) sign in front of every coordinate (rows *and* columns) for the LOOKUP Table (**8 \$ signs** in all) as illustrated in Fig. 5.25

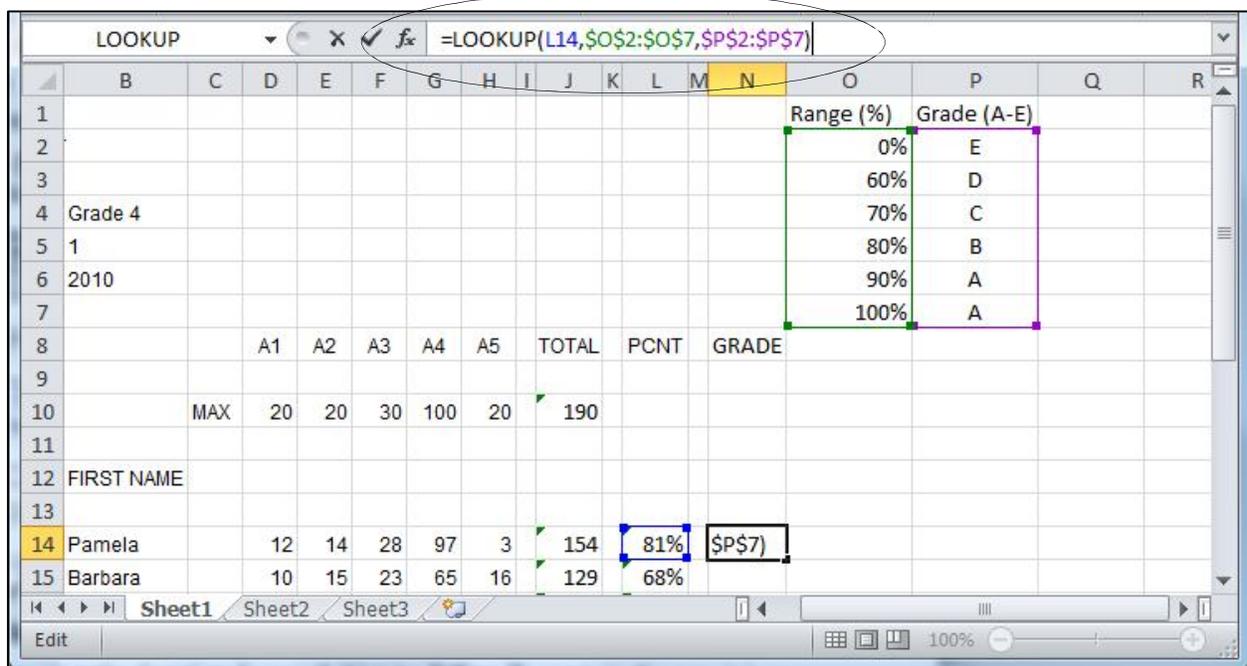


Fig. 5.25 Absolute references are preceded by dollar (\$) signs

This will ensure that this part of the function will remain unchanged ("absolute") when you copy it shortly into the other cells in column N.

Click the **Accept button** (✓) to accept the LOOKUP function into cell **N14**

Here now are the steps to copy the function from cell N14 by **Filling Down** into the remaining cells of the GRADE column (Column N).

Make sure the current cell is still cell **N14**

Grab hold of the small **Fill handle** in the **lower right** corner of **cell N14** and drag down to **cell N23**

You now should see the correct letter grade for each student in column N.

While you have the cells in **column N** highlighted, **center** the grades in the column

You also need to lock the cells and protect the worksheet again.

Press **Ctrl-a** to **Select All** the cells in the spreadsheet (or click in the small box in the top left corner of the row and column headings)

From the **Home Ribbon > Cells Group** select **Format** and, in the **Protection Section** towards the bottom of the **Format Menu**, select the option to **Lock Cell**

This locks all the cells in your spreadsheet, but they are not yet protected against changes. You'll recall by now that you have one more thing to do.

