

PART I

THE BASICS

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1

Working with Excel 2007 or Excel 2010

Extensive changes were made in the Excel 2007 user interface. Excel's familiar drop-down menus with their familiar commands were replaced by the Ribbon. (The Excel 2010 Ribbon is virtually unchanged from the Excel 2007 version.) If you're a long-time Excel user, you'll probably find the ribbon interface confusing and infuriating, although some people profess to like it.

At the end of this chapter I suggest several ways to make the change to Excel 2007 or 2010 easier for Excel 2003 users.

What's New in Excel 2007 and 2010

Let's look at the changes that were introduced in Excel 2007. They're listed in decreasing order of what I consider to be their importance for the average user.

The Ribbon

The Ribbon is the major component of what's officially called the Office Fluent user interface; it replaces the familiar drop-down menus and toolbars of earlier versions of Excel. The Ribbon is essentially a multi-row toolbar. Clicking on one of a series of tabs located on something similar to the Excel 2003 menu bar displays the Ribbon for that particular tab. The primary tab captions are Home, Insert, Page Layout, Formulas, Data, Review, and View. Figure 1-1 shows the Home tab of the Ribbon. (The appearance of the Ribbon may be different, depending on your screen width and/or resolution.)

Other tabs may be displayed depending on context. If a chart is the active window, the Design, Layout and Format tabs are displayed. The Developer tab, for working with VBA procedures, is only displayed if the user previously opted

to display it. The Add-Ins tab appears only if custom menu commands or toolbuttons have been added to the Ribbon; these appear in the Menu Commands and Toolbar Commands groups, respectively.

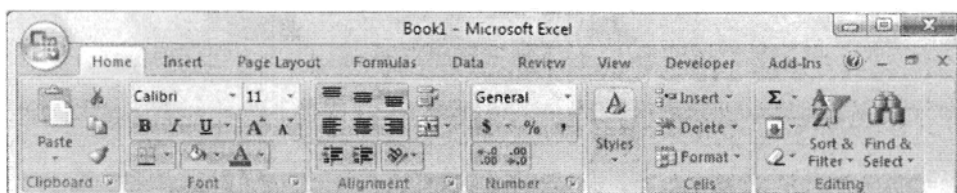


Figure 1-1. The Excel 2007 Home tab.

New File Formats

Microsoft has moved to new XML-based file formats. Instead of the familiar .xls file extension, indicating an Excel workbook, there are now a number of workbook file types. Table 1-1 shows the most important of these new file types. The filename extension now consists of four letters. The first two characters, xl, identify the document as an Excel file. The third character, either s, t or a, identifies the file as spreadsheet, template or add-in. The final character, either x or m, identifies the file as either macro-free or macro-enabled. In addition to these file types, the .xlsb file format identifies a workbook in binary format, while the .crtx file format is used to save chart templates.

Table 1-1. New File Formats in Excel 2007/2010

.xlsx	A workbook containing no macros (the default Excel 2007/2010 file format)
.xlsm	A workbook containing one or more macros (either VBA or Excel 4 macro language)
.xlsb	The Excel 2007/2010 Binary file format.
.xlam	An Add-in workbook containing either VBA procedures or Excel 4.0 macros).
.xltx	An Excel template, without VBA or Excel 4 macro language code.
.xltn	An Excel template with VBA macro code or Excel 4 macro sheets.
.crtx	An Excel chart template.

A Much Larger Worksheet

Worksheets now have more rows and columns: 1,048,576 rows by 16,384 columns for a total of 17,179,869,184 cells in each worksheet. (The column designation now ends at XFD instead of IV.) Granted, Excel 2003's 256 columns

was sometimes not enough – many people wanted to have at least 365 columns, one for each day of the year – but seventeen billion cells in each worksheet seems a bit much.

Larger Limits for Some Features

There are larger limits for a number of Excel features. Excel 2003 allowed three levels of conditional formatting; in Excel 2007/2010, the number of conditional formats is limited by available memory. The number of levels of nested functions in a formula in Excel 2003 was seven; the new limit is 64 levels. The number of sort levels in Excel 2003 was three; the new limit is 64 levels. A more complete list of Excel 2007/2010 specifications can be found at the end of this chapter.

New Worksheet Functions

There are more built-in functions, but this is largely because the 89 Engineering functions, loaded in Excel 2003 with the Analysis ToolPak Add-In, are now a permanent part of the list of functions. Apart from the Engineering functions, only five new functions have been added: SUMIFS, AVERAGEIF, AVERAGEIFS, COUNTIFS and IFERROR. These are discussed in Chapter 3, "Excel Formulas and Functions".

The Downside

There are some changes that, in my opinion, are not for the better. Since there are no menus, VBA code that installs a new menu command in, for example, the **Tools** menu of Excel 2003 doesn't work as it did before. If you're lucky, the custom menu command will appear in the Add-Ins tab. The same is true of custom toolbuttons; they also appear in the Add-Ins Tab. If you're not lucky, the VBA code that installs a custom menu command or custom toolbutton may have to be modified.

What's New in Excel 2010

There have been a few changes in Excel 2010 from the previous version, Excel 2007. Among the more substantive changes are: changes in some functions (see "Changes to Functions in Excel 2010" in Chapter 3), the Equation Tool to display an equation in a text box (see "Entering an Equation in a Text Box" later in this chapter), and the ability to customize the Ribbon, not just the Quick Access Toolbar (see "Customizing the Ribbon" in Chapter 23).

The Excel 2007/2010 Document Window

An Excel workbook is a *document* that appears in its own *document window*. Although you can have several workbooks open at the same time and can see several displayed on the screen simultaneously, only one workbook can be the *active workbook*. The default Excel 2007/2010 workbook contains three worksheets; only one worksheet in the active workbook can be the *active worksheet*.

Figure 1-2 shows the Excel 2007 document window. The Excel 2010 window is essentially identical. In Figure 1-2, reading from the top down you'll see the *application title bar*, the *Ribbon tabs* (Home, Insert, Page Layout, etc.), the *Ribbon* (the Home tab of the Ribbon is displayed), the *Quick Access Toolbar* (with New, Open, Save, etc. toolbuttons), the *formula bar*, the rows and columns of cells, and, at the bottom, the *sheet tabs*, the *horizontal scroll bar* and the *status bar*. To the left of the formula bar is the Name Box or *cell reference area*, displaying the cell reference of the currently selected cell. Depending on your monitor, your screen may show a different number of rows or columns and a different view of the Ribbon.

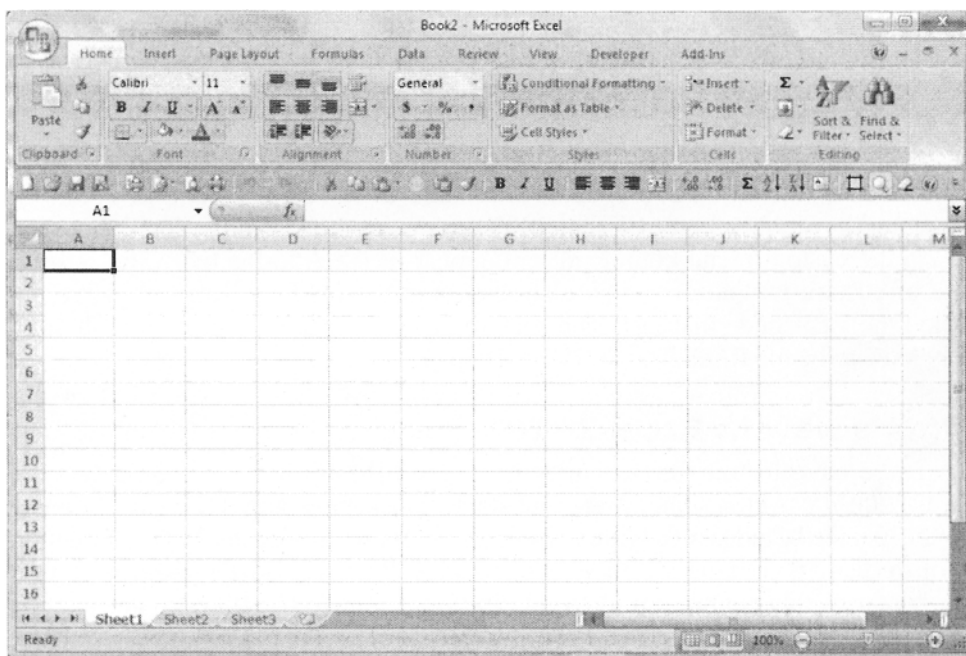





Figure 1-2. The Excel 2007 document window, showing the Home tab.

button  that allows you to increase the size of the formula bar to accommodate long formulas. You can also right-click in the formula bar to display a shortcut menu that allows you to expand the formula bar.

Hiding, Moving or Resizing a Document Window

If you click on the Minimize button (the  button in the upper right corner of the document) the window will be closed and only the title bar will appear in the tray. To restore the window, click on the document in the tray.

If you click on the Restore Window button (the  button in the upper right corner of the document), the window size will be reduced so that it no longer completely fills the document window. To restore it to its full size, click the Restore Window button again.

To manually change the size of a window, click and drag any of its borders or corners; the mouse pointer changes shape when you click on a border or corner. You can adjust the document to any size you desire.

To change the position of a document within the Excel window, click on the title bar and drag the document. It can even extend off-screen.

Working with Excel 2007/2010

In my view, some of the most confusing changes that were made in Excel 2007 were those that corresponded to commands in the **File** menu of Excel 2003, and in the **Options** command in the **Tools** menu. These two changes will be discussed first.

The Office Button (Excel 2007)



The Office Button, shown at the left, is located at the left of the Ribbon tabs. Pressing this button displays the Office Button window, shown in Figure 1-3.

The Office Button window is the approximate equivalent of the **File** menu in Excel 2003. In addition to the commands found in the Excel 2003 **File** menu (**New**, **Open**, **Close**, **Save**, **Save As**, **Print**, **Exit**, etc.), clicking on the Excel Options button at the bottom of the window displays the Options window. The Options window contains the options that were located in the Excel 2003 **Options** command of the **Tools** menu and is described in a following section.

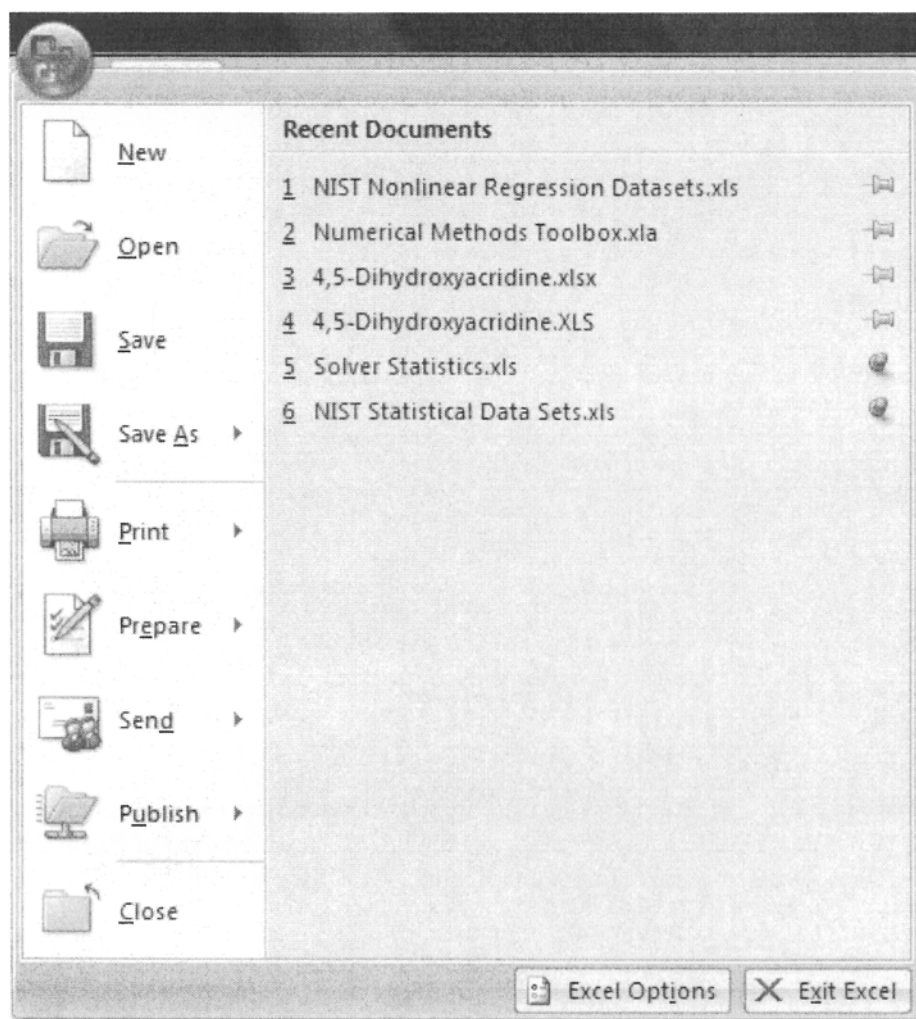


Figure 1-3. The Excel 2007 Office Button window

The File Tab (Excel 2010)

The Excel 2007 Office Button was confusing to new users. (*Why* did Microsoft disguise the former **File** menu as a simple logo?) Excel 2010 got rid of the Office Button and replaced it with the File tab, shown in Figure 1-4.

The File tab of the Ribbon contains the following buttons: Save, Save As, Open, Close, Info, Recent, New, Print, Save & Send, Help, Options and Exit.

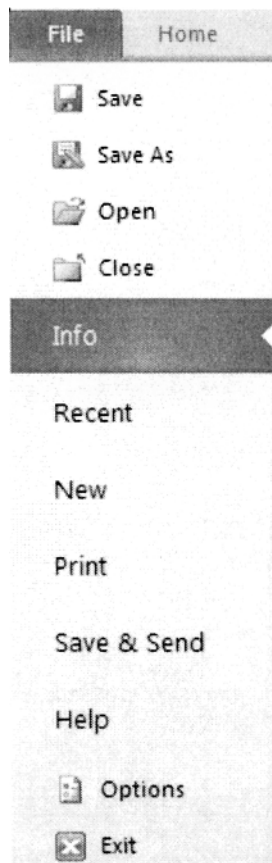


Figure 1-4. The Excel 2010 File tab.

The Excel Options Window

Pressing the Excel Options button in the Office Button window (Excel 2007) or the Options button in the File tab of the Ribbon (Excel 2010) displays the Excel Options window. The menu of options, shown in Figure 1-5, is in the left pane of the window. There are nine options available: Five of these (Popular, Formulas, Save, Advanced, Customize) contain most of the options that are found in the Excel 2003 **Options** command in the **Tools** menu. Figure 1-5 shows the Excel 2010 General options window; the Excel 2007 window is similar but called the Popular Options window.

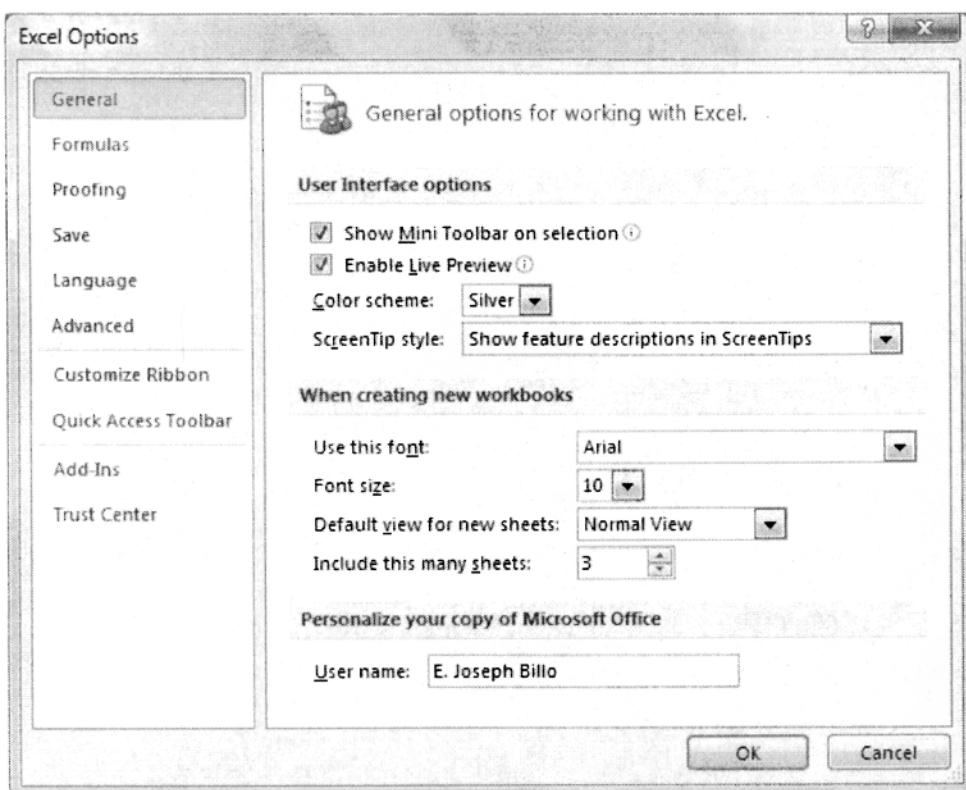


Figure 1-5. The Excel 2010 Options window, showing General options.

One of the five Options windows, the Advanced Options window, is so large that it requires that you scroll down to view all the options. One of the most frustrating things about Excel 2007/2010, even for experienced Excel users, is the difficulty of finding the location of a desired option. Table 1-2 is a guide to help Excel 2003 users navigate their way to Excel 2007/2010 options.

The Ribbon: An Overview

Commands on the Ribbon are represented by icons. Related icons are organized in groups. For example, the Cut, Copy and Paste icons are located in the Clipboard group in the Home tab of the Ribbon. Many of the icons on the Ribbon are identical to Excel 2003 toolbuttons. Some icons have a drop-down button that, when clicked, displays a menu of options.


The appearance and arrangement of icons on the Ribbon depends on the size of the document window. If the window fills the complete screen, the icons in the Ribbon are usually arranged in two rows. If the size of the window is made smaller, the icons may be arranged in three rows, and some groups may not

Table 1-2. A Guide to Excel 2007/2010 Options

Excel 2003 Option Tab	Option	Where to Find It in Excel 2007/ 2010 Options
General	R1C1 reference style	Formulas
	Number of recently used files	Advanced: Display
	Number of sheets in new workbook	General (2010), Popular (2007)
View	Standard font and size	General (2010), Popular (2007)
	Show Formula Bar, Status bar, etc	Advanced: Display
	Show Comment indicator, etc	Advanced: Display
	Show scroll bars, sheet tabs	Advanced: Display options for this workbook
Edit	Show gridlines, row & column headers, page breaks, etc.	Advanced: Display options for this worksheet
	Allow Edit Directly in Cell	Advanced: Editing options
	Allow Drag-and-Drop Editing	Advanced: Editing options
	Automatic % entry	Advanced: Editing options
	Move selection after Enter	Advanced: Editing options
	Extend formats and formulas	Advanced: Editing options
	Fixed decimal	Advanced: Editing options
Calculation	Enable AutoComplete	Formula
	Calculation: Automatic, manual	Formula
	Iteration	Formula
	Update remote references	Advanced: When calculating this workbook
	Precision as displayed	Advanced: When calculating this workbook
	1904 date system	Advanced: When calculating this workbook
Custom Lists	Save external link values	Advanced: When calculating this workbook
		General (2010), Popular (2007)
Chart	Plot empty cells as	(see Chapter 4)
International	Number handling	Advanced: Editing options
Save	AutoRecover every ? Minutes	Save
Error Checking	Enable background error checking	Formula
Color	Standard and custom colors	(Use color palette for object)
	Error-checking rules	Formula
Spelling	Dictionary	Proofing
	AutoCorrect Options	Proofing
Security	File encryption settings	Prepare → Encrypt Document
	File sharing settings	Prepare → Restrict Permission
	Digital signatures	Prepare → Digital Signature
Transition	Menu key, formula evaluation, entry	Advanced: Lotus compatibility

display all available icons. For the screen shots of the Ribbon that are shown in this chapter, windows were resized so that icons were displayed in three rows. For that reason, the images may not look exactly like what you see on your computer screen.

