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# Introduction to Microsoft Excel

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**Microsoft Excel** is a member of the spreadsheet family of software. Spreadsheet software is used to store information in columns and rows which can then be organized and/or processed. Spreadsheets are designed to work well with numbers but often include text. Sometimes text in a spreadsheet is called a **label**, because it is labeling columns and rows of numbers. Numbers are called **values** sometimes, and can include numbers for counts or measurements, dates, times, and calculations from numbers. Spreadsheets can help organize information, like alphabetizing a list of names or other text or reordering records according to a numeric field. However, spreadsheets are more often used for calculating, such as totaling a column of numbers or generating a more sophisticated formula to calculate some statistical measure on a list of numbers.

Spreadsheets and databases are in competition and have similar features. Yet the way they work in the background is different. When you work in a spreadsheet, you view the data you are entering as a section. In a database, you only see the data you are entering - you have to request a report or different display to see more of the information. Other differences are: (1) databases are more often used for applications with long textual entries, (2) very large applications (thousands of entries) are more often handled in databases; and (3) spreadsheets are easier to learn to use and get calculations from than a database program. This latter reason is why many researchers and students prefer spreadsheets for keeping track of their data over databases.

# 1

## LESSON

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### In This Lesson:

Starting Excel

The Excel Window

Toolbars

Workbooks and Worksheets

The Cell

Moving Around the Worksheet

+ + + +

It is impossible to give a complete listing of applications that can be done in spreadsheets, but they include budgeting displays, checkbook registers, enrollment records, inventories, coded surveys, field and laboratory research data, and financial and accounting applications.

The capacities of Excel are as follows. You can have 256 columns of information. You can have up to 65,536 rows. That comes out to over 16,777,216 cells of information and that's only on the first sheet! You can have 16 sheets of information in one workbook, and the number of sheets can be increased, if needed. Excel refers to each file as a workbook, because there can be multiple sheets (pages) in one file.

## Starting Excel

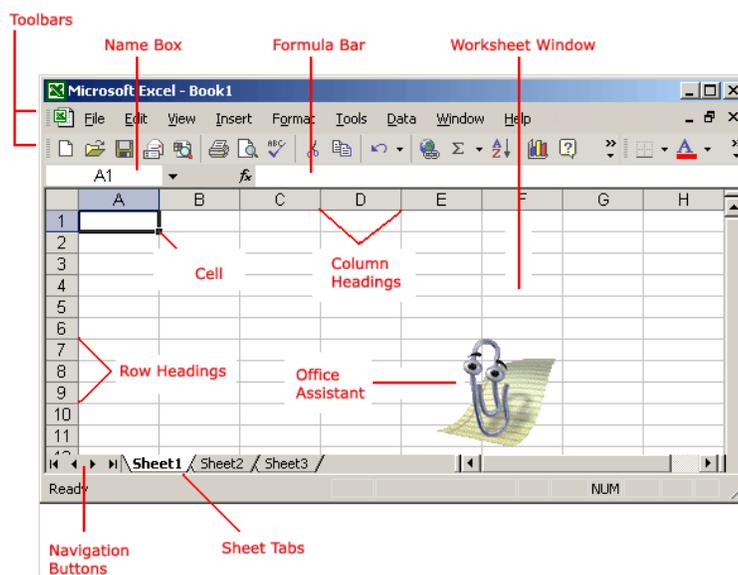
There are 2 ways to start Microsoft Excel.

**From the desktop:** Clicking the  icon if it is present.

**From the  button (located at leftmost bottom on your screen):** Press the start button on the keyboard or click it with the mouse and put the mouse pointer over the word **All Programs** and click the  icon.

## The Excel Window

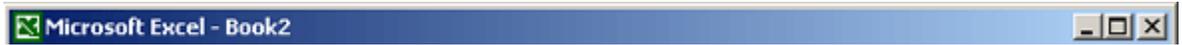
Many items you see on the Excel XP screen are standard in most other Microsoft software programs like Word, PowerPoint and previous versions of Excel. Some elements are specific to Excel XP.



## Workbook

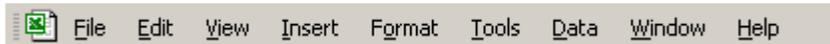
Also called a spreadsheet, the Workbook is a unique file created by Excel XP.

## Title bar



The Title bar displays both the name of the application and the name of the spreadsheet.

## Menu bar



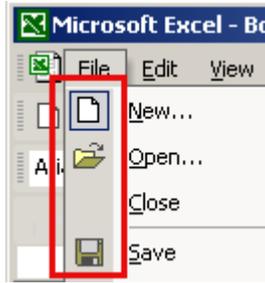
The Menu bar displays all the menus available for use in Excel XP. The contents of any menu can be displayed by clicking on the menu name with the left mouse button.

Each menu groups together related commands, sometimes using submenus to further group commands:

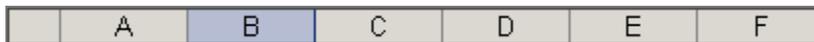
- **File** – Create, open, save, print, and close workbooks.
- **Edit** – Perform editing functions on your workbook, including copying, cutting, and pasting data and objects, moving to various locations in a workbook, and undoing and redoing actions.
- **View** – Change the workbook's display size and style.
- **Insert** – Insert new worksheets, or additional space, such as new cells, columns, or rows; also insert charts, comments, functions, hyperlinks and other objects into your workbooks.
- **Format** – Apply formatting to worksheets and their contents.
- **Tools** – Use Excel's tools, such as the spell and grammar checker, macro recorder, and protection and collaboration features, and set your Microsoft Excel preferences.
- **Data** – Sort, filter, and otherwise arrange the data on your worksheets.
- **Window** – Switch between open workbook windows, or split the window of the current workbook.
- **Help** – Access Microsoft Excel's online help.

To access a menu command, click the main menu to open it, and then select (click) the command. Excel hides those commands you don't use frequently, so if you don't see a command, click the double arrows at the bottom of the menu to expand it. Excel then displays all the available commands. Once you select a command, Excel includes it with the others you commonly use.

Some commands in the menus have pictures or icons associated with them. These pictures may also appear as shortcuts in the Toolbar.



### Column Headings



Each Excel spreadsheet contains 256 columns. Each column is named by a letter or combination of letters.

### Row Headings



Each spreadsheet contains 65,536 rows. Each row is named by a number.

### Name Box



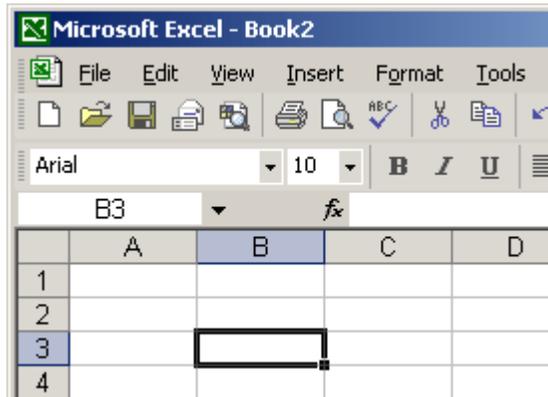
Shows the address of the current selection or active cell.

### Formula Bar



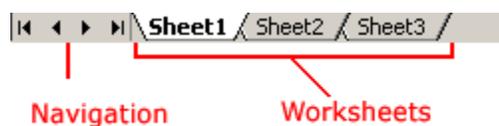
Displays information entered-or being entered as you type-in the current or active cell. The contents of a cell can also be edited in the Formula bar.

## Cell



A cell is an intersection of a column and row. Each cell has a unique cell address. In the picture above, the cell address of the selected cell is B3. The heavy border around the selected cell is called the cell pointer.

## Navigation Buttons and Sheet Tabs



Navigation buttons allow you to move to another worksheet in an Excel workbook. Used to display the first, previous, next or last worksheets in the workbook.

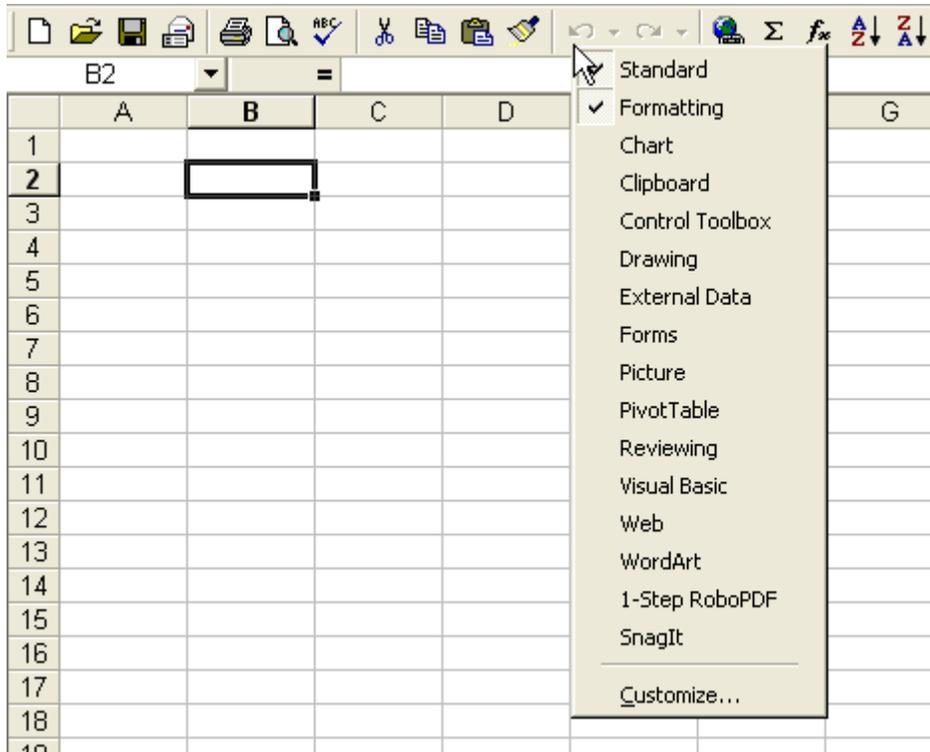
Sheet tabs separate a workbook into specific worksheets. A Workbook defaults to three worksheets. A Workbook must contain at least one worksheet.

## Toolbars

The Microsoft Excel toolbars group together shortcuts to common commands; these shortcuts take the form of buttons. You can click a toolbar button to quickly apply formatting, save or print a workbook, copy or paste data, or accomplish another of a variety of tasks.



To show or hide a toolbar, open the **View** menu, select **Toolbars**, and then select the toolbar you want to show or hide. You can also access the toolbar menu by right-clicking anywhere on a visible toolbar.



The most frequently used toolbars are the **Standard** toolbar and the **Formatting** toolbar.

The **Standard** toolbar contains buttons for opening, saving, printing, and editing workbooks.



The **Formatting** toolbar contains drop-down menus and buttons for applying formatting to worksheets.



By default, these two toolbars appear next to each other, just below the menu bar.

Other toolbars available in Excel are:

- **Chart** – Create and work with charts.
- **Clipboard** – View and select the contents of the clipboard.
- **Control Toolbox** – Insert ActiveX controls into a form.
- **Drawing** – Insert and format drawing objects.
- **External Data** – Work with data imported from external sources.
- **Forms** – Insert form objects.
- **Picture** – Insert and format pictures.

- **Pivot Table** – Create and work with pivot tables, interactive tables for large amounts of data.
- **Reviewing** – Insert, edit, and delete comments for or by reviewers.
- **Visual Basic** – Record and run macros, and work with Microsoft Word Visual Basic code.
- **Web** – Navigate a Web document.
- **WordArt** – Insert and format WordArt.

You can customize any of these toolbars by adding and removing buttons, or you can create your own toolbars to group your favorite commands: Just right-click one of the visible toolbars, select **Customize** from the menu that appears, and, in the **Customize** dialog, select the **Commands** tab to add or remove commands.

Each of Excel's toolbars can be moved simply by clicking and dragging the title bar (if the toolbar is floating) or the move handle (if the toolbar is docked).

The move handle is located at the left edge of the toolbar. When you move the mouse over it, the pointer changes to horizontal and vertical arrows, indicating you can drag the toolbar.



1. Drag the toolbar off the row. The toolbar changes from docked to floating.



2. Click the title bar and drag the toolbar back into place.

If you drag a toolbar to a full row, the surrounding toolbars will shrink to make room for it. To access a button that's no longer visible, click the chevrons at the right edge of the toolbar.



**Tip:**

To quickly remove buttons you don't use, or add new buttons, select **Add or Remove Buttons**. In the menu, uncheck the buttons you don't need, or select new buttons to add. Select **Customize** to choose from all the available commands.

## Workbooks and Worksheets

A **Workbook** automatically shows in the workspace when you open Microsoft Excel XP. Each workbook contains three **worksheets**. A worksheet is a grid of cells, consisting of 65,536 rows by 256 columns. Spreadsheet information--text, numbers or mathematical formulas--is entered in the different cells.

|   | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 |   |   |   |   |   |   |
| 2 |   |   |   |   |   |   |
| 3 |   |   |   |   |   |   |
| 4 |   |   |   |   |   |   |
| 5 |   |   |   |   |   |   |

Column headings are referenced by alphabetic characters in the gray boxes that run across the Excel screen, beginning with the Column A and ending with Column IV.

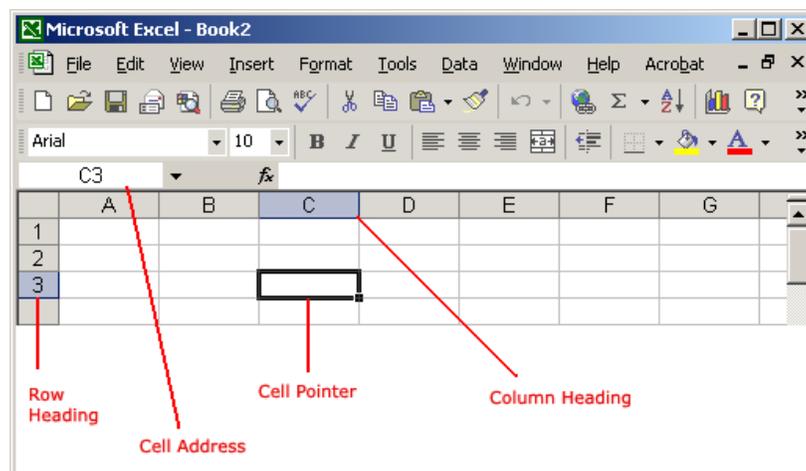
Rows are referenced by numbers that appear on the left and then run down the Excel screen. The first row is named Row 1 and the last row is named Row 65536.

### ➤ Important Terms

- A **workbook** is made up of three worksheets.
- The worksheets are labeled **Sheet1**, **Sheet2**, and **Sheet3**.
- Each Excel worksheet is made up of columns and rows.
- In order to access a **worksheet**, click on the tab that says **Sheet#**.

## The Cell

An Excel worksheet is made up of columns and rows. Where these columns and rows intersect, they form little boxes called **cells**. The active cell, or the cell that can be acted upon, reveals a dark border. All other cells reveal a light gray border. Each cell has a name. Its name is comprised of two parts: the column letter and the row number.



In the following picture the cell C3, formed by the intersection of column C and row 3, contains the dark border. It is the active cell.

|   | A | B | C | D | E | F |
|---|---|---|---|---|---|---|
| 1 |   |   |   |   |   |   |
| 2 |   |   |   |   |   |   |
| 3 |   |   |   |   |   |   |
| 4 |   |   |   |   |   |   |
| 5 |   |   |   |   |   |   |
| 6 |   |   |   |   |   |   |

#### ➤ Important Terms

- Each cell has a unique **cell address** composed of a cell's column and row.
- The **active cell** is the cell that receives the data or command you give it.
- A darkened border, called the **cell pointer**, identifies it.

## Moving Around the Worksheet

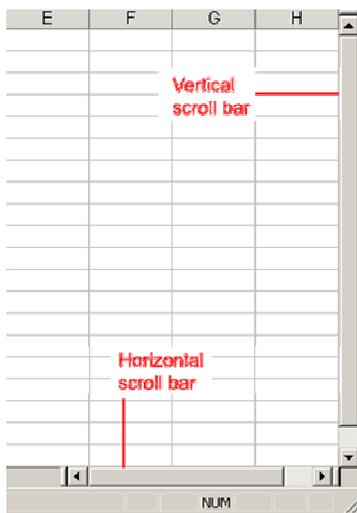
You can move around the spreadsheet in several different ways.

### To Move the Cell Pointer:

- To activate any cell, point to a cell with the mouse and click.
- To move the pointer one cell to the left, right, up, or down, use the keyboard **arrow keys**.

### To Scroll Through the worksheet:

The **vertical scroll bar** located along the right edge of the screen is used to move up or down the spreadsheet. The **horizontal scroll bar** located at the bottom of the screen is used to move left or right across the spreadsheet.



The **PageUp** and **PageDown** keys on the keyboard are used to move the cursor up or down one screen at a time. Other keys that move the active cell are **Home**, which moves to the first column on the current row, and **Ctrl+Home**, which moves the cursor to the top left corner of the spreadsheet or cell A1.

### To Move between worksheets

As mentioned, each Workbook defaults to three worksheets. These worksheets are represented by tabs-named Sheet1, Sheet2 and Sheet3-that appear at the bottom of the Excel window.

### To Move from one worksheet to another worksheet:

- Click on the sheet tab (Sheet1, Sheet2 or Sheet 3) that you want to display



### Challenge

- Display the contents of every menu in the menu bar and note the icons associated with specific menu choices. Then, try and find the pictures or shortcuts in the standard toolbar.
- Click on each of the three worksheet tabs-Sheet1, Sheet2 and Sheet3-to become familiar moving from sheet-to-sheet in the workbook.
- Page Up (PgUp) and Page Down (PgDn) to get used to scrolling in a worksheet.
- Use the horizontal and vertical scrollbars to practice scrolling up, down, left and right in the worksheet.

# Create, Open, and Save Workbooks

## LESSON 2

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### In This Lesson:

Understanding File Terms

Creating a Workbook

Saving a Workbook

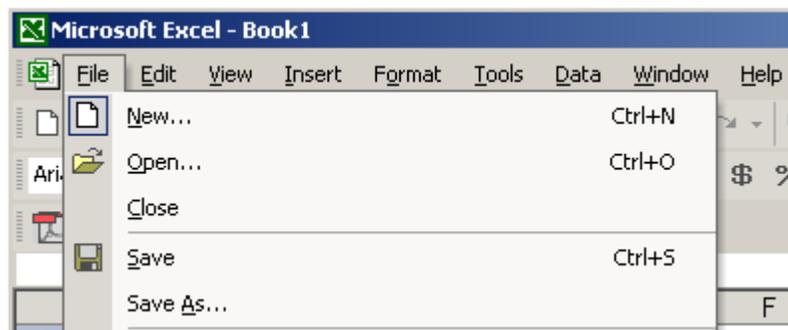
Opening a Workbook

Closing a Workbook

+ + + +

## Understanding File Terms

The File menu contains all the operations that we will discuss in this module: **New, Open, Close, Save** and **Save As**.



### New

Used to create a new Workbook.

### Open

Used to open an existing file from a floppy disk or hard drive of your computer.

### Close

Used to close a spreadsheet.

### Save As

Used when to save a new file for the first time or save an existing file with a different name.

## Save

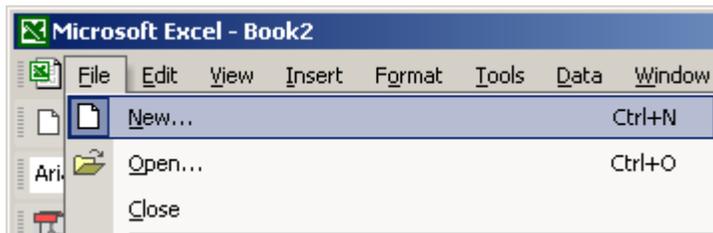
Used to save a file that has had changes made to it. If you close the workbook without saving then any changes made will be lost.

## Creating a Workbook

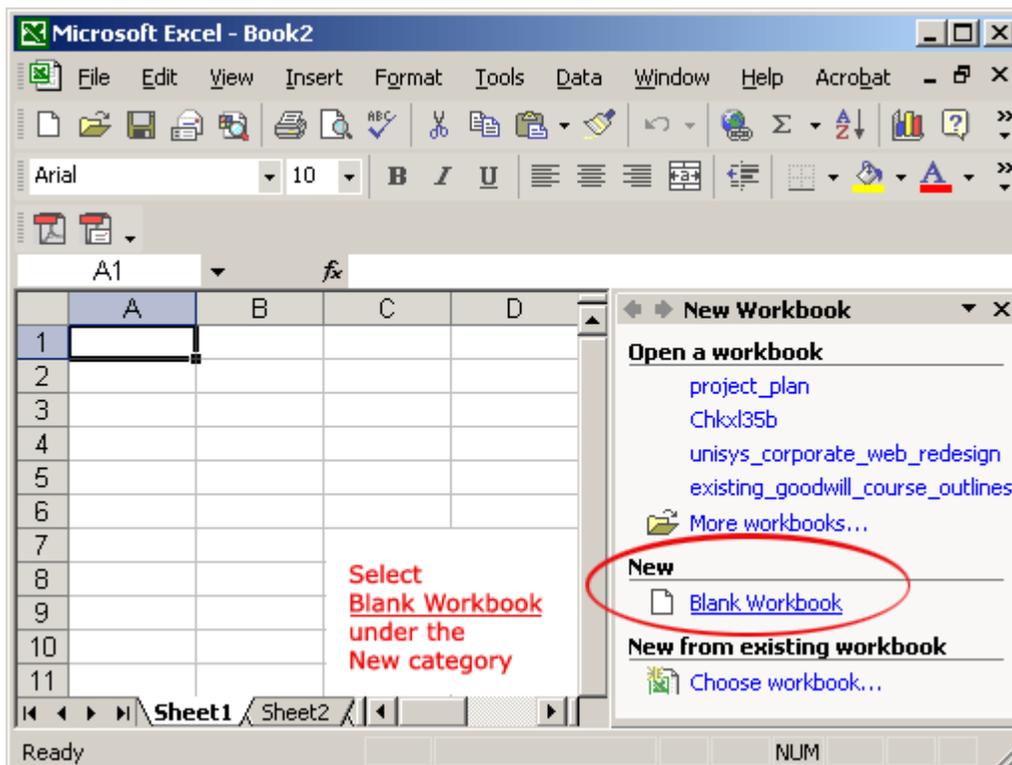
A blank workbook is displayed when Microsoft Excel XP is first opened. You can type information or design a layout directly in this blank workbook.

### To Create an Excel XP Workbook:

- Choose **File** → **New** from the menu bar.



- The **New Workbook** task pane opens on the right side of the screen.



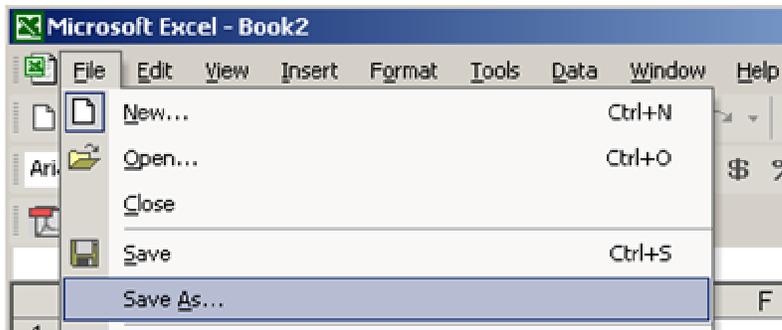
- Choose **Blank Workbook** under the **New** category heading.
- A blank workbook opens in the Excel window. The **New Workbook** task pane is closed.

## Saving a Workbook

Every workbook created in Excel must be saved and assigned a name to distinguish it from other workbooks. The first time you save a workbook, Excel will prompt you to assign a name through the **Save As** operation. Once assigned a name, any additional changes made to the text, numbers or formulas need to be saved using the **Save** operation.

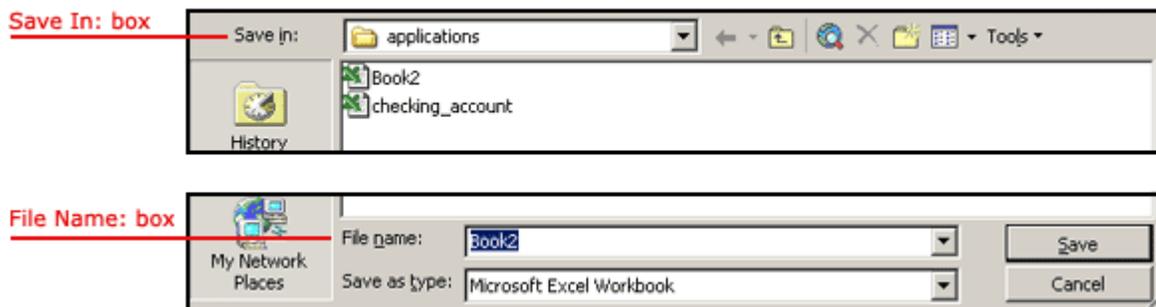
### To Save a new Workbook:

- Choose **File** → **Save As** from the menu bar.



**Choose the Save As Command when saving an Excel file for the first time.**

- The **Save As Dialog Box** appears.
- Click on the **Save In:** dropdown menu and locate where the file will be saved. Choose **3 1/2 Floppy (A:)** to save the file to a floppy disk or **Local Disk (C:)** to save the file to your computer.
- Type a name for your file in the **File Name:** box.
- Click the **Save** button.



### To Save Changes Made to an Existing Workbook:

- Choose **File** → **Save** from the menu bar, or

Click the  Save button on the Standard toolbar.

✓ If you're saving the file for the first time and you do not choose a file name, Microsoft Excel will assign a file name for you.

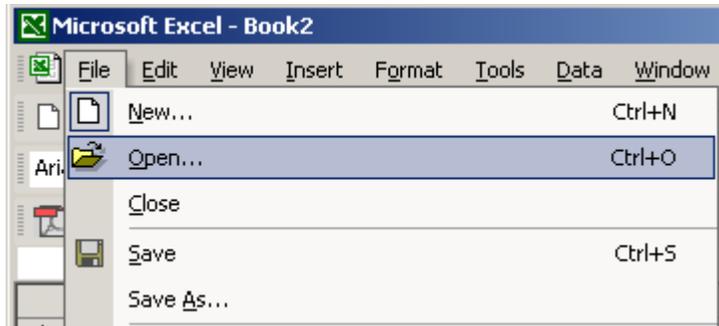
✓ It is a good idea to Save frequently when working in a spreadsheet. Losing information is never fun! You can quickly save your spreadsheet by using the quick-key combination Ctrl + S.

## Opening a Workbook

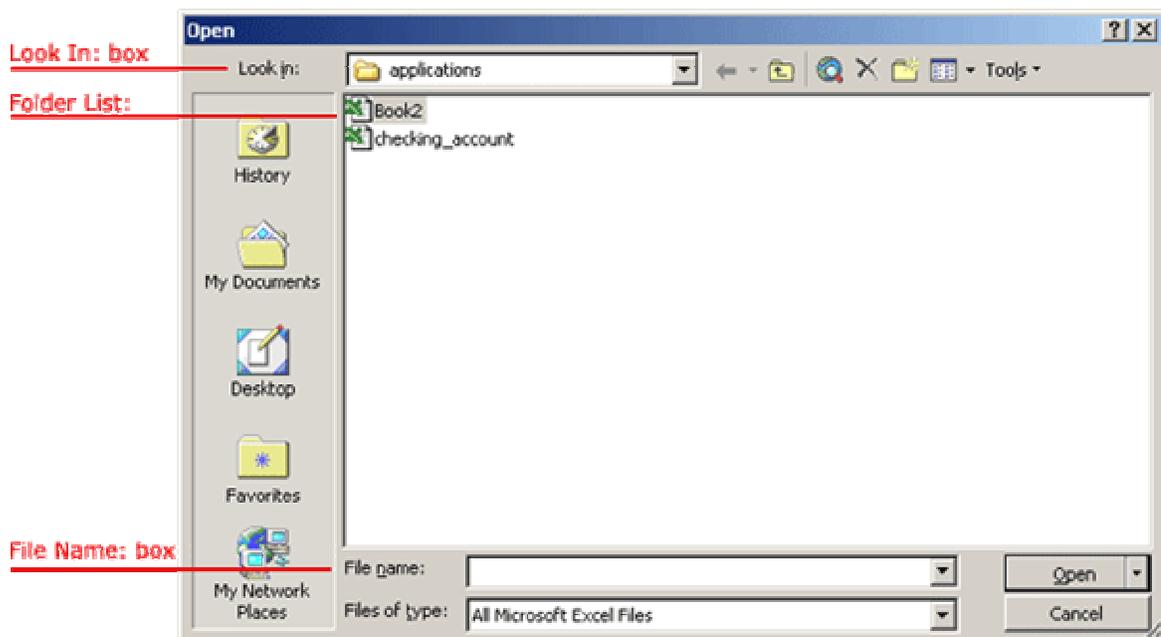
You can open any workbook that has previously been saved and given a name.

### To Open an Existing Excel XP Workbook:

- Choose **File** → **Open** from the menu bar.



- The **Open dialog box** opens.