From the **Home Ribbon > Cells Group** select **Format** and, in the **Protection Section** towards the bottom of the **Format Menu**, select the option to **Protect Sheet...**

In the **Protect Sheet dialog box** click on **OK**, then **Save** your work

If you need to think about the LOOKUP function a little more, go carefully back over what you have just done. Once you have a clear idea of how the LOOKUP function works, you and your students will be able to apply it in myriad situations when you build spreadsheets of your own.

Practice makes perfect

Your task now is to switch to the Grades Template document again, and add the LOOKUP function there, too. You do not have any data in the template (or at least you shouldn't have!), so your LOOKUP function will produce a column of meaningless grades (all E's!) in the GRADE column, just as was the case when you built a function into the PCNT column of the template document when you were working on Lesson 4. This is no problem, because the data will be relevant and correct when you use the spreadsheet with an actual class and enter meaningful sets of scores, as is the case in the Gradebook document itself.

You either can add the functions to the Grades Template document the long way, by repeating all the steps you just carried out for the Gradebook document, or you can use the Copy (Ctrl-c) function as you did a short while ago to copy the LOOKUP Table from the one document to the other.

Don't forget, when you're done, to **save** the changes you have made to the **Grades Template** spreadsheet

5.6 CREATING CHARTS BASED ON THE SPREADSHEET DATA

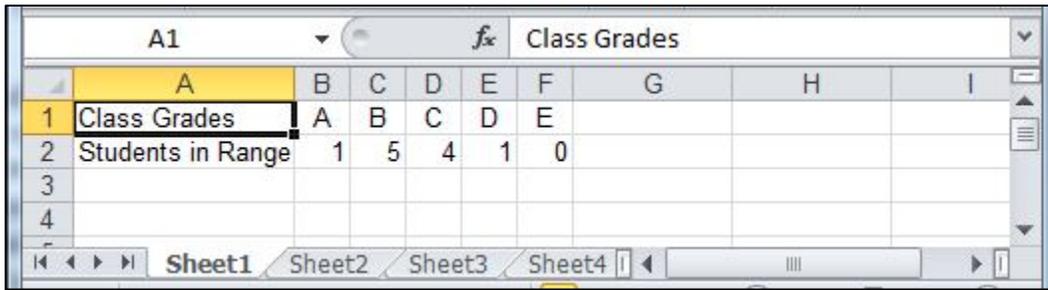
Why charts?

A spreadsheet user can take advantage of charts that are based on the numbers stored in its rows and columns of cells. Charts enable the user to visualize the data. "A picture," as they say, "is worth a thousand words." By the same token, a well-designed chart can help you make sense of a thousand numbers. Charts are also useful when you need to increase the impact of any oral or written presentation.

For this exercise you'll open a new spreadsheet document so you can practice creating charts.

Go to your **Work Files for Office 2010 > Miscellaneous Files > Other** folder and open the **Charts** document

Your Charts spreadsheet should look like Fig. 5.26.



The screenshot shows an Excel spreadsheet with the following data:

	A	B	C	D	E	F	G	H	I
1	Class Grades	A	B	C	D	E			
2	Students in Range	1	5	4	1	0			
3									
4									

Fig. 5.26 Data for Charts document

The *Excel* charting capability

Today we are in danger of being overwhelmed by a superabundance of data—the raw material of information. Charts—graphic, colorful, eye-catching, mind-enriching—have, for thousands of years, been a powerful way to convey what would otherwise be complex information. The *Office Excel 2010* spreadsheet makes it easy to create dozens of different types of charts. You can create a chart from information gathered in most any spreadsheet. It is not an exaggeration to say that your ability to take advantage of Excel’s charting capability will make you a more effective teacher.

Creating a Column chart

The values represented in a chart are called a *data series* or a *data set*. In the chart you are about to create, the number of students in the various grade ranges (A, B, C, etc.) will be represented by bars. The chart will have a title and a legend with names descriptive of the data series.

Most charts, except pie charts, have *axes*, which are the perpendicular lines along which the data are plotted or displayed. The Y axis is the *vertical* axis (running from top to bottom). The X axis is the *horizontal* axis (running from left to right).