The appearance of a command provides information about its form or availability:

- A command with an ellipsis (...), such as Paste Special..., indicates that the command opens a dialog box to obtain user input.
- Many buttons or commands display submenus, indicated by the  symbol at the bottom of the button or the ► symbol at the right edge of the command.
- Some commands are dimmed (i.e., appear as gray characters) when the command is unavailable. Some tabs appear on the Ribbon only when they are available.
- Some commands change the text of their command depending on circumstances. For example, you click on the Add Comment button in the Review tab of the Ribbon to add a comment to a cell; if you select a cell that already has a comment, the button text changes to Edit Comment so that you can edit the text of the comment.
- Some commands are preceded by a check mark if the option has been selected previously. To remove the selection, depending on the command you either click on the check mark or select the command again.

Shortcut Menus

Although Excel's menus have been replaced by the Ribbon, Excel still provides "context-sensitive" shortcut menus. For example, if you press the right mouse button while you select a worksheet element with the mouse pointer, a menu is displayed containing commands that apply to the selection. If you select a column with the right mouse button, a shortcut menu is displayed that contains editing and formatting commands appropriate for a column. In Excel 2007/2010, many of these shortcut menus are accompanied by the Mini Toolbar, described in a following section.

Keyboard Access to the Ribbon

You can access icons on the Ribbon by using the keyboard rather than the mouse. First, press the Alt key to display the KeyTips for the Ribbon icons. Figure 1-6 shows some KeyTips in the Formulas tab of the Ribbon.

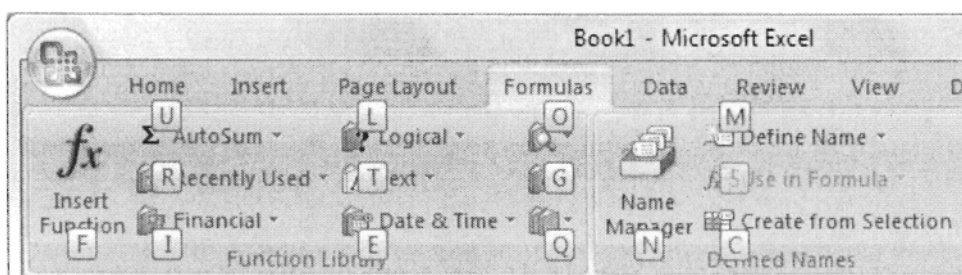


Figure 1-6. KeyTips displayed in the Home tab.

To activate a particular icon, press the keyboard letter that appears in the KeyTip over the icon. Depending on which letter you press, additional KeyTips may appear, and you may have to press additional keys.

To remove the KeyTips, press the Alt key a second time.

The Home Tab

Perhaps this tab, shown in Figure 1-1, should have been named the Format tab. This tab of the Ribbon contains the following groups: Clipboard, Font, Alignment, Number, Styles, Cells and Editing. Many of the icons in the Home tab of the Ribbon correspond to toolbuttons on the Excel 2003 Standard toolbar (Cut, Copy, Paste and the Format Painter) or to toolbuttons on the Formatting toolbar (Font and Font Size, Bold, Italic and Underline, Align Left, Center and Align Right, etc.), as well as a number of icons that perform actions that are in the **Edit**, **Insert** or **Format** menus of Excel 2003 (Insert or Delete cells, rows or columns, Find or Replace, Format cells, rows, columns or sheet).

Navigating Around the Workbook

Use the Switch Windows icon in the Window group in the View tab of the Ribbon to switch between one workbook and another. All open workbooks are listed in the drop-down menu; the active workbook is indicated with a check mark.

Use the Hide icon to hide a workbook. Most commonly I use Hide with workbooks that contain macros. A macro is still available for use even when it's hidden.

Inserting or Deleting Worksheets

The default Excel 2007/2010 workbook contains three worksheets. You can change the default, so that all new workbooks will have, for example, only one worksheet. In Excel 2010, click on the File tab, press the Options button, click

on the General button, and in the "When Creating New Workbooks" group, change the "Include this many sheets" option. In Excel 2007, click on the Office Button, press the Excel Options button, click on the Popular options button, and in the "When Creating New Workbooks" group, change the "Include this many sheets" option.

To insert an additional worksheet in an existing workbook, press the Insert Worksheet button (located to the right of the sheet tabs, see Figure 1-7). A nice feature of this button is that the sheet is added to the right of the existing sheets, instead of to the left of the selected sheet, so that Sheet 4 follows Sheet 3, for example.

Excel Tip. You can right-click the sheet tab of a worksheet to display the shortcut menu, and then choose Insert or Delete.

In Excel 2003, if you increase the number of sheets in a workbook, not all of them may be visible. In Excel 2007/2010, as you increase the number of sheets, the area that displays the sheet tabs widens, permitting more sheet tabs to be visible, but the horizontal scroll bar narrows correspondingly. You can change the size of the sheet tab area by dragging the small button between the sheet tabs and the scroll bar.

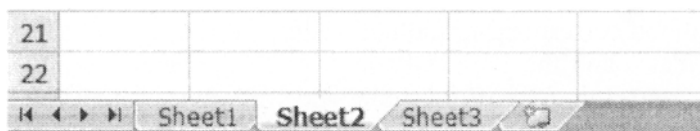


Figure 1-7. Excel 2007/2010 sheet tabs, with the Insert Worksheet button.

To select a worksheet, simply click on the sheet tab. If the workbook contains a large number of worksheets, the tab for the sheet that you want to select may not be visible. Use the tab scroll buttons, located to the left of the sheet tabs, to scroll through the sheet tabs. From left to right, these four buttons allow you to jump to the first sheet tab, scroll toward the first sheet tab, scroll toward the last sheet tab, or jump to the last sheet tab. When the desired sheet tab is visible, click on it.

You can select a specific sheet by right-clicking on any of the scroll buttons, to display the list of all visible sheets. Choose the desired sheet from the shortcut menu, as illustrated in Figure 1-8.

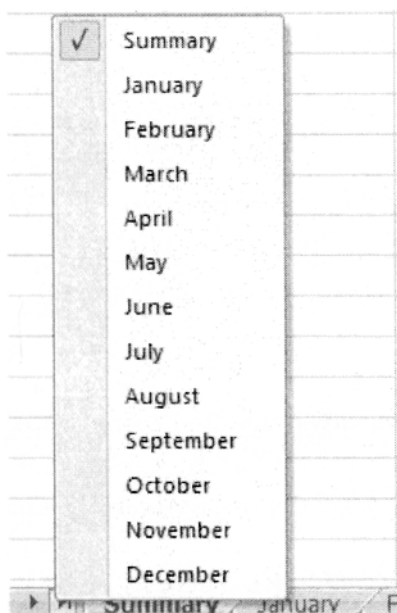


Figure 1-8. Right-click to display the list of all sheets in a workbook.

Changing the Name of a Worksheet

When you create a new workbook, the sheet tabs have the default names Sheet1, Sheet2, etc. To rename a sheet, double-click on the sheet tab, or right-click to display the shortcut menu and choose Rename. The sheet name will be highlighted and you can enter a more descriptive name, as, for example, in Figure 1-9. Click outside the sheet tab to exit from edit mode.

A worksheet name can have a maximum of 31 characters.

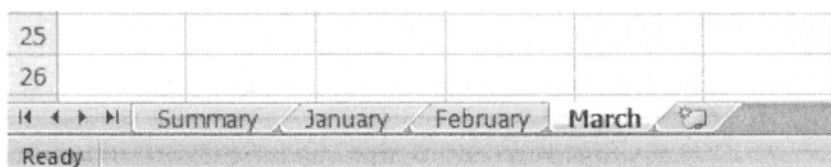


Figure 1-9. Descriptive sheet names are helpful.

Rearranging the Order of Sheets in a Workbook

To move a sheet tab, just click and drag it. The mouse pointer shape becomes an icon showing a sheet at the end of the arrow pointer (Figure 1-10). An arrow above the sheet tab indicates where the tab will be inserted.

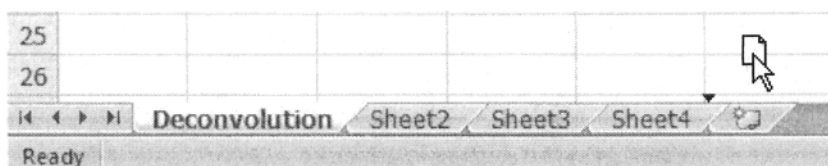


Figure 1-10. Moving a sheet tab with the mouse.

To make a copy of a worksheet, hold down the Ctrl key while dragging the sheet tab. A small + sign appears in the icon (Figure 1-11).

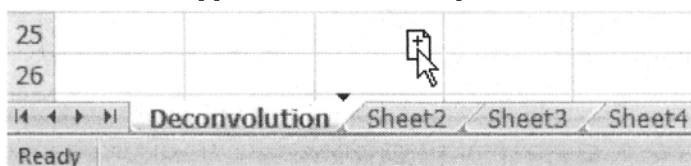


Figure 1-11. Copying a sheet with the mouse.

Selecting Multiple Worksheets: [Group] Mode

To make a non-adjacent selection of worksheets (e.g., Sheet1 and Sheet3), hold down the Ctrl key while clicking on each sheet tab. To select a contiguous range of sheets, click on the sheet tab at one end of the range, then hold down the Shift key and click on the sheet tab at the other end of the range. All the sheet tabs in the range will be selected. To select all the sheets in a workbook, you can right-click on any sheet tab; this displays a shortcut menu that will allow you to Select All Sheets.

You are now in Group Edit mode; [Group] appears in the title bar at the top of the worksheet, and the sheet tabs of all grouped sheets are shown as selected (Figure 1-12).

Once you have grouped sheets, any changes you make in one of them, such as entering or editing data or applying formatting, will be applied to all sheets in the group.

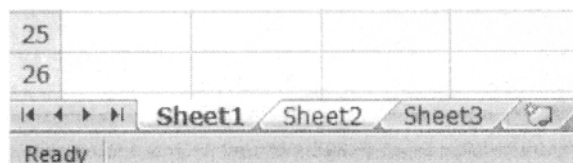


Figure 1-12. Appearance of sheet tabs in [Group] mode.

To Ungroup sheets, click on any ungrouped sheet tab. If all sheets have been selected, right-click on any sheet tab and choose **Ungroup Sheets** from the submenu.

You can also copy, move, delete or print a selection of sheets when in [Group] mode.

Excel Tip. *If you have grouped a number of sheets, choosing Insert Sheet from the Cells group on the Home tab will insert an equal number of worksheets.*

Changing the Color of Sheet Tabs

You can color-code sheet tabs as an aid in organizing your work. Right-click on the sheet tab and then choose Tab Color from the shortcut menu. Alternatively, you can click on the Format button in the Cells group in the Home tab of the Ribbon, and then click on Tab Color.

Using Move or Copy Sheet or Delete Sheet

To move or copy sheets within a workbook, or from one workbook to another, use the Move or Copy Sheet... command (Figure 1-13) in the Format submenu in the Cells group in the Home tab. Since you can easily move sheets within a workbook by using the mouse, the more important use of Move or Copy Sheet is to send a sheet, or a copy of a sheet, from one workbook to another.

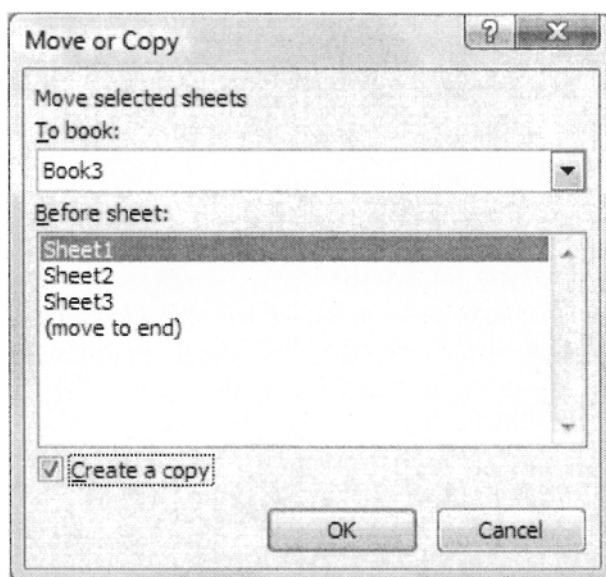


Figure 1-13. The Move or Copy Sheet dialog box.

Navigating Around the Worksheet

You can move around a worksheet either by means of the mouse or by using keystrokes.

Use the arrows in the vertical and horizontal scroll bars (the gray bars on the right edge and at the bottom of the window) to scroll through the worksheet. A single click of the mouse on an arrow moves the worksheet one row or column. The position of the scroll box (the white square in the gray bar) indicates the position of the window relative to the worksheet. You can also scroll through the worksheet by clicking on an arrow and holding down the mouse button, by dragging the scroll box with the mouse, or by clicking in the gray space on either side of the scroll box. Table 1-3 lists keystroke commands for cursor movement.

Table 1-3. Keys for Cursor Movement

Arrow keys	Move left, right, up, down one cell
Enter	Move down one cell
Tab	Move right one cell
Home	Move to the beginning of a row
End	Move to the end of a row
Page Up	Move to the top of the window
Page Down	Move to the bottom of the window
Alt + Page Up	Move to the left of the window
Alt + Page Down	Move to the right of the window

Selecting a Range of Cells

You can select a range of cells on the worksheet in several ways:

- Click on the cell in one corner of the range, hold down the mouse button and drag to the cell in the opposite corner of the range. The range of cells will be highlighted. The size of the selection (e.g., 10R × 3C) is displayed in the reference area (the Name Box) of the formula bar, until you release the mouse button.
- Click on the cell in one corner of the range, then hold down the Shift key and click on the cell in the diagonally opposite corner of the range. The range of cells will be highlighted.
- Select a complete row or column of cells by clicking on the row or column heading. The row or column will be highlighted.

Selecting Non-Adjacent Ranges

To select non-adjacent ranges, select the first range, then hold down the Ctrl key while selecting the second range. Both cell ranges will be highlighted (Figure 1-14).

	A	B	C	D
1	time (sec)	[A] _t	[B] _t	[C] _t
2	0	5.00E-03	0.00E+00	0.00E+00
3	0.2	4.72E-03	2.60E-04	1.71E-05
4	0.6	4.21E-03	6.50E-04	1.37E-04
5	1.0	3.76E-03	9.04E-04	3.38E-04
6	1.4	3.35E-03	1.06E-03	5.90E-04
7	1.8	2.99E-03	1.14E-03	8.72E-04
8	2.2	2.67E-03	1.16E-03	1.17E-03
9	2.6	2.38E-03	1.16E-03	1.46E-03
10	3.0	2.12E-03	1.12E-03	1.76E-03
11	4.0	1.60E-03	9.76E-04	2.43E-03
12	5.0	1.20E-03	8.04E-04	3.00E-03
13	6.0	9.02E-04	6.41E-04	3.46E-03
14	7.0	6.78E-04	5.02E-04	3.82E-03
15	8.0	5.10E-04	3.87E-04	4.10E-03
16	9.0	3.83E-04	2.97E-04	4.32E-03
17	10.0	2.88E-04	2.26E-04	4.49E-03
18				

Figure 1-14. Selecting non-adjacent ranges.

Extending a Selection

To extend the range of a cell selection you just made, hold down the Shift key, select the last cell in the selection, and drag to include the additional cells. Alternatively, hold down the Shift key and use an arrow key to extend the selection. You can also decrease the number of cells in the selection in the same way.

Selecting a Block of Cells

A *block of cells* is a range of cells containing values and bounded by empty cells. There are several shortcuts for selecting cells within a block:

- Use Ctrl + Shift + (arrow key) to select in the appropriate direction.
- Select a cell at a boundary of the block (at the top, bottom or side of the block). Move the mouse pointer over the edge of the selected cell


until the pointer changes to the arrow pointer (Figure 1-15 Left). Hold down the Shift key and double-click on the bottom edge of the selected cell to select all cells in the column from the top to the bottom of the block, as shown in Figure 1-15 Right. You can select cells from top to bottom, from bottom to top, from left to right or from right to left within a block. You can also select multiple columns or rows in the same way.


	A	B
1	X	Y
2	0.100	-2.303
3	0.200	-1.609
4	0.300	-1.204
5	0.400	-0.916
6	0.500	-0.693
7	0.600	-0.511
8	0.700	-0.357
9	0.800	-0.223
10	0.900	-0.105

Figure 1-15. Using the mouse pointer to select a block of data.
Left: Selecting a cell edge. Right: Selecting the block of data
by double-clicking while holding down the Shift key.

Entering Data in a Worksheet

As you type a value in a cell, the characters appear in the formula bar and the active cell. You can complete the entry in several ways.

- Press the Enter key. This moves the selection to the cell below (although you can change the default option so that the selection is not moved). This is the usual way for entering data in cells.
- Press the Enter button  in the formula bar. The cell remains selected. This method is useful if you want to examine a value or formula after entering.

To cancel the entry and revert to the original contents of the cell, press the Cancel button  or the Esc key.

Excel Tip. To enter the same formula or value in a range of cells, select the range of cells, type the value, then press Ctrl + Enter.

Entering Numbers

Excel has a remarkable ability to recognize the type of value that you have entered: a number, a percent, a debit value, as currency, in scientific notation, as a date or time, or even as a fraction. The number will be displayed in the cell in the proper format. Table 1-4 illustrates number formats recognized by Excel.

Table 1-4. Number Formats Recognized by Excel

Type	As Entered at Keyboard	As Displayed in Cell	As Displayed in Formula Bar	As Used in Calculation
Percent	15%	15%	15%	0.15
Scientific	2e-3	2.00E-03	0.002	0.002
Currency	\$50	\$50	50	50
Currency	\$20000	\$20,000	20000	20000
Debit	(5000)	-5000	-5000	-5000
Fraction	2 5/8	2 5/8	2.625	2.625
Date	7/4	4-Jul	7/4/2010*	**
Date***	8/3/28	8/3/2028	8/3/2028	**
Date***	8/3/38	8/3/1938	8/3/1938	**
Time	4:30	4:30	4:30:00 AM	**
Time	16:00	16:00	4:00:00 PM	**
Time	4 p	4:00 PM	4:00:00 PM	**

* Enters current year.