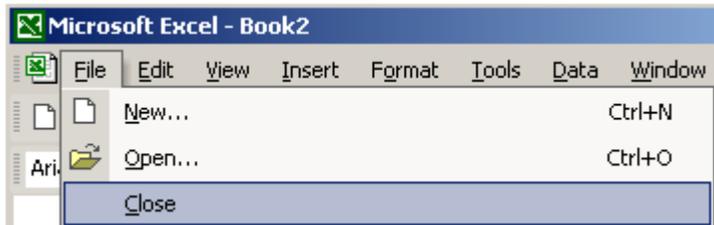


- In the **Look in** list, click the drive, folder, or Internet location that contains the file you want to open.
- In the **folder list**, open the folder that contains the file. Once the file is displayed, click on the file you want to open.
- Click the **Open** button.

## Closing a Workbook

### To close an existing Excel XP Workbook:

- Choose **File** → **Close** from the menu bar. The workbook in the Excel window is closed.



- ✓ Excel XP will prompt you to save information if any has been typed between the last save and the time you close the file.

## Challenge

- Create a **new** blank file and **save as** to c:\my documents as "test.xls"
- **Close** the file "test.xls"
- **Open** the file "test.xls"
- **Save** the file "test.xls"

# Enter, Edit and Delete Data

## LESSON 3

+ + + +

### In This Lesson:

Entering Text in a Cell

Entering More Than One Line of Text in a Cell

Pointer Shapes to Remember

Editing Information in a Cell

Deleting Information in a Cell

Performing Undo and Redo

Selecting Multiple Cells

+ + + +

## Entering Text in a Cell

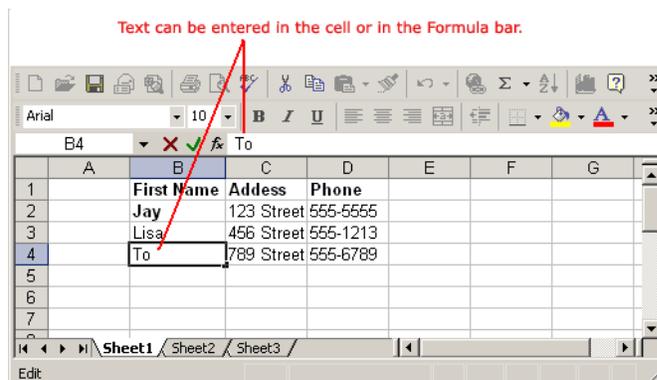
You can enter three types of data in a cell: **text**, **numbers**, and **formulas**. Text is any entry that is not a number or formula. Numbers are values used when making calculations. Formulas are mathematical calculations.

### To Enter Data into a Cell:

- Click the cell where you want to type information.
- Type the data. An insertion point appears in the cell as the data is typed.



- The data can be typed in either the cell or the Formula bar.

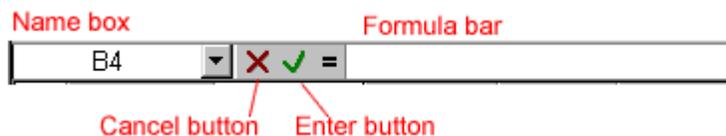


- Data being typed appears in the both **active cell** and in the **formula bar**.

Text appears in the both active cell  
and in the formula bar as it is typed.

|   | A | B          | C          | D        | E |
|---|---|------------|------------|----------|---|
| 1 |   | First Name | Address    | Phone    |   |
| 2 |   | Jay        | 123 Street | 555-5555 |   |
| 3 |   | Lisa       | 456 Street | 555-1213 |   |
| 4 |   | To         | 789 Street | 555-6789 |   |
| 5 |   |            |            |          |   |
| 6 |   |            |            |          |   |

- Notice the Cancel and Enter buttons in the formula bar.



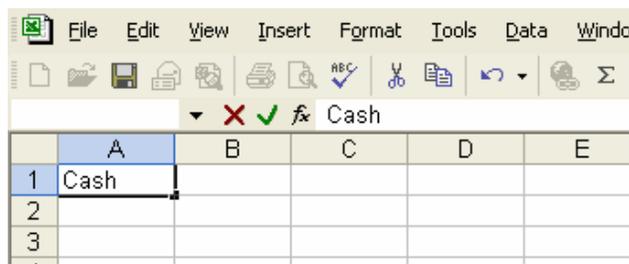
- Click the **Enter button** to end the entry and turn off the formula bar buttons.

✓ Excel's **AutoComplete** feature keeps track of previously-entered text. If the first few characters you type in a cell match an existing entry in that column, Microsoft Excel fills in the remaining characters for you.

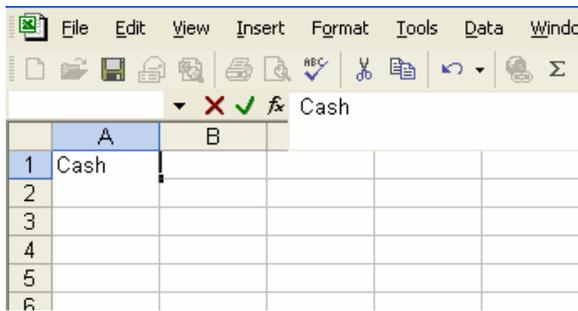
## Entering More Than One Line of Text in a Cell

**To enter more than one line of text in one cell:**

- Type the first line in the cell

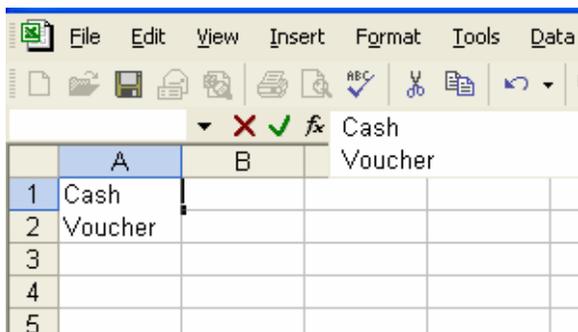


- Hold the **Alt key** and press **Enter button**



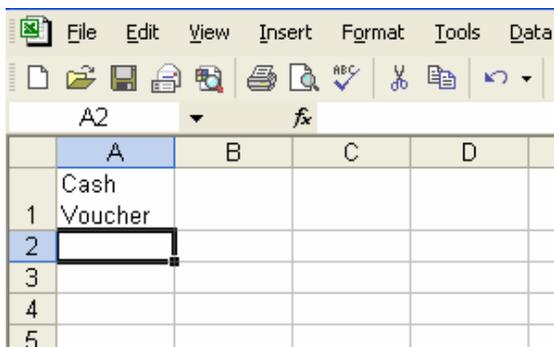
Notice the column header is covered because the formula bar is expanded to two lines.

- Type the next line in the cell



In this example, the next line typed is "Voucher."

- Press the **Enter** button to finish.



✓ To enter more than two lines of text, just repeat the second and third steps for each line.

### Pointer Shapes to Remember

As with other Microsoft programs, the shape of the pointer changes as you are working with the program. Each pointer shape is communicating something about how Excel is working. The shape of the pointer when you click and drag a cell will greatly influence the results of the click and drag. The following table document includes a table that describes each of the pointer shapes that you may encounter in your Excel work.

| Shape   | Meaning  | Action  |
|---|--|---|
|  | The default pointer shape.   | Move cell pointer or select a range of cells                                    |
|  | When the pointer is on a border (column, row, or window), the pointer changes to a two-headed black pointer. When adjusting row height, the arrow goes up and down. When adjusting column width, the arrows point right to left. | Adjust the column width, row height, or window size                             |
|  | When you are editing the contents of a cell, the pointer will change to an I-beam.   | Move the insertion point within the cell  |
|  | The pointer turns to a four-headed arrow when you have a graphic that may be moved   | With the pointer over the graphic, click and drag to the new location           |
|  | Appears when you are pointing to the border of a cell.   | Click and drag cell to a new location   |
|  | Appears when you are at the "fill corner" of a cell or range of cells.   | Click and drag the fill corner to AutoFill other cells with similar information |

## Editing Information in a Cell

Information in a spreadsheet is likely to change over time. Information can be changed in either of two ways.

### Quick and Easy Method:

- Click the cell that contains the information to be changed.
- Type the new entry. The old entry is **replaced** by the new entry.

If the original entry is long and requires only a minor adjustment (in spelling, for example), then you can directly edit the information in the cell.

### To Edit Information in a Cell:

#### Method 1: Direct Cell Editing

- **Double-click** on the cell that contains the information to be changed.

- The cell is opened for **direct editing**.

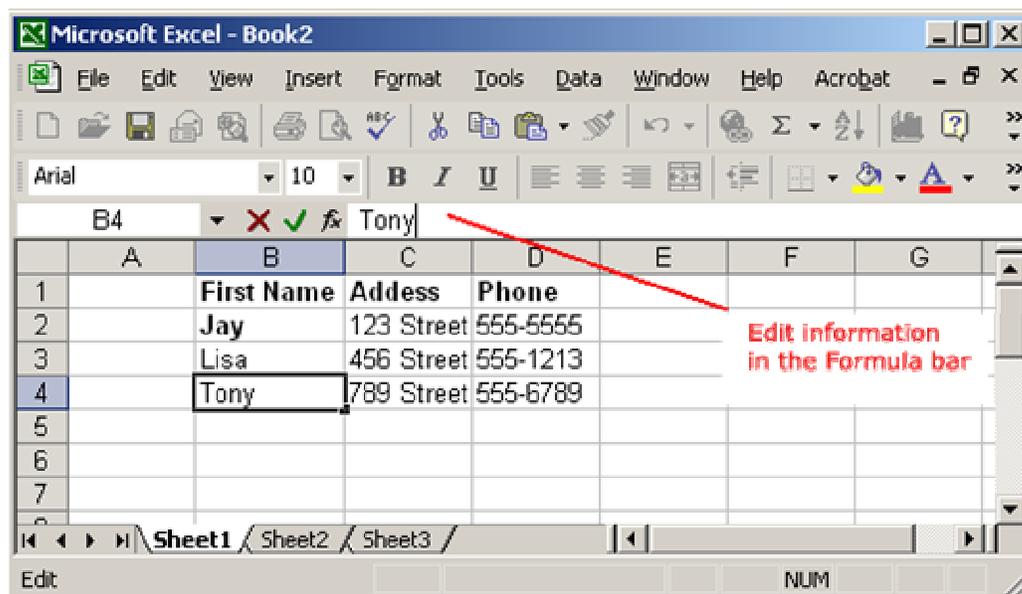
|   | A | B                 | C              | D            | E |
|---|---|-------------------|----------------|--------------|---|
| 1 |   | <b>First Name</b> | <b>Address</b> | <b>Phone</b> |   |
| 2 |   | Jay               | 123 Street     | 555-5555     |   |
| 3 |   | Lisa              | 456 Street     | 555-1213     |   |
| 4 |   | Tony              | 789 Street     | 555-6789     |   |
| 5 |   |                   |                |              |   |
| 6 |   |                   |                |              |   |
| 7 |   |                   |                |              |   |

Double-click on the cell and edit information directly in the cell.

- Make the necessary corrections.
- Press **Enter** or click the **Enter button** on the Formula bar  to complete the entry.

### Method 2: Formula Bar Editing

- Click the cell that contains the information to be changed.
- Edit the entry in the **formula bar**.



### Deleting Information in a Cell

#### To Delete Data that Already Appears in a Cell:

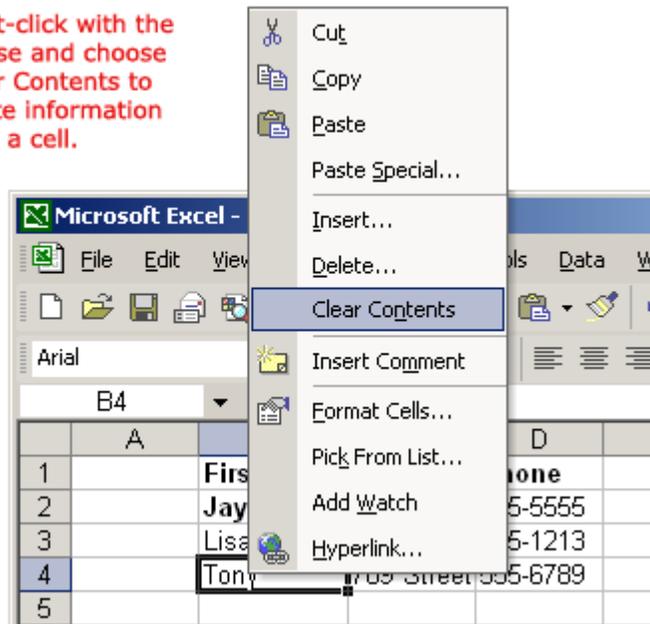
- Click the cell that contains the information to be deleted.
- Click on the information displayed in the **formula bar**.
- Click the **Cancel** button  to delete an entry and turn off the formula buttons.

OR

- Click the cell that contains the information to be deleted.
- Press the **Delete key**, or

- **Right-click** and choose **Clear Contents** from the shortcut menu.

Right-click with the mouse and choose **Clear Contents** to delete information from a cell.



#### To Delete Data Being Typed But Not Yet Added to the Cell:

- Cancel an entry by pressing the **Escape key**.

#### Performing Undo and Redo

Sometimes, you might do something to a spreadsheet that you didn't mean to do, like type the wrong number in a cell. Excel XP allows you to undo an operation. Use the  **Undo button** on the Standard toolbar to recover an error. The last single action is recoverable.

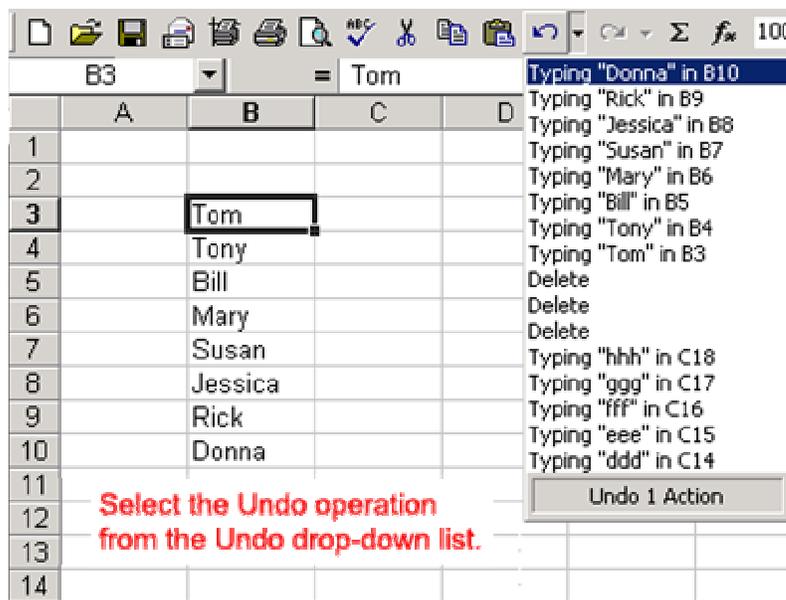
#### To Undo Recent Actions (typing, formatting, etc), One at a Time:

- Click the  **Undo button**.

#### To Undo Several Recent Actions at Once:

- Click the arrow next to the **Undo button**.

- Select the desired Undo operation(s) from the list.



- Microsoft Excel reverses the selected action and all actions that appear in the list above it.

An **Undo** operation can be cancelled by applying a **Redo**. This is useful when an Undo operation was mistakenly applied. Remember, a Redo is possible only if you have not changed an Excel spreadsheet since the last Undo operation was completed:

#### To Redo an Undo Operation:

- Press the  Redo button.

#### To Redo several recent Undo actions at once:

- Click the arrow next to **Redo** button.
- Select the desired Redo operation from the list.
- Microsoft Excel reverses the Undo operation.

### Selecting Multiple Cells

The currently-selected cell in Excel XP is called the **active cell**. You can also select a group of adjacent cells, or a **cell range**. Many operations can be done against a cell range: move it, copy, it, delete it or format it. A cell range can be defined in different ways: select a specific range of cells, select multiple columns or rows, or select the entire worksheet.

#### To Select a Range of Cells:

- Move to the **first cell** in the range.
- The mouse pointer becomes a **large cross**.
- Click-and-hold the left mouse button and **drag** left or right, up or down to the last cell you want to select.
- Release the mouse button.

- The cells you selected are shaded.

|   | A | B                 | C              | D            |
|---|---|-------------------|----------------|--------------|
| 1 |   | <b>First Name</b> | <b>Address</b> | <b>Phone</b> |
| 2 |   | Jay               | 123 Street     | 555-5555     |
| 3 |   | Lisa              | 456 Street     | 555-1213     |
| 4 |   | Tony              | 789 Street     | 555-6789     |
| 5 |   |                   |                |              |
| 6 |   |                   |                |              |

#### To Select All Cells in a Column or Row:

- Click the gray **Column** heading to select the entire column. (Click and drag the cursor across other column headings to select those columns).

|   | A | B                 | C              | D            |
|---|---|-------------------|----------------|--------------|
| 1 |   | <b>First Name</b> | <b>Address</b> | <b>Phone</b> |
| 2 |   | Jay               | 123 Street     | 555-5555     |
| 3 |   | Lisa              | 456 Street     | 555-1213     |
| 4 |   | Tony              | 789 Street     | 555-6789     |
| 5 |   |                   |                |              |
| 6 |   |                   |                |              |
| 7 |   |                   |                |              |

Click on the gray column heading to select the entire column.

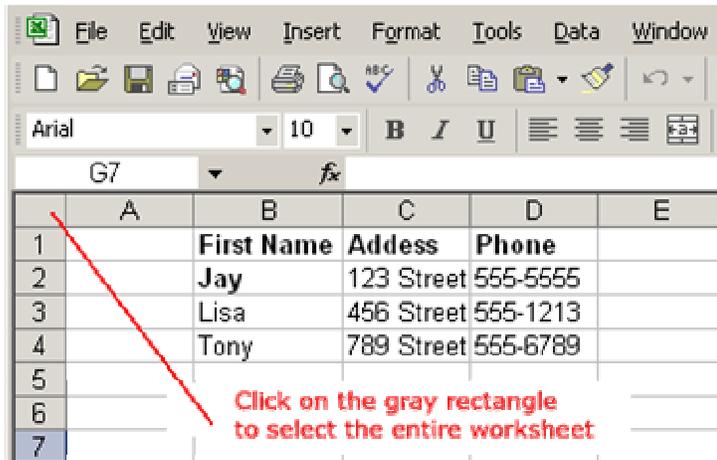
- Click the gray **Row** heading to select the entire row. (Click and drag the cursor down through the row headings select those rows).

|   | A | B                 | C              | D            | E |
|---|---|-------------------|----------------|--------------|---|
| 1 |   | <b>First Name</b> | <b>Address</b> | <b>Phone</b> |   |
| 2 |   | Jay               | 123 Street     | 555-5555     |   |
| 3 |   | Lisa              | 456 Street     | 555-1213     |   |
| 4 |   | Tony              | 789 Street     | 555-6789     |   |
| 5 |   |                   |                |              |   |
| 6 |   |                   |                |              |   |

Click on the gray row heading to select the entire row.

**To Select the Entire Worksheet:**

- Click the **gray rectangle** in the upper left corner to select entire worksheet.

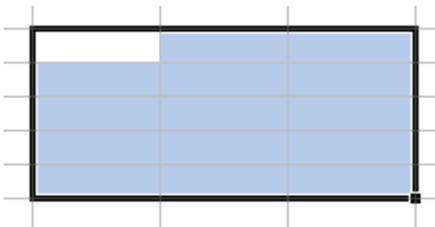


- ✓ If the cells and columns you want to select are not directly next to one another, select one of the ranges you want to select, and hold down the **Control key** while selecting other ranges.

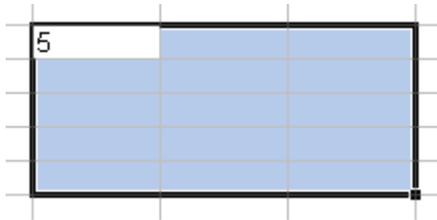
|   | A | B          | C          | D        |
|---|---|------------|------------|----------|
| 1 |   | First Name | Address    | Phone    |
| 2 |   | Jay        | 123 Street | 555-5555 |
| 3 |   | Lisa       | 456 Street | 555-1213 |
| 4 |   | Tony       | 789 Street | 555-6789 |
| 5 |   |            |            |          |
| 6 |   |            |            |          |
| 7 |   |            |            |          |

Ranges in Excel are used in a variety of ways. You can select a range to apply the same formatting to all the cells (such as font, size, color, borders, and shading), or you can enter the same data into each of the cells in the range using the **Ctrl + Enter** shortcut:

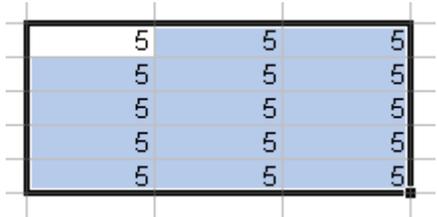
1. Select the range.



2. Type the data.



3. Press **Ctrl + Enter**.



Ranges are also used in performing calculations. When you enter a formula in the formula bar, you designate a range by typing the first cell in the range, followed by a colon (:), followed by the last cell in the range. For example:

### **A1:F3**

The range above includes cells A1 through A3, B1 through B3, C1 through C3, and so on through cell F3.

### **Challenge**

- Type the following data in the spreadsheet:

In cell B1, type **Name**

In cell C1, type **Address**

In cell D1, type **Phone**

In cell B2, type **Jay**

In cell C2, type **123 Street**

In cell D2, type **555-5555**

In cell B3, type **Lisa**

In cell C3, type **456 Street**

In cell D3, type **555-1213**

- Edit the label entered in cell B1 using the Direct Cell Editing method. Change **Name** to **First Name**.
- Delete the phone number that appears in cell D3.
- Undo the last operation.
- Edit the phone number entered in cell D3 using the Formula Bar Editing method. Change the phone number to **555-1214**.
- Select all the contents of any column or row.

# Moving, Copying, and Deleting Cell Contents

## LESSON 4

+ + + +

### In This Lesson:

Cut, Copy, Paste Defined

Copy and Paste Cell  
Contents

Cut and Paste Cell Contents

Moving Information Using  
Drag-and-Drop

AutoFill

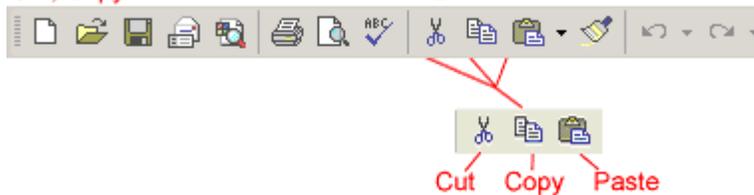
+ + + +

## Cut, Copy, Paste Defined

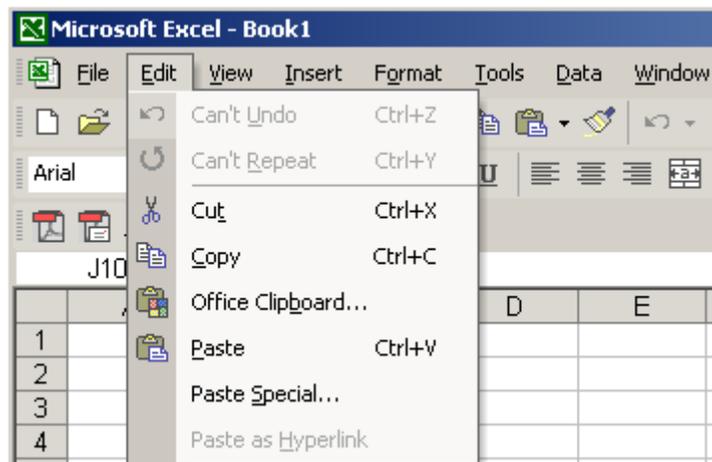
**Cut**, **Copy** and **Paste** are very useful operations in Excel XP. You can quickly copy and/or cut information in cells (text, numbers or formulas) and paste them into other cells. These operations save you a lot of time from having to type and retype the same information.

The **Cut**, **Copy** and **Paste** buttons are located on the Standard toolbar.

### Cut, Copy and Paste Buttons on the Standard Toolbar



The **Cut**, **Copy** and **Paste** operations also appear as choices in the **Edit** menu:



The **Cut**, **Copy** and **Paste** operations can also be performed through shortcut keys:

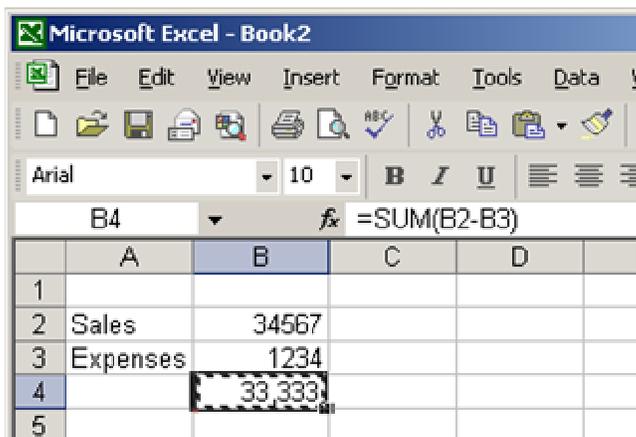
|       |        |
|-------|--------|
| Cut   | Ctrl+X |
| Copy  | Ctrl+C |
| Paste | Ctrl+V |

## Copy and Paste Cell Contents

The **Copy** feature allows you to copy selected information from the spreadsheet and temporarily place it on the Clipboard, which is a temporary storage file in your computer's memory. The **Paste** feature allows you to select any of the collected items on the Clipboard and paste it in a cell of the same or different spreadsheet.

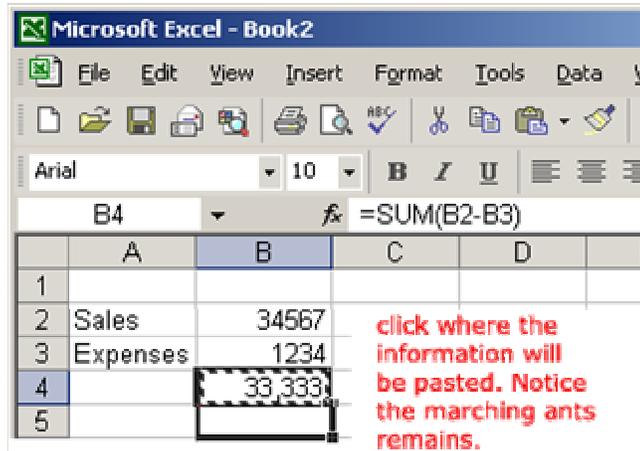
### To Copy and Paste:

- Select a cell or cells to be duplicated.
- Click on the  **Copy button** on the **standard toolbar**.
- The border of the copied cell(s) takes on the appearance of marching ants.



marching ants appear during the copy process

- Click on the cell where you want to place the duplicated information. The cell will be highlighted. If you are copying contents into **more than one cell**, click the **first cell** where you want to place the duplicated information.



- Press the **Enter** key. Your information is copied to the new location.

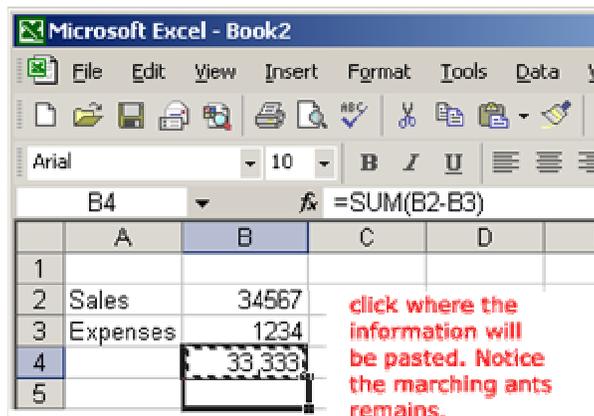
✓ Be careful if you paste copied cell information into cells that already contain data. If you do, the existing data is overwritten.

## Cut and Paste Cell Contents

The **Cut** feature allows you to remove information from cells in the spreadsheet. Information that is cut can be pasted in another cell, as long as the pasting occurs before you perform another operation. If you don't paste the cut information immediately, it is removed from the Office clipboard.

### To Cut and Paste:

- Select a cell or cells to be cut.
- Click on the **Cut**  button on the **Standard toolbar**.
- The information in the cell is deleted.
- The border of the cut cell(s) take on the appearance of marching ants.
- Click on the cell where you want to place the duplicated information. The cell will be highlighted. If you are copying contents into **more than one cell**, click the **first cell** where you want to place the duplicated information.



- Press the **Enter** key. Your information is pasted to the new location.

## Moving Information Using Drag-and-Drop

Another way to move information from one cell to another is to use the drag-and-drop method. You use the cursor to point to the information to be moved and then drag the cell to its new location.

### To Use Drag and Drop:

- Highlight and select the cell(s) you want to **move** to a new location.
- Position the mouse pointer near one of the **outside edges** of the selected cell(s). The mouse pointer changes from a large, white cross and becomes a slender, black cross with arrows at all ends.

|   |         |     |   |         |     |
|---|---------|-----|---|---------|-----|
| 2 | Savings | 245 | 2 | Savings | 245 |
| 3 |         |     | 3 |         |     |
| 4 |         |     | 4 |         |     |
| 5 |         |     | 5 |         |     |

Large, white cross

slender, black cross with arrows at all ends

- Keep the mouse pointer on the **outer edge** of the selected cell, click and hold the left mouse button and **drag** the cell(s) to a new location.

|    |         |     |  |  |
|----|---------|-----|--|--|
| 17 |         |     |  |  |
| 18 | Savings | 245 |  |  |
| 19 |         |     |  |  |
| 20 |         |     |  |  |
| 21 |         |     |  |  |

C19:D19

Drag and Drop in Excel

- Release the mouse button to move the information to its new location.