To create a chart in *Excel*, you must first designate the set of cells in the spreadsheet that you want included in the chart. This is called the *chart range*. Let’s select the Chart Range now.

Select, by dragging and highlighting, cells **A1** through **F2**

Now, let’s check out each of the 7 categories of charts.

In the **Insert Ribbon > Charts Group**, click on the **Column charts** icon and look at the **19** different types of Column Charts you can make

Click on the **Line charts** icon and look at the **7** different types of Line Charts you can make

Click on the **Pie charts** icon and look at the **6** different types of Pie Charts you can make

Click on the **Bar charts** icon and look at the **15** different types of Bar Charts you can make

Click on the **Area charts** icon and look at the **6** different types of Area Charts you can make

Click on the **Scatter charts** icon and look at the **5** different types of Scatter Charts you can make

Click on the **Other charts** icon and look at the **15** different types of Charts you can make

After you have checked out the various chart types, in the **Insert Ribbon > Charts Group**, click on the **Column charts** icon

In the **Column Charts** menu, click on the icon for a **3-D clustered Column** chart (Fig. 5.27)

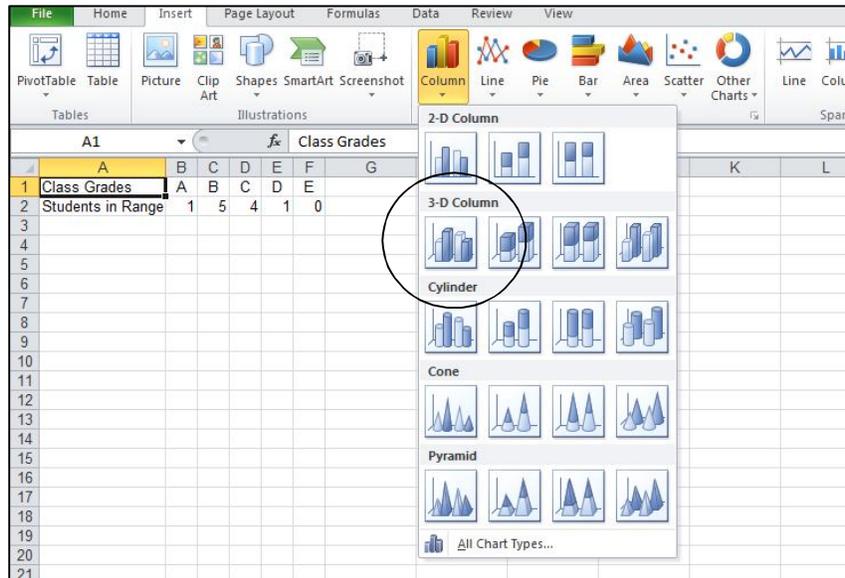


Fig. 5.27 The Column Charts menu

Immediately *Excel* creates the chart and displays it on the screen (Fig. 5.28).

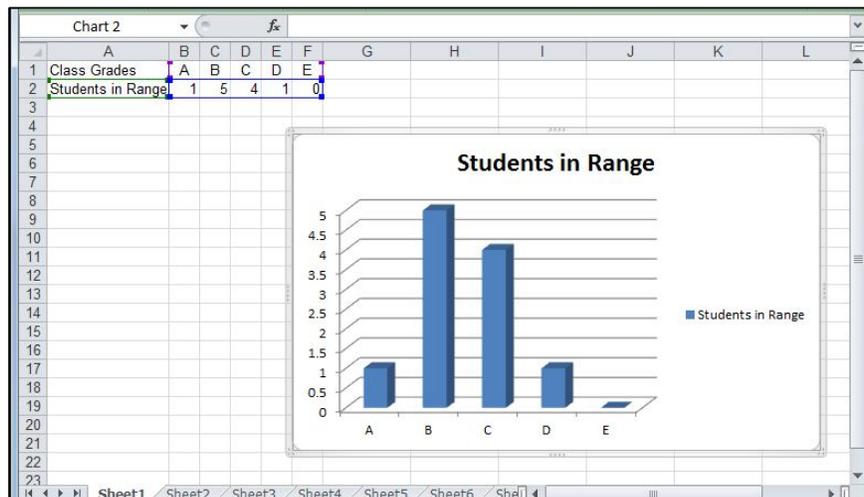


Fig. 5.28 3-D Clustered Column chart

Notice that Excel has automatically put the grades along the X axis and the scale indicating the number of students with each grade along the Y axis. Excel has also indicated a legend that the blue columns show how many students scored in each of the letter grade categories.