** See Chapter 3 for a discussion of date and time calculations.

*** A 2-digit year in the range 00-29 is assumed to be in the 21st century.

Since the slash character indicates either a date or a fraction, if you enter what you intended to be a fraction, such as 1/3, it will be interpreted as a date, specifically 3-Jan. To prevent Excel from converting the entry to a date, enter a zero and a space before the fraction (0 1/3). The zero indicates that the entry is a number, and the value will appear in the formula bar as 0.333333333333333.

How Excel Stores and Displays Numbers

Excel can accept numbers in the range from $\pm 1\text{E}-307$ to $\pm 9.99999999999999\text{E}+307$.

Excel stores numbers with 15-significant-figure accuracy. These are displayed in the formula bar and used in all calculations, no matter what number formatting has been applied. Thus the fraction 1/3 appears in the formula bar as 0.333333333333333, and π as 3.14159265358979.

Excel switches between floating-point and scientific notation for best display of values. The formula bar can display numbers up to 21 characters, including the decimal point. Thus 1E-19 entered on the keyboard will be displayed as 0.0000000000000000001 (21 characters) in the formula bar, while 1E-20 will appear as 1E-20. Similarly, 1E20 is displayed as 10000000000000000000, while 1E21 appears as 1E21. Since a total of 21 characters can be displayed, the number of significant figures determines the magnitude of a number less than 1 that can be displayed in non-E format in the formula bar. Thus 1.2345E-15 appears as 0.0000000000000012345, while 1.23456E-15 is displayed as 1.23456E-15.

Entering Text

If you enter text characters (any character other than the digits 0 – 9, the decimal point, or the characters +, -, *, /, ^, \$, %) in a cell, Excel will recognize the entry as text. For example, Chestnut Hill MA 02167-3860 is a text entry. Each cell can hold up to 32,767 characters (but only 1,024 will display in a cell). You can distinguish text entries from number entries in the following way: text entries are left-aligned, and numbers are right-aligned. Of course, if you format the alignment of a cell to be right-aligned, its value will be right-aligned whether the value is a number or text.

You can format individual characters in a cell using Bold, Italic, Underlined, etc., or with different fonts, by highlighting the character(s) in the formula bar and then applying the formatting.

***Excel Tip.** Sometimes it is necessary to enter a number or a date as a text value. To do this, begin the entry with a single quote.*

Entering Formulas

Instead of entering a number in a cell, you can enter an equation (called a *formula* in Microsoft Excel) that will calculate and display a result. Usually formulas refer to the contents of other cells by using *cell references*, such as A2, a reference to a cell, or B5:B12, a reference to a range of cells. The value displayed in a cell containing a formula will be automatically updated if values elsewhere in the worksheet are changed. Formulas can contain values, arithmetic operators and other operators, cell references, the wide range of Excel's worksheet functions, and parentheses.

The rules for writing formulas (the *syntax*) are as follows:

- A formula must begin with the equal sign (=).
- The *arithmetic operators* are addition (+), subtraction (-), multiplication (*), division (/) and exponentiation (^). Other types of operator are described in Chapter 3.

- Parentheses are used in the usual algebraic fashion to prevent errors caused by the *hierarchy of arithmetic operations* (multiplication or division is performed before addition or subtraction, for example).

Some examples of simple formulas:

=A1+273.15	Adds 273.15 to the value in cell A1.
=A2^2+13*A2-5	Evaluates the function $x^2 + 13x - 5$, where the value of x is stored in cell A2.
=SUM(B3:B47)	Sums the values contained in cells B3 through B47.
=(-C3+SQRT(C3^2-4*C2*C4))/(2*C2)	Finds one of the roots of the quadratic equation whose coefficients a , b and c are stored in cells C2, C3 and C4, respectively.

Excel formulas are discussed in much greater detail in Chapters 3 and 6.

There are some techniques that you can use for entering worksheet formulas.

- Type formulas in lowercase to facilitate detection of typographical errors. When you enter a formula, Excel converts functions and cell references to uppercase. If you type the formula `=offset(d1,5,1)`, Excel will convert it to `=OFFSET(D1,5,1)` when you enter the formula; but if you type "offset" instead of "offset," Excel won't recognize it and will display the error message `#NAME?`. When you examine the formula, you'll easily see that the incorrect function name remained in lowercase letters.
- Enter cell or range references in formulas by selecting, not by typing. This makes it less likely that you will enter an incorrect reference and also makes entering complicated references (such as external references) much easier.
- If formulas contain terms identical to those used in other cells, you can Copy that part of the formula from the formula bar and Paste it into the new formula.

Excel Tip. *Formulas that return the wrong result because of errors in the hierarchy of calculation are common. When in doubt, use parentheses.*

Editing Cell Entries

When you select a cell that contains an entry, the contents of the cell appear in the formula bar. As soon as you begin to enter a new value, the old value disappears. To make minor editing changes in the old entry, place the mouse pointer in the text in the formula bar at the point where you want to edit the entry. The mouse pointer becomes the vertical insertion-point cursor. You can

now edit the text in the formula bar using the Copy, Cut, Paste or Delete commands or keys. Complete the entry using the Enter button in the formula bar, or by pressing the Enter key on the keyboard.

Alternatively, you can use Excel's Edit Directly In Cell feature: use function key F2 or double-click on the cell to enter edit mode. You can use the right and left arrow keys to move through the formula, or Ctrl+(arrow key) to jump to the next element of the formula, or Ctrl+Shift+(arrow key) to select the next element of the formula.

Excel uses colors to show range references in formulas and the corresponding ranges on the worksheet. When you enter Edit mode, by clicking in the formula bar, double-clicking on the cell, or pressing F2, the precedents (inputs) to the formula will appear in color and the corresponding inputs indicated by similarly colored cell or range borders (blue for the first input, green for the second, and so on). Each of these colored outlines has a handle in the bottom right corner; you can change the range of a formula input by dragging its handle.

***Excel Tip.** To select (highlight) a word or reference for editing, double-click on it.*

The Order in Which Excel Performs Operations in Formulas


If several operators are combined in a single formula, Excel evaluates the formula in the following order: reference operators (colon, space, comma), negation (minus), percent (%), exponentiation (^), multiplication and division (* and /), addition and subtraction (+ and -), concatenation (&), comparison (=, <, >, <=, >=, <>).

If an expression contains operators with the same precedence (multiplication and division or addition and subtraction), Excel evaluates the operators from left to right.

Expressions enclosed in parentheses are evaluated first, no matter where they appear in the formula.

Adding a Text Box

You can add visible comments or other information to a worksheet by typing them into one or more worksheet cells. Another way to add comments, in a much more flexible form, is by using a text box.

To create a text box, click on the Text Box icon  in the Text group in the Insert tab, or click on the Text Box toolbutton if you have added it to the Quick Access Toolbar (see Chapter 23 for instructions on how to customize the Quick Access Toolbar). The mouse pointer will change to a crosshair. Position the crosshair pointer where you want to place the text box, and click and drag to outline it (the text box can be moved and sized later). An empty text box will be displayed with a blinking text cursor. Type the desired text within the box.

Text box input has many features of a simple word processor: you can Cut, Copy or Paste text, make individual portions of text bold, italic or underlined, use different font styles, etc., as shown in Figure 1-16. The text within the box can be formatted with the Alignment toolbuttons or with the Alignment command.

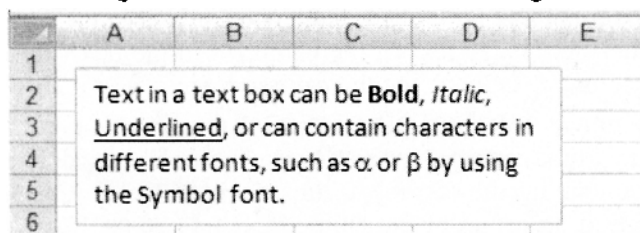


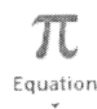
Figure 1-16. A text box.

To move a text box, click on it to select it, place the mouse pointer on the border of the text box and drag it to its new position. To resize a text box, select it (white handles will appear), then place the mouse pointer on one of the handles and click and drag to move the border of the box. If you hold down the Ctrl key while dragging, you make a copy of the text box (a small plus sign appears beside the mouse pointer); if you hold down the Alt key, the text box will align with the cell gridlines; if you hold down the Shift key, the text box can only be dragged in either horizontal or vertical alignment with its original position.

Entering an Equation in a Text Box

In addition to the Equation Editor (see "Using the Equation Editor" in Chapter 2), Excel 2007/2010 provides the Equation Tool that allows you to write and edit equations inside a text box on a worksheet.

The Equation button, shown here on the right, is not active until you use the Text Box button to draw a text box. When you click on the Equation button (located in the Insert tab of the Ribbon in the Symbols group), the text "Type equation here" is displayed in the text box, and the Design tab with Equation Tools is displayed.



The Equation Tools Design tab contains icons for inserting a wide range of equation elements. Or you can press the drop-down button below the Equation button to choose from a menu of built-in equations: area of a circle, binomial theorem, expansion of a sum, Fourier series, Pythagorean theorem, quadratic formula, Taylor expansion and two trigonometric equations.

Once the Equation button is made active, you don't need to draw text boxes for additional equations – just press the Equation button and a new text box will be created, containing the text "Type equation here".

Entering a Cell Comment

You can attach a *cell comment* to a cell, for documentation purposes. A comment appears on the worksheet in a small box similar to a Screen Tip. A small red triangle in the upper right corner of the cell indicates that the cell contains a comment. When the mouse pointer is moved over a cell that contains a cell comment, the cell comment appears.

To add a comment to a cell, click on New Comment in the Comments group of the Review tab. Enter the text of the comment in the box (Figure 1-17). To exit, simply click on any cell outside the comment box.

To edit a comment, select the cell containing the comment, then click on Edit Comment in the Comments group of the Review tab. To delete a comment, select the cell containing the comment, then click on Delete Comment, or click on Clear in the Editing group of the Home tab, and choose Comments from the submenu.

To turn display of comments and/or comment indicators on or off, click on the Office Button, press the Excel Options button, click on Advanced in the list of options, scroll down to the Display group, and press the appropriate button in the Comments category.

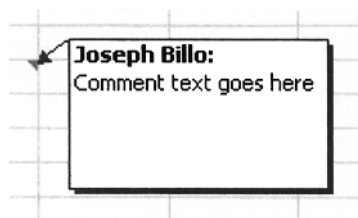


Figure 1-17. A cell comment.

Opening, Closing and Saving Documents

Commands for managing documents are in the File tab of the Ribbon (Excel 2010) or in the Office Button window (Excel 2007). Clicking on the Excel 2007 Office Button displays the Office Button window, shown in Figure 1-3, that contains the commands that were in the Excel 2003 **File** menu: **New**, **Open**, **Save**, **Save As**, **Print**, **Close**, and **Exit**, plus a list of recently used documents.

Opening or Creating Workbooks

Use the Open command to locate and open an existing document; or New to create a new document. The New dialog box gives you a choice of opening either a new worksheet or any of the built-in or user-created template sheets.

To open an existing workbook or worksheet from the desktop, simply double-click on it. This will open the document (and will start Excel as well if it isn't already running). If you start Excel first, it will open a new blank workbook.

The List of Recently Used Files

In Excel 2003, a list of recently used files was displayed at the bottom of the File menu. In Excel 2007/2010, the list of recent files has an added feature: you can "pin" a file to the list so that it remains even after many other files have been opened.

To keep a file pinned in the recently used files list, click on the Office Button to display the list of Recent Documents (Excel 2007) or click on the File tab and then click the Recent button to display the list of Recent Workbooks (Excel 2010). Click the pin icon next to the filename; click again to unpin the file.

To clear all unpinned files from the list of recently used files (Excel 2010 only), click on the File tab and then click the Recent button to display the list of Recent Workbooks. Right-click any file in the list and select Clear Unpinned Items, then press "Yes".

Using Close or Exit

You can close a document either with the Close button in the File tab (Excel 2010) or the Office Button window (Excel 2007) or by using the Close button on the document title bar. You will be asked if you want to save changes.

When you use the Exit button in the File tab (Excel 2010) or the Office Button window (Excel 2007), you close all open documents (you will be asked if you want to save changes) and then exit from Excel.

Using Save or Save As...

When you save a newly created workbook, the Save dialog box will prompt you to assign a name to the document. Excel 2007/2010 automatically appends a four-letter filename extension (e.g., .xlsx) to identify the file format type.

A document name can contain up to 218 characters (the name includes the complete path to the file, including drive letter, server name, folder path, file name and the filename extension). File names can include spaces but not any of the following characters: slash (/), backslash (\), greater-than sign (>), less-than sign (<), asterisk (*), question mark (?), quotation mark ("), pipe symbol (|),

colon (:), semicolon (;). Sheet names can include most of the preceding characters, but can't include question mark (?), colon (:), backslash (\) or asterisk (*) (wildcard characters or file delimiters).

You can use Save As... to create a backup copy of a workbook by giving the copy a different name.

To Save a File for Use in Excel 2003

If you transmit an Excel 2007/2010 workbook to an Excel 2003 user, you may want to send it in Excel 2003 format, since some users of Excel 2003 may be unable to open documents in Excel 2007 format.

Excel 2010. Click on Save As in the File tab of the Ribbon. In the Save As dialog box, choose "Excel 97-2003 Workbook (*.xls)" in the Save As Type list box.

Excel 2007. Click on the Microsoft Office Button, and then click Save As. In the list of file types, choose Excel 97-2003 Workbook (Excel 2007).

Excel features that are specific to Excel 2007/2010 (for example, 16,384 columns) will not be displayed when the workbook is opened in Excel 2003, but they will still be available even if the workbook is edited, saved in Excel 2003 format, and then reopened in Excel 2007/2010.

If you want to save all Excel workbooks in Excel 97-2003 format without going through the above, click on Options in the File tab of the Ribbon (Excel 2010) or click on Excel Options in the Office Button window (Excel 2007) to display the Excel Options window. Click on Save in the list on the left side of the window. In the Save Workbooks category, click on the Save Files In This Format drop-down button to display the list of file formats, and choose Excel 97-2003 Workbook. Now you can just choose Save and your document will be saved in the old format.

Editing a Worksheet

Most commands for editing and formatting a worksheet are located in the Home tab.

Inserting or Deleting Rows or Columns

In Excel 2003, the commands for deleting cells, rows or columns were located in the **Edit** menu, while the corresponding commands for inserting were located in the **Insert** menu. Excel 2007 located all of these commands in a more logical manner, in the same Home tab of the Ribbon.

To insert an entire column of blank cells, click on a column header (the gray rectangle at the top of the column) to select (highlight) an entire column. Then

click on the Insert icon in the Cells group in the Home tab. A new column will be inserted to the left of the column you selected. Insert a new row in a similar way; the new row will be inserted to the left of the selected row. Multiple rows or columns can be inserted in a similar fashion, by selecting as many rows or columns as you want to insert.

If you click on the drop-down button at the bottom of the Insert icon to display the Insert submenu, illustrated in Figure 1-18 Left, you can choose to insert cells, rows, columns, or a new worksheet. Deleting cells, rows, columns or a worksheet is done in a similar way, using the Delete icon (Figure 1-18 Right).

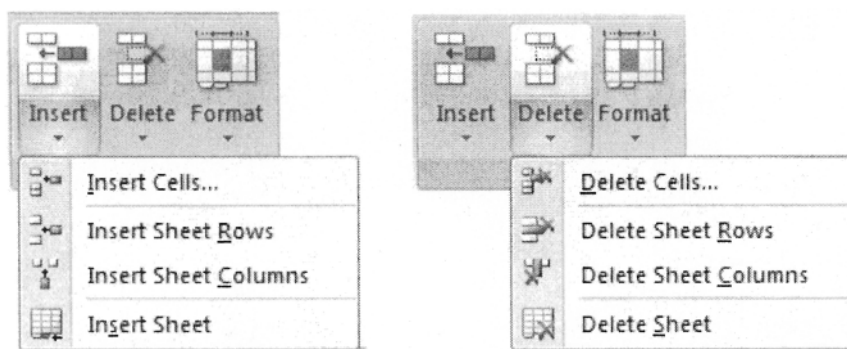


Figure 1-18. The Insert (left) and Delete (right) icons

To insert additional cells within a row or column, select the cell range above or to the left of which you want to insert cells and click on Insert Cells... in the Insert menu (Figure 1-18 Left). Excel usually makes a pretty good guess whether the cells should be shifted to the right or down to make the proper insertion, but always check to make sure. Then click OK in the dialog box (Figure 1-19). Deleting cells is done in a similar manner.

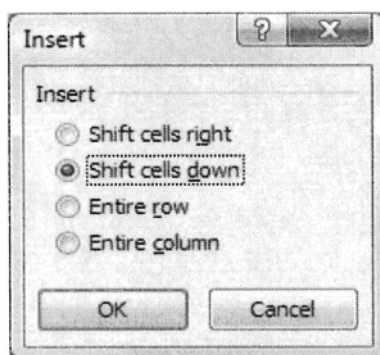


Figure 1-19. The Insert dialog box.

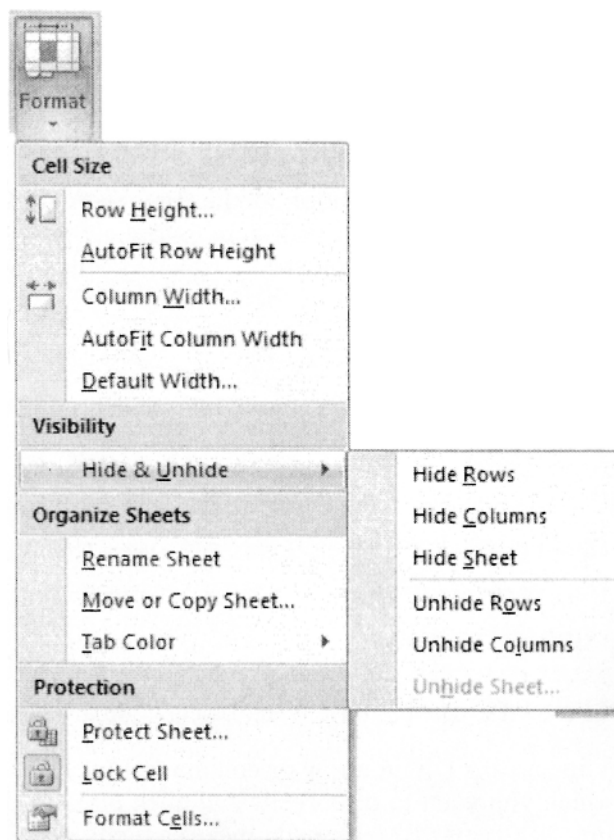


Figure 1-20. The Format Cells menu, showing the Hide/Unhide submenu.

Hiding Rows or Columns

If you have a spreadsheet with many columns or rows of intermediate formulas that lead to a final result, you can hide these intermediate calculations, in order to make the spreadsheet less cluttered. First, select the rows or columns to be hidden. Click on Format in the Cells group in the Home tab of the Ribbon, click on Hide & Unhide in the drop-down menu, and choose Hide Rows or Hide Columns from the submenu (Figure 1-20).

Using Cut, Copy and Paste

Single cells, ranges of cells, or whole rows or columns can be copied or cut from the worksheet and inserted into other locations. In general the destination will be the same size as the range of copied or cut cells, although the contents of a single cell can be copied into a range.