## AutoFill

MS Excel contains a feature called AutoFill, which copies a logical series of values, labels or formulas. The AutoFill handle can be located at the bottom right corner of the Active Cell(s).

Place the pointer over the small square in the bottom right corner of the Active Cell(s). The pointer will change to a cross hair. Click and Drag in any direction. The data to be entered automatically will pop-up. Then release the mouse.

EXAMPLES:

| <b><u>If you Enter:</u></b> | <b><u>The result will be:</u></b>  |
|-----------------------------|------------------------------------|
| Monday                      | Tuesday, Wednesday, Thursday, etc. |
| January                     | February, March, April, etc.       |
| 1 Qtr                       | 2 Qtr, 3 Qtr, 4 Qtr                |
| 1/2/00                      | 1/3/00, 1/4/00, 1/5/00, etc.       |

| HOT CHOCOLATES |         |          |      |      |      |      |
|----------------|---------|----------|------|------|------|------|
|                | JANUARY | FEBRUARY |      |      |      |      |
| TYPE           |         |          |      |      |      |      |
| Dark           | 2000    | 4500     | 1590 | 4360 | 2100 | 1500 |
| White          | 1900    | 3700     | 3400 | 5000 | 3200 | 1900 |
| Milk           | 3000    | 8010     | 4750 | 6500 | 5500 | 3000 |

To get numbers in a specific sequential order (1,2,3 or 10,20,30), you **MUST** set up a two cell pattern for AutoFill to follow.

Type the first two numbers in the sequence in two separate cell. Select both cells and THEN AutoFill.

|  |    |    |  |
|--|----|----|--|
|  |    |    |  |
|  | 33 | 66 |  |
|  |    |    |  |

### Challenge

- Type the words **cut** in cell A1, **copy** in cell B1 and **paste** in cell C1.
- Highlight a cell range to include cell A1 and cell B1.
- Move the cell range to cell D1 and cell E1.
- Cut the information in cell E1 (it should be the word, **copy**).
- Paste the cut information in cell A1.
- Copy the contents of cell A1 (it should be the word, **copy**).
- Paste the copied information in cell F1.

# Inserting, Deleting, and Hiding Rows and Columns

## LESSON 5

+ + + +

In This Lesson:

Inserting a Row

Inserting a Column

Deleting Columns and Rows

Hiding Columns and Rows

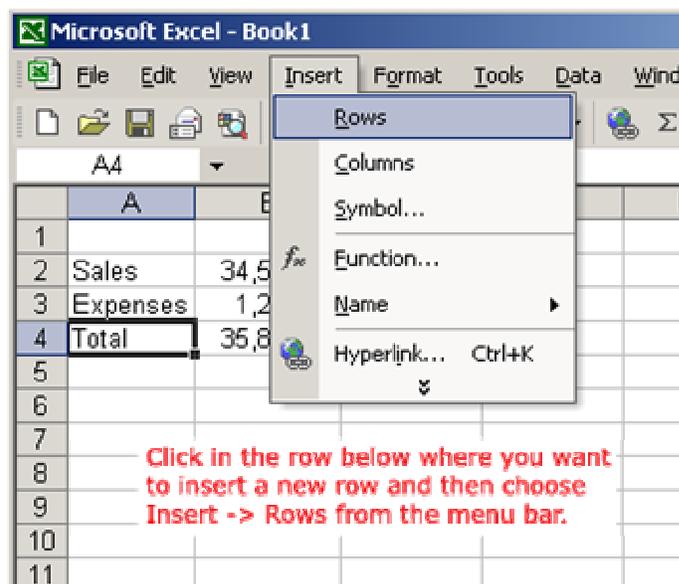
+ + + +

### Inserting a Row

You can insert a **row** in a spreadsheet anywhere you need it. Excel moves the existing rows down to make room for the new one.

#### To Insert a Row:

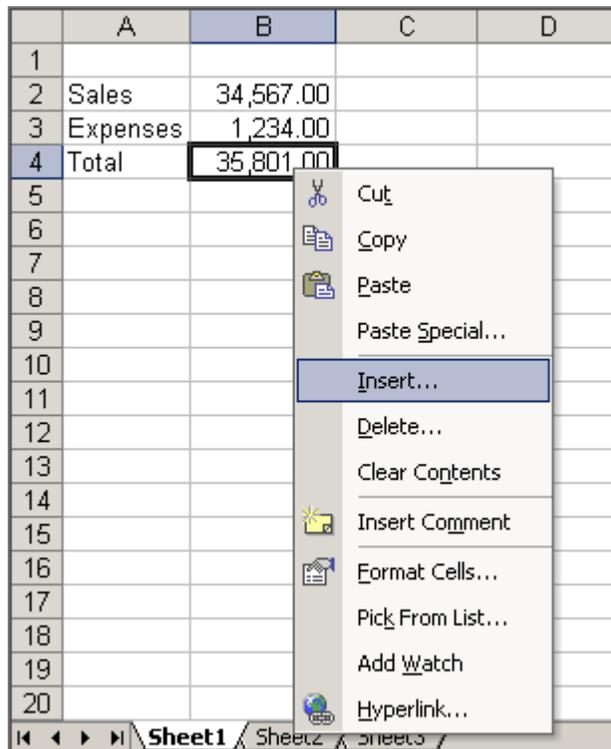
- Click anywhere in the row **below** where you want to insert the new row.
- Choose **Insert** → **Rows** from the menu bar.



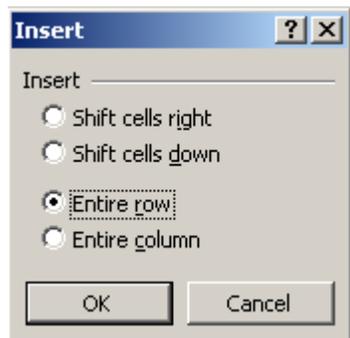
- A new row is inserted above the cell(s) you originally selected.

OR

- Click anywhere in the row **below** where you want to insert the new row.
- **Right-click** and choose **Insert** from the shortcut menu.



- The **Insert** dialog box opens.



- Choose the **Entire Row** radio button.
- Click the **OK** button.
- A new row is inserted above the cell(s) you originally selected.

|   | A        | B         | C |
|---|----------|-----------|---|
| 1 |          |           |   |
| 2 | Sales    | 34,567.00 |   |
| 3 | Expenses | 1,234.00  |   |
| 4 |          |           |   |
| 5 | Total    | 35,801.00 |   |
| 6 |          |           |   |

A blank row is inserted between rows 3 and 4.

- ✓ Select multiple rows before choosing Insert to add rows quickly. Excel inserts the same number of new rows that you originally selected.

## Inserting a Column

In Excel, you can insert a **column** anywhere you need it. Excel moves the existing columns to make room for the new one.

### To Insert a Column:

- Click anywhere in the column where you want to insert a new column.
- Choose **Insert** → **Columns** from the menu bar.

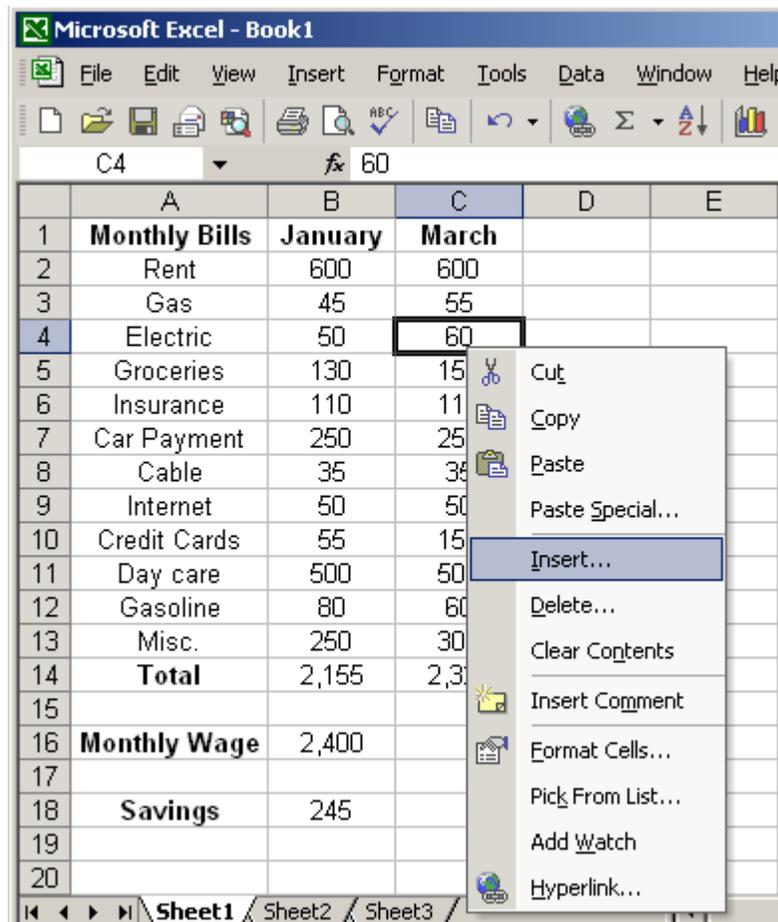
|    | A                    |       |       |
|----|----------------------|-------|-------|
| 1  | <b>Monthly Bills</b> |       |       |
| 2  | Rent                 |       |       |
| 3  | Gas                  |       |       |
| 4  | Electric             |       |       |
| 5  | Groceries            |       |       |
| 6  | Insurance            | 110   | 110   |
| 7  | Car Payment          | 250   | 250   |
| 8  | Cable                | 35    | 35    |
| 9  | Internet             | 50    | 50    |
| 10 | Credit Cards         | 55    | 155   |
| 11 | Day care             | 500   | 500   |
| 12 | Gasoline             | 80    | 60    |
| 13 | Misc.                | 250   | 300   |
| 14 | <b>Total</b>         | 2,155 | 2,325 |
| 15 |                      |       |       |
| 16 | <b>Monthly Wage</b>  | 2,400 |       |
| 17 |                      |       |       |
| 18 | <b>Savings</b>       | 245   |       |
| 19 |                      |       |       |

- A new column is inserted to the **left** of the existing column.

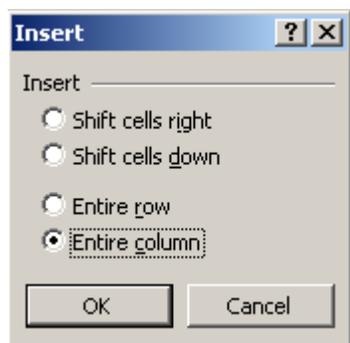
OR

- Click anywhere in the column where you want to insert a new column.

- **Right-click** and choose **Insert** from the shortcut menu.



- The **Insert** dialog box opens.



- Click the **Entire Column** radio button in the Insert dialog box.
- Click the **OK** button.

- A new column is inserted to the **left** of the existing column.

|    | A                    | B              | C | D            | E |
|----|----------------------|----------------|---|--------------|---|
| 1  | <b>Monthly Bills</b> | <b>January</b> |   | <b>March</b> |   |
| 2  | Rent                 | 600            |   | 600          |   |
| 3  | Gas                  | 45             |   | 55           |   |
| 4  | Electric             | 50             |   | 60           |   |
| 5  | Groceries            | 130            |   | 150          |   |
| 6  | Insurance            | 110            |   | 110          |   |
| 7  | Car Payment          | 250            |   | 250          |   |
| 8  | Cable                | 35             |   | 35           |   |
| 9  | Internet             | 50             |   | 50           |   |
| 10 | Credit Cards         | 55             |   | 155          |   |
| 11 | Day care             | 500            |   | 500          |   |
| 12 | Gasoline             | 80             |   | 60           |   |
| 13 | Misc.                | 250            |   | 300          |   |
| 14 | <b>Total</b>         | 2,155          |   | 2,325        |   |
| 15 |                      |                |   |              |   |
| 16 | <b>Monthly Wage</b>  | 2,400          |   |              |   |
| 17 |                      |                |   |              |   |
| 18 | <b>Savings</b>       | 245            |   |              |   |
| 19 |                      |                |   |              |   |

A new column is inserted between the January and March columns.

✓ You can also select multiple columns before choosing Insert to add columns quickly. Excel inserts the same number of new columns that you originally selected.

## Deleting Columns and Rows

Columns and rows are deleted in much the same manner as inserting columns and rows.

### To Delete a Row and All Information in It:

- Select a cell in the row to be deleted.
- Choose **Edit** → **Delete** from the menu bar.
- Click the **Entire Row** radio button in the **Delete** dialog box.

|    | A                    | B              | C            | D |
|----|----------------------|----------------|--------------|---|
| 1  | <b>Monthly Bills</b> | <b>January</b> | <b>March</b> |   |
| 2  | Rent                 | 600            | 600          |   |
| 3  | Gas                  | 45             | 55           |   |
| 4  | Electric             | 50             | 60           |   |
| 5  | Groceries            | 130            | 150          |   |
| 6  | Insurance            | 110            | 110          |   |
| 7  | Car Payment          |                |              |   |
| 8  | Cable                |                |              |   |
| 9  | Internet             |                |              |   |
| 10 | Credit Cards         |                |              |   |
| 11 | Day care             |                |              |   |
| 12 | Gasoline             |                |              |   |
| 13 | Misc.                |                |              |   |
| 14 | <b>Total</b>         |                |              |   |
| 15 |                      |                |              |   |
| 16 | <b>Monthly Wage</b>  | 2,400          |              |   |
| 17 |                      |                |              |   |
| 18 | <b>Savings</b>       | 245            |              |   |
| 19 |                      |                |              |   |

**Delete** [?] [X]

Delete

Shift cells left

Shift cells up

Entire row

Entire column

OK Cancel

- Click the **OK** button.

#### To Delete a Column and All Information in it:

- Select a cell in the column to be deleted.
- Choose **Edit** → **Delete** from the menu bar.
- Click the **Entire Column** radio button in the **Delete** dialog box.

|    | A                    | B              | C | D            | E |
|----|----------------------|----------------|---|--------------|---|
| 1  | <b>Monthly Bills</b> | <b>January</b> |   | <b>March</b> |   |
| 2  | Rent                 | 600            |   | 600          |   |
| 3  | Gas                  | 45             |   | 55           |   |
| 4  | Electric             | 50             |   | 60           |   |
| 5  | Groceries            | 130            |   | 150          |   |
| 6  | Insurance            | 110            |   | 110          |   |
| 7  | Car Payment          | 250            |   |              |   |
| 8  | Cable                | 35             |   |              |   |
| 9  | Internet             | 50             |   |              |   |
| 10 | Credit Cards         | 55             |   |              |   |
| 11 | Day care             | 500            |   |              |   |
| 12 | Gasoline             | 80             |   |              |   |
| 13 | Misc.                | 250            |   |              |   |
| 14 | <b>Total</b>         | 2,155          |   |              |   |
| 15 |                      |                |   |              |   |
| 16 | <b>Monthly Wage</b>  | 2,400          |   |              |   |
| 17 |                      |                |   |              |   |
| 18 | <b>Savings</b>       | 245            |   |              |   |
| 19 |                      |                |   |              |   |

- Click the **OK** button.

## Hiding Columns and Rows

At times, there may be information in your worksheet which you no longer need to see. At other times, you might be printing your worksheet and want to print only columns A-F and columns H-J, skipping column G. Rather than rearrange your worksheet for either of these examples, you can simply hide the information. You can also hide information in specific cells. The following topics are included in this document:

### Hiding Columns

If there is information on your worksheet you do not need to see or if you want to print only certain columns, you can hide those columns you do not want to see or print.

1. Select a cell within the column(s) to be hidden
2. From the *Format* menu, select **Column » Hide**  
The column is hidden.

### Hiding Columns: Quick Menu Option

1. Right click the column ID (e.g., B) » select **Hide**

### Redisplaying Columns

1. Select at least one cell from both of the columns around the hidden column(s) to be redisplayed, e.g., if column B is hidden, select a cell from both columns A and C  
HINT: If you cannot select the appropriate cells, you can use the [Go To](#) command.
2. From the *Format* menu, select **Column » Unhide**  
The column reappears.

### Redisplaying Columns: Quick Menu Option

1. Hold your cursor over ID for a column on either side of the hidden column  
The cursor will change to an open, double sided arrow as shown here.



2. Windows: Right click » select **Unhide**

### Redisplaying Column A: Quick Menu Option

This option works well for redisplaying column A, since there are not columns on both sides of column A.

1. Hold you cursor over ID for column B toward the left side  
The cursor will change to an open, double sided arrow as shown here.



2. Right click » select **Unhide**

### Hiding Rows

If there is information on your worksheet you do not need to see or if you want to print only certain rows, you can hide those rows you do not want to see or print.

1. Select a cell within the row(s) to be hidden
2. From the *Format* menu, select **Row » Hide**  
The row is hidden.

### Hiding Rows: Quick Menu Option

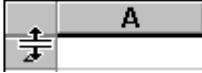
1. Right click the row ID (e.g., 5) » select **Hide**

### Redisplaying Rows

1. Select at least one cell from both of the rows around the hidden row(s) to be redisplayed, e.g., if row 5 is hidden, select a cell from rows 4 and 6.  
HINT: If you cannot select the appropriate cells, you can use the [Go To](#) command.
2. From the *Format* menu, select **Row » Unhide**  
The row reappears.

### Redisplaying Rows: Quick Menu Option

1. Hold your cursor over the ID for a row on either side of the hidden row  
The cursor will change to an open, double sided arrow as shown here.



2. Right click » select **Unhide**

### Redisplaying Row 1: Quick Menu Option

This option works well for redisplaying row 1, since there are not rows on both sides of row 1.

1. Hold your cursor over the ID for row 2 toward the top  
The cursor will change to an open, double sided arrow as shown here.



2. Right click » select **Unhide**

### Challenge

- In column A, type the following names in cells A1, A2, A3 and A4, respectively:

**Mary**, in cell A1

**Bob**, in cell A2

**Susan**, in cell A3

**John**, in cell A4

- In column B, type the following numbers next to each name entered in column A:

**44**, in cell B1, to the right of Mary's name

**28**, in cell B2, to the right of Bob's name

**36**, in cell B3, to the right of Susan's name

**89**, in cell B4, to the right of John's name

- **Insert a column** between columns A and B. Type the following numbers in the new column B.

**76**, in cell B1, to the right of Mary's name

**57**, in cell B2, to the right of Bob's name

**29**, in cell B3, to the right of Susan's name

**61**, in cell B4, to the right of John's name

- **Insert a row** between rows 2 and 3. Type the following numbers in the new row 3.

**Rick**, in cell A3

**45**, in cell B3

**58**, in cell C3

**61**, in cell B4

# Changing Column Width and Row Height

## LESSON 6

+ + + +

In This Lesson:

Adjusting Column Widths

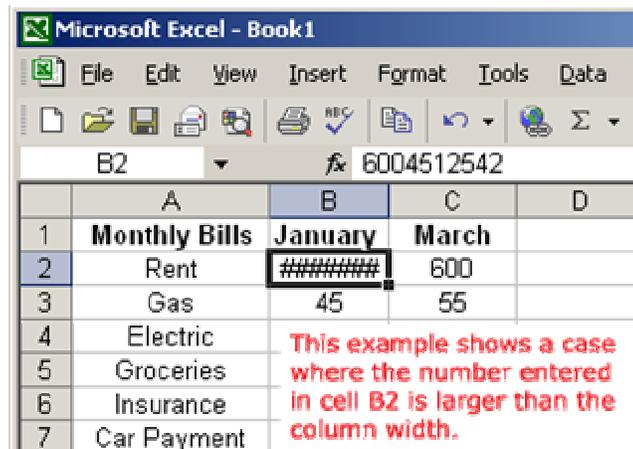
Adjusting Row Height

+ + + +

### Adjusting Column Widths

By default, Excel's columns are 8.43 characters wide, but each individual column can be enlarged to 240 characters wide.

If the data being entered in a cell is wider or narrower than the default column width, you can adjust the **column width** so it is wide enough to contain the data.



The screenshot shows a Microsoft Excel spreadsheet titled "Book1". The active cell is B2, containing the formula "6004512542". The spreadsheet has columns A, B, C, and D, and rows 1 through 7. The data in the spreadsheet is as follows:

|   | A             | B       | C     | D |
|---|---------------|---------|-------|---|
| 1 | Monthly Bills | January | March |   |
| 2 | Rent          | #####   | 600   |   |
| 3 | Gas           | 45      | 55    |   |
| 4 | Electric      |         |       |   |
| 5 | Groceries     |         |       |   |
| 6 | Insurance     |         |       |   |
| 7 | Car Payment   |         |       |   |

A red text box is overlaid on the spreadsheet, stating: "This example shows a case where the number entered in cell B2 is larger than the column width." The number "6004512542" is truncated to "#####" in cell B2.

✓ You can adjust column width **manually** or use **AutoFit**.

### To Manually Adjust a Column Width:

- Place your mouse pointer to the **right side** of the gray column header.

- The mouse pointer changes to the **adjustment tool** (double-headed arrow).

|   | A                    | B              | C            | D | E |
|---|----------------------|----------------|--------------|---|---|
| 1 | <b>Monthly Bills</b> | <b>January</b> | <b>March</b> |   |   |
| 2 | Rent                 | 600            | 600          |   |   |
| 3 | Gas                  | 45             | 55           |   |   |
| 4 | Electric             | 50             | 60           |   |   |
| 5 | Groceries            | 130            | 150          |   |   |
| 6 | Insurance            | 110            | 110          |   |   |

The mouse pointer changes to the Adjustment tool.

- Drag** the Adjustment tool left or right to the desired width and release the mouse button.

|    | A                    | B              | C            | D |
|----|----------------------|----------------|--------------|---|
| 1  | <b>Monthly Bills</b> | <b>January</b> | <b>March</b> |   |
| 2  | Rent                 | 600            | 600          |   |
| 3  | Gas                  | 45             | 55           |   |
| 4  | Electric             | 50             | 60           |   |
| 5  | Groceries            | 130            | 150          |   |
| 6  | Insurance            | 110            | 110          |   |
| 7  | Car Payment          | 250            | 250          |   |
| 8  | Cable                |                |              |   |
| 9  | Internet             |                |              |   |
| 10 | Credit Cards         |                |              |   |

Notice the difference in width columns B and C.

#### To AutoFit the Column Width:

- Place your mouse pointer to the **right side** of the column header.
- The mouse pointer changes to the **adjustment tool** (double-headed arrow).
- Double-click** the column header border.
- Excel "AutoFits" the column, making the entire column slightly larger than the largest entry contained in it.

✓ To access AutoFit from the menu bar, choose **Format** → **Column** → **AutoFit Selection**.

#### Adjusting Row Height

Changing the **row height** is very much like adjusting a column width. There will be times when you want to enlarge a row to visually provide some space between it and another row above or below it.

#### To Adjust Row Height of a Single Row:

- Place your mouse pointer to the **lower edge** of the **row heading** you want to adjust.

- The mouse pointer changes to the **adjustment tool** (double-headed arrow).

|   | A             | B       | C     | D |
|---|---------------|---------|-------|---|
| 1 | Monthly Bills | January | March |   |
| 2 | Rent          | 600     | 600   |   |
| 3 | Gas           | 45      | 55    |   |
| 4 | Electric      | 50      | 60    |   |
| 5 | Groceries     |         |       |   |
| 6 | Insurance     |         |       |   |
| 7 | Car Payment   |         |       |   |
| 8 | Cable         |         |       |   |
| 9 | Internet      | 50      | 50    |   |

The mouse pointer changes to the Adjustment tool.

- Drag** the Adjustment tool up or down to the desired height and release the mouse button.

|   | A             | B       | C     | D |
|---|---------------|---------|-------|---|
| 1 | Monthly Bills | January | March |   |
| 2 | Rent          | 600     | 600   |   |
| 3 | Gas           | 45      | 55    |   |
| 4 | Electric      |         |       |   |
| 5 | Groceries     |         |       |   |
| 6 | Insurance     |         |       |   |
| 7 | Car Payment   |         |       |   |
| 8 | Cable         |         |       |   |

Notice the difference in height between row 1 and the other rows in the spreadsheet.

### To AutoFit the Row Height:

- Place your mouse pointer to the **lower edge** of the **row heading** you want to adjust.
- The mouse pointer changes to the **adjustment tool** (double-headed arrow).
- Double-click** to adjust the row height to "AutoFit" the font size.

Excel XP "AutoFits" the row, making the entire row slightly larger than the largest entry contained in the row.

### Challenge

- Type the sentence, "**Mary had a little lamb,**" in cell B2.
- Define the **row height** of row 2 as **25**.
- AutoFit the **column width** of column B.

# Inserting, Deleting, Merging, and Hiding Cells

## LESSON 7

+ + + +  
In This Lesson:

Inserting a Cell

Deleting a Cell

Merging Cells

Hiding Cell Contents

+ + + +

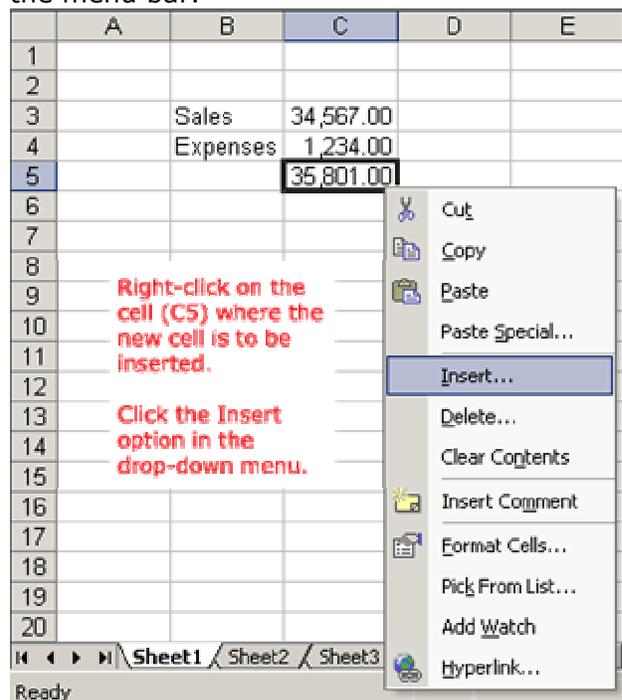
### Inserting a Cell

When working in an Excel XP worksheet, you may need to **insert or delete cells** without inserting or deleting entire rows or columns.

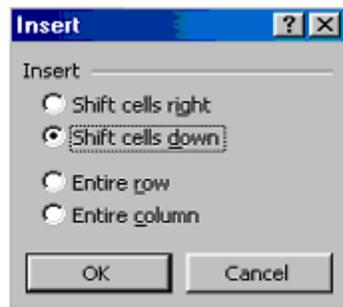
#### To Insert Cells:

- Select the location where the new cell(s) should be inserted. It can be a single cell or a range of cells.
- Right-click and choose Insert.

Note: You could also choose **Insert** → **Cell** on the menu bar.



- The **Insert** dialog box opens. Select either:
- **Shift cells right** to shift cells in the same row to the right.
- **Shift cells down** to shift selected cells and all cells in the column below it downward.



**Insert dialog box**

- Choose an option and click the OK button.
- Your result displays in the spreadsheet.

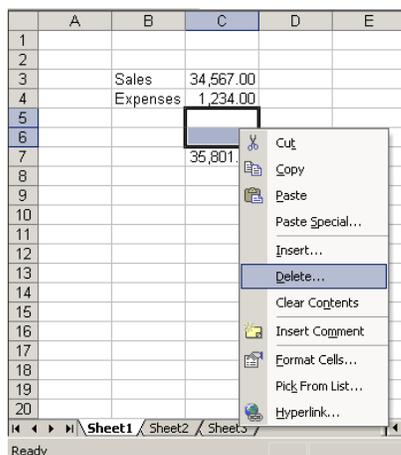
|   | A             | B        | C         | D |
|---|---------------|----------|-----------|---|
| 1 |               |          |           |   |
| 2 |               |          |           |   |
| 3 |               | Sales    | 34,567.00 |   |
| 4 |               | Expenses | 1,234.00  |   |
| 5 |               |          |           |   |
| 6 | Inserted cell |          | 35,801.00 |   |
| 7 |               |          |           |   |
| 8 |               |          |           |   |

- ✓ Remember, you can also use the **Insert** dialog box to insert or delete columns and rows.

## Deleting a Cell

**To Physically Delete the Cell from the Spreadsheet:**

- **Right-click** and choose **Delete**.



- The **Delete** dialog box opens. Select either:
- **Shift cells left** to shift cells in the same row to the left.