The only change you need to make is to the chart title. It should say something like “Class Grades Distribution.”

Drag across the chart title **Students in Range** and in its place type **Class Grades Distribution**

You can easily make changes to the chart. Try this now.

Right click on any piece of the chart (title, any other text, the bars, the chart background, the gridlines, the chart area as a whole, the legend, the axis numbers or letters)

Notice the handles that immediately appear around the object you've selected. Also notice that each part of the chart has different options in its pop up context menu.

Select the Format option from the context menu that pops up and interact with the dialog box to change fonts, colors and so forth

Try variations on the look and feel of the chart; undo anything you don't like

Now, in the **Chart Tools Design Ribbon > Chart Styles Group** try some of the different preset styles

When you're done practicing, go to **File menu > Save As...** and, in your **Work Files for Office 2010 > Data Files** folder, save the chart with the name **Column Chart**

That's all you want to do with the Column Chart, so you might as well remove it from the spreadsheet window before the next exercise.

Left click on the border of the **Column chart** to select the **whole chart** and not some piece of the chart's contents, then hit the **Del(ete)** key

Creating a pie chart

Creating a pie chart is straightforward if you just successfully completed the bar chart. You will use the same set of data for the exercise that follows.

Drag to select cells **A1** through **F2**, then in the **Insert Ribbon > Charts Group**, click on the **Pie charts** icon

In the **Pie Charts** menu, click on the icon for an **Exploded Pie in 3-D** chart (Fig. 5.29)

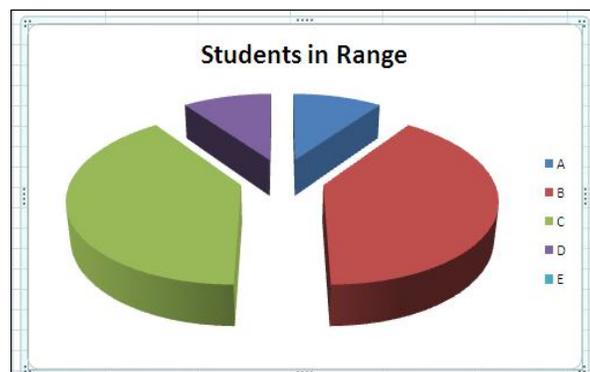


Fig. 5.29 Pie Chart

Change the Chart Title to **Class Grades Distribution** as you did for the Column Chart

Right click on any piece of the chart (title, any other text, the bars, the chart background, the gridlines, the chart area as a whole, the legend, the axis numbers or letters)

Notice the handles that immediately appear around the object you've selected. Also notice that each part of the chart has different options in its pop up context menu.

Select the Format option from the context menu that pops up and interact with the dialog box to change fonts, colors and so forth

Try variations on the look and feel of the chart; undo anything you don't like

Now, in the **Chart Tools Design Ribbon > Chart Styles Group** try some of the different preset styles

When you're done practicing, go to **File menu > Save As...** and, in your **Work Files for Office 2010 > Data Files** folder, save the chart with the name **Pie Chart**

That's all you want to do with the Column Chart, so you might as well remove it from the spreadsheet window before the next exercise.

Left click on the border of the **Pie chart** to select the **whole chart** and not some piece of the chart's contents, then hit the **Del(ete)** key

Do the same to create a **Clustered Horizontal Cylinder Bar Chart** with your choice of **preset chart style**, and **save** the chart in your **Data Files** folder with the name **Bar Chart**

Do the same to create an **Exploded Donut Chart**, and **save** the chart in your **Data Files** folder with the name **Donut Chart**

5.7 PRINTING THE UPDATED SPREADSHEET

Selecting a section of the spreadsheet for printing

You're going to print out the Gradebook document twice. When you first print out your Gradebook document, you do not want the LOOKUP Table to appear on the printed report. You want to print only that block of cells that contains the data pertaining to student grades for the semester. This includes columns A through N and Rows 1 through 27.