First, select the cell or range that you wish to copy or cut. Then click on Copy or Cut in the Clipboard group of the Home tab, or press Ctrl+C (Copy) or Ctrl+X (Cut). A *marquee* (a dashed line) will appear around the selected cells and a copy of the cells will be placed on the Clipboard. Next, select the destination cell or range. You can now transfer the copy to the destination by clicking on the Paste button in the Clipboard group, or by pressing Ctrl +V (Paste).

Excel Tip. When performing a Paste operation, instead of selecting a destination range that is the same size as the copied or cut range, you should always select the single cell that is the upper left corner of the destination range.

You can also copy or cut text in the formula bar and paste it in a worksheet cell. Select the text to be copied or cut, then copy or cut as described previously. Complete the operation by clicking the Enter button in the formula bar. Then paste in the desired cell.

Using Paste Special...

When you copy a cell and then paste it, Excel transfers the cell's contents, format and comment, if present. You can choose to transfer only some of these cell attributes by using Paste Special... in the drop-down menu of the Paste button. Paste Special permits you to paste only formulas, formats or comments. In addition, you can convert formulas to constants by choosing Values.



Figure 1-21. The Paste menu, showing the Paste Special... command.

To display the Paste Special dialog box, you must first copy cell contents. After copying, select a cell or range in which you want the copied values to be placed. In the Clipboard group in the Home tab, click on the drop-down arrow of the Paste icon to display the Paste options (Figure 1-21) and click on Paste Special... to display the Paste Special dialog box (Figure 1-22).

If you press one of the Operation buttons in the Paste Special dialog box, the value in the destination cell will be added to, subtracted from, multiplied by, or divided by the value in the copied cell.

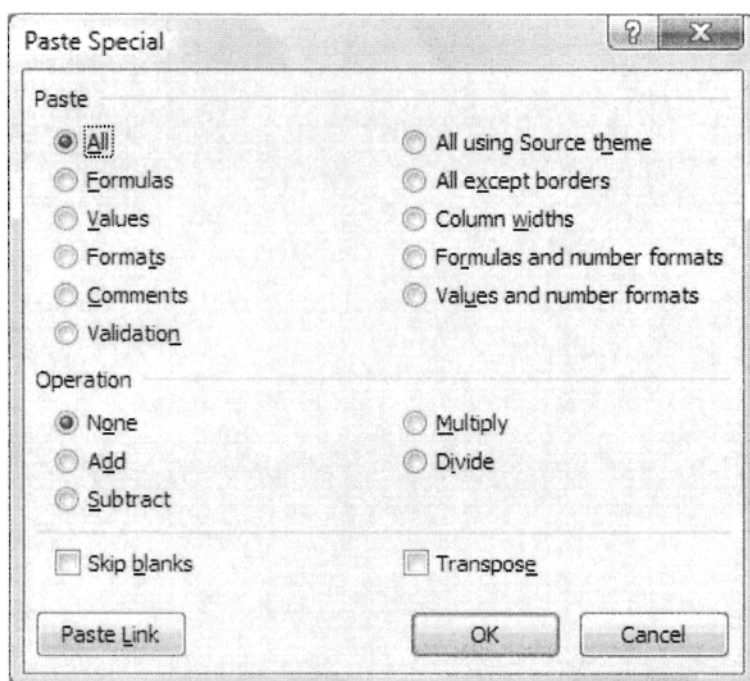


Figure 1-22. The Paste Special dialog box.

If the cell in either the source or the destination contains a formula, then the formula will be enclosed in parentheses and joined to the contents of the destination cell by the arithmetic operator. You may wish to experiment to see exactly how this works. Relative references in the source will be changed in the same way as in a normal Paste operation. You can also Copy cells that contain formulas and press both the Values button and one of the Operation buttons to either Add, Subtract, Multiply or Divide.

If you check the Skip Blanks check box, only non-blank cells in the source will be pasted.

Using Paste Special to Transpose Rows and Columns

If values in the source range are arranged in rows, you can convert the data to column format, or vice versa, as shown in Figure 1-23.

First, copy the cells, then select a cell or range in which you want the transposed values to be placed. Display the Paste Special dialog box, check the Transpose box, then press OK.

	A	B	C	D	F	G
1	pH	6.00	6.20	etc.	pH	Absorbance
2	Absorbance	0.903	0.861	etc.	6.00	0.903
					6.20	0.861
					etc.	etc.

Figure 1-23. Rows and columns transposed.

(Left) Before using and (Right) after using Paste Special (Transpose).

One limitation of Transpose: The copied cells cannot be pasted over any part of the source range.

Copying and Pasting a Picture of Cells

In Excel 2003, if you hold down the Shift key while selecting the **Edit** menu, the **Copy** command becomes **Copy Picture....** This feature is now found in the Paste menu in the Clipboard group in the Home tab of the Ribbon. Choose the "As Picture" command from the submenu to display the Copy as Picture dialog box (Figure 1-24). You can choose the appearance and format of the copied cells.

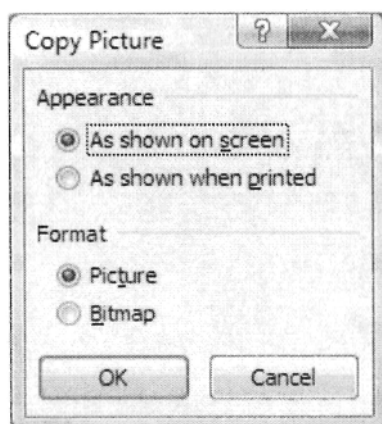



Figure 1-24. The Copy Picture dialog box.

Using Clear

Pressing the Clear button in the Editing group in the Home tab of the Ribbon displays a submenu with Clear All, Clear Formats, Clear Contents, and Clear Comments. If you choose Clear Formats from the submenu, for example, you can remove only formats from selected cells. Choosing Clear Contents will delete the cell value but not the format.

Excel Tip. You can add the Clear All toolbutton  to the Quick Access Toolbar. See Chapter 23 for instructions on how to customize the Quick Access Toolbar.

Copy, Cut or Paste Using Drag-and-Drop Editing

You can also copy, cut or paste using Excel's "Drag-and-Drop" method. With this method you cut and paste or copy and paste a selection by using only the mouse pointer.

To use this method, Drag and Drop must be enabled. Click on the File tab and press the Options button (Excel 2010) or click on the Office Button and press the Excel Options button (Excel 2007). Press the Advanced button and check the "Enable fill handle and cell drag-and-drop" box in the Editing Options group.

To cut and paste by Using Drag-and-Drop, select the range of cells to be moved. Position the mouse pointer over a border of the selection (top, bottom or side). The mouse pointer will change to an arrow. Drag the selection toward the desired position. The border of the selection will be indicated as you drag it (Figure 1-25). Finally, position the selection as desired and release the mouse button.

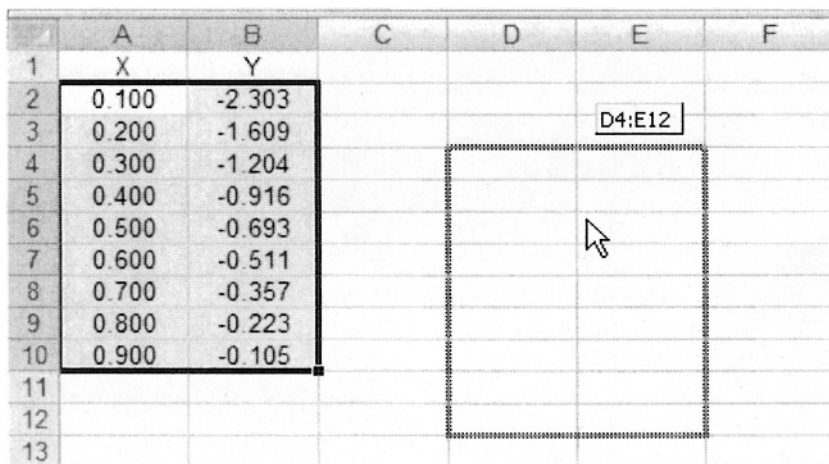
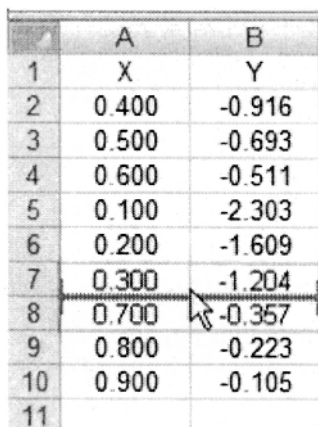


Figure 1-25. Cutting and Pasting cells using Drag-and-Drop editing.

To copy the selection instead of cutting, hold down Ctrl while dragging. A small plus sign will appear near the arrow pointer.

To insert the selection, hold down the Shift key while dragging. The insertion point of the selection will be indicated by a horizontal or vertical bar as you drag (Figure 1-26).



	A	B
1	X	Y
2	0.400	-0.916
3	0.500	-0.693
4	0.600	-0.511
5	0.100	-2.303
6	0.200	-1.609
7	0.300	-1.204
8	0.700	-0.357
9	0.800	-0.223
10	0.900	-0.105
11		

Figure 1-26. Inserting cells using Shift+ Drag-and-Drop.

Duplicating Values or Formulas in a Range of Cells

To copy a value or formula in one cell into a range of cells, highlight the source cell whose value you want to duplicate, plus the destination cells below or to the right of where you want the value duplicated. Then click on the Fill button in the Editing group of the Home ribbon and choose Down, Right, Up or Left from the submenu.

If the cell contains a number or a text label, the value will be duplicated in the rest of the cells. If the cell contains a formula, the formula will be copied into the selected cells, except that Microsoft Excel uses *relative referencing* when formulas are copied. For example, if cell A2 contains the formula `=A1+1`, and Fill Down is used to copy the formula into a range of cells below cell A2, the formula copied into cell A3 will be `=A2+1`, and so on.

Cell references are adjusted when you insert or delete rows or columns, too. If you insert a new column to the left of column A in the preceding example, the formula in cell B2, which used to be cell A2, will read `=B1+1`.

To use the Across Worksheets option in the Fill submenu, you must select multiple sheets beforehand (see "Selecting Multiple Worksheets: [Group] Mode" earlier in this chapter). When you choose Across Worksheets from the submenu, the Fill Across Worksheets dialog box (Figure 1-27) will appear; you can choose to fill Contents, Formats or both.

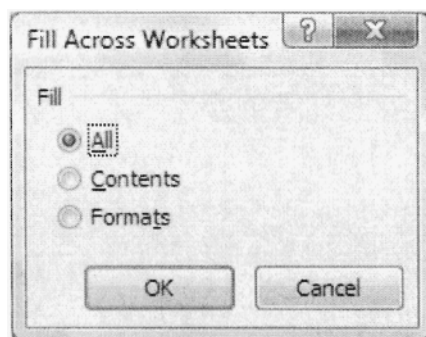


Figure 1-27. The Fill Across Worksheets dialog box.

Absolute, Relative and Mixed References

A relative reference such as A1, becomes A2, A3, etc., as you Fill Down a formula into cells below the original formula. To keep the address of a cell fixed when you use the Fill commands, precede both its letter and number designation by a dollar sign (e.g., \$A\$1). An *absolute reference* such as \$A\$1 remains \$A\$1 as you Fill Down. You will find this absolute cell addressing useful if you wish to use a constant in a formula.

Occasionally it is useful to use *mixed references*. A mixed reference is a reference such as A\$1 or \$A1; the row or the column designation, respectively, will remain constant when you Fill Down or Fill Right.

	A	B
1	X	Y
2	0.100	-2.303
3	0.200	-1.609
4	0.300	-1.204
5	0.400	-0.916
6	0.500	-0.693
7	0.600	-0.511
8	0.700	-0.357
9	0.800	-0.223
10	0.900	-0.105

Figure 1-28. Two views of the same worksheet, showing formulas (left) and values (right). The formula in cell A4 has been filled down into A5:A12.

Relative References When Using Copy or Cut

If you copy and paste a formula, its references will be transferred using relative referencing. Thus, if you copy the formula `=A1+1` from cell A2 and paste it in cell A10, the formula in cell A10 will be `=A9+1`. If you copy the formula from cell A2 and paste it in cell C2, the formula in cell C2 will be `=C1+1`. (This is probably not the formula you want.)

On the other hand, if you cut the formula in cell A2 and paste it anywhere in the worksheet, it will still be the formula `=A1+1`.

Thus the difference (with respect to cell references) between copy and paste and cut and paste is that cut adjusts relative references so that they still refer to the original cells, while copy does not adjust relative references, with the result that they refer to different cells.

The best way to copy a formula to a different row and column without altering relative references is to copy it from the formula bar, click the Enter box to complete the copy operation, and then paste in the destination cell.

Using Autofill to Fill Down or Fill Right

Excel's AutoFill feature lets you Fill Down or Fill Right simply by using the mouse pointer. To use AutoFill to Fill Down a formula in a cell, select a cell by clicking on it. You will see a small black square on the lower right corner of the selected cell. Position the mouse pointer exactly over the small black square (the AutoFill handle or simply the *fill handle*). The mouse pointer becomes a small black cross. Click and drag in the usual way to select a range of cells. If the cell contains a formula, it will be copied into the rest of the range just as if you had used Fill Down or Fill Right; relative references in the formula will be adjusted appropriately. If the cell contains a number or a text label, the value will be duplicated in the rest of the cells. With AutoFill you can also Fill Up and Fill Left.

Excel Tip. To Fill Down a value or formula to the same row as an adjacent block of values, select the source cell and double-click on the fill handle.

Using Autofill to Create a Series

AutoFill provides an additional feature: you can use it to create a series. There are several ways to create a series. For example, to create the series of integers 1, 2, 3, . . . in column A, you can either:

- Enter the value 1 in cell A1, enter the formula `=A1+1` in cell A2, and then use Fill Down to create the series. You can then use Copy and Paste Special (Values) to convert the formulas to values.

- Use Series... from the Fill submenu of the Editing group in the Home tab. With Series (Figure 1-29) you enter the start value, the end value and the increment.

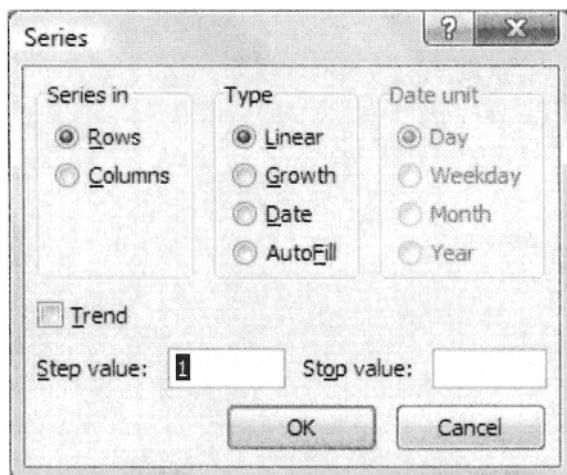


Figure 1-29. The Series dialog box.

- Use AutoFill. This is by far the simplest and most convenient method. If you select a cell containing a number formatted as a date or time, or a text label containing a number, and use AutoFill to fill a range of cells, AutoFill creates a series using the selected cell as the starting value. The value of the series being entered in the active cell is displayed in a Screen Tip box as you drag the AutoFill handle.

If you select a cell containing a date, Excel will create a date series. For example, if you select a cell containing 29-Jan and use AutoFill to Fill Right, the series 29-Jan, 30-Jan, 31-Jan, 1-Feb, 2-Feb... will be created. A cell containing the text "Sunday" will produce the series Sunday, Monday, Tuesday,...; "Sample 1" produces Sample 1, Sample 2, Sample 3,....

If you select two cells, AutoFill will create a series based on the cells you select, as shown in the second and third examples of Figure 1-30.

Excel Tip. To prevent AutoFill from creating a series, hold down the Ctrl key as you position the black cross pointer over the fill handle. A small plus sign will appear to the right of the black cross pointer. Click and drag in the usual way to fill rather than create a series.

	A
1	January

	A
1	1
2	3

	A
1	Sample 1
2	Experimental
3	Calculated
4	

	A
1	January
2	February
3	March
4	April
5	May
6	June
7	July
8	August
9	September
10	October
11	November
12	December

	A
1	1
2	3
3	5
4	7
5	9
6	11
7	13
8	15
9	17
10	19
11	21
12	23

	A
1	Sample 1
2	Experimental
3	Calculated
4	
5	Sample 2
6	Experimental
7	Calculated
8	
9	Sample 3
10	Experimental
11	Calculated
12	

Figure 1-30. Some examples of the use of AutoFill to produce a series. (Above) Cells before using AutoFill. (Below) Series produced by AutoFill.

The AutoFill Shortcut Menu

If you use the right mouse button to drag down the Fill Handle to create a date series, a shortcut menu will be displayed when you release the mouse button (Figure 1-31).

You can then choose to create a series of consecutive dates (Fill Days), a series consisting only of weekdays (Fill Weekdays), a series consisting of a single date in each month (Fill Months) or a series consisting of a single date in each year (Fill Years).

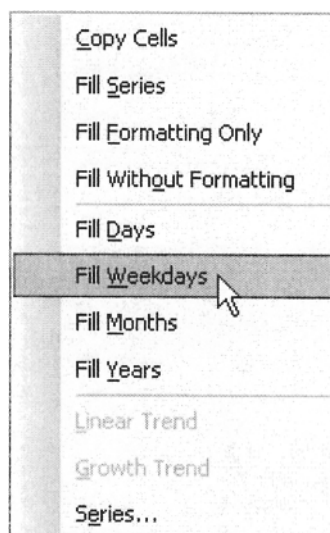


Figure 1-31. The AutoFill shortcut menu.

Formatting Worksheets

You can use commands in the Home tab of the Ribbon to change and improve the appearance of the worksheet and to modify the way number values are displayed.

Using Column Width... and Row Height...

When Excel creates a blank worksheet, all rows are the same default height, all columns the same width. You can change the width of columns, or the height of rows, to improve the appearance of a worksheet or to eliminate wasted space so that you can get more information on a single page. You can also hide rows or columns by reducing their height or width to zero. The data they contain will still be still there, but it will be hidden.

To change the width of a column or the height of a row, click on the Format button in the Cells group in the Home tab of the Ribbon, then choose from the Cell Size group in the drop-down menu. You can enter a value for the height of a row or width of a column (one width unit corresponds to the width of one character of the current font). Column widths and row heights can also be adjusted by choosing the appropriate Autofit option from the submenu. You can adjust the column width or row height to fit a single selected cell or a range of cells, or to be the best fit to the widest entry in a whole column or row.

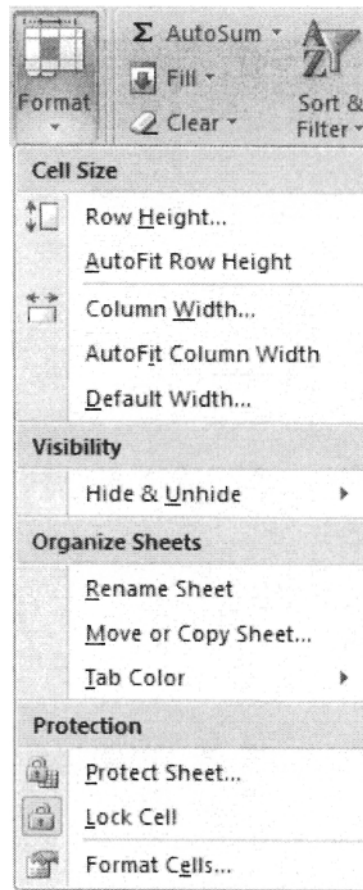



Figure 1-32. The Format menu.