- **Shift cells up** to shift selected cells and all cells in the column above it upward.

|    | A | B        | C         | D | E | F |
|----|---|----------|-----------|---|---|---|
| 1  |   |          |           |   |   |   |
| 2  |   |          |           |   |   |   |
| 3  |   | Sales    | 34,567.00 |   |   |   |
| 4  |   | Expenses | 1,234.00  |   |   |   |
| 5  |   |          |           |   |   |   |
| 6  |   |          |           |   |   |   |
| 7  |   |          | 35,801.00 |   |   |   |
| 8  |   |          |           |   |   |   |
| 9  |   |          |           |   |   |   |
| 10 |   |          |           |   |   |   |
| 11 |   |          |           |   |   |   |
| 12 |   |          |           |   |   |   |
| 13 |   |          |           |   |   |   |
| 14 |   |          |           |   |   |   |
| 15 |   |          |           |   |   |   |
| 16 |   |          |           |   |   |   |
| 17 |   |          |           |   |   |   |
| 18 |   |          |           |   |   |   |
| 19 |   |          |           |   |   |   |

You can delete multiple cells at the same time.

**Delete** [?] [X]

Delete \_\_\_\_\_

Shift cells left  
 Shift cells up  
 Entire row  
 Entire column

OK Cancel

- Choose an option and click the **OK** button.
- Your result displays in your spreadsheet.

## Merging Cells

In Excel XP, you have another alignment option available to you: **merge and center**. This is performed when you want to select one or more cells and merge them into a larger cell. The contents will be **centered** across the new merged cell.

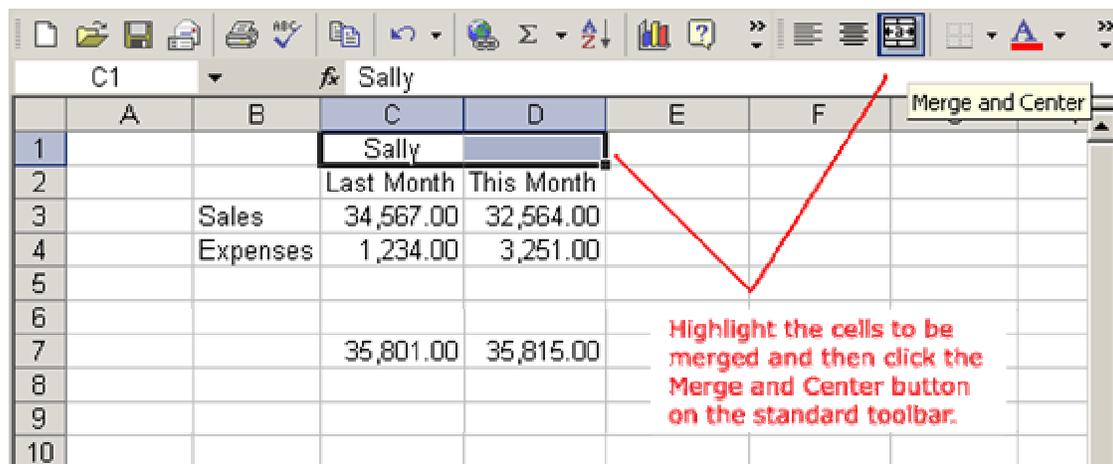
The picture below shows why we might want to merge two cells. The spreadsheet presents Last Month and This Month Sales and Expenses for Sally. Notice that Sally's name appears above the Last Month column. To evenly center Sally's name across the two cells we would perform a merge and center.

|   | A | B        | C          | D          | E | F |
|---|---|----------|------------|------------|---|---|
| 1 |   |          | Sally      |            |   |   |
| 2 |   |          | Last Month | This Month |   |   |
| 3 |   | Sales    | 34,567.00  | 32,564.00  |   |   |
| 4 |   | Expenses | 1,234.00   | 3,251.00   |   |   |
| 5 |   |          |            |            |   |   |
| 6 |   |          |            |            |   |   |
| 7 |   |          | 35,801.00  | 35,815.00  |   |   |
| 8 |   |          |            |            |   |   |
| 9 |   |          |            |            |   |   |

We would like to see Sally's name centered over both cell C1 and D1.

**To Merge Two Cells Into One:**

- Select the cells that you want to merge. It can be cells in a column, row or both columns and rows.
- Click the  **Merge and Center** button on the standard toolbar.



- The two cells are now merged into one.

|   | A | B        | C          | D          | E |
|---|---|----------|------------|------------|---|
| 1 |   |          | Sally      |            |   |
| 2 |   |          | Last Month | This Month |   |
| 3 |   | Sales    | 34,567.00  | 32,564.00  |   |
| 4 |   | Expenses | 1,234.00   | 3,251.00   |   |
| 5 |   |          |            |            |   |
| 6 |   |          |            |            |   |
| 7 |   |          | 35,801.00  | 35,815.00  |   |
| 8 |   |          |            |            |   |

**Hiding Cell Contents**

You have the ability to hide the contents of individual cells if you do not need to view their contents or you simply do not want to print certain cells.

1. Select the cell(s) to be hidden
2. From the *Format* menu, select **Cells ...**  
The *Format Cells* dialog box appears.
3. From the *Format Cells* dialog box, select the **Number** tab
4. Under *Category*, select **Custom**
5. In the *Type* text box, type three semicolons ( ; ; ; )
6. Click **OK**  
The cell(s) is now hidden.

**To redisplay cell information:**

1. Select the cell(s) to be redisplayed
2. From the *Format* menu, select **Cells ...**  
The *Format Cells* dialog box appears.

3. From the *Format Cells* dialog box, select the **Number** tab
4. Under *Category*, select the appropriate date, time, or number format
5. Click **OK**  
The cell(s) reappears.

### Challenge

- Type the name "**Oscar**" in cell B2.
- Type the name "**Ben**" in cell C2.
- Type the name "**Ruth**" in cell D2.
- **Insert a cell** between cell C2 and cell D2, and then "**shift the cells right.**"
- Type the name "**Mary**" in new cell D2.
- Type the label "**Sales People**" in cell B1.
- **Merge and Center** cells B1, C1, D1 and E1.

# Creating Simple Formulas

## LESSON 8

+ + + +

### In This Lesson:

#### About Formulas

#### Creating a Simple Addition Formula

#### Creating a Simple Subtraction Formula Using the Point-and-Click Method

#### Creating Simple Multiplication Formulas

#### Creating Simple Division Formulas

+ + + +

## About Formulas

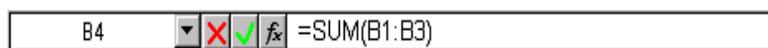
In school, you learned formulas used to calculate math problems. Microsoft Excel uses these same **formulas** to perform calculations in a spreadsheet.

A formula can be a combination of values (numbers or cell references) and math operators (+, -, /, \*, =) into an algebraic expression. Excel requires every formula to begin with an equal sign (=).

The following table illustrates the mathematical operators learned in school and those represented in Excel XP.

|                | School | Excel XP |
|----------------|--------|----------|
| Addition       | +      | +        |
| Subtraction    | -      | -        |
| Multiplication | X      | *        |
| Division       | /      | /        |
| Equals         | =      | =        |

The result of a formula—the answer to  $2+3$ , for example—displays in the cell on the Excel worksheet. The formula is visible only in the formula bar. A formula's result will change as different numbers are entered into the cells included in the formula's definition.



## Creating a Simple Addition Formula

A simple formula in Excel contains one mathematical operation only: one number plus a second number equals a third number. Writing a simple formula is really no more difficult than that:  $1+1$ . The only difference in Excel is that all formulas **must** begin with the **equal sign** (=). It is not enough to type **1+1** in Excel because what will appear in the cell is "1+1." You must begin the equation with an equal sign, or **=1+1**. This holds true for any formula, simple or complicated, that adds, subtracts, multiplies or divides.

Let's add two numbers to create a third,  $128+345=473$ . In Excel XP, this would be expressed by the formula, **=128+345**, as shown below.

|   | A | B   | C | D |
|---|---|-----|---|---|
| 1 |   |     |   |   |
| 2 |   | 473 |   |   |
| 3 |   |     |   |   |
| 4 |   |     |   |   |

The formula, **=128+345**, produces an answer of **473**.

### To Create a Simple Formula that Adds Two Numbers:

- Click the cell where the formula will be defined.
- Type the equal sign (=) to let Excel know a formula is being defined.
- Type the first number to be added (128, for example)
- Type the **addition sign (+)** to let Excel know that an add operation is to be performed.
- Type the second number to be added (345, for example)
- Press **Enter** or click the **Enter button** on the Formula bar to complete the formula.

But what if a column contains many numbers, each of which regularly changes? You don't want to write a new formula each time a number is changed. Luckily, Excel XP lets you include cell references in formulas.

A formula can add the value of two cells-B2 and B3, for example. Type any two values in these two cells and the formula will adjust the answer accordingly.

Using this method to calculate two numbers-128 and 345, for example-requires that you type 128 in cell B2, for example, and 345 in cell B3. The Excel formula, **=B2+B3**, would then be defined in cell B4.

The image shows two screenshots of an Excel spreadsheet. The left screenshot shows the formula bar with the text `=sum(B2+B3)` and the spreadsheet with values 128 in cell B2 and 345 in cell B3. The right screenshot shows the result 473 in cell B4. A red arrow points from the text below to cell B4 in the right screenshot.

Type the formula, `=B2+B3`, in cell B4 and press Enter to see the result

### To Create a Simple Formula that Adds the Contents of Two Cells:

- Type the numbers you want to calculate in separate cells (for example, type 128 in cell B2 and 345 in cell B3).
- Click the cell where the answer will appear (B4, for example).
- Type the equal sign (=) to let Excel know a formula is being defined.
- Type the cell number that contains the first number to be added (B2, for example).
- Type the **addition sign (+)** to let Excel know that an add operation is to be performed.
- Type the cell number that contains the first number to be added (B3, for example).
- Press **Enter** or click the **Enter button** on the Formula bar to complete the formula.

### Creating a Simple Subtraction Formula Using the Point-and-Click Method

Formulas can be created by using either numbers or cell references in the definition. You can also use the mouse to select the cells to be used in the formula instead of typing the cell number or cell reference. Using this method, we are going to write a simple formula that subtracts one cell from another: `=B3-B2`.

The image shows a screenshot of an Excel spreadsheet. The formula bar shows `=B3-B2`. The spreadsheet has values 128 in cell B2 and 345 in cell B3. Cell B4 is highlighted with a dashed box, indicating it is the target cell for the formula. A red arrow points from the text below to cell B4.

Formula `=B3-B2` subtracts cell B3 from cell B2.

### To Create a Simple Formula using the Point and Click Method:

- Type the numbers you want to calculate in separate cells (for example, type 128 in cell B2 and 345 in cell B3).
- Click the cell where the answer will appear (B4, for example).
- Type the equal sign (=) to let Excel know a formula is being defined.
- Click on the **first cell** to be included in the formula (B3, for example).
- Type the **subtraction sign (-)** to let Excel know that a subtraction operation is to be performed.

- Click on the **next cell** in the formula (B2, for example).
- If you include multiple cells in the formula, repeat steps 4 and 5 until the entire formula is entered.
- Press **Enter** or click the **Enter button** on the Formula bar to complete the formula.

### Creating Simple Multiplication Formulas

- Creating multiplication formulas is very similar to addition and subtraction formulas. To **multiply** two cells the formula, B2 and B3, you would need to insert a multiplication operator \* between them, **=B2\*B3**. Press **Enter** or click the **Enter button** on the Formula bar to complete the formula.

|   | A | B      | C | D | E |
|---|---|--------|---|---|---|
| 1 |   |        |   |   |   |
| 2 |   | 128    |   |   |   |
| 3 |   | 345    |   |   |   |
| 4 |   | =B2*B3 |   |   |   |
| 5 |   |        |   |   |   |
| 6 |   |        |   |   |   |

Formula =B2\*B3 multiplies cell B2 by cell B3.

### Creating Simple Division Formulas

Creating division formulas is very similar to the addition, subtraction and multiplication formulas. To **divide** the contents of cell B2 by cell B3, you would need to insert a division operator / between them, **=B2/B3**. Press **Enter** or click the **Enter button** on the Formula bar to complete the formula.

|   | A | B      | C | D | E |
|---|---|--------|---|---|---|
| 1 |   |        |   |   |   |
| 2 |   | 128    |   |   |   |
| 3 |   | 345    |   |   |   |
| 4 |   | =B2/B3 |   |   |   |
| 5 |   |        |   |   |   |
| 6 |   |        |   |   |   |

Formula =B2/B3 divides cell B2 by cell B3.

### Challenge

- In cell A1, type **1234**
- In cell A2, type **15865**
- Click the cell where you want the result to appear.
- Type a formula in cell A3 that **adds** cell A1 and cell A2
- Type a formula in cell A4 that **subtracts** cell A1 from cell A2
- Type a formula in cell A5 that **multiplies** cell A1 by cell A2
- Type a formula in cell A6 that **divides** cell A2 by cell A1

# Creating Complex Formulas

## LESSON 9

+ + + +

### In This Lesson:

Complex Formulas Defined

Creating Complex Formulas

Filling Formulas to Other Cells (AutoFilling Formulas)

Copy and Paste Formulas

Revising Formulas

Creating an Absolute Reference

+ + + +

## Complex Formulas Defined

Simple formulas have one mathematical operation. **Complex formulas** involve more than one mathematical operation.

The order of mathematical operations is very important. If you enter a formula that contains several operations--like adding, subtracting and dividing--Excel XP knows to work those operations in a specific order. The order of operations is:

1. Operations enclosed in parenthesis
2. Exponential calculations (to the power of)
3. Multiplication and division, whichever comes first
4. Addition and subtraction, whichever comes first

Using this order, let us see how the formula **120/(8-5)\*4-2** is calculated in the following picture:

$$120/(8-5)*4-2$$

Perform the operation in parentheses first:  $8-5=3$

formula becomes

$$120/3*4-2$$

Because the division comes before the multiplication, divide  $120/3=40$

formula becomes

$$40*4-2$$

Next, the multiplication takes place before the subtraction:  $40*4=160$

formula becomes

$$160-2$$

Finally,  $160-2=158$

The final answer is 158

Let's take a look at another example:

$$2*(6-4) = ?$$

Is the answer 8 or 4? Well, if you ignored the parentheses and calculated in the order in which the numbers appear,  $2*6-4$ , you'd get the wrong answer, 8. You must follow the order of operations to get the correct answer.

#### To Calculate the Correct Answer:

- Calculate the operation in parenthesis (6-4), where the answer is 2.
- Multiply the answer obtained in step #1, which is 2, to the numeric 2\* that opened the equation. In other words, multiply  $2*2$ .
- The answer is 4.

✓ When using **formulas** with cell references, the results change each time the numbers are **edited**.

✓ Remember: In Excel, never do math "in your head" and type the answer in a cell where you would expect to have a formula calculate the answer.

Before moving on, let's explore some more formulas to make sure you understand the order of operations by which Excel calculates the answer.

$$5*3/2$$

Multiply  $5*3$  before performing the division operation because the multiplication sign comes before the division sign. The answer is **7.5**.

$$5/3*2$$

Divide  $5/3$  before performing the multiplication operation because the division sign comes before the multiplication sign. The answer is **3.333333**.

$$5/(3*2)$$

Perform the operation in parentheses ( $3*2$ ) first and divide this result by 5. The answer is **0.833333**.

$$5+3-2$$

Add  $5+3$  before performing the subtraction operation because the addition

$$5-2+3$$

sign comes before the subtraction sign. The answer is **6**.

Subtract 5-2 before performing the addition operation because the subtraction sign comes before the addition sign. The answer is **6**.

$$5-2*3$$

Multiply 2\*3 before performing the subtraction operation because the multiplication sign is of a higher order than the subtraction sign. The answer is **-1**.

$$(5-2)*3$$

Perform the operation in parenthesis (5-2) first and then multiply by 3. The answer is **9**.

## Creating Complex Formulas

Excel XP automatically follows a standard order of operations in a complex formula. If you want a certain portion of the formula to be calculated first, put it in parentheses.

If we wanted to add the contents of cell B2 and cell B3, for example, and then take that answer and multiply it by the data in cell A4, then we would need to define the following formula: **=(B2+B3)\*A4**.

|    | A  | B           | C | D | E |
|----|----|-------------|---|---|---|
| 1  |    |             |   |   |   |
| 2  |    | 128         |   |   |   |
| 3  |    | 345         |   |   |   |
| 4  | 97 |             |   |   |   |
| 5  |    | =(B2+B3)*A4 |   |   |   |
| 6  |    |             |   |   |   |
| 7  |    |             |   |   |   |
| 8  |    |             |   |   |   |
| 9  |    |             |   |   |   |
| 10 |    |             |   |   |   |

The formula **=(B2+B3)\*A4** first adds 128 and 345 and then multiplies the answer by 97

- Enter the numbers you want to calculate.
- Click the cell where you want the formula **result** to appear.

- Type the equal sign (=) to let Excel know a formula is being defined.
- Type an open parenthesis, or (
- Click on the **first cell** to be included in the formula (cell B2, for example).
- Type the **addition sign (+)** to let Excel know that an add operation is to be performed.
- Click on the **second cell** in the formula. The reference B3 displays where you want your result.
- End the B2+B3 operation by adding the close parenthesis, or )
- Type the next mathematical operator, or the **multiplication symbol (\*)** to let Excel know that an multiply operation is to be performed.
- Click on the **third cell** to be included in the formula, cell A4.
- **Very Important:** Press **Enter** or click the **Enter button**  on the Formula bar. This step ends the formula.

✓ Try changing one of the values in the formula and watch the answer to the formula change.

### Filling Formulas to Other Cells (AutoFilling Formulas)

Sometimes, you will write a formula that gets used a lot in different places of a worksheet. For example, a spreadsheet may contain several columns of numbers. Each column will contain a formula that adds all the numbers in it. You could write the formula several times, once in each column. Or you could copy-and-paste it into each column. The **fill formula** method allows you to copy a formula and fill it into many different consecutive cells at the same time.

The mouse pointer changes to a black crosshair when passed over the fill handle, or the square box in the lower right corner of the cell.

|    | B5 | fx =(B2+B3)*A4 |   |   |   |   |
|----|----|----------------|---|---|---|---|
|    | A  | B              | C | D | E | F |
| 1  |    |                |   |   |   |   |
| 2  |    | 128            |   |   |   |   |
| 3  |    | 345            |   |   |   |   |
| 4  | 97 |                |   |   |   |   |
| 5  |    | 45881          |   |   |   |   |
| 6  |    |                |   |   |   |   |
| 7  |    |                |   |   |   |   |
| 8  |    |                |   |   |   |   |
| 9  |    |                |   |   |   |   |
| 10 |    |                |   |   |   |   |

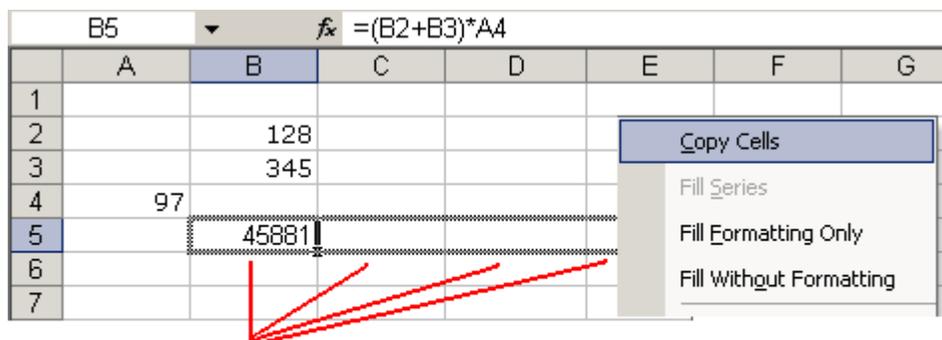
The mouse pointer changes to a black crosshair when passed over the fill handle.

Fill handle

#### To Use the Fill Handle to Copy a Formula to a Surrounding Cell:

- Click on the cell that contains the formula to be copied.
- Position the mouse pointer over the fill handle.
- Click and hold the left mouse button, and then drag the contents to the cell that's to receive the fill formula.
- Release the mouse button.

- Select the **Copy Cells** option in the fill formula drop-down menu.



Copy the formula in cell B5 and fill it into cells C5, D5 and E5.

The cell references in a formula are automatically updated when the formula is copied to other cells in the spreadsheet.

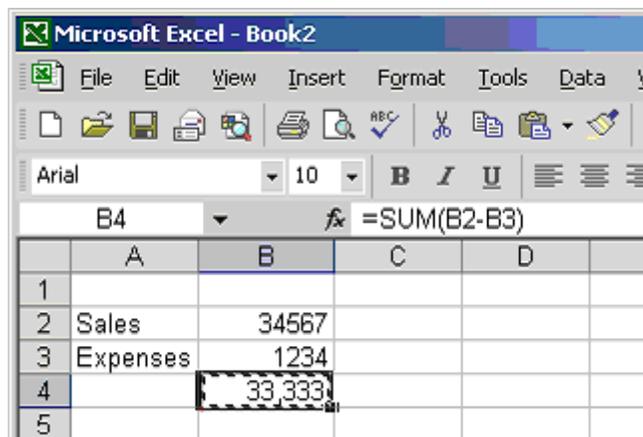
- ✓ You can also use **copy and paste** to copy a formula to other cells.

### Copy and Paste Formulas

The process to copy and paste a formula is identical to that process used to copy and paste text.

#### To Copy and Paste a Formula:

- Select the cell that contains the formula to be copied.
- Click the  **Copy** button. Marching "ants" appear around the copied cell(s).



marching ants appear during the copy process

- Select the cell where the copied formula is to be pasted.
- Press the **Enter key**. The formula is copied to the new location.

## Revising Formulas

You can **revise** any formula that was previously written in a worksheet.

### To Revise a Formula using the Keyboard:

- Double-click the cell that contains the formula you want to revise.
- The cursor can now move left and right between the values in the formula in cell B5.

|    | A        | B         | C         | D |
|----|----------|-----------|-----------|---|
| 1  |          |           |           |   |
| 2  | Sales    | 34,567.00 |           |   |
| 3  | Expenses | 1,234.00  | 35,124.00 |   |
| 4  |          |           |           |   |
| 5  |          | =B2+B3    |           |   |
| 6  |          |           |           |   |
| 7  |          |           |           |   |
| 8  |          |           |           |   |
| 9  |          |           |           |   |
| 10 |          |           |           |   |
| 11 |          |           |           |   |

To replace cell B2 with cell C3 in your formula, type C3 where B2 appears and then delete B2.

- Make the necessary changes to the formula.
- Press the Enter key or click the Enter button to accept the new formula.

## Relative and Absolute Cell References

Excel uses two types of cell references to create formulas. Each has its own purpose. Read on to determine which type of cell reference to use for your formula.

### Relative Cell References

This is the most widely used type of cell reference in formulas. Relative cell references are basic cell references that adjust and change when copied or when using AutoFill.

Example:

=SUM(B5:B8), as shown below, changes to =SUM(C5:C8) when copied across to the next cell.

|   | A             | B        | C           |
|---|---------------|----------|-------------|
| 1 |               |          |             |
| 2 |               |          |             |
| 3 |               |          |             |
| 4 | Region        | Books    | Periodicals |
| 5 | North         | \$15,678 | \$8,796     |
| 6 | South         | \$13,865 | \$9,776     |
| 7 | East          | \$25,401 | \$11,392    |
| 8 | West          | \$18,552 | \$4,928     |
| 9 | Product Total | \$73,496 |             |

|    |               |          |             |
|----|---------------|----------|-------------|
| C9 |               |          | =SUM(C5:C8) |
|    | A             | B        | C           |
| 1  | Smith's Bo    |          |             |
| 2  | Septemb       |          |             |
| 3  |               |          |             |
| 4  | Region        | Books    | Periodicals |
| 5  | North         | \$15,678 | \$8,796     |
| 6  | South         | \$13,865 | \$9,776     |
| 7  | East          | \$25,401 | \$11,392    |
| 8  | West          | \$18,552 | \$4,928     |
| 9  | Product Total | \$73,496 | \$34,892    |

### Absolute Cell References

Situations arise in which the cell reference must remain the same when copied or when using AutoFill. Dollar signs are used to hold a column and/or row reference constant.

Example:

In the example below, when calculating commissions for sales staff, you would not want cell B10 to change when copying the formula down. You want both the column and the row to remain the same to refer to that exact cell. By using \$B\$10 in the formula, neither changes when copied.

|    |                             |             |             |
|----|-----------------------------|-------------|-------------|
|    | A                           | B           | C           |
| 1  | Commissions - November 2000 |             |             |
| 2  |                             |             |             |
| 3  |                             | Total Sales | Commission  |
| 4  | Bob                         | 26,000      | =B4*\$B\$10 |
| 5  | Sally                       | 35,350      |             |
| 6  | Joseph                      | 42,000      |             |
| 7  | Celia                       | 28,800      |             |
| 8  |                             |             |             |
| 9  |                             |             |             |
| 10 | Rate:                       | 10%         |             |

|    |                             |        |             |
|----|-----------------------------|--------|-------------|
| C5 |                             |        | =B5*\$B\$10 |
|    | A                           | B      | C           |
| 1  | Commissions - November 2000 |        |             |
| 2  |                             |        |             |
| 3  |                             | Tot:   |             |
| 4  | Bob                         | 26,000 | 2600        |
| 5  | Sally                       | 35,350 | 3535        |
| 6  | Joseph                      | 42,000 | 4200        |
| 7  | Celia                       | 28,800 | 2880        |
| 8  |                             |        |             |
| 9  |                             |        |             |
| 10 | Rate:                       | 10%    |             |

A more complicated example:

Let's pretend that you need to calculate the prices of items in stock with two different price discounts. Take a look at the worksheet below.

|    | A                             | B              | C            | D | E                 | F                 |
|----|-------------------------------|----------------|--------------|---|-------------------|-------------------|
| 1  | <b>Sale Price Comparisons</b> |                |              |   |                   |                   |
| 2  |                               |                |              |   |                   |                   |
| 3  | <b>Item #</b>                 | <b>Product</b> | <b>Price</b> |   | <b>Discount A</b> | <b>Discount B</b> |
| 4  | 125A                          | Scooter        | \$59.99      |   | =C4-\$C4*A\$12    |                   |
| 5  | 789A                          | Tricycle       | \$129.95     |   |                   |                   |
| 6  | 78B                           | Soccer Ball    | \$12.35      |   |                   |                   |
| 7  | 489A                          | Crybaby Doll   | \$21.99      |   |                   |                   |
| 8  | 57B                           | Art Kit        | \$14.95      |   |                   |                   |
| 9  |                               |                |              |   |                   |                   |
| 10 | <b>Discounts</b>              |                |              |   |                   |                   |
| 11 | A                             | B              |              |   |                   |                   |
| 12 | 10%                           | 15%            |              |   |                   |                   |

Examine the formula in cell E4. By making the first cell reference \$C4, you keep the column from changing when copied across, but allow the row to change when copying down to accommodate the prices of the different items going down. By making the last cell reference A\$12, you keep the row number from changing when copied down, but allow the column to change and reflect discount B when copied across. Confused? Check out the graphics below and the cell results.

#### Copied Across

|    | A                             | B              | C            | D | E                 | F                 |
|----|-------------------------------|----------------|--------------|---|-------------------|-------------------|
| 1  | <b>Sale Price Comparisons</b> |                |              |   |                   |                   |
| 2  |                               |                |              |   |                   |                   |
| 3  | <b>Item #</b>                 | <b>Product</b> | <b>Price</b> |   | <b>Discount A</b> | <b>Discount B</b> |
| 4  | 125A                          | Scooter        | \$59.99      |   | \$53.99           | \$50.99           |
| 5  | 789A                          | Tricycle       | \$129.95     |   |                   |                   |
| 6  | 78B                           | Soccer Ball    | \$12.35      |   |                   |                   |
| 7  | 489A                          | Crybaby Doll   | \$21.99      |   |                   |                   |
| 8  | 57B                           | Art Kit        | \$14.95      |   |                   |                   |
| 9  |                               |                |              |   |                   |                   |
| 10 | <b>Discounts</b>              |                |              |   |                   |                   |
| 11 | A                             | B              |              |   |                   |                   |
| 12 | 10%                           | 15%            |              |   |                   |                   |

#### Copied Down

|    | A                             | B              | C            | D | E                 | F                 |
|----|-------------------------------|----------------|--------------|---|-------------------|-------------------|
| 1  | <b>Sale Price Comparisons</b> |                |              |   |                   |                   |
| 2  |                               |                |              |   |                   |                   |
| 3  | <b>Item #</b>                 | <b>Product</b> | <b>Price</b> |   | <b>Discount A</b> | <b>Discount B</b> |
| 4  | 125A                          | Scooter        | \$59.99      |   | \$53.99           | \$50.99           |
| 5  | 789A                          | Tricycle       | \$129.95     |   | \$116.96          |                   |
| 6  | 78B                           | Soccer Ball    | \$12.35      |   | \$11.12           |                   |
| 7  | 489A                          | Crybaby Doll   | \$21.99      |   | \$19.79           |                   |
| 8  | 57B                           | Art Kit        | \$14.95      |   | \$13.46           |                   |
| 9  |                               |                |              |   |                   |                   |
| 10 | <b>Discounts</b>              |                |              |   |                   |                   |
| 11 | A                             | B              |              |   |                   |                   |
| 12 | 10%                           | 15%            |              |   |                   |                   |

Now, you might be thinking, why not just use 10% and 15% in the actual formulas? Wouldn't that be easier? Yes, if you are sure the discount percentages will never change - which is highly unlikely. It's more likely that eventually those percentages will need to be adjusted. By referencing the *cells* containing 10% and 15% and not the actual numbers, when the percentage changes all you need to do is change the percentage one time in cell A12 and/or B12 instead of rebuilding all of your formulas. Excel would automatically update the discount prices to reflect your discount percentage change.