The steps that follow will show you how to select just this block of cells for printing.

In the **View Ribbon > Window Group** select the **Gradebook** document

Next you must select (highlight) the range of cells that you want to print.

In the **Page Layout Ribbon > Page Setup > Print Area** menu, select the option to **Set Print Area**

Now drag down diagonally from cell **A1** to cell **N27** (this will include the **Average, Max Score, and Min Score** summary lines at the bottom of the Gradebook document, but **not** the cells with the LOOKUP table)

From the **File menu** select **Print**

In the Print dialog box (Fig. 5.30) you can select the option to print the spreadsheet in landscape (sideways) orientation. This option usually works well with spreadsheets.

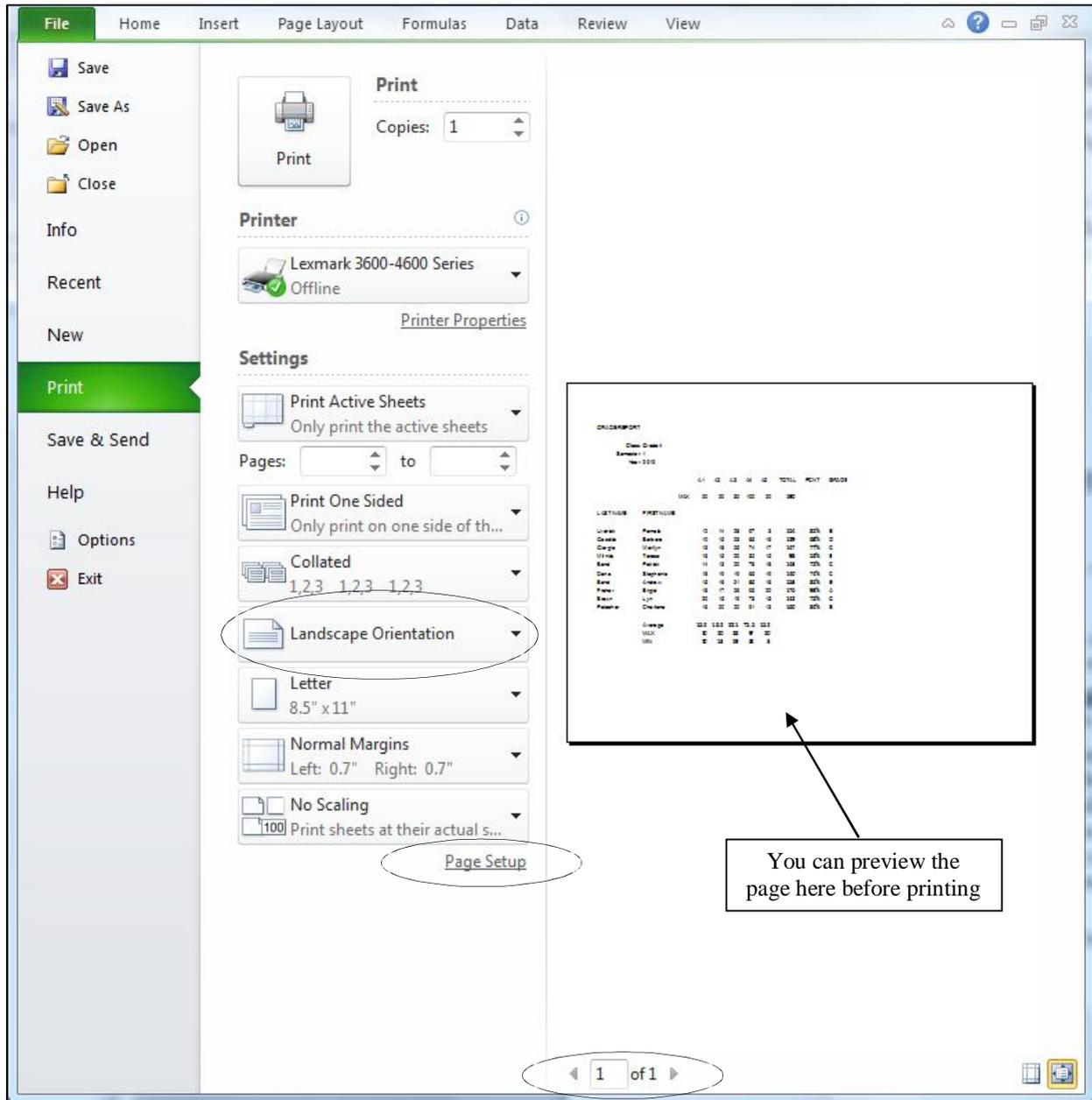


Fig. 5.30 The Print dialog box