You can also change the column width by using the mouse pointer. Place the cursor on the separator bar between column headings, on the right of the column whose width you want to change. The cursor changes to a double-headed arrow: . Click the mouse button and drag to the right or left to change column width. The column width is displayed in an "InfoBox" as you drag the separator bar.

Excel Tip. To adjust several columns at a time to the same width, select the columns and then perform the column width adjustment with the mouse pointer on any of the selected columns. When you release the mouse button, all the columns will have the adjusted width. You can also get a "best fit" simply by double-clicking on the row or column separator bar. To adjust several rows or columns at once, select the columns and double-click on any row or column separator bar.

Formatting Cells

Formatting allows you to change the appearance of values in cells. You can format cells either by using icons in the Home tab of the Ribbon, by using toolbuttons on the Quick Access Toolbar, by using the Mini Toolbar, or by clicking on the Format Cells... command to display the Format Cells dialog box.

The Mini Toolbar

The Mini Toolbar is a formatting toolbar that can be used to format text. It appears automatically when you select (highlight) the contents of a cell, either in the cell or in the Formula Bar. A faint image of the Mini Toolbar will appear above the text. If you move the mouse toward the Mini Toolbar, the image intensifies; if you move the mouse away, it fades. If you do neither, it disappears after a few seconds.

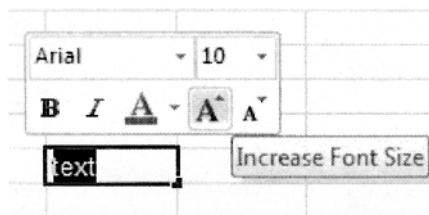


Figure 1-33. The Mini Toolbar appears when formatting text in a cell.

A different Mini Toolbar appears when you select text in a chart.

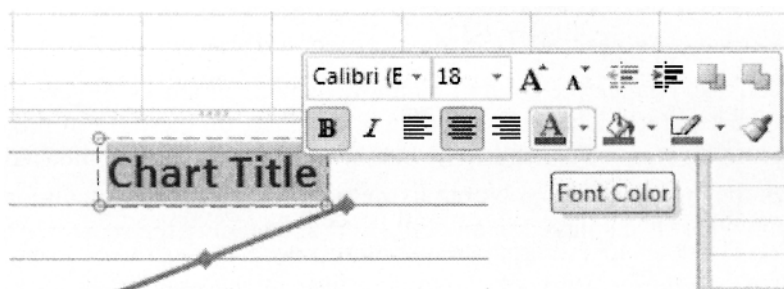


Figure 1-34. The Mini Toolbar appears when formatting text in a chart.

In Excel 2010 only, if you click on the drop-down list of fonts or font sizes and move the mouse downwards to hover over a font or size from the list, the text in the cell will temporarily display the formatting.

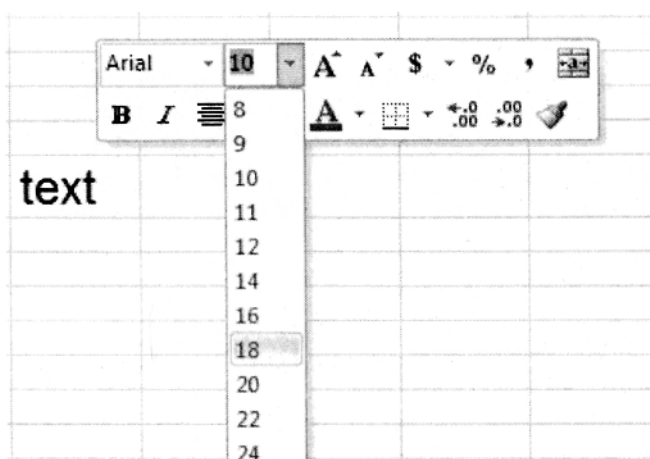


Figure 1-35. Using the Mini Toolbar to change font size.


If you right-click on an object – a cell, textbox, row, column, etc. – you will display a shortcut menu with commands appropriate for that object, plus a Mini Toolbar.

To disable the Mini Toolbar in Excel 2010, click on the File tab and click on the Options button. Click on the General options button and uncheck the "Show Mini Toolbar On Selection" box. For Excel 2007, click on the Office Button and click on the Excel Options button. Click on the Popular options button and uncheck the "Show Mini Toolbar On Selection" box.

The Format Cells Dialog Box

The Format Cells dialog box is identical to the dialog box in Excel 2003. To display the dialog box, click on the Format button in the Cells group in the Home tab of the Ribbon. Click on Format Cells in the drop-down menu (Figure 1-32).

The Format Cells dialog box has Font, Alignment and Number tabs to format values within cells, Border and Patterns tabs to format cells, and the Protection tab to set the security of values within cells. The possibilities for Font, Alignment, Border and Patterns are many and varied, and only some of these possibilities will be discussed here. Number formatting is important for scientific spreadsheets; it is discussed in detail in a following section.

Excel Tip. Click on the small button  at the bottom right of the Font, Alignment or Number groups in the Home tab of the Ribbon to display the complete Format Cells dialog box.

Using Alignment

The Alignment tab in the Format Cells dialog box provides a number of formatting options for the alignment of values in cells. There are option buttons for both horizontal and vertical alignment (Figure 1-36). The Vertical orientation options are useful if you want to add a text label to a narrow column. The Orientation "inclinometer" allows you to display text on any angle.

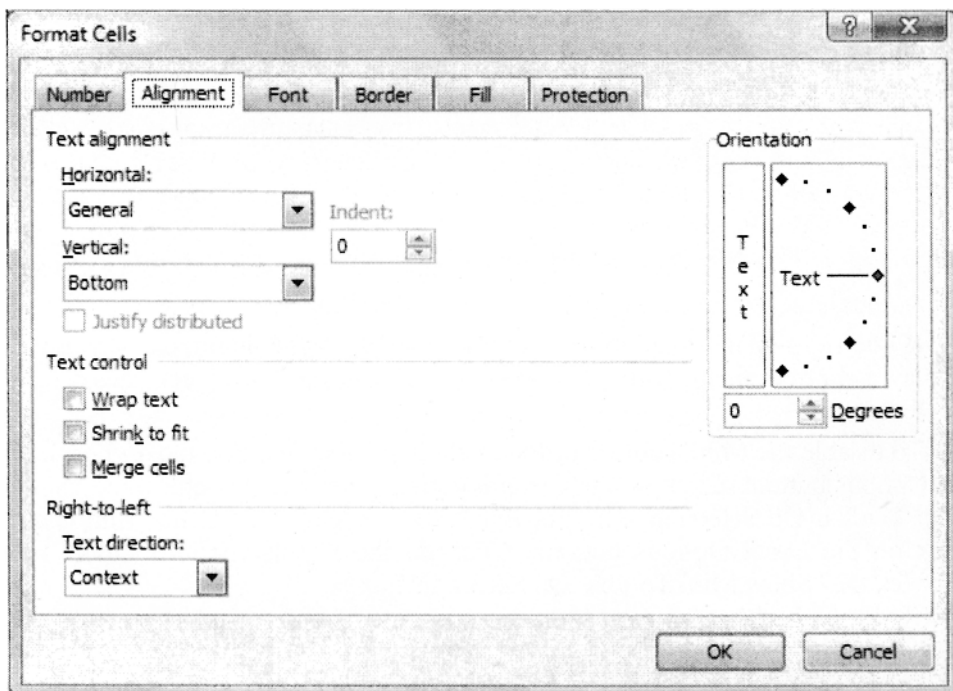





Figure 1-36. The Alignment dialog box.

To use the Merge Cells option, first select the range of cells to be merged, check the Merge Cells box and press OK. You can also use the Merge and Center button in the Alignment group in the Home tab of the Ribbon, or customize the Quick Access Toolbar with the Merge and Center toolbutton (see Chapter 23 for instructions on how to customize the Quick Access Toolbar).

	A	B	C	D	E
1	Centered Across Selected Columns				
2					

Figure 1-37. Using Merge and Center.

For the most common horizontal alignment options you can use the alignment toolbuttons    in the Alignment group in the Home tab of the Ribbon to align text in cells left, centered or right, respectively.

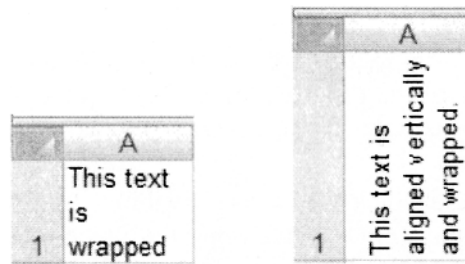


Figure 1-38. Examples of using Wrap Text.

You can also format a text entry in a cell so that the text wraps and is displayed in more than one line (Figure 1-38), by checking the Wrap Text box in the Format Cells dialog box. Excel breaks the text at a space character. Text can be aligned vertically and wrapped.

If you select text in a text box, the Alignment button is not active. To change the alignment of text in a text box, you must press the Orientation button in the Alignment group. Only vertical orientations are available.

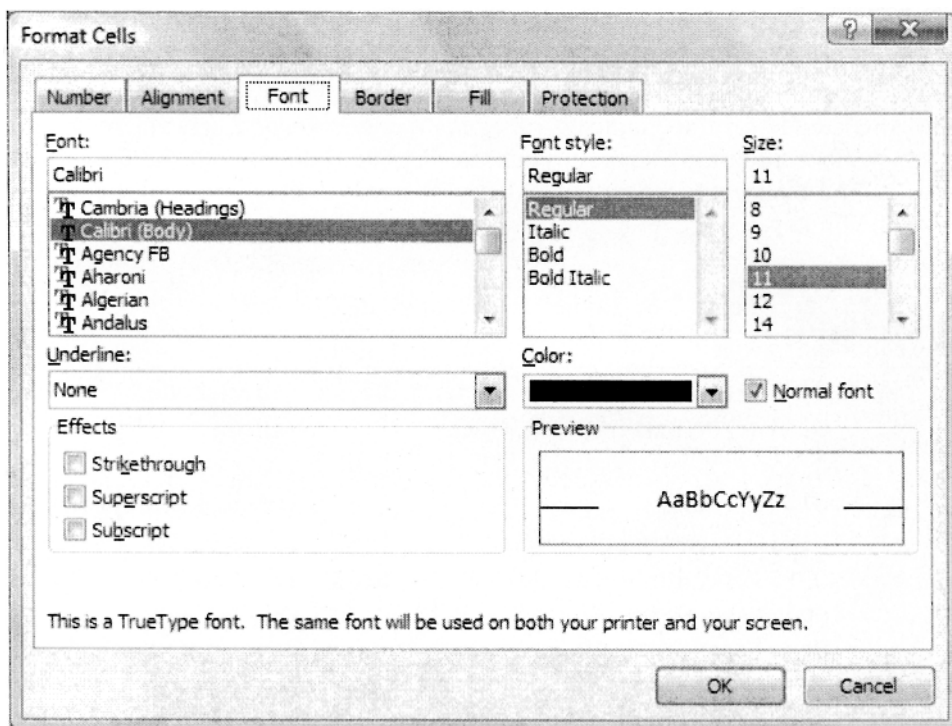


Figure 1-39. The Font dialog box.

Using Font

The Font tab (Figure 1-39) in the Format Cells dialog box allows you to format cells in any of the installed fonts. In addition, you can format individual characters in various font styles or sizes, or as strikethrough, superscript or subscript characters.

You can also use Greek letters, as shown in the text box example in Figure 1-16, by formatting the Roman letter using the Symbol font. Of course, you must know the correspondence between Roman and Greek letters: The Roman S becomes the Greek Σ , for example.

The Alternate Character Set

You can enter symbols that are in the so-called *alternate character set*; an example is shown in Figure 1-40. The characters produced may be different for each different font.

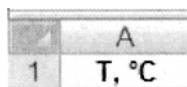


Figure 1-40. A special character (°) typed by using the alternate character set.

The characters are obtained by holding down the Alt key and typing the four-digit ASCII code for the character, *using the numeric keypad*. (If you're using a laptop without a numeric keypad, you'll need to hold down both the Fn and the Alt keys and then press the keys labeled with small digits 1 – 9, color-coded to match the Fn key.)

Table 1-5. Some Useful Alternate Characters

symbol	4-digit code	symbol	4-digit code
€	0128 (Euro)	β	0223 (Greek beta)
£	0163 (Pound)	μ	0181 (Greek mu)
¥	0165 (Yen)	Å	0197 (Ångstrom)
•	0149 (bullet)		0160 (unbreakable space)
•	0183 (centered dot)	°	0186 (superscript)
×	0215 (multiply)	¹	0183 (superscript)
÷	0247 (divide)	²	0178 (superscript)
±	0177 (plus or minus)	³	0179 (superscript)
°	0176 (degree)	—	0151 (em dash)

If you use a different font, you'll have to experiment to see what alternate characters are produced.

The range of useful characters obtainable in this way is rather limited. Table 1-5 shows some useful characters obtained using the Arial font. The complete set of alternate characters is listed in Appendix J.

Entering Subscripts and Superscripts

You can enter subscripts and superscripts in text, as in Figure 1-41. First, highlight the characters to be subscripted or superscripted, either in the formula bar or directly in the cell. Choose the Font tab in the Format Cells dialog box, check the Subscript or Superscript check box (see Figure 1-39), press the OK button, and then enter the text by pressing the Enter key or the Enter button.

	A
1	$C_{12}H_{22}O_{11}$
2	$BaCl_2 \cdot 2H_2O$
3	$H_2SO_4 + 2NaOH == Na_2SO_4 + 2H_2O$

Figure 1-41. Subscripts in Excel.

Using Border and Patterns

The Border tab in the Format Cells dialog box allows you to place a border around one or more sides of a selected cell or range. This is useful if you want to emphasize comments, instructions or values. The Patterns tab is used to change the background color or pattern of cells.


BOSTON COLLEGE				DATE	6/5/1996	
OFFICE OF THE UNIVERSITY REGISTRAR				ACADEMIC YEAR	1996	
CHESTNUT HILL, MASSACHUSETTS 02167				SEMESTER	96S	
COURSE		CH 222 01 INTRO/INORGANIC CHEM				
INSTRUCTOR		BILLO, E JOSEPH				
MEETING PLACE						
STUDENT'S NAME	ID NUMBER	SCHOOL	CLASS	MAJOR	CREDIT	GRADE

Figure 1-42. Using Border to create a custom report form.

The Border option is often used to underline headings, or in a sheet in which the gridlines have been removed, to create a custom form. Figure 1-42 shows a portion of a sheet produced in this way. To remove the existing gridlines, click on Options in the Office Button window or in the File tab, click on Advanced, and in the "Display options for this worksheet" group, and uncheck the Show Gridlines box.

The built-in template sheets provided with Excel (click on New in the File tab in Excel 2010 or click on New in the Office Button window in Excel 2007) are good examples of the use of Border and Patterns to create custom forms.

Using the Format Painter Toolbutton

The Format Painter button in the Clipboard group in the Home tab of the Ribbon, or the Format painter toolbutton , copies and pastes formats from one cell or range to another cell or range. To use it, do the following: Select the cell or range with the desired format(s), click the Format Painter toolbutton (this copies the formats), and click on a cell or drag across a range of cells to paste the format(s).

***Excel Tip.** To use the Format Painter button to "paint" a format on a series of non-adjacent cells or ranges, select the cell with the desired format, and then double-click on the Format Painter button. This will keep the button in the "pressed" position, allowing you to click on several cells or ranges to paste the format. When you're done, click once on the button to return it to the "unpressed" state.*

Number Formatting

The formatting described in the preceding sections — bold text, italic text, alignment of text, adjusting column widths, etc. — is sometimes referred to as *stylistic formatting*. In addition, it is possible to change the way number values are displayed in cells. This type of formatting, called *number formatting*, is described in the following sections.

Using the Number Formatting Toolbuttons

You can also format number values in cells by using the number formatting toolbuttons shown following.





Increases the number of decimal places.



Decreases the number of decimal places.



Formats the number in percent style, with no decimal places.

-  Formats the number in currency style, with two decimal places.
-  Formats a number with commas and two decimal places.

Excel Tip. There isn't a toolbutton to format number values in scientific format. You can apply scientific format conveniently by using the shortcut key sequence `Ctrl+Shift+^`. See Appendix E for a complete list of shortcut keys.

Using Excel's Built-In Number Formats

To change the way a number is displayed in a cell, click on the drop-down list box button (labeled "General") at the top of the Number group in the Home tab of the Ribbon. The list, shown in Figure 1-43, displays most of the available number format categories — Number, Currency, Date, Time, Percentage, Scientific, etc.

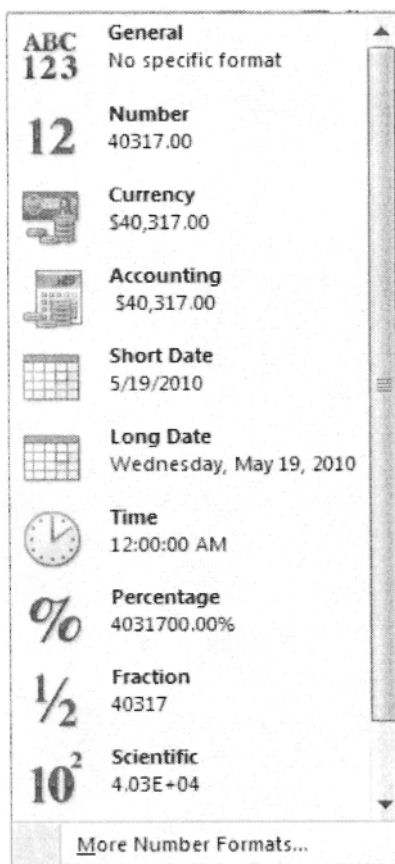


Figure 1-43. The Number Format drop-down menu.

For example, selecting a cell and then choosing Number from the list of categories will display the value in the cell to two decimal places (the default); you can change the number of displayed decimal places using the Decimal Places box. You can also display values as percentages or in exponential notation, for example.

Another route to number formatting is to click on the Format button in the Cells group in the Home tab of the Ribbon and then click on Format Cells in the drop-down menu (Figure 1-32). Click on the Number tab to display the Number Format dialog box (Figure 1-44). The number formats in the Category list correspond to the formats shown in Figure 1-43.