**Summary of absolute cell reference uses:**

|        |   |
|--------|---|
| \$A1   | Allows the row reference to change, but not the column reference. |
| A\$1   | Allows the column reference to change, but not the row reference. |
| \$A\$1 | Allows neither the column nor the row reference to change.        |

There is a shortcut for placing absolute cell references in your formulas!

When you are typing your formula, after you type a cell reference - press the **F4** key. Excel automatically makes the cell reference absolute! By continuing to press **F4**, Excel will cycle through all of the absolute reference possibilities. For example, in the first absolute cell reference formula in this tutorial, =B4\*\$B\$10, we could have typed, =B4\*B10, then pressed the **F4** key to change B10 to \$B\$10. Continuing to press **F4** would have resulted in B\$10, then \$B10, and finally B10. Pressing **F4** changes only the cell reference directly to the left of your insertion point.

**Challenge**

- Type the following information:

In cell A1, type **12345**

In cell A2, type **15865**

In cell B1, type **9347**

In cell B2, type **11942**

In cell C1, type **19348**

In cell C2, type **17103**

- Create the following simple formulas:

In cell A3, **write a formula** to add cell A1 and cell A2

- **Fill the formula** in cell A3 to both cell B3 and cell C3
- Create the following complex formula:

In cell A5, **write a formula** that divides cell A1 by the sum of cells A3, B3 and C3

- In the formula defined in cell A5, **create an absolute reference** to all cells and rows referenced in the following part of the formula: sum of cells A3, B3 and C3.
- **Copy** the formula and absolute reference in cell A5 and **paste** it into cell B5 and cell C5.
- Note how the formulas that appear in cell A5, cell B5 and cell C5 differ from one another.

# Functions

LESSON

# 10

+ + + +

In This Lesson:

Using Functions

Excel's Different Functions

Finding the Sum of a Range of Data

Finding the Average of a Range of Numbers

Using the MAX, MIN, and COUNT for a Range of Numbers

Using the IF Function

Accessing Excel XP Function

+ + + +

## Using Functions

A **function** is a **pre-defined formula** that helps perform common mathematical functions. Functions save you the time of writing lengthy formulas. You could use an Excel function called **Average**, for example, to quickly find the average of range of numbers. Or you could use the **Sum** function to find the sum of a cell range. Excel XP contains many different functions.

Each function has a specific order, called **syntax**, which must be strictly followed for the function to work correctly.

Syntax Order:

1. All functions begin with the = sign.
2. After the = sign define the **function name** (e.g., Sum).
3. One or more **arguments**-numbers, text or cell references-enclosed by parentheses. If there is more than one argument, separate each by a comma.

An example of a function with one argument that adds a range of cells, B3 through B10:

**=SUM(B3:B10)**

equal sign    function name    argument

An example of a function with **more than one argument** that calculates the average of numbers in a range of cells, B3 through B10, and C3 through C10:

**=AVG(B3:B10, C3:C10)**

equal sign      function name      argument

Excel literally has hundreds of different **functions** to assist with your calculations. Building formulas can be difficult and time-consuming. Excel's functions can save you a lot of time and headaches.

## Excel's Different Functions

There are many different functions in Excel XP. Some of the more common functions include:

### Statistical Functions:

- **SUM** - summation adds a range of cells together.
- **AVERAGE** - average calculates the average of a range of cells.
- **COUNT** - counts the number of chosen data in a range of cells.
- **MAX** - identifies the largest number in a range of cells.
- **MIN** - identifies the smallest number in a range of cells.

### Financial Functions:

- **Interest Rates**
- **Loan Payments**
- **Depreciation Amounts**

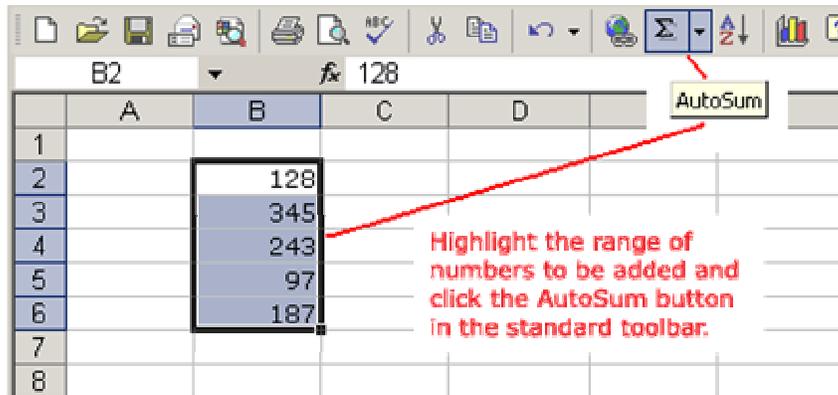
### Date and Time functions:

- **DATE** - Converts a serial number to a day of the month
- **Day of Week**
- **DAYS360** - Calculates the number of days between two dates based on a 360-day year
- **TIME** - Returns the serial number of a particular time
- **HOUR** - Converts a serial number to an hour
- **MINUTE** - Converts a serial number to a minute
- **TODAY** - Returns the serial number of today's date
- **MONTH** - Converts a serial number to a month
- **YEAR** - Converts a serial number to a year

✓ You don't have to memorize the functions but should have an idea of what each can do for you.

## Finding the Sum of a Range of Data

The **AutoSum function** allows you to create a formula that includes a cell range-many cells in a column, for example, or many cells in a row.



### To Calculate the AutoSum of a Range of Data:

- Type the numbers to be included in the formula in separate cells of column B (Ex: type 128 in cell B2, 345 in cell B3, 243 in cell B4, 97 in cell B5 and 187 cell B6).
- Click on the **first cell** (B2) to be included in the formula.
- Using the point-click-drag method, drag the mouse to define a cell range from cell B2 through cell B6.
- On the **Standard** toolbar, click the **Sum** button.
- The sum of the numbers is added to cell B7, or the cell immediately beneath the defined range of numbers.
- Notice the formula, **=SUM(B2:B6)**, has been defined to cell B7.

|   | A | B    | C | D | E |
|---|---|------|---|---|---|
| 1 |   |      |   |   |   |
| 2 |   | 128  |   |   |   |
| 3 |   | 345  |   |   |   |
| 4 |   | 243  |   |   |   |
| 5 |   | 97   |   |   |   |
| 6 |   | 187  |   |   |   |
| 7 |   | 1000 |   |   |   |
| 8 |   |      |   |   |   |

The AutoSum of cells B2 through B6 is added to cell B7. Notice the formula, =SUM(B2:B6), defined in cell B7.

### Finding the Average of a Range of Numbers

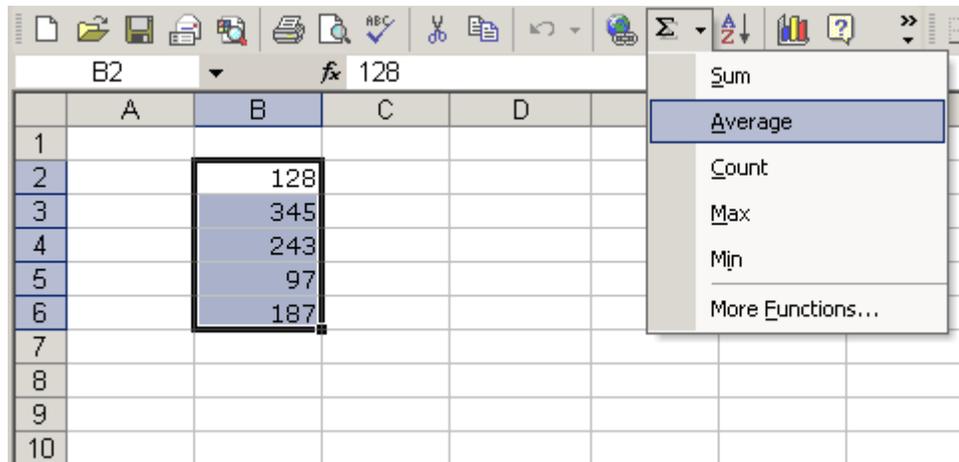
The **Average** function calculates the average of a range of numbers. The Average function can be selected from the AutoSum drop-down menu.

### To Calculate the Average of a Range of Data:

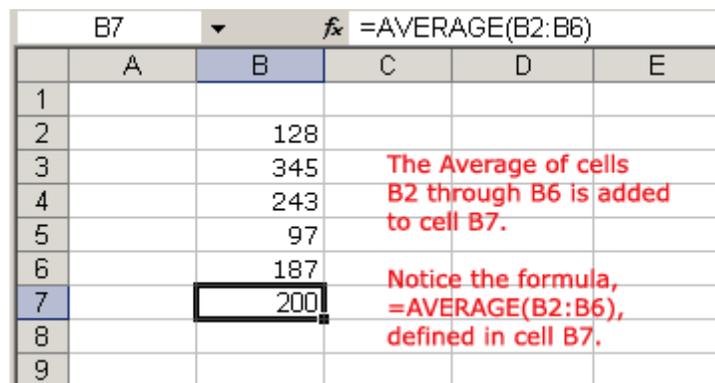
- Type the numbers to be included in the formula in separate cells of column B (Ex: type 128 in cell B2, 345 in cell B3, 243 in cell B4, 97 in cell B5 and 187 cell B6).
- Click on the **first cell** (B2) to be included in the formula.
- Using the point-click-drag method, **drag** the mouse to define a cell range from cell B2 through cell B6.
- On the **Standard** toolbar, click on the drop-down part of the **AutoSum** button.



- Select the **Average function** from the drop-down Functions list.



- The average of the numbers is added to cell B7, or the cell immediately beneath the defined range of numbers.
- Notice the formula, **=AVERAGE(B2:B6)**, has been defined to cell B7.

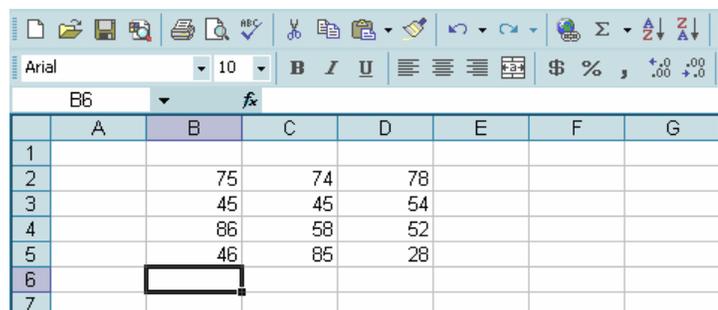


### Using the MAX, MIN, and COUNT for a Range of Numbers

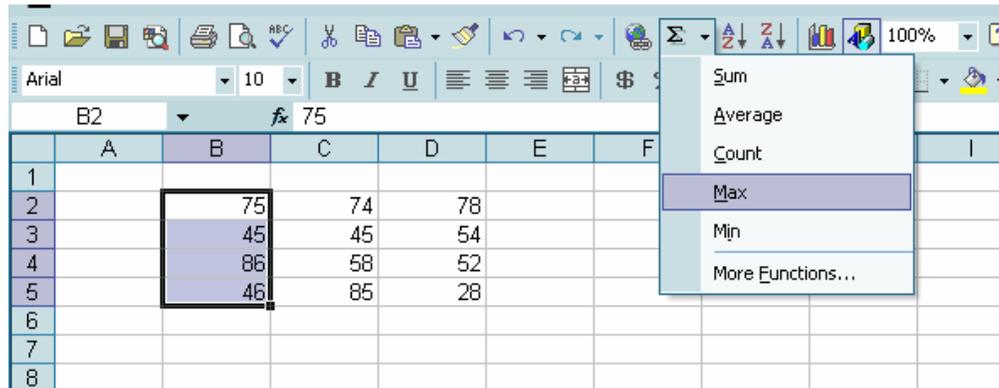
The **Max function** obtains the maximum value while the **Min function** obtains the minimum value. The **Count function** counts the number of entries inputted.

#### To use the MAX, MIN, and COUNT functions:

- Type the numbers to be included in the formula in separate cells. For this example, the data inputted are as follows:



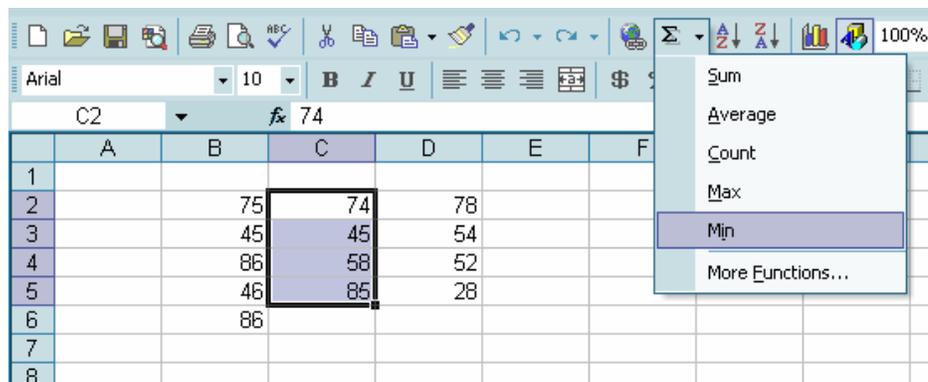
- Highlight cell B2 to cell B5 and click the drop-down part of the **Auto Sum** button and choose **Max** to obtain the highest number of the given range.



- The highest number appears at cell B6.
- Notice the formula, **=MAX(B2:B5)**, has been defined to cell B6.

|   | A | B  | C  | D  | E |
|---|---|----|----|----|---|
| 1 |   |    |    |    |   |
| 2 |   | 75 | 74 | 78 |   |
| 3 |   | 45 | 45 | 54 |   |
| 4 |   | 86 | 58 | 52 |   |
| 5 |   | 46 | 85 | 28 |   |
| 6 |   | 86 |    |    |   |
| 7 |   |    |    |    |   |

- For getting the lowest number in column C, highlight cell C1 to cell C5 and go to drop down part of the **Auto Sum** button and choose **Min**.



- The lowest number appears at cell C6.

- Notice the formula, **=MIN(C2:C5)**, has been defined to cell C6.

|   | A | B  | C  | D  | E |
|---|---|----|----|----|---|
| 1 |   |    |    |    |   |
| 2 |   | 75 | 74 | 78 |   |
| 3 |   | 45 | 45 | 54 |   |
| 4 |   | 86 | 58 | 52 |   |
| 5 |   | 46 | 85 | 28 |   |
| 6 |   | 86 | 45 |    |   |
| 7 |   |    |    |    |   |
| 8 |   |    |    |    |   |

- To count how many entries does column D have, highlight cell D2 to cell D5 and from the **Auto Sum** button drop down list, choose **Count**.

|   | A | B  | C  | D  | E | F |
|---|---|----|----|----|---|---|
| 1 |   |    |    |    |   |   |
| 2 |   | 75 | 74 | 78 |   |   |
| 3 |   | 45 | 45 | 54 |   |   |
| 4 |   | 86 | 58 | 52 |   |   |
| 5 |   | 46 | 85 | 28 |   |   |
| 6 |   | 86 | 45 |    |   |   |
| 7 |   |    |    |    |   |   |
| 8 |   |    |    |    |   |   |

- The number of entries appears at cell D6.
- Notice the formula, **=COUNT(D2:D5)**, has been defined to cell D6.

|   | A | B  | C  | D  | E |
|---|---|----|----|----|---|
| 1 |   |    |    |    |   |
| 2 |   | 75 | 74 | 78 |   |
| 3 |   | 45 | 45 | 54 |   |
| 4 |   | 86 | 58 | 52 |   |
| 5 |   | 46 | 85 | 28 |   |
| 6 |   | 86 | 45 | 4  |   |
| 7 |   |    |    |    |   |

### Using the IF Function

The IF function can give your formulas decision making abilities.

This function enables you to perform a calculation only **IF** a certain condition is true, and a completely different calculation if that condition is false.

The syntax (the fancy name for the order and sequence) for the **Excel IF function** is

**=IF(logical\_test,value\_if\_true,value\_if\_false)**

where:

**logical\_test** is any value or expression that can be evaluated to TRUE or FALSE

**value\_if\_true** is the value that is returned if logical\_test is TRUE. If omitted TRUE is returned.

**value\_if\_false** is the value that is returned if logical\_test is FALSE. If omitted FALSE is returned.

### IF Function Example

Let's say that we own a small grocery store that offers a home delivery service. It is obviously more efficient and profitable for us if we deliver fewer large orders than several small orders.

We enter all the orders onto spreadsheets and if any person has orders totaling 500 or more in a calendar month we will give them a discount of 10% because we are extremely generous.

|   | C3 | fx =IF(B3>=500,"You have 10% discount", "Sorry! No discount.") |                       |   |   |   |   |
|---|----|--|-----------------------|---|---|---|---|
|   | A  | B  | C                     | D | E | F | G |
| 1 |    |  |                       |   |   |   |   |
| 2 |    | Order Value  | Discount%             |   |   |   |   |
| 3 |    | 100  | Sorry! No discount.   |   |   |   |   |
| 4 |    | 200  | Sorry! No discount.   |   |   |   |   |
| 5 |    | 300  | Sorry! No discount.   |   |   |   |   |
| 6 |    | 400  | Sorry! No discount.   |   |   |   |   |
| 7 |    | 500  | You have 10% discount |   |   |   |   |
| 8 |    | 600  | You have 10% discount |   |   |   |   |
| 9 |    |  |                       |   |   |   |   |

As you can see in the example above, we have placed our IF function in cell C3, then subsequently copied it down through to cell C7 using Autofill.

Using our syntax let's work through the formula.

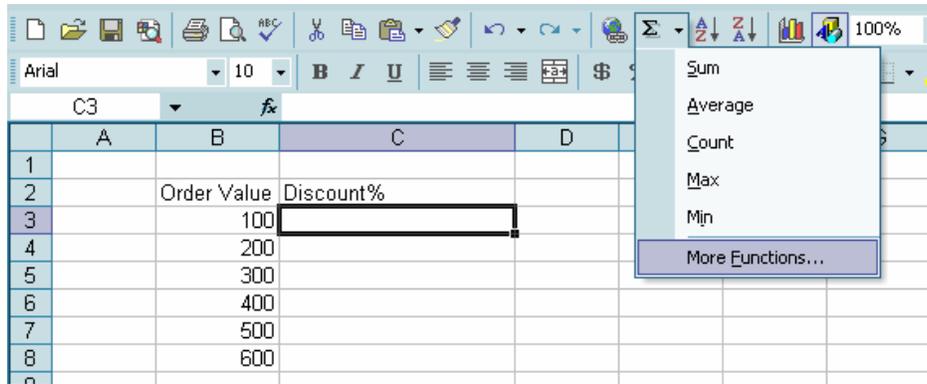
The **logical\_test** asks "Is the value of cell B3 greater than (>) or equal to (=) 500?"

**value\_if\_true** says "It's true! Enter 10% in the cell."

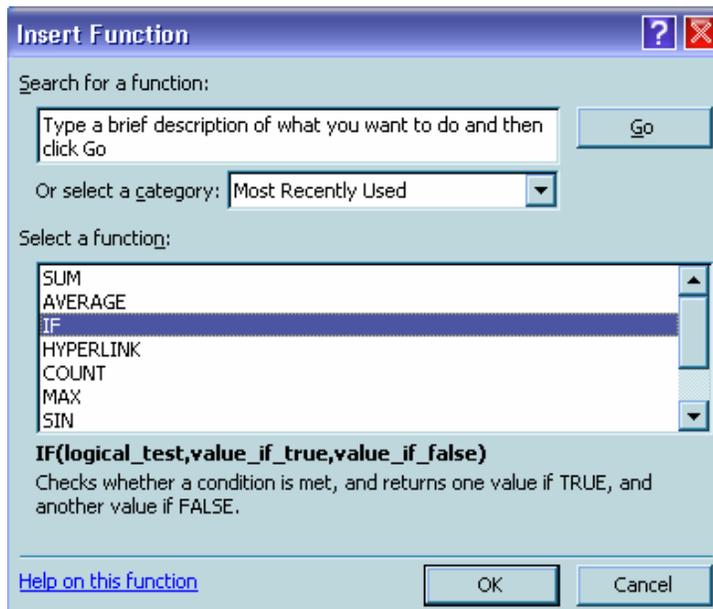
**value\_if\_false** says "That's not true. Enter 'Sorry! No discount.' in the cell."

### Another way to perform the example above:

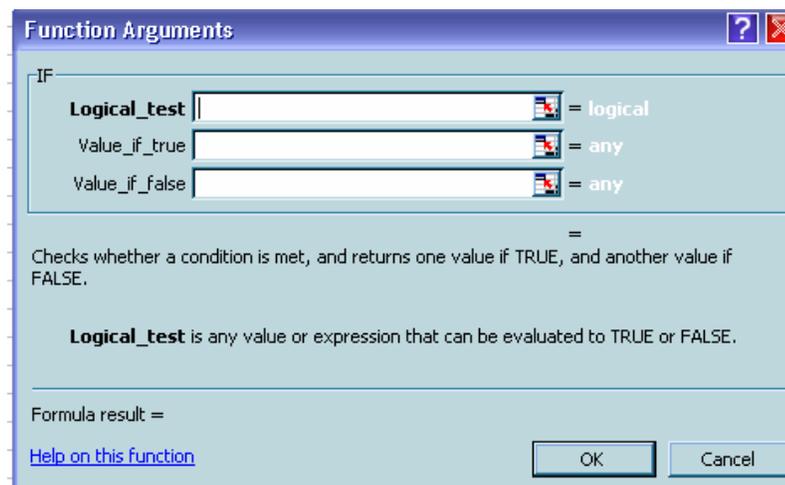
- Position the cell pointer at cell C3.
- Click the drop-down part of the **Auto Sum** button and choose **More Functions**.



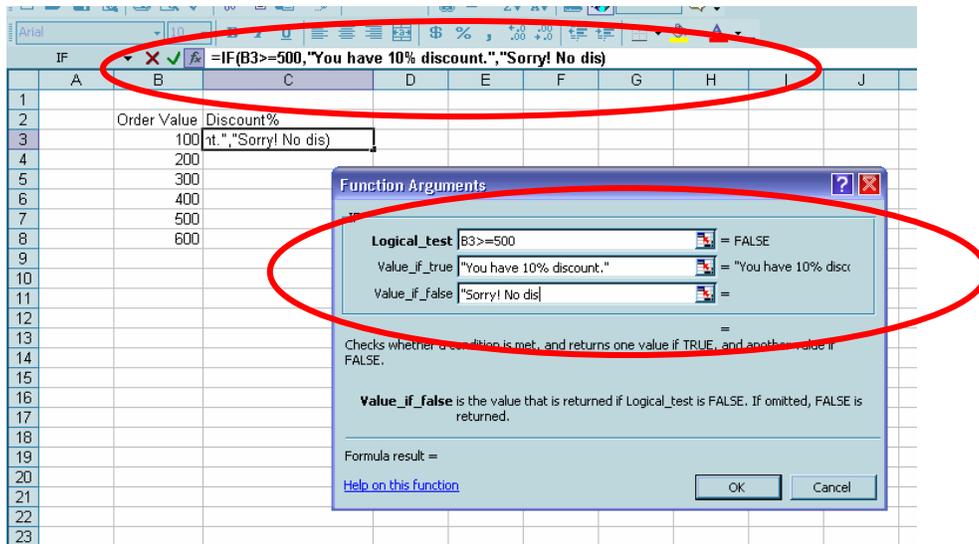
- After clicking **More Functions**, the following window appears and choose **IF**.



- Click **OK** and the following window appears.



- As you fill the text boxes with arguments, notice the **IF** function slowly building its function call.



- Press **OK** and the result in C3 appear.

| C3 |             | =IF(B3>=500,"You have 10% discount.,"Sorry! No discount.) |   |   |   |   |  |
|----|-------------|---|---|---|---|---|--|
| A  | B           | C   | D | E | F | G |  |
| 1  |             |   |   |   |   |   |  |
| 2  | Order Value | Discount%   |   |   |   |   |  |
| 3  | 100         | Sorry! No discount.                                       |   |   |   |   |  |
| 4  | 200         |   |   |   |   |   |  |
| 5  | 300         |   |   |   |   |   |  |
| 6  | 400         |   |   |   |   |   |  |
| 7  | 500         |   |   |   |   |   |  |
| 8  | 600         |   |   |   |   |   |  |

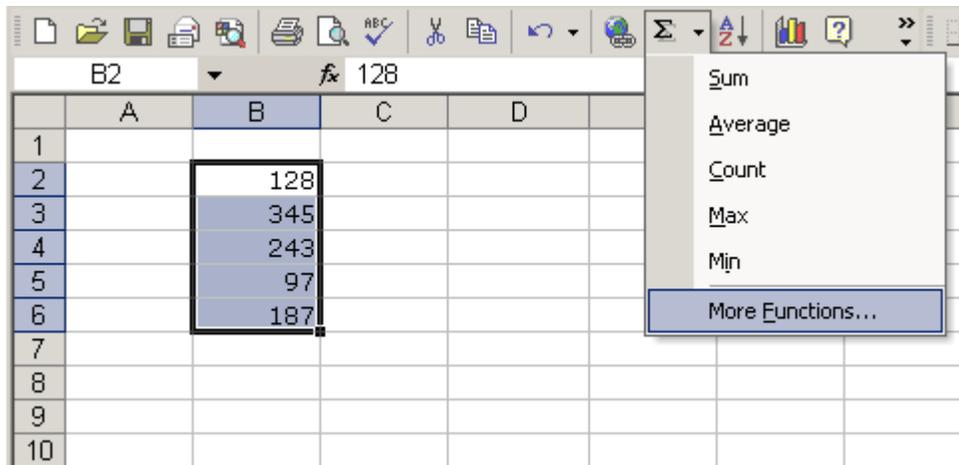
- AutoFill cell C3 and obtain the following result.

| C3 |             | =IF(B3>=500,"You have 10% discount.,"Sorry! No discount.) |   |   |   |   |  |
|----|-------------|---|---|---|---|---|--|
| A  | B           | C   | D | E | F | G |  |
| 1  |             |   |   |   |   |   |  |
| 2  | Order Value | Discount%   |   |   |   |   |  |
| 3  | 100         | Sorry! No discount.                                       |   |   |   |   |  |
| 4  | 200         | Sorry! No discount.                                       |   |   |   |   |  |
| 5  | 300         | Sorry! No discount.                                       |   |   |   |   |  |
| 6  | 400         | Sorry! No discount.                                       |   |   |   |   |  |
| 7  | 500         | You have 10% discount                                     |   |   |   |   |  |
| 8  | 600         | You have 10% discount                                     |   |   |   |   |  |
| 9  |             |   |   |   |   |   |  |

### Accessing Excel XP Functions

#### To Access Other Functions in Excel:

- Using the point-click-drag method, select a cell range to be included in the formula.
- On the **Standard** toolbar, click on the drop-down part of the **AutoSum** button.
- If you don't see the function you want to use (Sum, Average, Count, Max, Min), display additional functions by selecting **More Functions**.

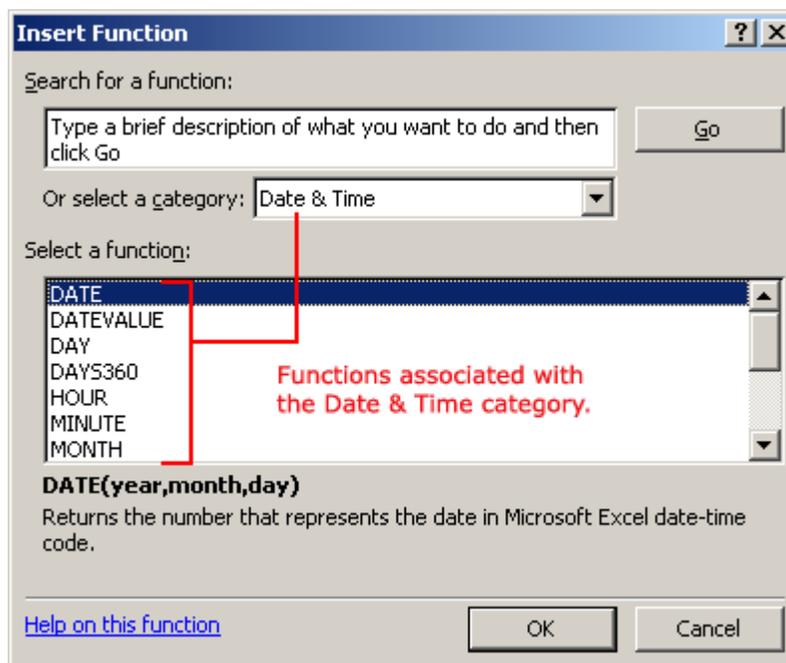


- The **Paste Function** dialog box opens.
- There are three ways to locate a function in the **Insert Function** dialog box:

You can type a question in the **Search for a function box** and click **GO**, or

You can scroll through the alphabetical list of functions in the **Select a function** field, or

You can select a function category in the **Select a category** drop-down list and review the corresponding function names in the **Select a function** field.