Your spreadsheet has just one page. If you wanted to check on how many pages there are in a spreadsheet before printing, you would find the answer at the bottom of the Print dialog box (Fig. 5.28 above).

Notice also that in the Print dialog box you can Preview the worksheet before printing.

You need to take care of one more detail. The printed spreadsheet will look better if you remove column and row headings as well as the cell gridlines, as illustrated in the print preview box above.

Click on the **Page Setup** hotlink in the **Preview** window (Fig. 5.28 above), then click on the **Sheet** tab (Fig. 5.31)

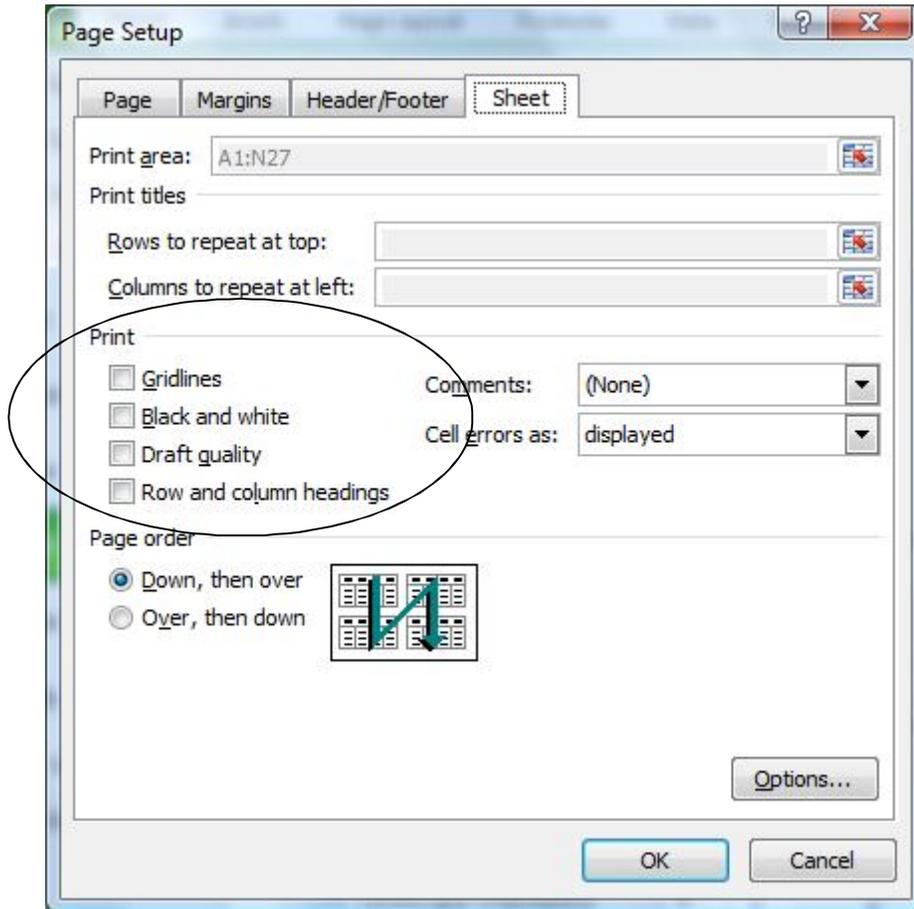


Fig. 5.31 Removing Gridlines and Row and Column headings

Click to **remove** the **check mark** from the boxes next to **Gridlines** and **Row and column headings**, then click on **OK**