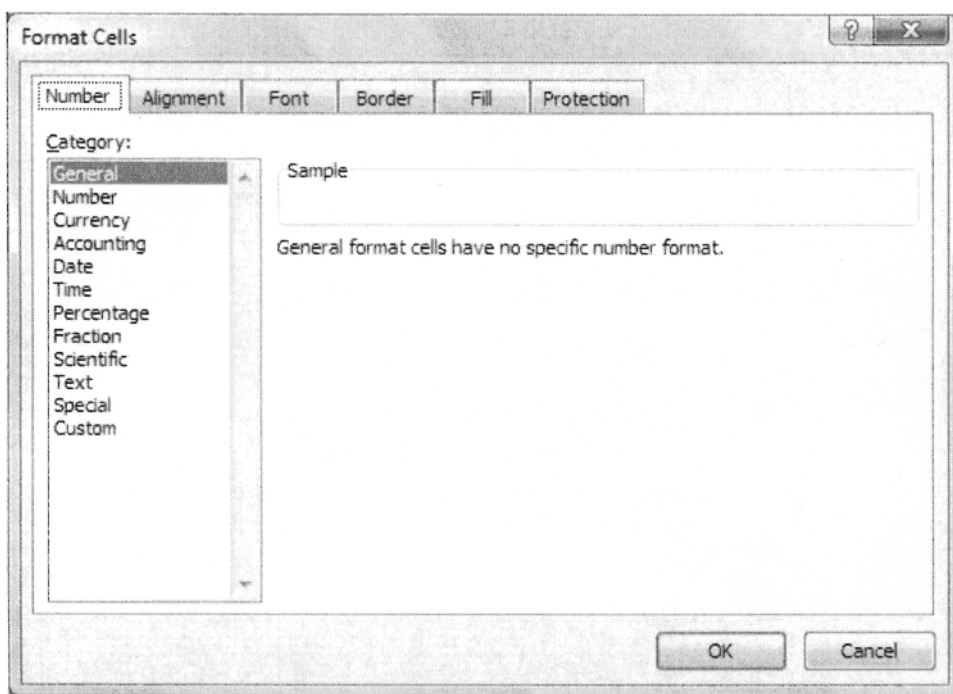


Figure 1-44. The Number Format dialog box.

The appearance of the Number dialog box will be different, depending on the number format category you select.

If you choose the Custom category, you will see the number formatting code that was applied to the cell. If you scroll through the list of codes, you'll see that many of them are quite complex (see Figure 1-45). For the meaning of the built-in number format code symbols, see Table 1-6 or go to "Number Format Codes" in Excel's On-Line Help.

Custom Number Formats

You can create your own custom number formats. First, choose the Custom category from the list of number formats. This will display the list of (so far) built-in number formats. To add a new, user-defined number format (it will be added at the bottom of the list), type the format in the Type box. For example, if you want to display numbers to four decimal places, type 0.0000 in the Type box. The new format will be stored in the list of formats so that you can apply it to other cells; the format is available in all sheets in the workbook.

Table 1-6 lists the formatting symbols you can use to create your own custom formats.

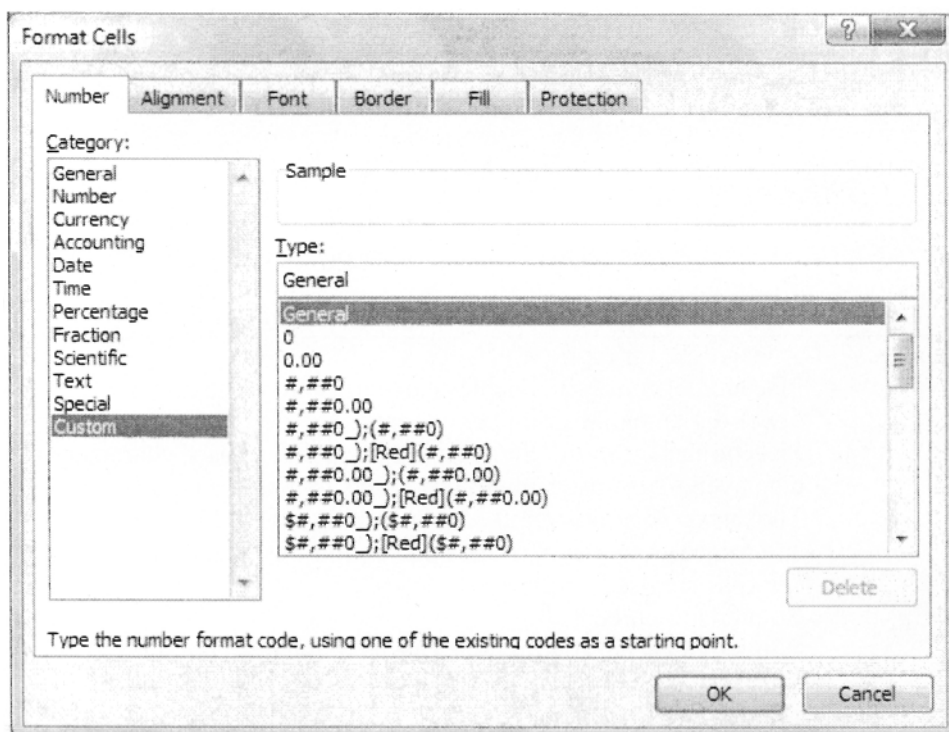


Figure 1-45. The Number Format dialog box showing number formatting codes.

For example, to format a column of telephone numbers, use the custom format (###) ###-####. This will format a cell entry such as 6175523619 in the format (617) 552-3619. The format #.??????? was used to format the table of atomic weight values shown in Figure 1-47, so that they are aligned on the decimal. (Note that, since the format contains seven ? symbols and the atomic weight of Na has only six digits to the right of the decimal point, there is an additional space to the right of the number.)

	A	B
1	H	1.00797
2	O	15.9994
3	Na	22.989768
4	S	32.066

Figure 1-46. Values aligned on the decimal point by using the ? formatting symbol.

You can create some fairly sophisticated number formats. For example, the format `$#.0,`, (dollar sign, number sign, period, zero, comma, comma) formats financial entries rounded to millions, with one decimal; the value 21180000 is displayed as \$21.2.

You can use number formatting to add units to a number value. For example, the format `"# g"` appends the grams unit g to a number value; the value 50 is displayed as 50 g, as shown in Figure 1-47.

	A
1	50 g

Figure 1-47. Units added to a value by means of number formatting.

Table 1-6. Number Formatting Symbols

#	Placeholder for digit.
0	Placeholder for digit. Displays an extra zero if the number has fewer digits than the number of zeros specified in the format.
?	Placeholder for digit. Same as 0, except that a space character is displayed. Also used when formatting a number as a fraction.
,	Thousands separator (if used with # or 0). Used alone, it rounds and truncates to the thousands place (millions place if two commas are used, etc.)
%	Converts to percent.
E	Converts to scientific format. Use E- to include sign with negative exponents only, E+ to include sign with both positive and negative exponents.
/	Converts to a fraction. Usually used in the form # ??/? or ##/##. The number of ? or # symbols determines the accuracy of the display.
"text"	Text characters can be included in a format by enclosing them in quotes. You can sometimes get away without the quotes, but it's safer to use them.
@	Text placeholder. If the cell contains a text entry, the text is displayed in the format where the @ symbol appears.
[RED]	Displays the characters in the cell in red. You can also use [BLUE], [GREEN], [YELLOW], etc.

Custom Date Formats

You can create custom date formats by using the year, month and day formats listed in Table 1-7. Day or month formats can have one-, two-, three- or four-letter formats; year formats can have either two- or four-letter formats. For example, the number format dddd, mmmm d, yyyy applied to a date entered as 8/3/38 will display Wednesday, August 3, 1938.

Table 1-7. Date Formatting Symbols*

d	Displays the day as a number without leading zeros (1-31)
m	Displays the month as a number without leading zeros (1-12)
dd	Displays the day as a number with leading zeros (01-31)
mm	Displays the month as a number with leading zeros (01-12)
ddd	Displays the day as an abbreviation (Sun-Sat)
mmm	Displays the month as an abbreviation (Jan-Dec)
dddd	Displays the day as a full name (Sunday-Saturday)
mmmm	Displays the month as a full name (January-December)
yy	Displays the year as a two-digit number, e.g., 97
yyyy	Displays the year as a four-digit number, e.g., 1997

* See Chapter 12, "Other Language Versions of Excel", for date formatting symbols for some other languages.

Time Formats

Excel's built-in or custom time formats use the symbols in Table 1-8.

Table 1-8. Time Formatting Symbols

h	Displays the hour without leading zeros (0-23)
hh	Displays the hour with leading zeros (00-23)
m	Displays the minutes with leading zeros (0-59)
mm	Displays the minutes with leading zeros (00-59)
s	Displays the seconds without leading zeros (0-59)
ss	Displays the seconds with leading zeros (00-59)
s.000	Displays seconds to the millisecond
AM/PM	Displays the hour as AM or PM instead of 24-hour time
[h]	Displays elapsed time in hours
[h]:mm	Displays elapsed time in hours and minutes

Variable Number Formats

Different number formats can be applied to positive, negative, zero and text values entered into a cell. A complete format consists of four sections separated by semicolons, for positive, negative, zero and text values, respectively. If only one number format is specified, it applies to all values. If two number formats are specified, then the first one applies to positive numbers and zero, the second to negative numbers. For example, the format `$#,###;[Red]$#,###` formats positive amounts in black, Excel's default color, and negative amounts in red.

Conditional Number Formats

Conditional number formats can be created by using the syntax `[condition, value] format statement`. *Condition* is one of the symbols `<`, `>`, `=`, `>=`, `<=`, `<>`; *value* may be any number. Format statement may be any built-in or custom format. For example, the number format

`[>1] "Number too large"`

displays any input less than 1 but otherwise issues an error message.

Several conditions may be combined using semicolons. The number format

`[>999]#.##,%;#" ppm"`

displays the values 110 and 21560 as 110 ppm and 2.16%, respectively.

Formatting Numbers Using "Precision as Displayed"

To permanently change *all values* stored on a worksheet to their displayed values, use the Precision As Displayed option. Once this command has been invoked, you can't restore the original values.

To apply Precision as Displayed, click on the File tab and press the Options button (Excel 2010) or click on the Office Button and press the Excel Options button (Excel 2007); click on Advanced and check the Set Precision As Displayed box. Because this is an irreversible change, Excel asks you to confirm the change.

To change only a selected range of values to "precision as displayed", use the FIXED worksheet function (see "Text Functions" in Chapter 3).

Excel Tip. You can apply the same formatting to multiple worksheets simply by grouping the sheets (click on the first sheet tab in the range of sheets to be formatted, then hold down the Shift key and click on the last sheet in the range). When you apply the desired formatting to the active sheet, it will be applied to all sheets in the group.

Conditional Formatting (Part I)

The number formatting tools that we have seen described in preceding sections can only change the way the number appears in the cell: as a floating point number, in scientific notation, etc. But none of the number formatting tools allows you to apply stylistic formatting to a cell based on the value in that cell — to display a number in italics if it is negative, for example. Conditional formatting provides this capability.

Conditional formatting allows you to do one of two things: to apply stylistic formatting to a cell based on the value in that cell, or to apply formatting to a cell based on values in several cells (in the same or different worksheets or workbooks). The former — formatting a cell based on the value in that cell — will be described here; the latter will be reserved for Chapter 3, Excel Formulas and Functions.

Conditional formatting has been improved significantly in Excel 2007/2010. In Excel 2003, you can format cells that contain values that satisfy one of eight criteria: between, not between, equal to, not equal to, greater than, less than, greater than or equal to, less than or equal to. In Excel 2007/2010 many more criteria can be applied in addition to the ones listed. Other possibilities include highlighting cells that contain error values, specified text or date values, duplicate or unique values, top *N* values (e.g., top 10), top *N*th percent, above or below average. Figure 1-48 illustrates some of the most popular options provided by Excel 2007/2010 conditional formatting.

As an example of the use of conditional formatting, consider the case of a worksheet that contains a column of values. If any value in the column is above 90 (for example), the measurement is out of range and needs to be examined more closely. You can flag these out-of-range values with conditional formatting. After highlighting the range of cells to be formatted, click on Conditional Formatting in the Styles group of the Home tab, click on Highlight Cells Rules in the drop-down list, and then click on Greater Than... in the submenu, to display the Greater Than dialog box. Enter the value 90 as the criterion, choose Light Red Fill as the format, and press OK. The cells satisfying the criterion will be highlighted, as illustrated in Figure 1-50.

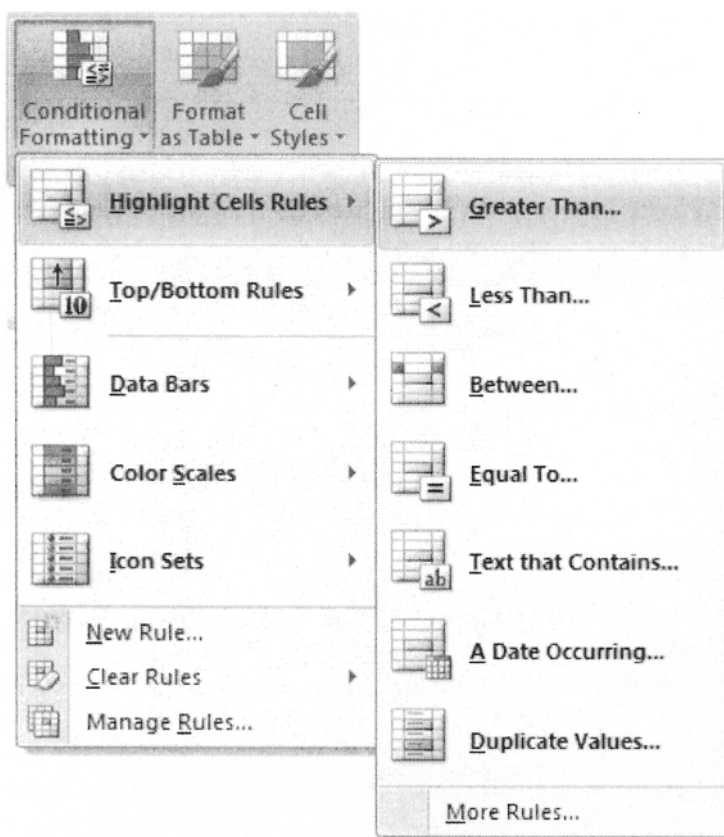


Figure 1-48. Some of the choices for Conditional Formatting.

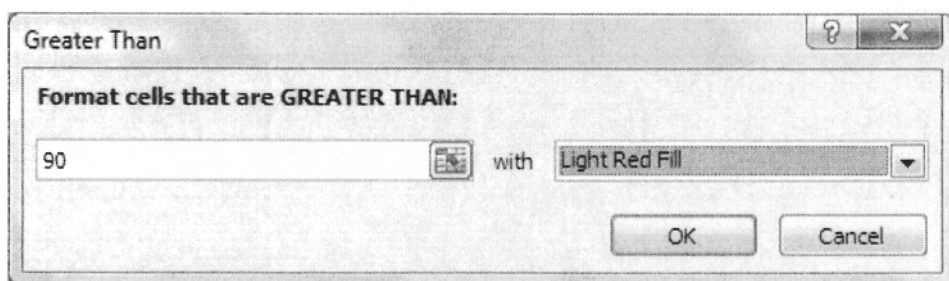


Figure 1-49. The Greater Than dialog box.

	L
1	7.88248
2	86.42525
3	27.06193
4	70.87242
5	99.36292
6	73.5115
7	22.08262
8	74.31941
9	13.85085
10	88.59572
11	11.99503
12	5.40923
13	96.69842
14	75.1717
15	29.25795

Figure 1-50. A portion of a range of cells with conditional formatting.

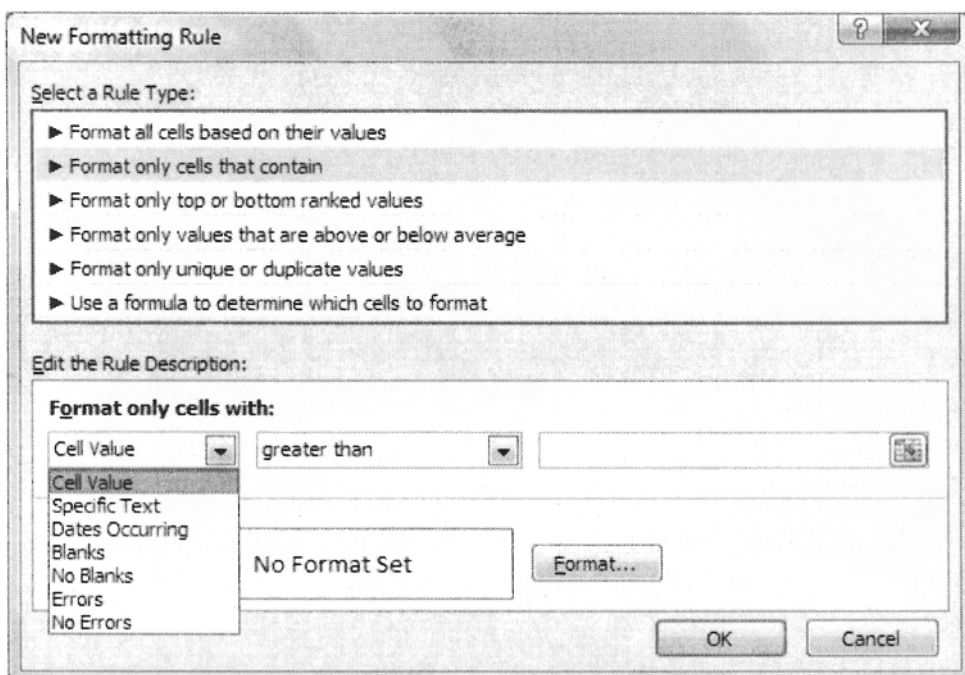


Figure 1-51. The New Formatting Rule dialog box.

Users more comfortable with the Excel 2003 Conditional Formatting dialog box can choose **More Rules...** in the **Highlight Cells Rules** submenu (see Figure 1-48) to go directly to the **New Formatting Rule** dialog box, shown in Figure 1-51. This dialog box provides a greater range of formatting options than the built-in options of, for example, the **Greater Than** dialog box shown in Figure 1-49.

In addition to formatting cells with font color, cell border or cell background, the Excel 2007/2010 conditional formatting allows you to flag cells with data bars, color scales, or icons. The gallery of icons is shown in Figure 1-52.



Figure 1-52. The gallery of Conditional Formatting icons.

Like other formatting, you can apply a conditional format to a range of cells or apply it to one cell and then Copy it to other cells.

Printing Documents

Commands for printing documents are located in the File tab of the Ribbon (Excel 2010) or in the Office Button window (Excel 2007).

Excel 2010. If you click on the Print button in the File tab, a dialog box is displayed (Figure 1-53) that contains most of the options in the Excel 2003 **Print...** and **Page Setup...** menu commands. You can choose pages to be printed, number of copies, two-sided printing, collated sheets, portrait or landscape orientation, paper size, margins, etc. For users more comfortable with the Excel 2003 Page Setup dialog box, there is a Page Setup hyperlink at the bottom right corner of the dialog box; see the following section for a description of the Page Setup dialog box. The Print Preview view of the document (not shown in Figure 1-53) is also displayed on the right side of the window.