- Select the function you want to use and then click the **OK** button.

# Text and Cell Alignment

## LESSON 11

+ + + +

### In This Lesson:

Using the Standard Toolbar to Align Text and Numbers in Cells

Changing Horizontal Cell Alignment

Changing Vertical Cell Alignment

Changing Text Control

Changing Text Orientation

+ + + +

## Using the Standard Toolbar to Align Text and Numbers in Cells

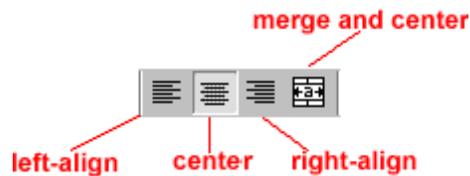
You've probably noticed by now that Excel XP **left-aligns text** (labels) and **right-aligns numbers** (values). This makes data easier to read.

|    | A | B  | C   | D | E |
|----|---|--|---|---|---|
| 1  |   |  |   |   |   |
| 2  |   |  |   |   |   |
| 3  |   | Sales  | 34,567.00   |   |   |
| 4  |   | Expenses   | 1,234.00  |   |   |
| 5  |   |  |   |   |   |
| 6  |   |  |   |   |   |
| 7  |   |  |   |   |   |
| 8  |   | Text, by default,<br>is left-aligned in<br>Excel XP. | Numbers, by default,<br>are right-aligned in<br>Excel XP. |   |   |
| 9  |   |  |   |   |   |
| 10 |   |  |   |   |   |
| 11 |   |  |   |   |   |
| 12 |   |  |   |   |   |

You do not have to leave the defaults. Text and numbers can be defined as left-aligned, right-aligned or centered in Excel XP. The picture below shows the difference between these alignment types when applied to labels.

|                           |
|---------------------------|
|                           |
|                           |
| <b>right-aligned text</b> |
| <b>left-aligned text</b>  |
| <b>centered text</b>      |
|                           |
|                           |

Text and numbers may be aligned using the left-align, center and right-align buttons of the **Formatting** toolbar:



### To Align Text or Numbers in a Cell:

- Select a cell or range of cells
- Click on either the **Left-Align**, **Center** or **Right-Align** buttons in the standard toolbar.
- The text or numbers in the cell(s) take on the selected alignment treatment.

### Changing Horizontal Cell Alignment

We've previously seen how to align text or numbers using the left-align, center and right-align buttons in the standard toolbar. You can also define alignment in the **Alignment** tab of the **Format Cells** dialog box.

|   | A   | B               | C                 | D                |
|---|---|-----------------|-------------------|------------------|
| 1 |   |                 |                   |                  |
| 2 | Some examples of Horizontal Alignment of information in a cell. |                 |                   |                  |
| 3 |   |                 |                   |                  |
| 4 |   |                 |                   |                  |
| 5 | Horizontal<br>Alignment   | Horizontal Left | Horizontal Center | Horizontal Right |
| 6 |   |                 |                   |                  |

✓ The **Horizontal** section features a drop-down that contains the same **left**, **center**, and **right** alignment options in the picture above and several more:

#### Fill

"Fills" the cell with the current contents by repeating the contents for the width of the cell.

#### Justify

If the text is larger than the cell width, **Justify** wraps the text in the cell and adjusts the spacing within each line so that all lines are as wide as the cell.

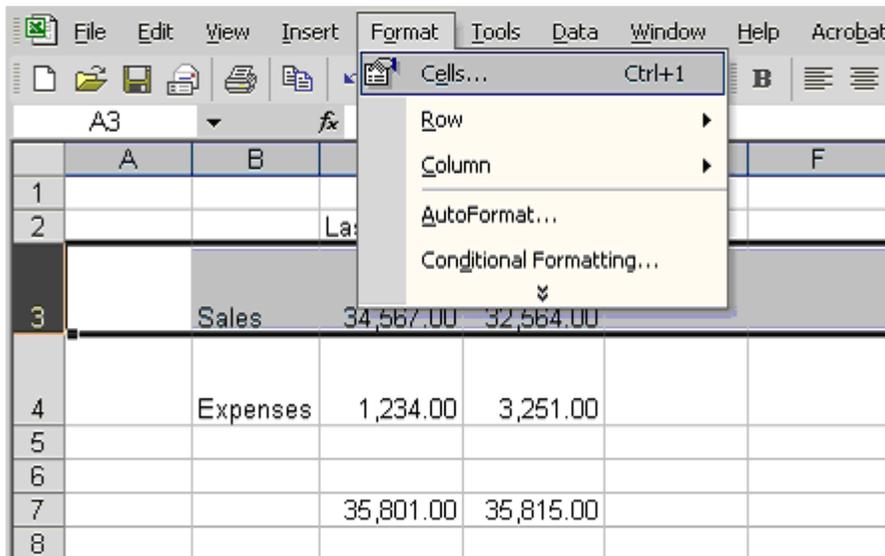
#### Center Across Selection

Contents of the cell furthest to the left are centered across the selection of cells. Similar to merge and center, except the cells are not merged.

#### To Change Horizontal Alignment using the Format Cells Dialog Box:

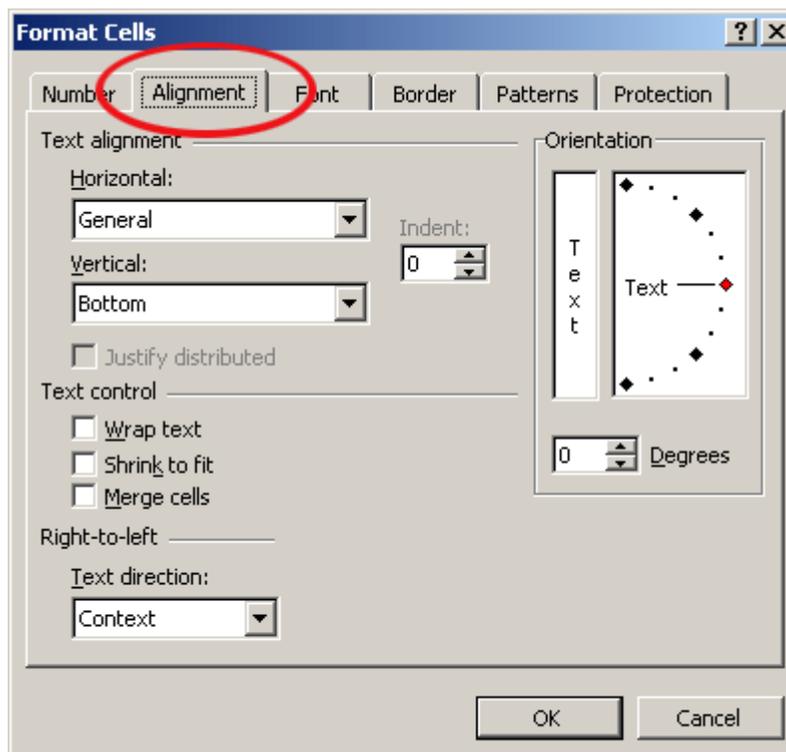
- Select a cell or range of cells.

- Choose **Format** → **Cells** from the menu bar.



(You could also right-click and choose **Format Cells** from the shortcut menu.)

- The **Format Cells** dialog box opens.
- Click the **Alignment** tab.



**Format Cells dialog box**

- Click the **Horizontal** drop-down menu and select a horizontal alignment treatment.
- Click OK to apply the horizontal alignment to the selected cell(s).

## Changing Vertical Cell Alignment

You can also define vertical alignment in a cell, similar to how it is done for horizontal alignment. In **Vertical alignment**, information in a cell can be located at the top of the cell, middle of the cell or bottom of the cell. The default is bottom.

|   | A   | B                | C               | D               |
|---|---|------------------|-----------------|-----------------|
| 1 |   |                  |                 |                 |
| 2 | Some examples of Vertical Alignment of information in a cell. |                  |                 |                 |
| 3 |   |                  |                 |                 |
| 4 |   |                  |                 |                 |
| 5 | Vertical Alignment  | Vertical Justify | Vertical Center | Vertical Bottom |
| 6 |   |                  |                 |                 |

### To Change Vertical Alignment using the Format Cells Dialog Box:

- Select a cell or range of cells.
- Choose **Format** → **Cells** from the menu bar.

(You could also right-click and choose **Format Cells** from the shortcut menu.)

- The **Format Cells** dialog box opens.
- Click the **Alignment** tab.
- Click the **Vertical** drop-down menu and select a vertical alignment treatment.
- Click OK to apply the vertical alignment to the selected cell(s).

## Changing Text Control

**Text Control** allows you to control the way Excel XP presents information in a cell. There are three types of Text control: **Wrapped Text**, **Shrink-to-Fit** and **Merge Cells**.

|   | A | B                                   | C     | D               | E |
|---|---|-------------------------------------|-------|-----------------|---|
| 1 |   | Text Control examples:              |       |                 |   |
| 2 |   |                                     |       |                 |   |
| 3 |   | This is an example of wrapped text. | ————— | Vertical Center |   |
| 4 |   |                                     |       |                 |   |
| 5 |   | Shrink-to-fit example.              | ————— | Shrink-to-fit   |   |
| 6 |   |                                     |       |                 |   |

➤ The **Wrapped Text** wraps the contents of a cell across several lines if it's too large than the column width. It increases the height of the cell as well.

➤ **Shrink-to-Fit** shrinks the text so it fits into the cell; the more text in the cell the smaller it will appear in the cell.

➤ **Merge Cells** can also be applied by using the  **Merge and Center** button on the standard toolbar.

### To Change Text Control using the Format Cells Dialog Box:

- Select a cell or range of cells.
- Choose **Format** → **Cells** from the menu bar.
- The **Format Cells** dialog box opens.
- Click the **Alignment** tab.
- Click on either the **Wrapped Text**, **Shrink-to-Fit** or **Merge Cells** check boxes-or any combination of them-as needed.
- Click the **OK** button.

### Changing Text Orientation

The fourth type of cell alignment in the Format Cells dialog box is **Text Orientation**, which allows text to be oriented 90 degrees in either direction up or down.

|   | A                                 | B                                    | C                           | D | E                            | F |
|---|-----------------------------------|--------------------------------------|-----------------------------|---|------------------------------|---|
| 1 | <b>Text Orientation examples:</b> |                                      |                             |   |                              |   |
| 2 |                                   |                                      |                             |   |                              |   |
| 3 |                                   | Text oriented at 90 Degrees          |                             |   | Text oriented at -90 Degrees |   |
| 4 |                                   |                                      | Text oriented at 45 degrees |   |                              |   |
| 5 |                                   |                                      |                             |   |                              |   |
| 6 |                                   |                                      |                             |   |                              |   |
| 7 |                                   | Text oriented at 0 Degrees (default) |                             |   |                              |   |
| 8 |                                   |                                      |                             |   |                              |   |

### To Change Text Orientation using the Format Cells Dialog Box:

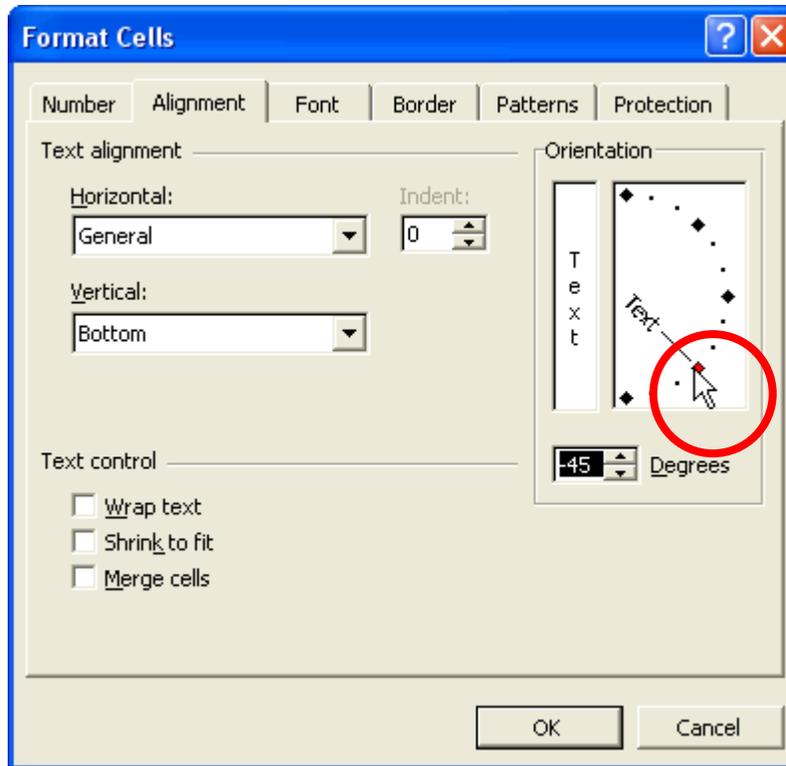
- Select a cell or cell range to be subject to text control alignment.
- Choose **Format** → **Cells** from the menu bar.
- The **Format Cells** dialog box opens.
- Click the **Alignment** tab.
- Increase or decrease the number shown in the **Degrees** field or spin box.
- Click the **OK** button.

**OR**

You can also click and drag the red point in the text pane to a new location indicating the orientation you want. The number in the **Degrees** field changes as you drag the pointer.

Example:

From this action...



Drag the red point.

Result:



## Challenge

- Type any text you want in cell B2.
- Change the **row height** of row 2 to 30.
- Change the **column width** of column B to 20.
- Apply a **horizontal text alignment**.
- Apply a **vertical text alignment**.
- Apply a **text orientation** of 90 degrees.

# Formatting Numbers

## LESSON 12

+ + + +

### In This Lesson:

Formatting Numbers in the Format Cells Dialog Box

Formatting Date in the Format Cells Dialog Box

Formatting Time in the Format Cells Dialog Box

Formatting Percentage in the Format Cells Dialog Box

Formatting Peso Sign in the Format Cells Dialog Box

+ + + +

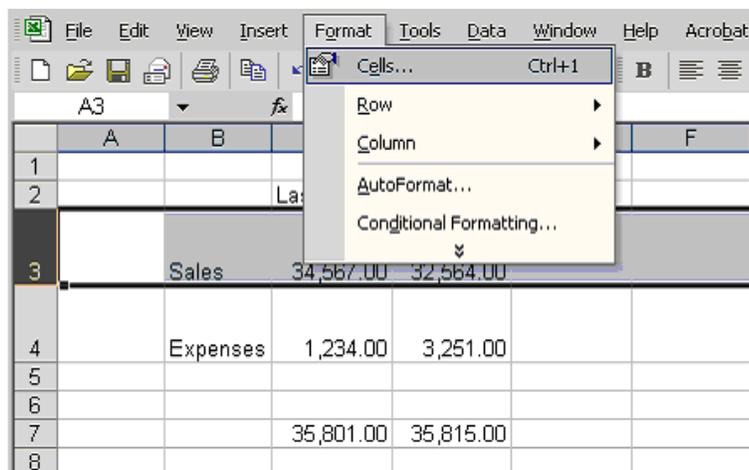
## Formatting Numbers in the Format Cells Dialog Box

Numbers in Excel can assume many different formats: Date, Time, Percentage or Decimals and even in Peso sign.

### To Format the Appearance of Numbers in a Cell:

- Select a cell or range of cells.

Choose **Format** → **Cells** from the menu bar.



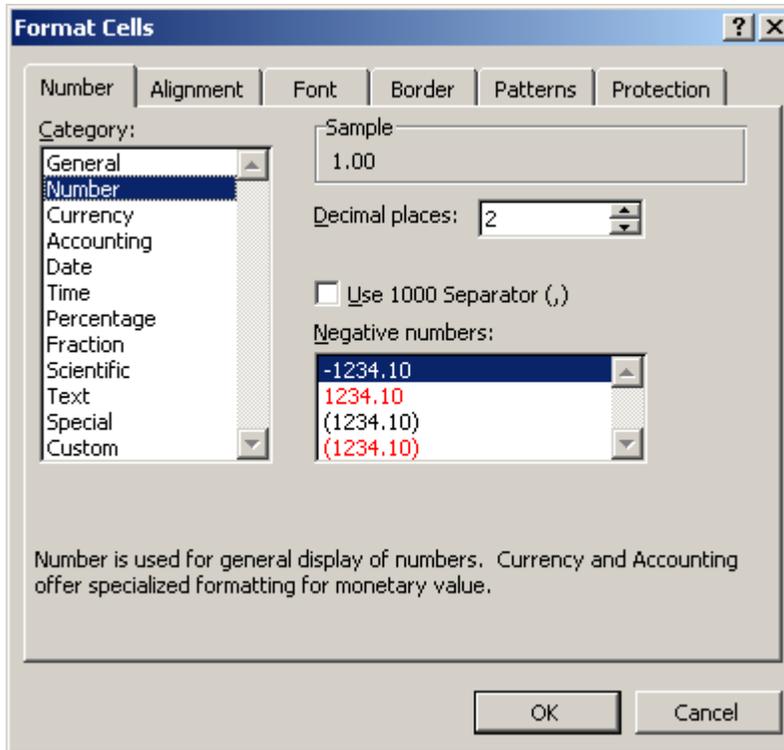
(You could also right-click and choose **Format Cells** from the shortcut menu.)

The **Format Cells** dialog box opens.

- Click the **Number** tab.



- Click **Number** in the **Category** drop-down list.



- Use the **Decimal places** scroll bar to select the number of decimal places (e.g., 2 would display 13.50, 3 would display 13.500).
- Click the **Use 1000 Separator** box if you want commas (1,000) inserted in the number.
- Use the **Negative numbers** drop-down list to indicate how numbers less than zero are to be displayed.
- Click the OK button.

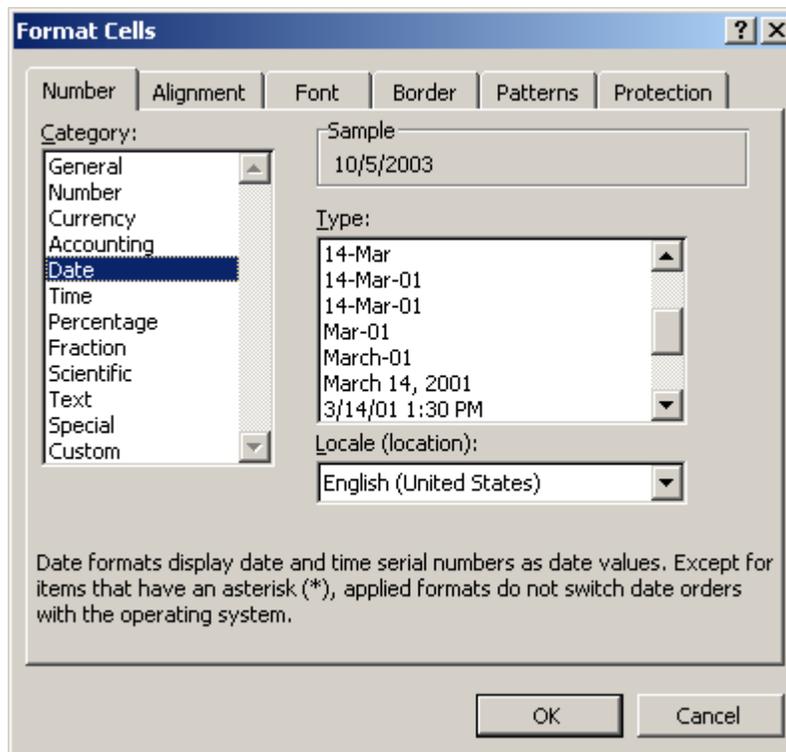
### Formatting Date in the Format Cells Dialog Box

The **date** can be formatted in many different ways in Excel XP. Here are a few ways it can appear:

October 6, 2003  
 10/06/03  
 10-Oct-03

**To Format the Appearance of a Date in a Cell:**

- Select a cell or range of cells.
- Choose **Format** → **Cells** from the menu bar.
- The **Format Cells** dialog box opens.
- Click the **Number** tab.
- Click **Date** in the **Category** drop-down list.



- Select the desired date format from the **Type** drop-down list.
- Click the OK button.

### Formatting Time in the Format Cells Dialog Box

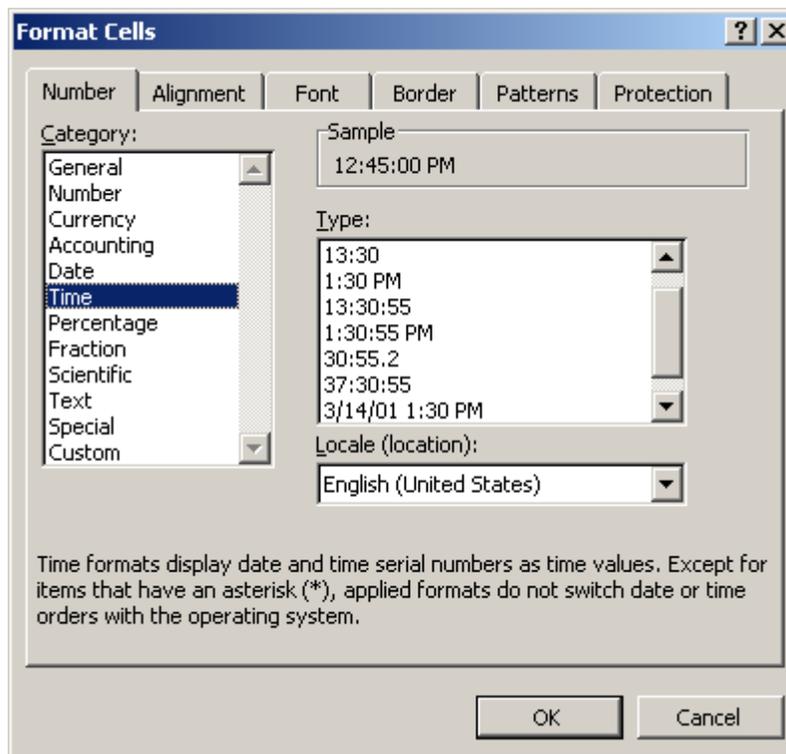
The **time** can be formatted in many different ways in Excel XP. Here are a few ways it can appear:

13:30  
1:30 PM

#### To Format the Appearance of Time in a Cell:

- Select the range of cells you want to format.
- Choose **Format** → **Cells** from the menu bar.
- The **Format Cells** dialog box opens.
- Click the **Number** tab.

- Click **Time** in the **Category** drop-down list.



- Select the desired time format from the **Type** drop-down list.
- Click the OK button.

### Formatting Percentage in the Format Cells Dialog Box

There may be times you want to display certain numbers as a **percentage**. For example, what percentage of credit cards bills account for your total monthly expenses?

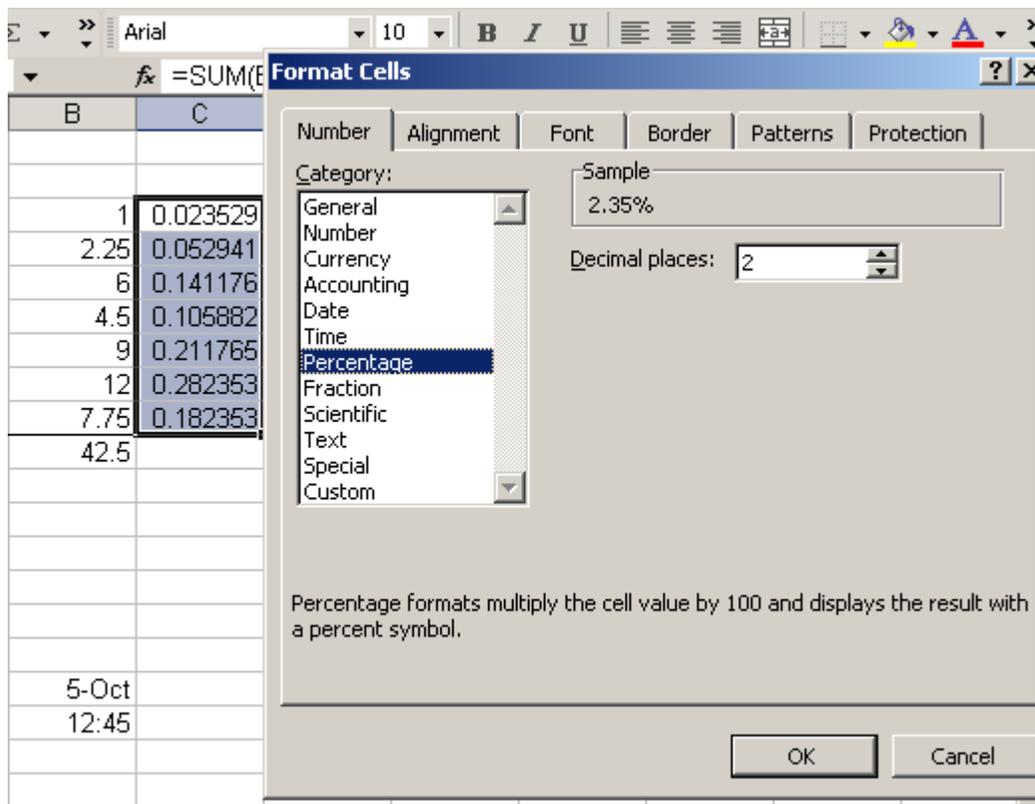
#### To Express Numbers as a Percentage in a Spreadsheet:

- Select a cell or range of cells.

|    | A       | B    | C        | D  | E |
|----|---------|------|----------|--|---|
| 1  |         |      |          |  |   |
| 2  |         |      |          |  |   |
| 3  | Numbers | 1    | 0.023529 | Highlight the cells to format as a Percentage. |   |
| 4  |         | 2.25 | 0.052941 |  |   |
| 5  |         | 6    | 0.141176 |  |   |
| 6  |         | 4.5  | 0.105882 |  |   |
| 7  |         | 9    | 0.211765 |  |   |
| 8  |         | 12   | 0.282353 |  |   |
| 9  |         | 7.75 | 0.182353 |  |   |
| 10 |         | 42.5 |          |  |   |
| 11 |         |      |          |  |   |

- Choose **Format** → **Cells** from the menu bar.
- The **Format Cells** dialog box opens.
- Click the **Number** tab.

- Click **Percentage** in the **Category** drop-down list.



- Define the **Decimal Places** that will appear to the right of each number.

Click the **OK** button.

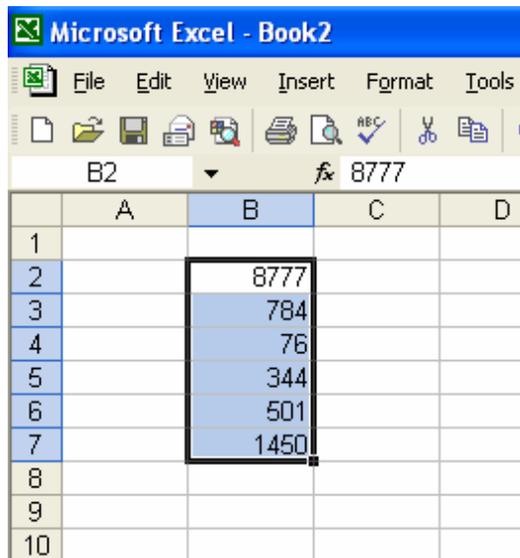
|    | A       | B    | C       | D  | E |
|----|---------|------|---------|--|---|
| 1  |         |      |         |  |   |
| 2  |         |      |         |  |   |
| 3  | Numbers | 1    | 2.353%  | The numbers<br>in the cell<br>reflect that<br>of a Percentage. |   |
| 4  |         | 2.25 | 5.294%  |  |   |
| 5  |         | 6    | 14.118% |  |   |
| 6  |         | 4.5  | 10.588% |  |   |
| 7  |         | 9    | 21.176% |  |   |
| 8  |         | 12   | 28.235% |  |   |
| 9  |         | 7.75 | 18.235% |  |   |
| 10 |         | 42.5 |         |  |   |
| 11 |         |      |         |  |   |
| 12 |         |      |         |  |   |

### Formatting Peso Sign in the Format Cells Dialog Box

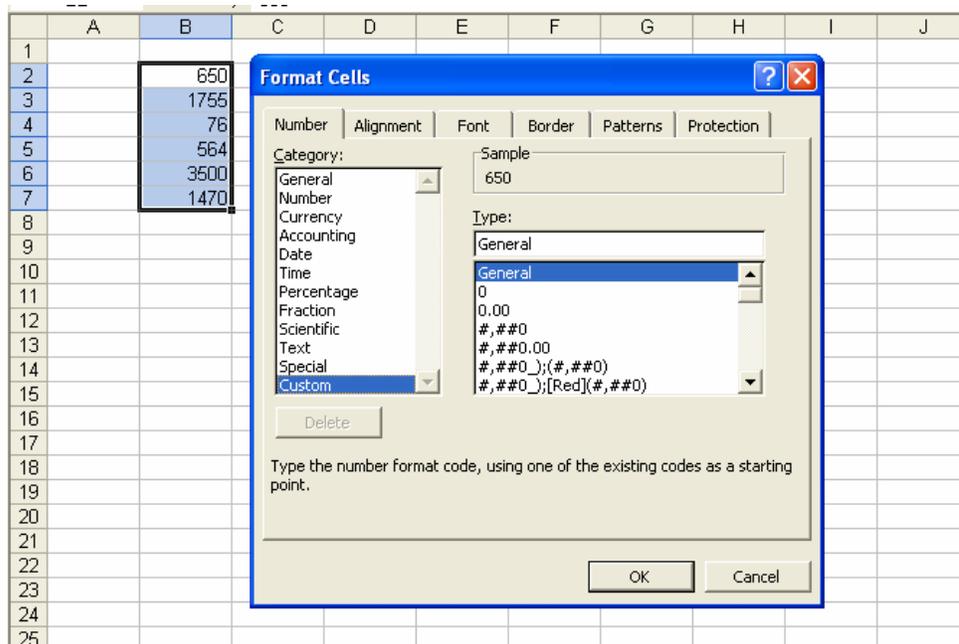
In dealing with money in our spreadsheet, we need to format the cells to fit it in our currency since there are no Peso sign available.