Finally click on the **Print** button towards the top of the **Print dialog box** to print out a hardcopy of the **Gradebook** document

Now **print** a second copy of the Gradebook document, but this time, in the Print Area (**Page Layout Ribbon > Page Setup > Print Area** menu, select the option to **Set Print Area**) include the **Lookup Table**, along with the **gridlines** and **row and column headings**

If you are completing the lesson for a class at school, hand in **both copies** of the spreadsheet to your instructor

5.8 MAKING A BACKUP COPY OF YOUR DOCUMENTS

Your last task before completing this session at the computer is to make a backup of your document on the backup disk. The Gradebook is still open in *Excel*. It is also saved in your Work Files for Office 2010 folder, which is in the disk drive.

From the **File menu** menu select **Save As...** and, in the **Save As...** dialog box change the file name to **Gradebook Backup** and click on **Save**, then close **Excel**

LOOKING BACK

Most people take advantage of only a fraction of the functionality of computer software. This tutorial, and the others that you have worked your way through thus far, have introduced you to a wider range of features of *Excel* than most *Excel* users are aware of. However, you still cannot consider yourself an expert, even though you are becoming a sophisticated user. To become an expert you must first of all use the software, taking advantage of the features you have learned so that you don't forget them. You also might study the User's Guide that Microsoft provides along with the *Excel* software.

Expertise is ephemeral. "Use it, or lose it," as they say.

LOOKING FORWARD

Lessons 7 and 8 will help you learn to use the *Access* database application. But before learning this new Office program, it will be good to return to Microsoft *Word* in order to learn how to use the mail merge feature of the word processor. This will be the subject of Lesson 6.

If you have completed all the tutorials in this book up to this point, you have spent a considerable amount of time at the computer. This is the only way to master the machine. Yet it is not enough. You must be prepared to strike out on your own, creating documents using the productivity tools you are learning in these tutorials to meet your needs both in and out of the classroom.

Deep, assimilated learning takes place only once you are working independently, because to do this you have to show that you have *understood* everything you have learned. Understanding leads to transference and acquisition of skills. Tutorials will open the doors to knowledge, and hold your hand while you make those first steps toward the acquisition of specific skills.

But you must have the desire to let go of the hand that guides you. *Without* this desire, the exercises that you are following will be wasted and yield no fruit. *With* this desire, you will be motivated to *understand* what you are learning so that you can apply it to new situations in your own professional experience.

SKILL CONSOLIDATION

Complete these exercises to reinforce what you have learned in Lesson 5.

1. List at least 5 applications, other than those presented in these tutorials, for which you think you would use the *Excel* spreadsheet in a classroom environment.
2. Either alone, or with a group, develop templates for each of the five spreadsheets identified in exercise 1. This could be an excellent class project. Each team would develop a different set of templates. Then all groups would present their results for review by everyone else in the class, and the complete set of templates could be made available on disk for everyone to take away from the course.
3. Load the Gradebook document to the Desktop.

- Add the function to calculate the average score for each of the tests, quizzes, homeworks, etc. The system will add up all the scores and divide by the number of cells that contain scores to arrive at the average. You should use the copy function to duplicate the functions across the spreadsheet.
 - Save the updated document
 - Print out only the columns that contain the student names and the final totals and percentages (so you will need to temporarily delete the columns in between--don't save this document!)
4. Load the Gradebook document onto the Desktop.
 - Add a new column for another set of scores
 - Add a new row for another student
 - Update the functions where necessary
 - Sort the student records based on the First and Last Name columns
 - Save the updated document
 5. Create a line chart based on a set of values for populations in several cities in the U.S. Generate a Bar chart from the data. Research the populations on the web at <http://www.census.gov/popest/states/NST-ann-est.html>
 6. Create a pie chart based on a set of values for the amount of rainfall for each of any ten cities world wide. Research the rainfall data at this web address: <http://www.worldclimate.com>