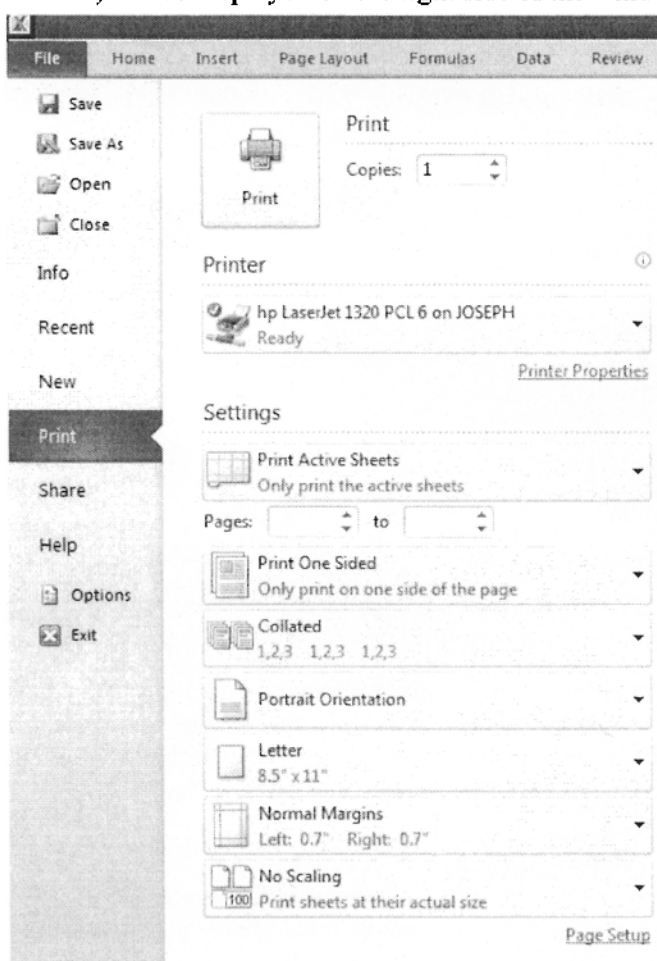


Figure 1-53. The Excel 2010 Print window.

Excel 2007. If you click on the Print button in the Office Button window, the "Print and preview the document" window is displayed (Figure 1-54).



Figure 1-54. The Excel 2007 "Print and preview the document" window.

Choosing Print in the "Print and preview the document" window displays the Print dialog box, identical to the Excel 2003 dialog box (see Figure 2-44 in Chapter 2), which allows you to specify the pages to be printed, and the number of copies. You can also select a printer, if you have more than one printer connected.

Choosing Print Preview in the "Print and preview the document" window activates the Print Preview tab of the Ribbon (Figure 1-55). The Page Setup button displays the Page Setup dialog box, identical to the Excel 2003 dialog box.

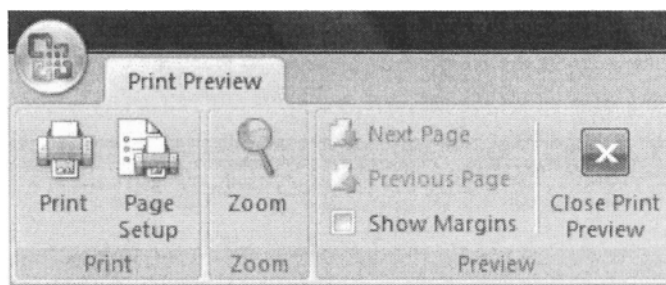



Figure 1-55. The Excel 2007 Print Preview tab of the Ribbon.

Print Preview is useful in other ways besides showing what your finished worksheet will look like when printed. If you preview your worksheet and then return to the document window, page breaks will be displayed on the worksheet as dashed lines, to assist you in adjusting column widths, for example, before printing.

Using Page Setup

The Page Setup dialog box, identical to the Excel 2003 version, contains four tabs: Page, Margins, Header/Footer, and Sheet. These dialog boxes are shown in Chapter 2, Figures 2-40, 2-41, 2-42 and 2-43. Use the Page tab to choose Portrait or Landscape orientation. Use the Margins tab to change margins. Use the Header/Footer tab to select header or footer text from a list of built-in options or create a custom header or footer. Use the Sheet tab of the Page Setup dialog box to enter a Print Area (range of cells that will be printed) or Rows To Repeat At Top (row or rows that will be printed at the top of each printed page), or to turn on or turn off the printing of gridlines, row and column headings, etc.

Excel Tip. Click on the small button  at the bottom right of the Page Setup or Sheet Options groups in the Page Layout tab to display the Page or Sheet tab of the Page Setup dialog box.

A new document has no header and no footer; these are the default values. To enter a header or footer, choose the Header/Footer tab in the Page Setup dialog box, which will display list boxes with a wide range of built-in formats for header and footer. You can also create custom headers or footers by pressing the Custom Header... or Custom Footer... button. The Header or Footer dialog boxes are identical; each enables you to enter filename, sheet name, page number, date, time or other information.

To adjust margins, use the Margins tab of the Page Setup dialog box, or click on the Page Layout tab of the Ribbon and click on the Margins icon to display the drop-down menu of margin settings (Figure 1-56).

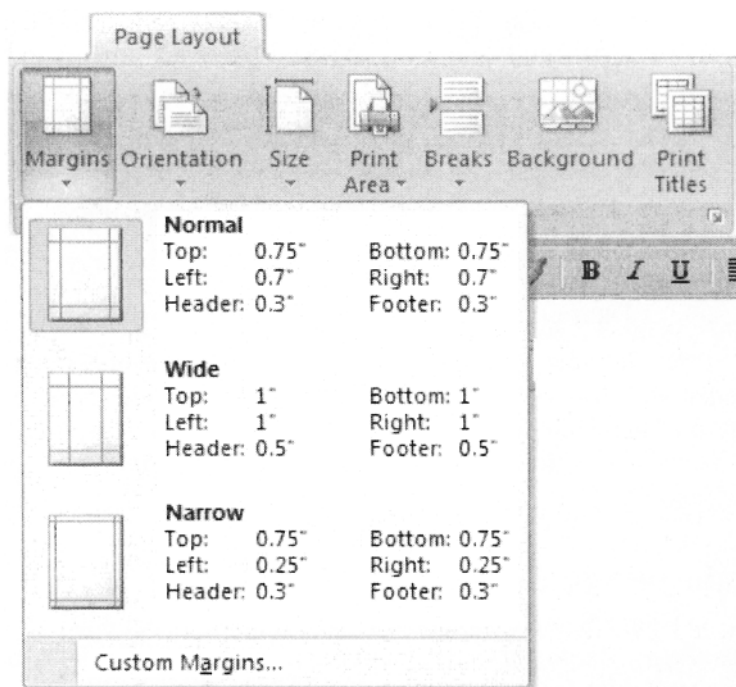


Figure 1-56. The Page Layout tab of the Ribbon, showing the Margins drop-down menu.

To squeeze the maximum amount of worksheet information on a single page, you can decrease the margin widths. The default margin values are 0.75 inch left and right and 0.7 inch top and bottom. If you set the margins to zero, any header and footer information will still be printed, usually right on top of data in your worksheet, so delete the header and/or footer information by choosing "(none)" from the list box.

You can choose Print Row And Column Headings and/or Print Cell Gridlines by choosing the Sheet tab in the Format Cells dialog box. If you de-select Cell Gridlines, they will still be displayed on the screen but they will not be printed.

You may need to use Print Black and White if your worksheet uses color. Colors may be printed as various patterns by your printer; to remove the patterns and produce text in cells in black and white, check the Print Black and White Cells box.

Using Print

If you choose the Print command and simply press the OK button, Excel will print the rectangular array of sheets that includes all filled cells. It's a good idea to use Print Preview before printing; the total number of pages to be printed will

be displayed in the status bar. This will tell you whether you can print the whole worksheet, or whether you need to specify a range of pages to be printed.

If you choose Print Preview or Page Setup, Excel displays the automatic page breaks as dashed lines in the worksheet. You can insert a forced page break if you want to print a portion of a worksheet page. To insert a horizontal page break, select an entire row as if you were going to insert a row. Then click on the Breaks button in the Page Setup group in the Page Layout tab of the Ribbon, and choose Insert Page Break from the submenu. The page break will be inserted immediately above the selected row. A forced vertical page break is inserted in a similar fashion; the page break is inserted immediately to the left of the selected column. If you want to insert both a vertical and a horizontal page break, select a single cell within the worksheet; the page breaks will be immediately above and to the left of the cell.

Printing a Selected Range of Cells in a Worksheet

To print a selected range of cells within a worksheet, you must first select (highlight) the range to be printed.

Excel 2010. Choose Print in the File tab of the Ribbon and press the drop-down button at the right of Print Active Sheets to display the drop-down menu shown in Figure 1-57. Click on Print Selection. Then press the Print button.

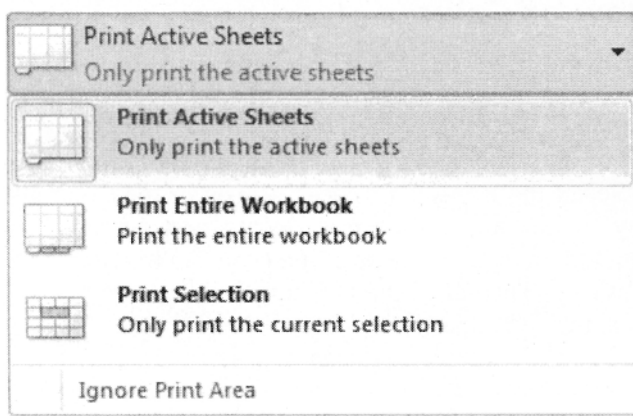


Figure 1-57. The Print Active Sheets drop-down menu.

Excel 2007. Choose Print from the Office Button window. Press the Selection button in the Print What category box in the lower left corner of the dialog box. Then press the Print button.

Using Set Print Area

To specify a range of cells to be printed each time you choose Print, you must use Set Print Area. You can do this in at least two different ways:

- Display the Page Setup dialog box (see earlier), and choose the Sheet tab. Click in the Print Area text box to select it. Now select the range of cells that you want to print (you can move the dialog box out of the way if necessary), and press the OK button. To cancel a Print Area selection, delete the reference within the Print Area text box.
- First, select the range of cells to be printed, then press the Print Area button in the Page Setup group in the Page Layout tab of the Ribbon, and choose Set Print Area from the submenu. The range to be printed will be indicated by Page Break lines. Choose Remove Print Area from the submenu to cancel the Print Area.

If the Print Area you selected requires more than one page, you can go to Page Setup and change the value in the Reduce/Enlarge box to less than 100%. Sheets printed with values less than about 60% are difficult to read, though. To obtain the appropriate reduction value automatically, after you've selected the area to be printed, choose the Page tab and press the Fit To 1 Pages Wide By 1 Tall button.

Printing Row or Column Headings for a Multi-Page Worksheet

If you are printing a multi-page worksheet, you can duplicate row or column headings automatically on each printed page. Click on the Print Titles icon in the Page layout tab of the Ribbon, or display the Page Setup dialog box and choose the Sheet tab. Select the Rows To Repeat At Top or the Columns To Repeat At Left text box by clicking the cursor in it. Now select the range of cells that you want to have printed on every page as a title (you can move the dialog box out of the way if necessary). Then click the OK button. The headings will appear at the top or left of each printed page.

Protecting Data in Workbooks

First of all, we should distinguish between security and protection. Security means protecting your computer from viruses. Protection means preventing users from modifying documents or viewing particular workbooks, worksheets or formulas; a number of ways of protecting data will be described in the following sections.

Protecting a Workbook

You can protect the structure of a workbook so that worksheets in the workbook can't be moved, deleted, hidden, unhidden, or renamed, new worksheets can't be inserted, and windows are the same size and in the same position each time the workbook is opened. Values and formulas in the workbook can still be modified, though; to prevent this, see "Protecting a Worksheet" later in this chapter.

To protect a workbook, click on Protect Workbook in the Protection group in the Review tab of the Ribbon, and choose Protect Structure and Windows from the drop-down menu, to display the dialog box (Figure 1-58).

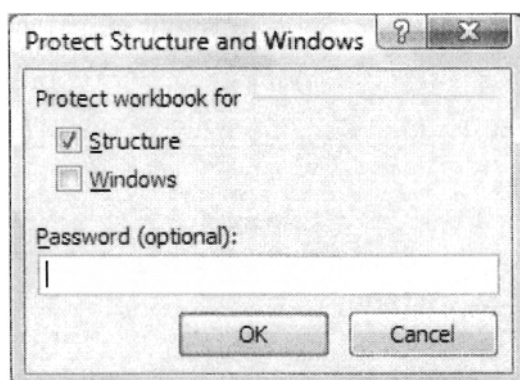


Figure 1-58. The Protect Workbook dialog box.

Check the boxes for Structure and/or Windows, enter a password if necessary (you will be asked to confirm it), and then press OK.

Protecting a Workbook by Making It a Read-Only Workbook

If you make a workbook read-only, users can view formulas in cells, and change values and formulas, but the changes cannot be saved.

To make a workbook read-only, the document should be closed. In the Windows Start menu, choose Programs, and then Windows Explorer. In the Exploring window, open the drive or folder that contains the file and select the document name. Choose Properties from the File menu, choose the General tab, and check the Read-only check box.

Hiding a Worksheet

To hide a worksheet, click on the Format button in the Cells group in the Home tab of the Ribbon, choose Hide & Unhide in the drop-down menu, and choose Hide Sheet in the submenu. However, anyone can view this sheet simply

by choosing **Unhide** from the submenu. You can hide a sheet so that most users can't view it, by using VBA: you set the `Visible` property of the sheet to `VeryHidden`, as described in the following paragraph. You may need to read Chapter 16, "Visual Basic for Applications: An Introduction", first.

To make a sheet `VeryHidden`, switch to the Visual Basic Editor by pressing **Alt + F11**. If the Project Window is not visible, display it by pressing **Ctrl+R**. In the hierarchy tree for the desired workbook, click on the name of the sheet you wish to hide.

If the Properties Window is not visible, display it by pressing **F4**. In the Properties Window, locate the `Visible` property (at the bottom of the list when the **Alphabetic** tab is selected). Click on the `Visible` box; this will cause a drop-down list button to appear in the properties list. Choose the `xlSheetVeryHidden` list property, as shown in Figure 1-60.

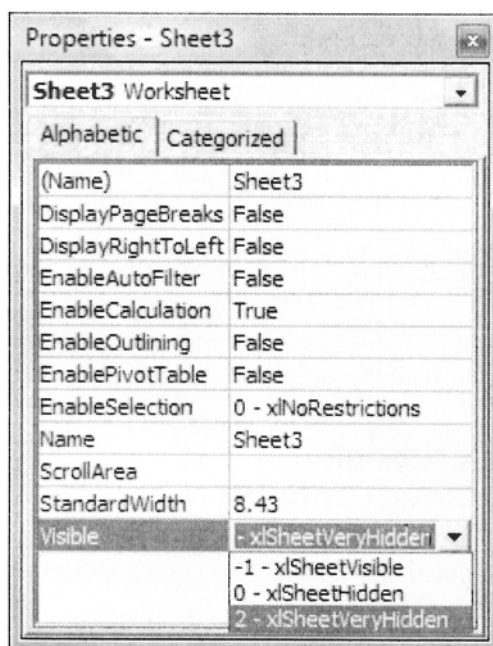


Figure 1-59. The VBA Properties Window.

When you switch back to the Excel workbook, the sheet tab will not be visible and the sheet name will not appear in the **Unhide Sheet** submenu.

Protecting a Worksheet by Locking or Hiding Cell Contents

You can lock cells (prevent them from being selected by the user) or hide the contents of the cells. For example, you may want the user to be able to enter values in certain cells while protecting the rest of the worksheet. If you protect cells in this way, before you access the Protect Sheet dialog box you must specify which cells will be protected or unprotected. You do this by using the Format Cells menu.

The process for doing this is somewhat complicated. First you select cells to be locked or unlocked, or cells whose contents will be hidden or visible, and set their status using the Protection tab of the Format Cells dialog box. Then you put the status into effect by choosing Protect Sheet from the Format drop-down menu.

Before you begin, it's important to know that when a new worksheet is opened, the status of *all* cells in the document is Locked. To lock only a limited range of cells in a document (as you will most often want to do), first set the status of all the cells in the document to Unlocked and then select the range of cells that you want to be locked.

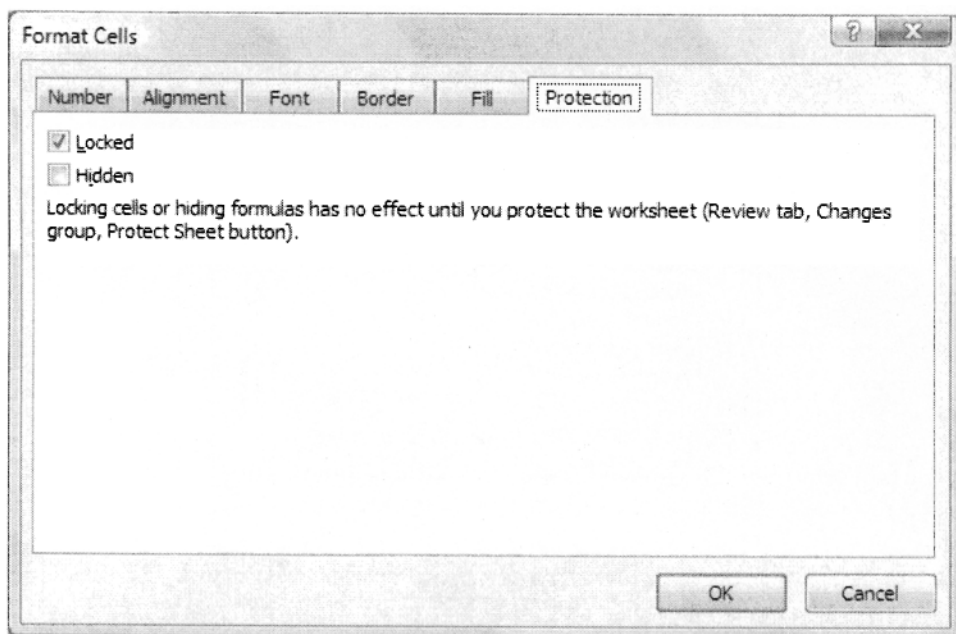


Figure 1-60. The Protection tab of the Format Cells dialog box.

As an example, let's protect a worksheet so that it has only a single unprotected cell. The user will only be able to enter a value in this cell; all other cells in the sheet will be locked. Here's how to do it: First, select the cell you want to be the unlocked cell. Now click on Format in the Cells group in the Home tab of the Ribbon and choose Format Cells from the drop-down menu. Choose the Protection tab to display the dialog box (Figure 1-60). In a new worksheet, by default all cells are locked, so simply uncheck the Locked box so that the cell you selected will be unlocked. Then press OK.

Locking or unlocking cells has no effect unless the worksheet is protected. Activate the worksheet to be protected. Click on Format in the Cells group in the Home tab of the Ribbon and choose Protect Sheet from the submenu. This will display the Protect Sheet dialog box (Figure 1-61). Here you can choose to prevent users from carrying out one or more actions on the whole worksheet (inserting or deleting rows or columns, etc.) or on specified cells. After choosing options from the list, you can enter a password if you desire (you will be asked, in a second dialog box, to confirm the password), in which case users will not be able to unprotect the sheet

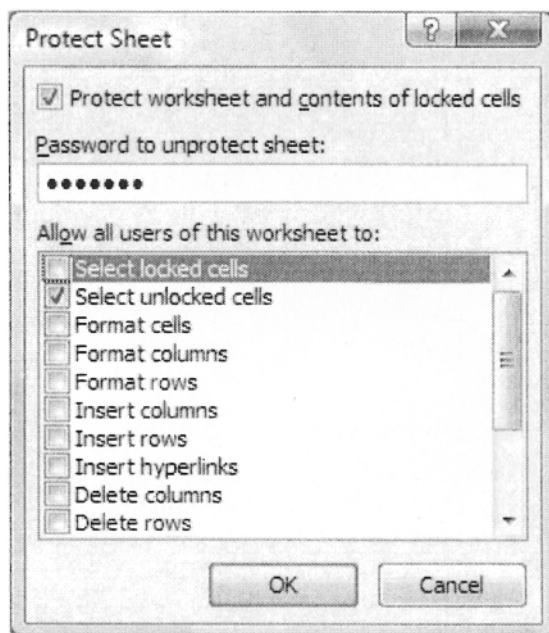


Figure 1-61. The Protect Sheet with Password dialog box.