**To Express Numbers with Peso sign in a Spreadsheet:**

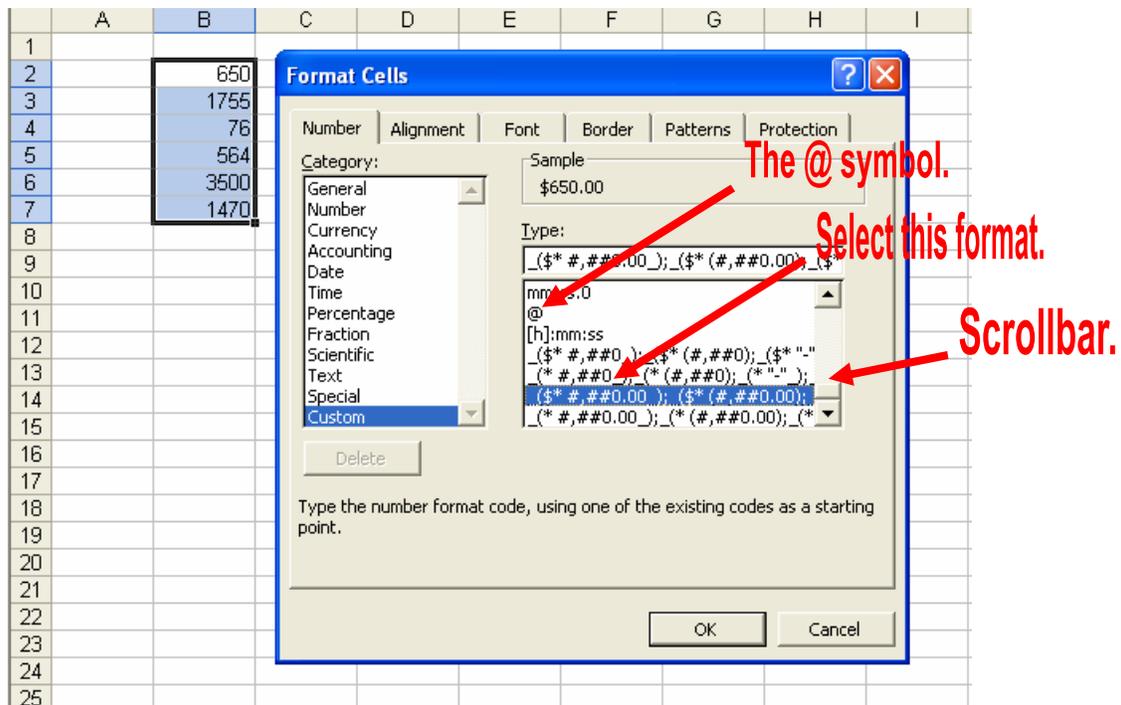
- Select a cell or range of cells.



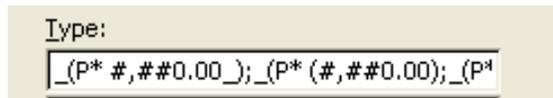
- Choose **Format** → **Cells** from the menu bar.
- The **Format Cells** dialog box opens.
- Click the **Number** tab.
- Click **Custom** in the **Category** drop-down list.



- Find the @ symbol by dragging down the scroll bar.
- From the @ symbol, select the format as indicated in the diagram.



- In the **Type** box, replace the **\$ sign** with **P** to format numbers in Pesos.



- Press **OK**.  
The result will be like this. Adjust the column header to make your result presentable.

|   | A | B          | C | D |
|---|---|------------|---|---|
| 1 |   |            |   |   |
| 2 |   | P 650.00   |   |   |
| 3 |   | P 1,755.00 |   |   |
| 4 |   | P 76.00    |   |   |
| 5 |   | P 564.00   |   |   |
| 6 |   | P 3,500.00 |   |   |
| 7 |   | P 1,470.00 |   |   |
| 8 |   |            |   |   |

### Challenge

- Type a **Number** in cell B2 and format it to have **four decimal places**.
- Type a **Date** in cell B3 and format it to look like: **October 6, 2003**
- Type a **Time** in cell B4 and format it to look like: **1:30:00 AM**
- Type a **large number** in cell B5 and a **smaller number** in cell C5. Then, in cell D5 **define a formula** to divide cell B5 by cell C5. Format the answer in cell D5 to be a **Percentage** with 1 decimal place.
- Copy the answer of D5 and paste it in E5 and convert it into Peso sign.

# Applying Font, Color, and Borders to Cells

## LESSON 13

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### In This Lesson:

Change Font Type, Size and Color

Underline, Italics, and Bold

Design and Apply Styles

Adding a Border to Cells

Adding Color to Cells

+ + + +

## Change Font Type, Size and Color

In Excel XP a font consists of three elements: **Typeface**, or the style of the letter; **Size** of the letter; and **Color** of the letter. The default font in a spreadsheet is **Arial 10 points**, but the typeface and size can be changed easily.

### Selecting a Font Typeface:

The amount of typefaces available for use varies depending on the software installed on your computer.

|    | A | B                                       | C | D | E |  |
|----|---|---|---|---|---|--|
| 1  |   |   |   |   |   |  |
| 2  |   |   |   |   |   |  |
| 3  |   | <b>Examples of different typefaces:</b> |   |   |   |  |
| 4  |   |   |   |   |   |  |
| 5  |   | <b>Arial</b>                            |   |   |   |  |
| 6  |   | Century Schoolbook                      |   |   |   |  |
| 7  |   | Courier                                 |   |   |   |  |
| 8  |   | <b>Impact</b>                           |   |   |   |  |
| 9  |   | <i>Monotype Corsiva</i>                 |   |   |   |  |
| 10 |   | Times New Roman                         |   |   |   |  |
| 11 |   | Verdana                                 |   |   |   |  |
| 12 |   |   |   |   |   |  |

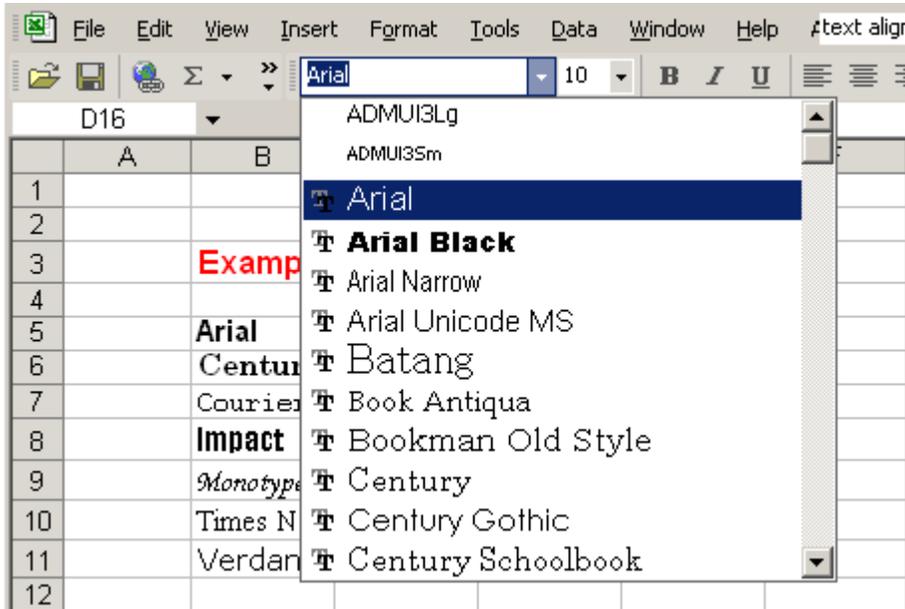
### To Apply a Typeface to Information in a Cell:

- Select a cell or range of cells.

- Click on the down arrow to the right of the **Font Name** list box on the Formatting toolbar.



- A drop-down list of available fonts appears.



- Click on the **Typeface** of your choice.
- The selection list closes and the new font is applied to the selected cells.

### To Apply a Font Size to Information in a Cell:

The "Font Size" list varies from typeface to typeface. The Arial font sizes, for example, are 8, 9, 10, 11, 12, 14, 16, 18, 20, 22, 24, 26, 28, 36, 48, 72.

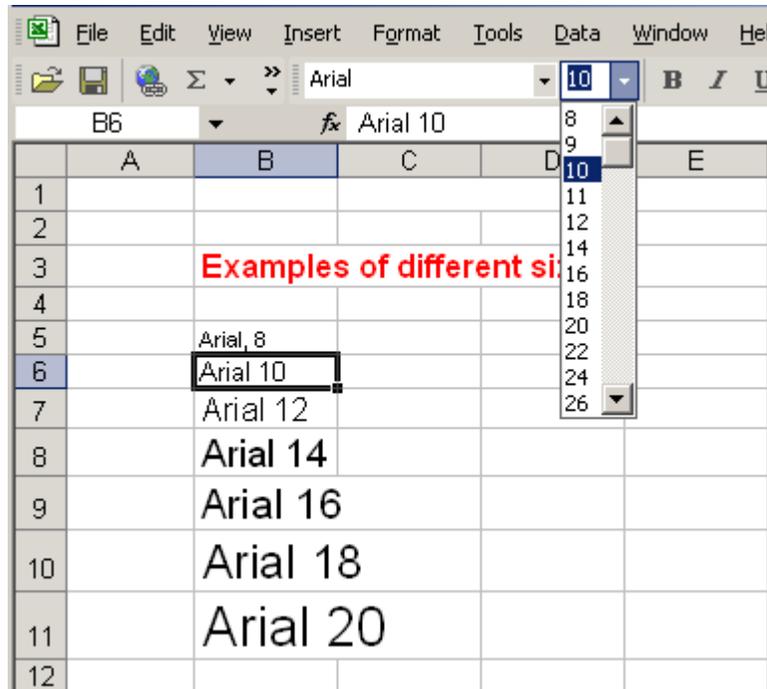
|    | A | B                                   | C | D | E |
|----|---|-------------------------------------|---|---|---|
| 1  |   |                                     |   |   |   |
| 2  |   |                                     |   |   |   |
| 3  |   | <b>Examples of different sizes:</b> |   |   |   |
| 4  |   |                                     |   |   |   |
| 5  |   | Arial, 8                            |   |   |   |
| 6  |   | Arial 10                            |   |   |   |
| 7  |   | Arial 12                            |   |   |   |
| 8  |   | <b>Arial 14</b>                     |   |   |   |
| 9  |   | Arial 16                            |   |   |   |
| 10 |   | Arial 18                            |   |   |   |
| 11 |   | Arial 20                            |   |   |   |
| 12 |   |                                     |   |   |   |

- Select a cell or range of cells.

- Click on the down arrow to the right of the **font size** list box on the Formatting toolbar.



- A drop down list of available font sizes appears.



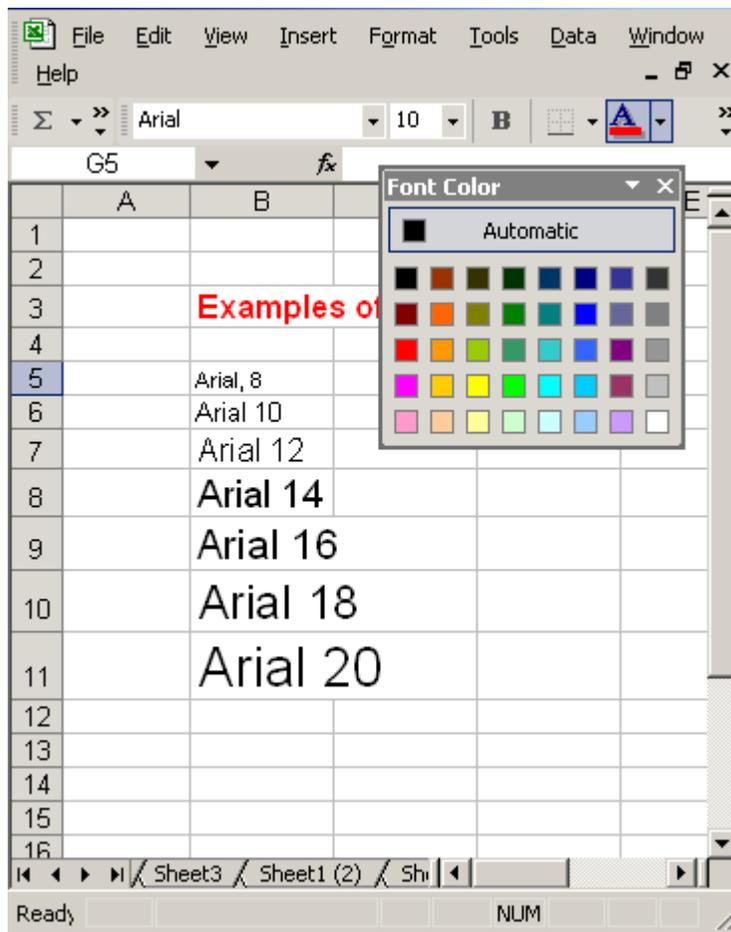
- Click on the **Font Size** of your choice.
- The selection list closes and the new font size is applied to the selected cells.

#### To Apply Color to Information in Cells:

- Select a cell or range of cells.
- Click on the down arrow to the right of the **font color** list box.



- A drop-down list of available colors appear.



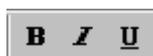
- Click on the **color** of your choice.
- The selection list closes and the new font color is applied to the selected cells.

### Underline, Italics and Bold

In addition to the typeface, size and color, you can also apply **Bold**, *italics*, and/or underline font style attributes to any text or numbers in cells.

#### To Select a Font Style:

- Select a cell or range of cells.
- Click on any of the following options on the Formatting toolbar.



- **Bold** button (Ctrl + B).
- *Italics* button (Ctrl + I).
- Underline button (Ctrl + U).
- The attribute(s) selected (**bold**, *italics*, or underline) are applied to the font.

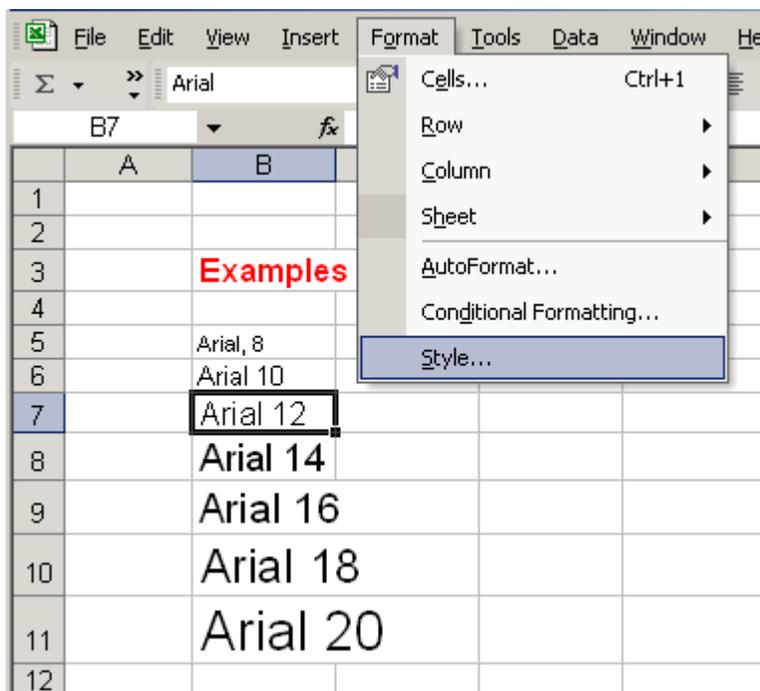
✓ The **Bold**, *Italics*, and Underline buttons on the **Formatting** toolbar are like toggle switches. Click once to turn it on, click again to turn it off.

## Design and Apply Styles

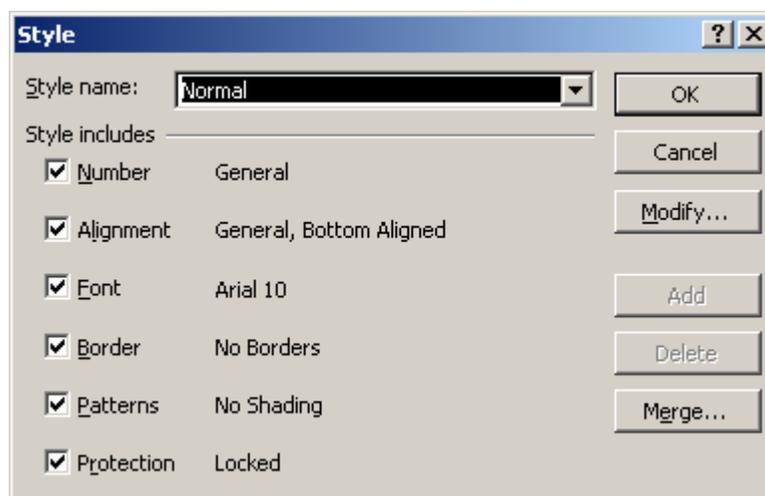
Styles can save a lot of time when formatting a spreadsheet. A **Style** is a unique collection of font attributes (Number, Alignment, Font, Border, Patterns and Protection). Many different styles can be created in a spreadsheet, each with different attributes and names. When applied to a cell, information in it resembles the attributes defined for that style.

### To Apply a style:

- Select the cell or range of cells.
- Choose **Format** → **Style** from the menu bar.



- Select a style from the **Style name** drop-down list.



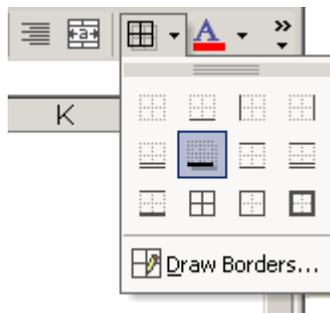
- ✓ You can change the style attributes (Number, Alignment, Font, Border, Patterns and Protection) for any Style Name.
- ✓ You can create new styles by clicking on the **Add** button in the Style dialog box.

## Adding a Border to Cells

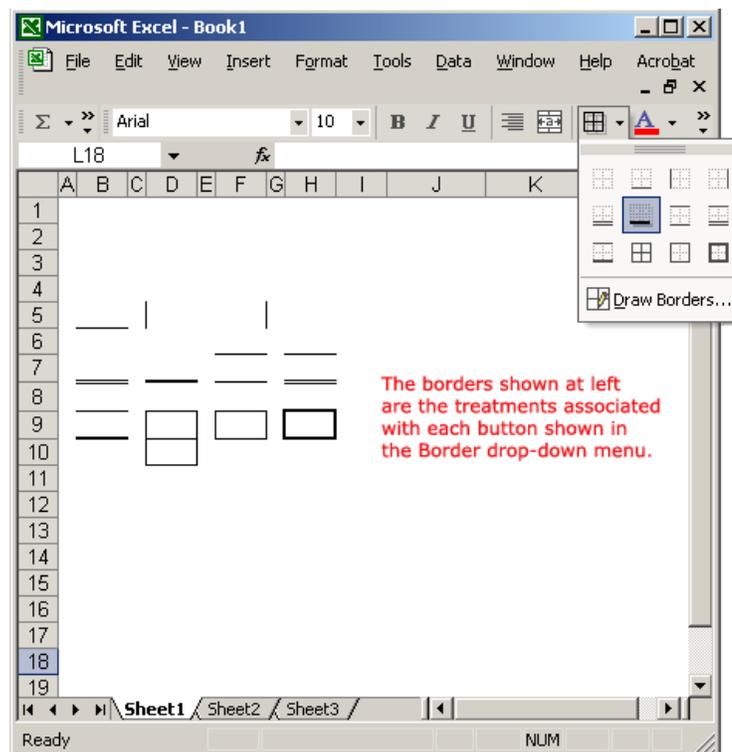
**Borders** can be applied to cells in your worksheet in order to emphasize important data or assign names to columns or rows.

### To Add a Border to a Cell or Cell Range:

- Select a cell or range of cells.
- Click on the down arrow next to the **Borders** button.
- The Border drop-down appears.



- Choose a **borderline** style from the **Border** drop-down menu.



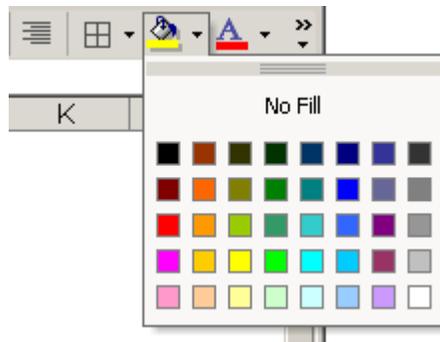
- The selected cells display the chosen border.

## Adding Color to Cells

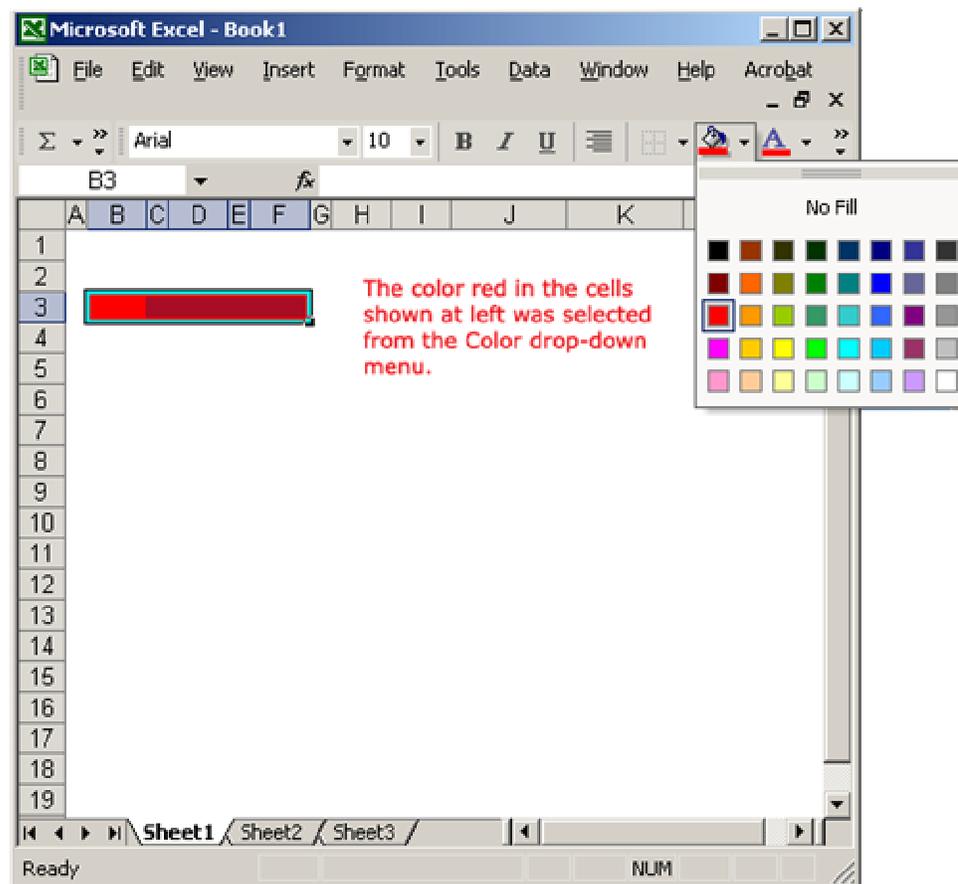
**Colors** can be applied to cells in your worksheet in order to emphasize important data or assign names to columns or rows.

### To Add Color to a Cell:

- Select a cell or range of cells.
- Click the down arrow next to the **Font Color** button. A **Font Color** drop-down menu displays.



- Choose a **font color** from the **Font Color** drop-down menu.



- The selected cells display the color.

## Challenge

- Type the label, "**Learning about fonts in Excel,**" in cell B2.
- Change the font in cell B2 to have a **typeface** of Times New Roman, a **size** of 16 and a **color** of red.
- Type the word, "**Underline,**" in cell B3 and apply an underline treatment to it.
- Type the word, "**Italics,**" in cell B4 and apply an italics treatment to it.
- Type the word, "**Bold,**" in cell B5 and apply a bold treatment to it.
- Select a **cell range** that includes cells B2, B3, B4 and B5.
- Add a **border** around the cell range.
- Define a **color** of yellow around the cell range.

# Copying and Deleting Formatting

## LESSON 14

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### In This Lesson:

Formatting with the Painter:  
Single Cell

Formatting with the Painter:  
Multiple Cells

Clearing All Formatting from  
a Cell

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New features included in Office XP applications is the **Format Painter** that allows you to copy the formatting to other texts and values without going through again to formatting process.

### Formatting with the Painter: Single Cell

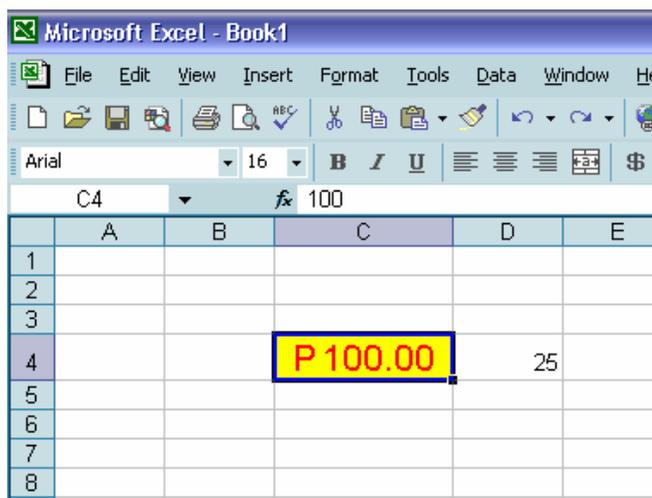
1. Select the cell that contains the formatting you want to copy
2. On the *Standard* toolbar, click **FORMAT PAINTER**  


The pointer changes shape to include a paint brush next to it.

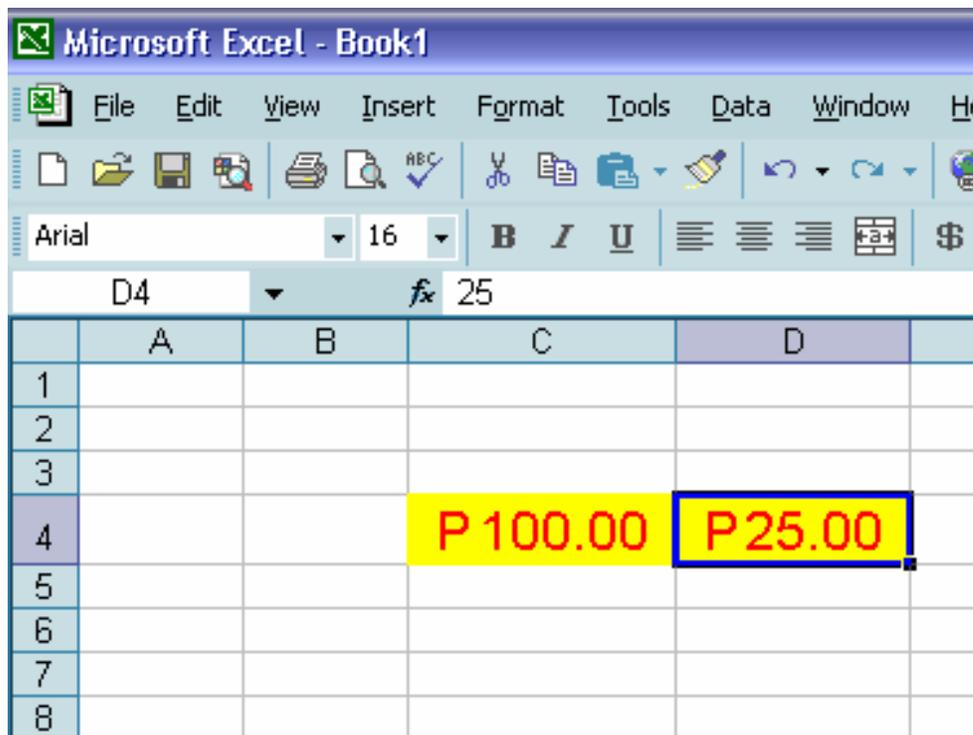
3. Click the cell to which you want the copied format applied

NOTE: You can also select a range of cells by clicking and dragging.

Example:



After the Format Painter is clicked, click on cell D4 and the formatting in cell C4 is then copied.



### Formatting with the Painter: Multiple Cells

1. Select the cell that contains the formatting you want to copy
2. On the *Standard* toolbar, double click **FORMAT PAINTER**   
The pointer changes shape to include a paint brush next to it.
3. Click the cell where you want the copied format applied  
You can also select a range of cells by clicking and dragging.
4. Repeat step 3 for additional cells in which you want the format applied
5. When done, to turn off the *Painter*, click **FORMAT PAINTER**  again

### Clearing All Formatting from a Cell

If you want to remove all formatting from a cell but leave the contents (text, value, or formulas), use the following command.