To Lock a Range of Cells in a New Document

1. Select all cells in the document by clicking on the row/column header button in the upper left corner of the worksheet.
2. Click on Format in the Cells group in the Home tab of the Ribbon and choose Format Cells from the drop-down menu. Choose the Protection tab, uncheck the Locked option, and press the OK button. This un-protects all cells in the worksheet.
3. Now select the range of cells that you want to protect. Click on Format in the Cells group in the Home tab of the Ribbon and choose Format Cells from the drop-down menu, choose the Protection tab, check the Locked option, and press the OK button.
4. Click on Format in the Cells group in the Home tab of the Ribbon and choose Protect Sheet from the submenu, to display the Protect Sheet dialog box. You can enter a password if you wish (Figure 1-61). If you merely want to prevent yourself from making accidental changes, no password is necessary. If you want to protect the document from changes by others, you need a password; make sure that you will be able to retrieve it when you need it.

Controlling the Way Documents Are Displayed

Although only one worksheet at a time can be the active window, Excel provides a number of ways to view data in several different worksheets, or different areas of the same worksheet, at the same time.

Using New Window and Arrange All

If you have more than one document open, you can view several of them simultaneously in a number of ways. One way is to resize and move the documents so that the desired part of each can be seen in the window. Another way is to use the New Window and Arrange All icons in the Window group in the View tab of the Ribbon. The latter method can be used to view multiple documents, or multiple sheets in the same workbook, as described in the following paragraph.

To view multiple worksheets in the active workbook, click on New Window. A second window will be opened for the active workbook. If, for example, the workbook is named Viscosity Data, the windows will be named Viscosity Data:1 and Viscosity Data:2. Activate each window in turn and click on the sheet that you want to display. Now choose Arrange All, Excel displays the Arrange

Windows dialog box (Figure 1-62). You can arrange the windows horizontally (one above the other) or vertically (side by side). If you have created a separate chart sheet from data in a worksheet, Arrange All provides a convenient way to work with a sheet and observe changes in the associated chart. With Arrange All, chart documents are reduced in size so that the whole chart appears in the window; worksheet documents are not reduced in size. Figure 1-63 illustrates a worksheet/chart combination displayed using the Arrange (Vertical) option.

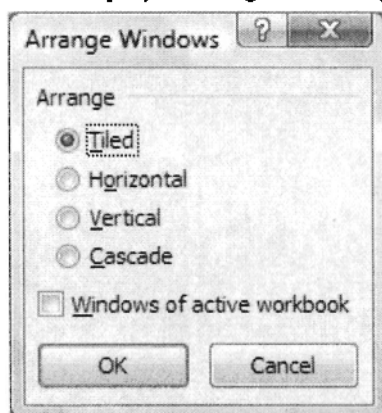


Figure 1-62. The Arrange Windows dialog box.

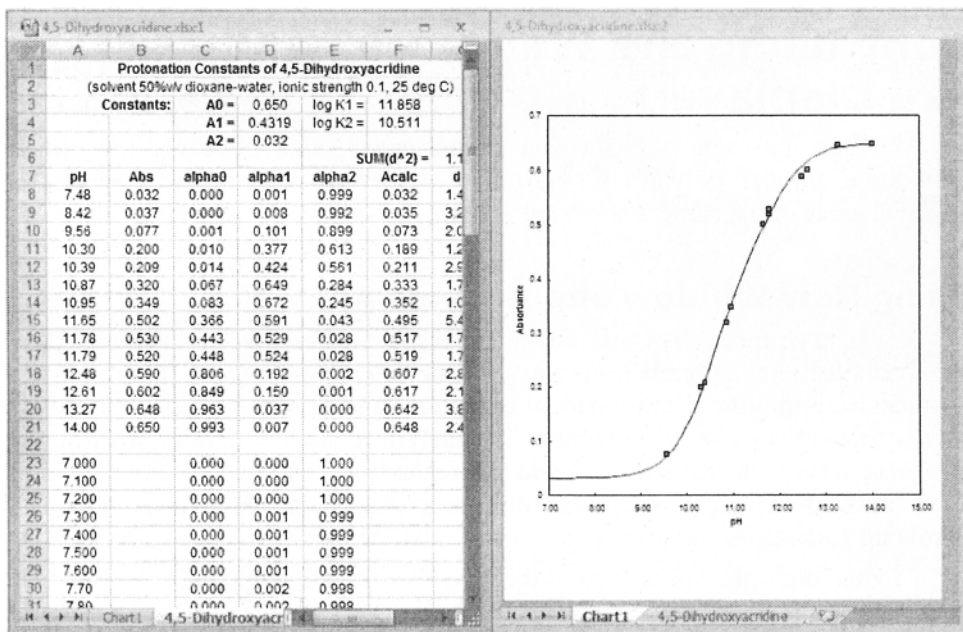


Figure 1-63. Two windows arranged vertically

With three open documents, the Tiled option arranges the documents with the active sheet occupying the left half of the screen; the other two sheets each occupy one-quarter of the screen, one above the other. With four documents Tiled, each occupies one-quarter of the screen. Click on any document to make it the active sheet. Double-click anywhere on the solid border between the windows to undo the arrangement.

Different Views of the Same Worksheet

As your worksheets get larger and more complicated, it becomes impossible to view all of a single worksheet at once, or even all cells in one row or column at one time. Excel provides several convenient ways to display separate portions of a single worksheet on the screen at the same time, so that you can view one part while entering or changing data in another part.

Click on New Window in the Window group of the View tab to display a second window of the active document. Use the Arrange All button to display two windows, either Horizontal or Vertical, of the active sheet.

You can resize and move the windows so that the desired parts of the worksheet can be seen at the same time. Click on the Title Bar at the top of a window and drag it to a suitable position for viewing; click on the side or bottom of a window and drag to resize it. This is useful if you want to Cut or Copy several cell ranges and then Paste them into another area of a worksheet, but the two areas of the worksheet are far apart.

You can set different display options for the two windows. Display values in one window and formulas in another to see the effect of changes to the formulas.

***Excel Tip.** To remove a workbook view, click on the window you want to remove (the active window has a blue title bar, the inactive one is "grayed out"). Now click on the Close button in the upper right corner of the active window.*

Using Split Screens

Use the Split icon in the Window group in the View tab of the Ribbon to split a document window vertically or horizontally into two windows. To split the screen vertically, select an entire column as if you were going to insert a column. Then click on the Split icon. This creates a split in the window, to the left of the selected column, as illustrated in Figure 1-64, with each part of the window displaying the active document. Each part of the document now has its own scroll bar, and you can scroll one part of the document while the other part remains fixed. A horizontal split is accomplished in a similar way.

You can also split the document window by placing the mouse pointer on either split button (the small rectangles at the right end of the horizontal scroll bar and at the top of the vertical scroll bar), and then click and drag the button.

The document window can be split both horizontally and vertically, by first selecting a single worksheet cell, and then clicking on the Split icon.

To remove a split, press the Split icon, or slide the split button back to its original position.

Excel Tip. To remove a split from a window, it's not necessary to slide the split button back to its original position at the top or left-hand side of the scroll bar. Just place the mouse pointer on the split button and double-click.

	A	E	F	G	H	I	J	K	M
1	Grade Sheet								
2		Hour Exams							
3	Name	#1	#2	#3	Oral report	Paper	Final Exam	Total	Grade
4	CAPICELLA, Jason	15	4	27	17.5	45	23	43.8	D
5	CHUNG, Min-Yin	18	13	44	17.5	45	47	61.5	C+
6	FERREIRO, Kathy	24	16	32	20	45	52	63.0	B-
7	GANGE, Eric	28	13	43	20	40	51	65.0	B-
8	GREALEY, John	22	14	40	17.5	40	56	63.2	C+
9	HAPPERSBACH, Bill	28	12	30	17.5	45	59	63.8	C+
10	HOGAN, Derek	37	17	37	20	50	60	73.7	B
11	LAROZI, Patrick	27	12	38	20	45	58	66.7	B-

Figure 1-64. A document with a split screen.

Using Freeze Panes

Freeze Panes (in the Window group of the View ribbon) can be used to create a similar split document window, but the upper or left part of the window is fixed and cannot be scrolled. Split panes are useful to display fixed row or column headings (or both) while scrolling through the rest of the worksheet.

To use the Freeze Panes feature to split a document window horizontally into two windows, select an entire row as if you were going to insert a row. Then click on the Freeze Panes button in the Window group of the View ribbon, and click on Freeze Panes in the drop-down menu. The portion of the window above the selected row will be frozen. (There are also built-in commands to freeze either the top row or the leftmost column of the sheet.

To split the window both horizontally and vertically, select the cell whose upper left corner defines the location of the split, and click on Freeze Panes.

To unfreeze, simply click on the Freeze Panes button.

	A	B	C	D	E	F	G	H	I	J	K
1	Grade Sheet										
2					Hour Exams						
3	Name	ID#	YOG	Major	#1	#2	#3	Oral report	Paper	Final Exam	Total
4	CAPICELLA, Jason	863162407	95	CHEMISTRY	15	4	27	17.5	45	23	43.8
5	CHUNG, Min-Yin	325417108	96	CHEMISTRY	18	13	44	17.5	45	47	61.5
6	FERREIRO, Kathy	011083979		EVENING C	24	16	32	20	45	52	63.0
7	GANGE, Eric	436860962	95	CHEMISTRY	28	13	43	20	40	51	65.0
8	GREALEY, John	123757619	96	CHEMISTRY	22	14	40	17.5	40	56	63.2
9	HAPPERSBACH, Bill	761132171	95	CHEMISTRY	28	12	30	17.5	45	59	63.8
10	HOGAN, Derek	547710365	94	BIOCHEMIST	37	17	37	20	50	60	73.7
11	LAROZI, Patrick	533421804	96	CHEMISTRY	27	12	38	20	45	58	66.7

Figure 1-65. A document displayed with Freeze panes.

Using Zoom

You can change the Zoom setting of the worksheet: decrease the zoom setting to see more rows and columns at a reduced size, or increase the setting for easier viewing of small details. To change the zoom setting, click on the Zoom button in the View tab to display the Zoom dialog box. You can choose from several built-in zoom settings or enter a custom setting. If you choose Fit Selection, the zoom setting will be adjusted to display the selected range of rows or columns, or the selected chart, text box, etc., in the window.

You can also use the Zoom Slider, located at the bottom right corner of the window, to change the zoom level.



Figure 1-66. The Excel 2007/2010 Zoom slider.

Excel Tip. Click on the Zoom Level button to the left of the Zoom Slider to display the Zoom dialog box.

Easing the Transition from Excel 2003 to Excel 2007/2010

There are some things that Excel 2003 users can do to make the transition to Excel 2007/2010 easier. You can customize the Quick Access Toolbar to look almost exactly like the Excel 2003 toolbar, you can use shortcut keys, or you can install a Classic Menus utility to provide the familiar Excel 2003 menus.

Customize the Quick Access Toolbar

I customized the Quick Access Toolbar (see Chapter 23 for instructions on how to customize it) with familiar toolbuttons to make it look like the Standard and Formatting toolbars of Excel 2003, in the "Toolbars share one row" form. Figure 1-67 shows part of the customized Quick Access Toolbar.

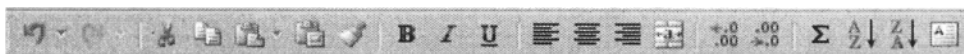


Figure 1-67. A customized Quick Access Toolbar.

Use Shortcut Keys

You can use shortcut keys to carry out many menu or toolbutton commands. Table 1-9 shows a list of the more common ones, and Appendices G and H contain a much more extensive list.

Table 1-9. Shortcut Keys for Excel 2003 Menu Commands

File menu		Insert menu	
New	Ctrl + N	Cells...	Ctrl + plus
Open	Ctrl + O	Rows	Ctrl + plus
Save	Ctrl + S	Columns	Ctrl + plus
Edit menu		Worksheet	Shift + F11
Undo	Ctrl + Z	Function...	Shift + F3
Redo	Ctrl + Y	Name ▾	
Cut	Ctrl + X	Define...	Ctrl + F3
Copy	Ctrl + C	Create...	Ctrl + Shift + F3
Paste	Ctrl + V	Format menu	
Fill ▾		Cells... (Number tab)	Ctrl + 1
Fill Down	Ctrl + D	Cells... (Font tab)	Ctrl + F
Fill Right	Ctrl + R	Row ▾	
Clear ▾		Hide	Ctrl + zero
Contents	Delete	Column ▾	
Delete...	Ctrl + minus	Hide	Ctrl + 9
Find	Ctrl + F	Tools menu	
Replace...	Ctrl + H	Macro ▾	
Go To...	Ctrl + G	Macros...	Alt + F8
		Visual Basic Editor	Alt + F11

Display Classic Menus

The introduction of Excel 2007 was quickly followed by the appearance of several commercial products that, when installed in Excel 2007/2010, provide "classic menus" -- that is, menus that look and operate very much like the Excel 2003 menus. You can find several of these products by searching on the web for "excel classic menus" or you can install the Classic Menus utility that is provided on the CD-ROM that accompanies this book.

The Classic Menus workbook contains VBA code that displays a version of the Excel 2003 Worksheet Menu Bar and Chart Menu Bar in Excel 2007/2010. The menus are located in the Add-Ins tab of the Ribbon. Most of the commands found in the Excel 2003 Worksheet Menu Bar are available. Figure 1-68 shows the **Tools** menu with the **Macro** submenu.

A few menu commands, such as the **Customize...** command in the **Tools** menu, are absent from the menus because they are not applicable to Excel 2007/2010.

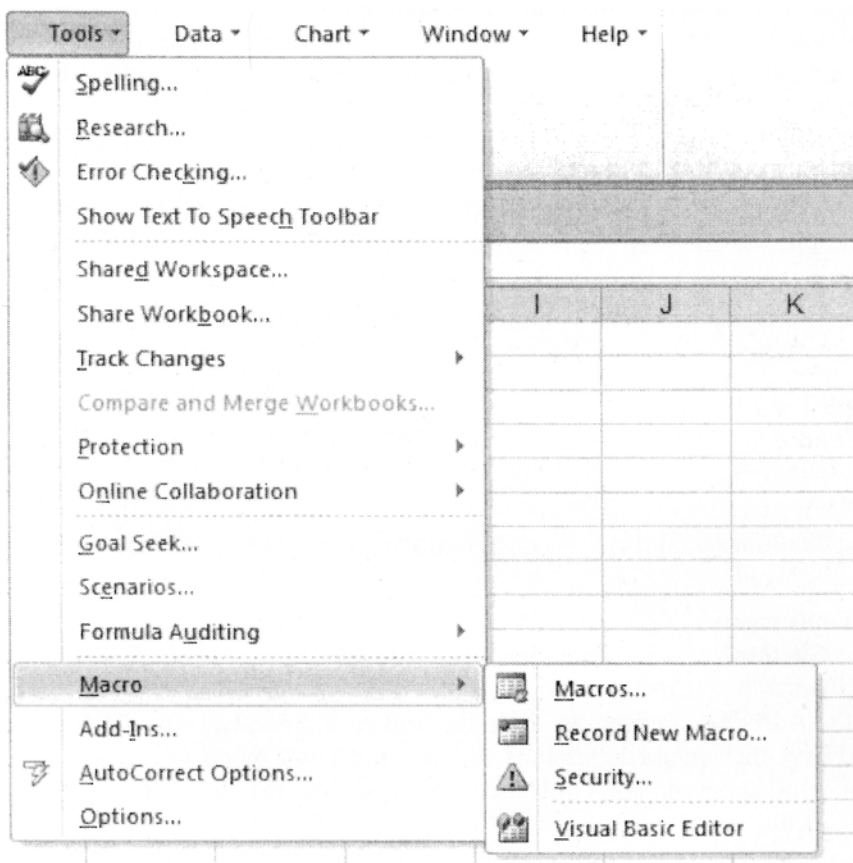


Figure 1-68. Excel 2003 Classic Menus installed in Excel 2010.

The VBA procedure in the Classic Menus workbook runs automatically when you open the workbook. You can install the classic menus by opening the document each time you want to have the menus available, but there are easier approaches. You can save the workbook as an Add-In; this will make the menus available each time you start Excel, provided the Classic Menus Add-In is checked in the Manage Excel Add-Ins list. This allows you to turn off the Classic Menus by unchecking the Add-In.

***Excel Tip:** Double-click on the Add-Ins tab to keep the classic menus displayed.*

The following box lists some of the differences between Excel 2003 menus and Classic Menus.

Differences between Excel 2003 Menus and Classic Menus

There is no separate **Chart** menu bar that appears when a chart is selected. The **Chart** menu is located in the "Classic Menus" menu bar; **Chart** menu commands become active when you select a chart.

In all menus:

1. Letters are not underlined in the menu bar to indicate accelerator keys; for example, **File** instead of **F**ile.
2. Shortcut keys are not shown in menu commands, but are still available: for example, Ctrl-C for **C**opy.

In the **File** menu:

1. Recent files do not have a number preceding the filename for use as a shortcut key.

In the **Edit** menu:

1. Shift+**E**dit to change **C**opy to **C**opy **P**icture... has not yet been implemented.

In the **View** menu:

1. The **T**oolbars command has been omitted, because there are no toolbars to be displayed.

In the **Tools** menu:

1. The **C**ustomize... command has been omitted because there are no menus or toolbars to be customized.
2. In the **A**dd-**I**ns... command, only the **S**olver and **A**nalysis **T**ool**P**ak add-ins will have their menu commands added to the **T**ools menu. To make the command appear in the **T**ools menu, after loading the add-in, click on the **F**ile menu.

In the **Chart** menu:

1. The **C**hart **O**ptions... command is not available. Use the Layout tab of the Excel 2007/2010 ribbon.

Excel 2007/2010 Workbook and Worksheet Specifications

Worksheet size*	1,048,576 rows by 16,384 columns
Maximum column width	255 characters
Maximum row height	409 points
Number precision	15 digits
Largest allowed positive number	9.999999999999999E+307
Largest allowed negative number	-9.999999999999999E+307
Smallest allowed negative number	-2.225E-308
Smallest allowed positive number	2.225E-308
Levels of Undo*	100
Number of worksheet functions*	341
Maximum number of...	
open workbooks	Limited by available memory
characters in a cell (text)	32,767
characters in a formula	8192
sheets in a workbook	Limited by available memory
colors in a workbook*	16,000,000
custom number formats	Between 200 and 250
windows in a workbook	Limited by system resources
panes in a window	4
arguments in a function*	255
nested levels of functions*	64
sort levels in a single sort	64

* indicates changes from Excel 2003