1. Select the cells that you want to clear the formatting from
2. From the *Edit* menu, select **Clear » Formats**

# Creating a Chart

## LESSON 15

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### In This Lesson:

Understanding the Different Chart Types

Creating Charts

Chart Items

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Charts are graphical representations of worksheet data. You can use charts to present complicated data to people who want to interpret the data quickly.

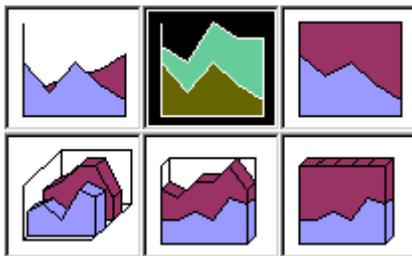
When you create a chart, you can either embed it in a worksheet, or create a new chart sheet in the workbook. If the chart is in a separate sheet, you can set it up with its own printing options, such as wide carriage or in color.

## Understanding the Different Chart Types

Excel XP allows you to create many different kinds of charts.

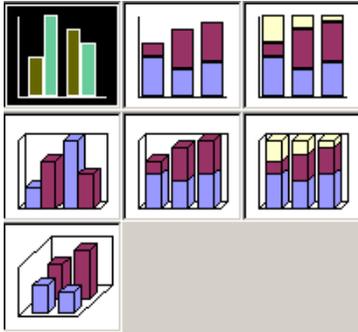
### Area Chart

An **area chart** emphasizes the trend of each value over time. An area chart also shows the relationship of parts to a whole.



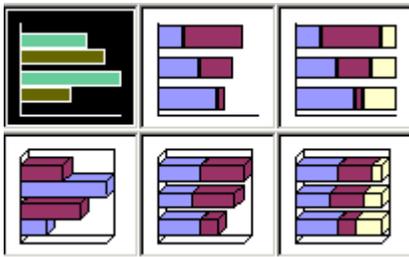
### Column Chart

A **column chart** uses vertical bars or columns to display values over different categories. They are excellent at showing variations in value over time.



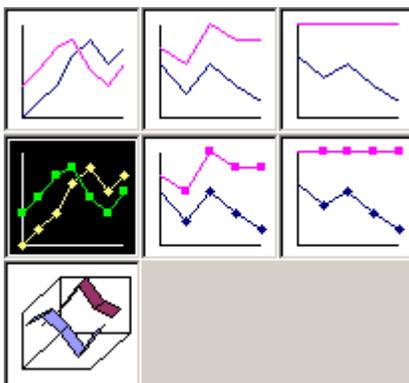
### Bar Chart

A **bar chart** is similar to a column chart except these use horizontal instead of vertical bars. Like the column chart, the bar chart shows variations in value over time.



### Line Chart

A **line chart** shows trends and variations in data over time. A line chart displays a series of points that are connected over time.



### Pie Chart

A **pie chart** displays the contribution of each value to the total. Pie charts are a very effective way to display information when you want to represent different parts of the whole, or the percentages of a total.



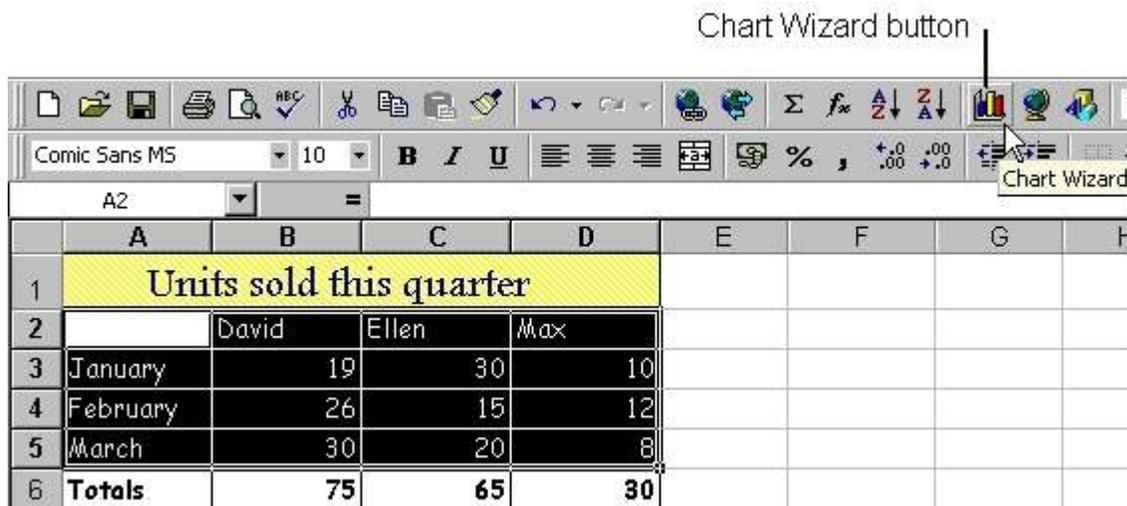
### Other Charts

Other charts that can be created in Excel XP include: **Doughnut; Stock XY (scatter); Bubble; Radar; Surface; or Cone, Cylinder, and Pyramid charts.**

### Creating Charts

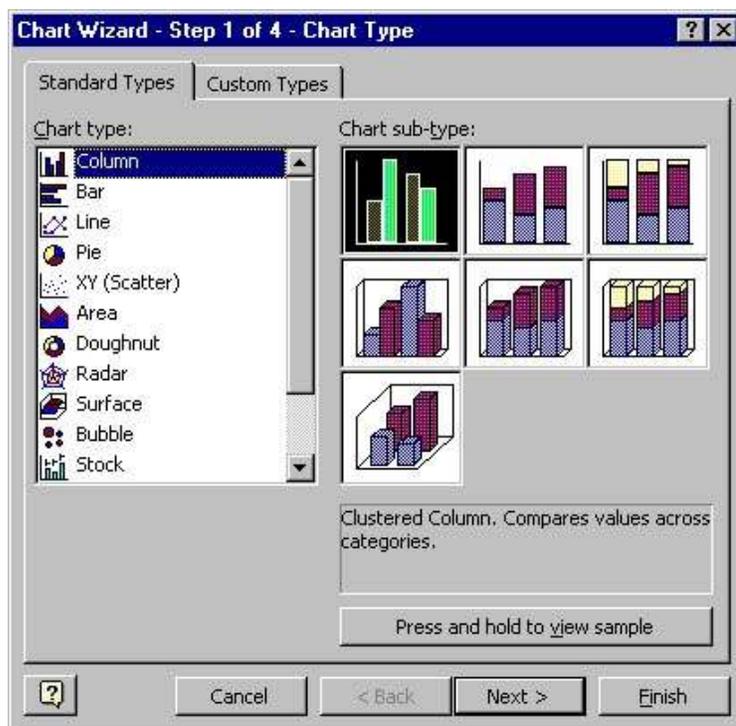
Excel has a special feature called the Chart Wizard to help you create charts in your workbooks. The Chart Wizard is a series of dialog boxes; from each dialog box you choose the options you want, then the Chart Wizard creates the chart based on the choices you make.

**Figure 1.** To create a chart, select the data you want Excel to plot, then click on the **Chart Wizard** button on the Standard toolbar.

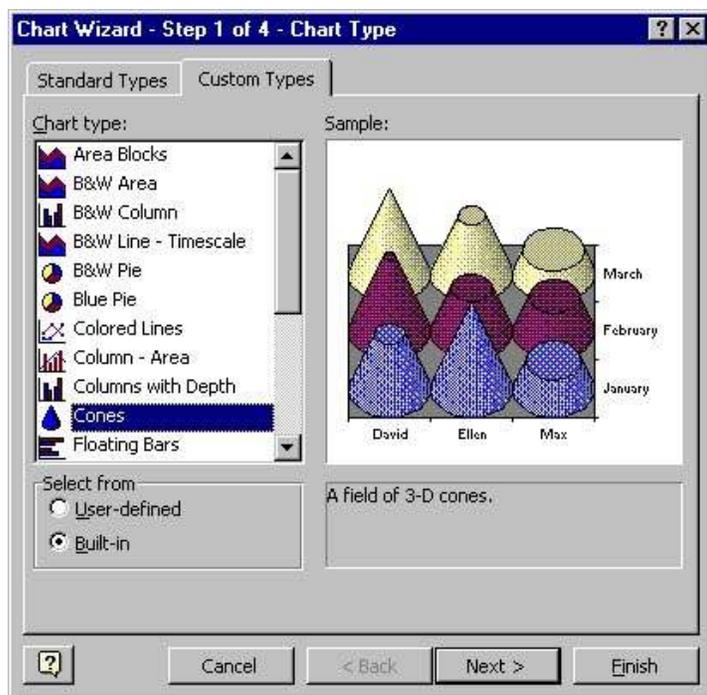


**Figure 2.** After you click on the **Chart Wizard** button, Excel opens the **Chart Wizard - Step 1 of 4 - Chart Type** dialog box. The title bar in each **Chart Wizard** dialog box lets you know which step you are up to. In the first step, you choose the chart type. You can choose a standard type from the **Standard Types** tab, or a custom type from the **Custom Types** tab.

On the **Standard Types** tab, from the **Chart type** box, select the type of chart you want to create, then from the **Chart sub-type** section, choose a sub-type. Once you have selected a sub-type, you can see how your chart will look by clicking on the **Press and hold to view sample** button.

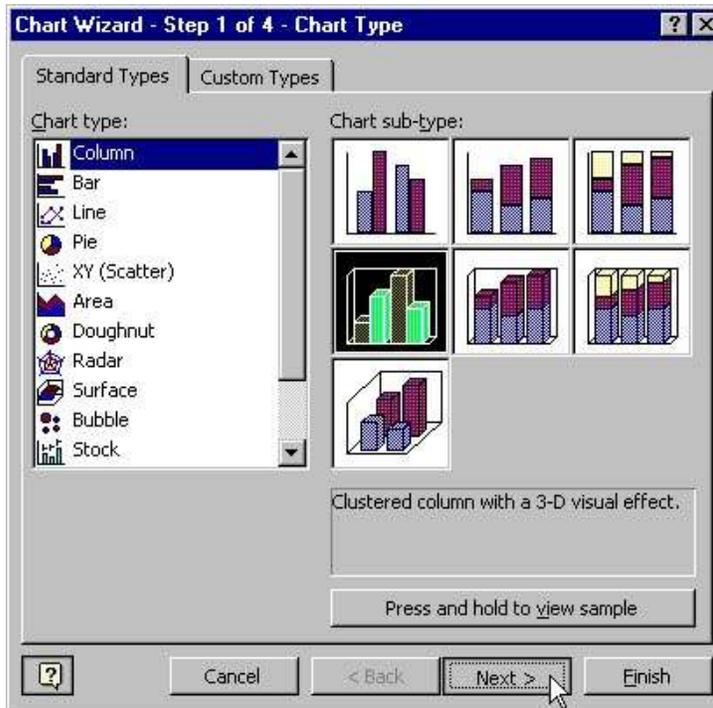


**Figure 3.** The **Custom Types** tab lets you choose a custom chart type. There are a number of built-in custom types, or you can define your own. The built-in custom types also contain custom formatting.



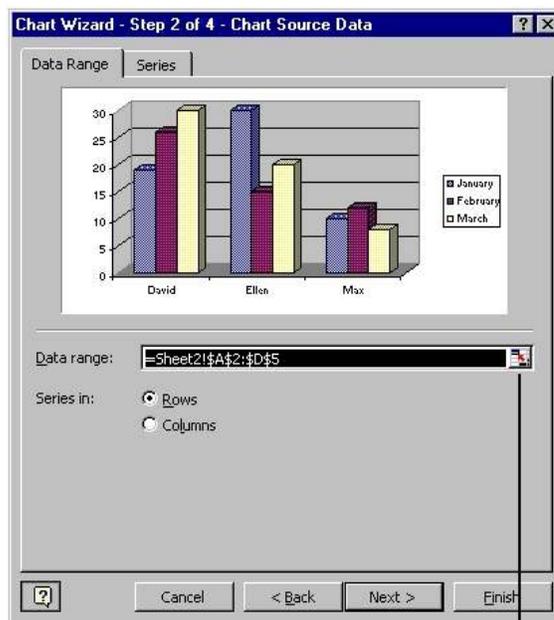
**Figure 4.** After you have selected a chart type, you can quickly create the chart by clicking on the **Finish** button. If you do this, the Chart Wizard creates your chart using default settings.

If you would prefer to customize your chart with the help of the Chart Wizard, you should click on the **Next** button in the first **Chart Wizard** dialog box.



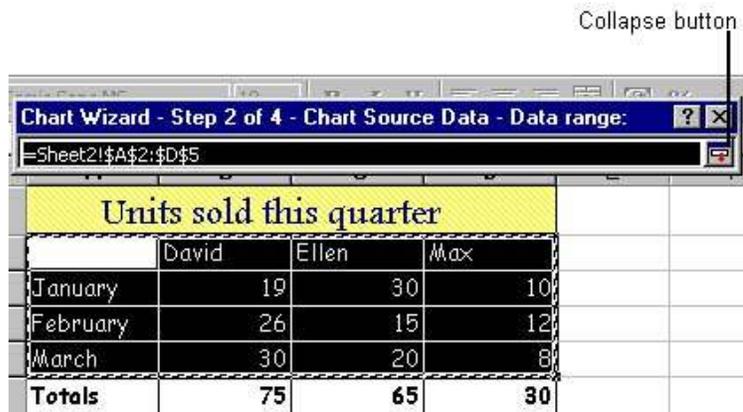
**Figure 5.** After you click on the **Next** button, Excel opens the **Chart Wizard - Step 2 of 4 - Chart Source Data** dialog box. In this step, you specify which source data you want to use in your chart.

On the **Data Range** tab, Excel indicates the cells you selected in the worksheet. If these are not the cells that you want to base your chart on, change the cell range. To do this, you can type a new range into the **Data range** text box, or you can select a new range from the worksheet. If you want to select the new range from the worksheet, you will probably have to collapse the dialog box so that you can see the data you want to select. To collapse the dialog box, click on the collapse button at the right-hand end of the **Data range** text box.



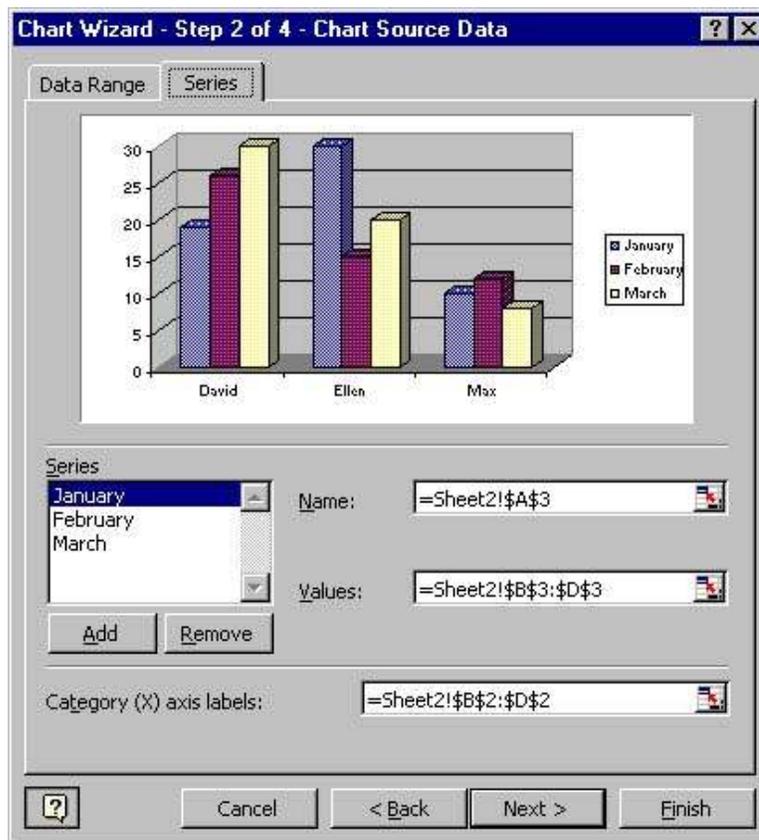
Collapse button

**Figure 6.** After you click on the collapse button, the dialog box collapses. All that remains is the title bar and the **Data range** text box. You can now select data directly on the worksheet. To expand the dialog box, click on the collapse button again.



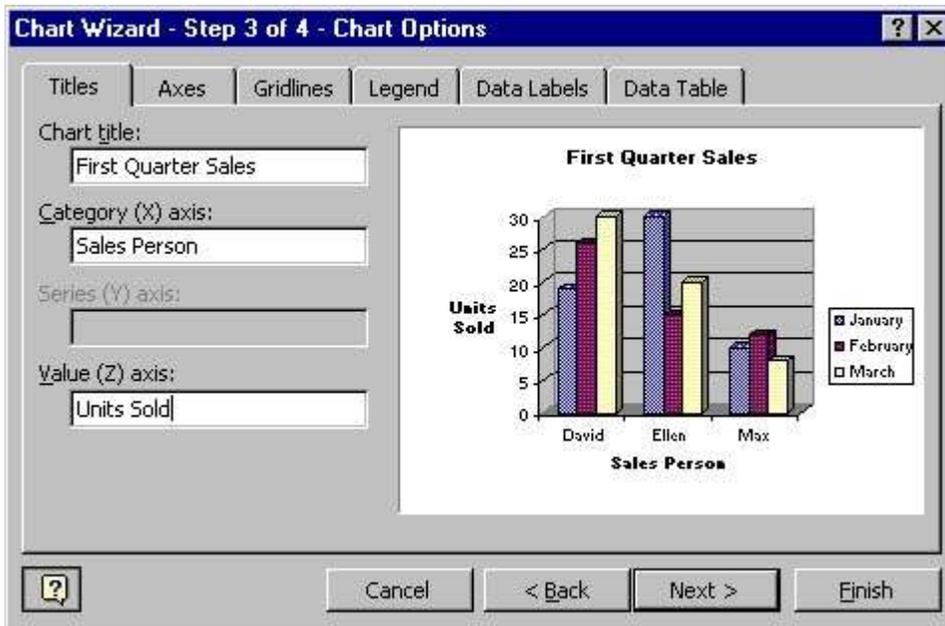
**Figure 7.** The **Series** tab lets you change the series for the chart. If the sample is how you want the chart to look, then you don't need to make any changes. If the sample shows that the series in your chart will not be the way you want them, you can change them here. You can also add and delete series using the options on this tab. Each text box contains a collapse button so that you can collapse the dialog box if you need to.

When the chart source data is as you want it, all you have to do is click on the **Next** button.



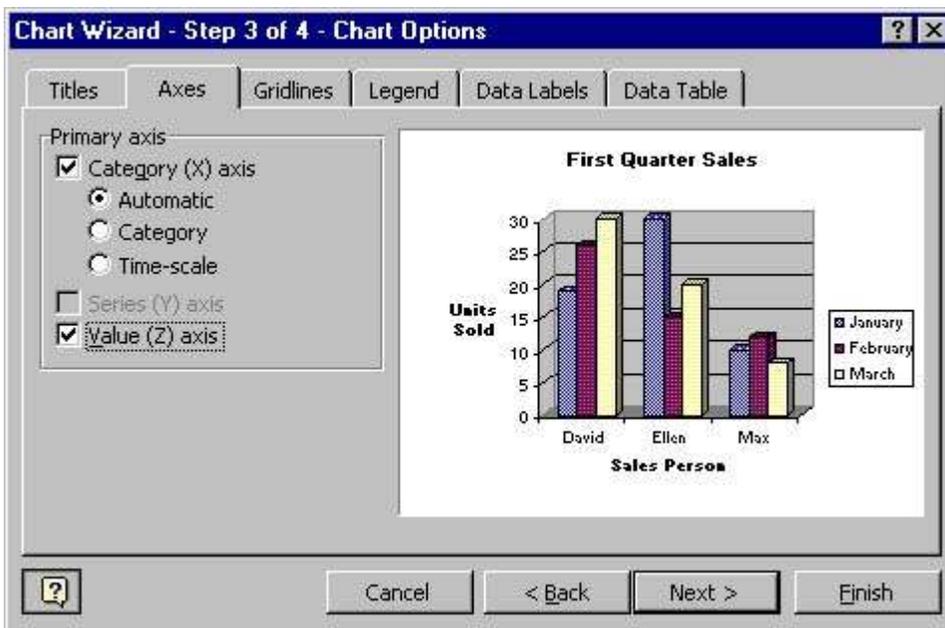
**Figure 8.** Excel then opens the **Chart Wizard - Step 3 of 4 - Chart Options** dialog box. This dialog box contains six tabs which let you choose options for different parts of the chart.

The **Titles** tab lets you add titles to the chart. Type into the appropriate text boxes any titles that you want to appear on the chart; the preview chart shows how they will look. When you have added any titles you want to include, click on the **Axes** tab.



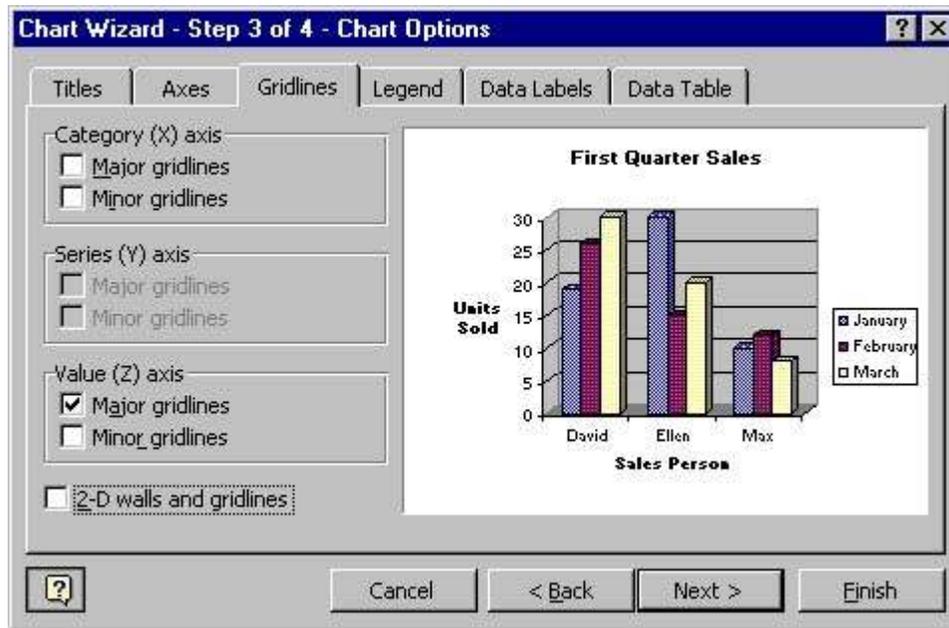
**Figure 9.** The **Axes** tab lets you turn standard axes options on and off. When you select or de-select an option, make sure you check the preview chart.

When the preview chart is as you want it, click on the **Gridlines** tab.



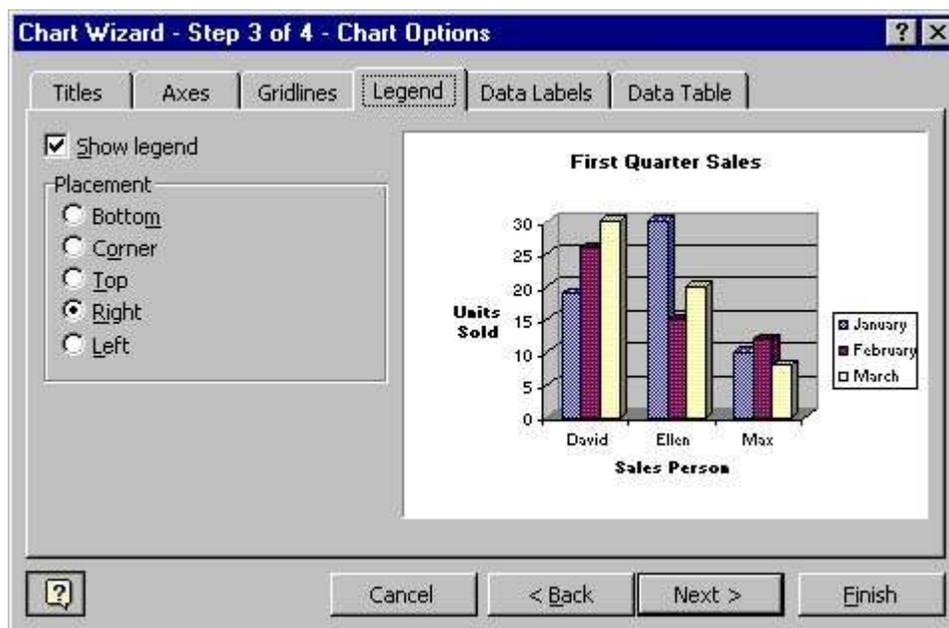
**Figure 10.** The **Gridlines** tab contains options that let you turn the chart's gridlines on and off.

When the preview chart is as you want it, click on the **Legend** tab.



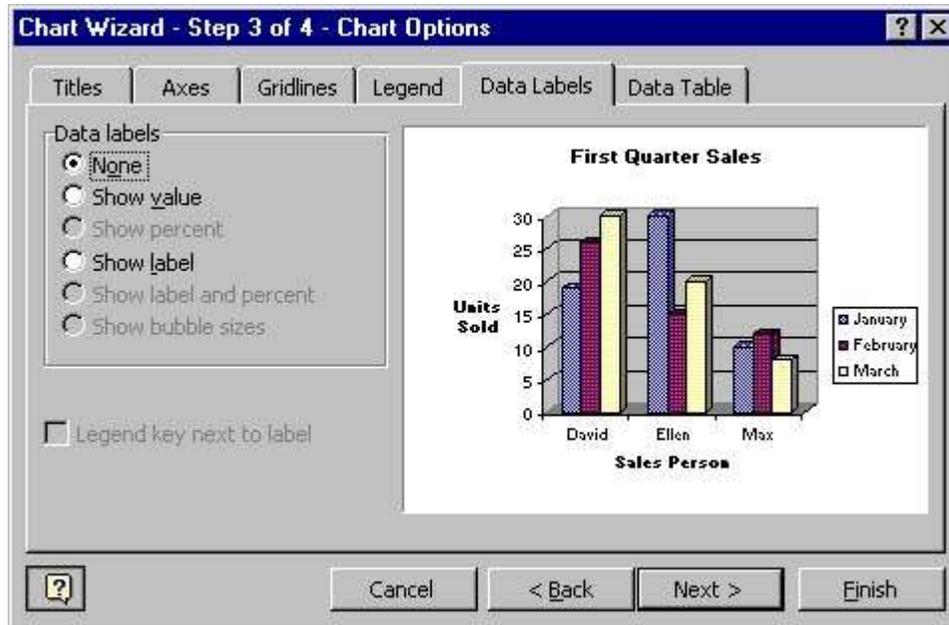
**Figure 11.** The **Legend** tab lets you specify whether or not you want your chart to have a legend. If you choose to have a legend, you can then choose its position.

When the preview chart is as you want it, click on the **Data Labels** tab.



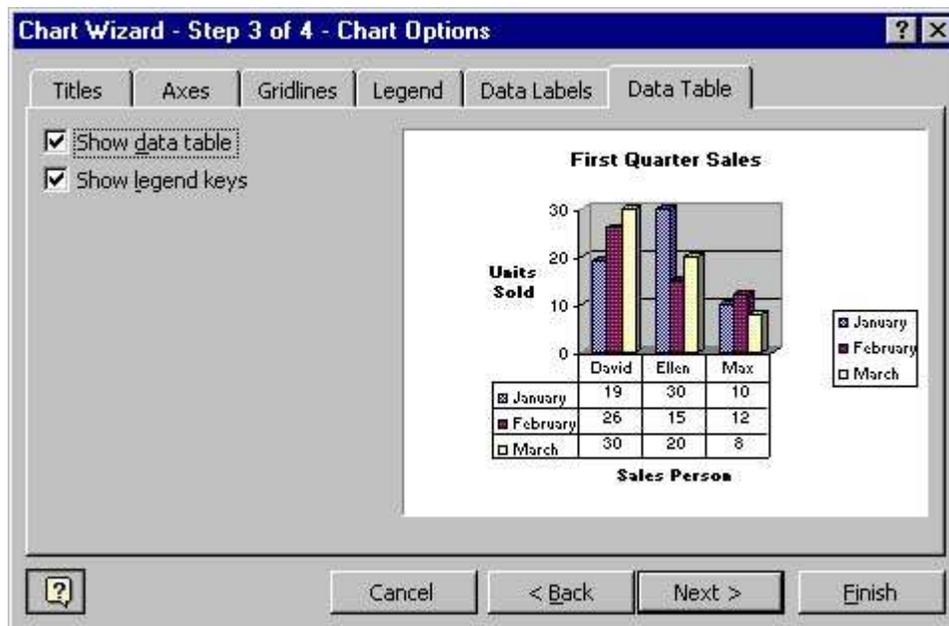
**Figure 12.** You can add data labels to the markers in your chart. Data labels show the value represented by each chart marker. The **Data Labels** tab lets you specify whether or not you want to include data labels in your chart.

When the preview chart is as you want it, click on the **Data Table** tab.



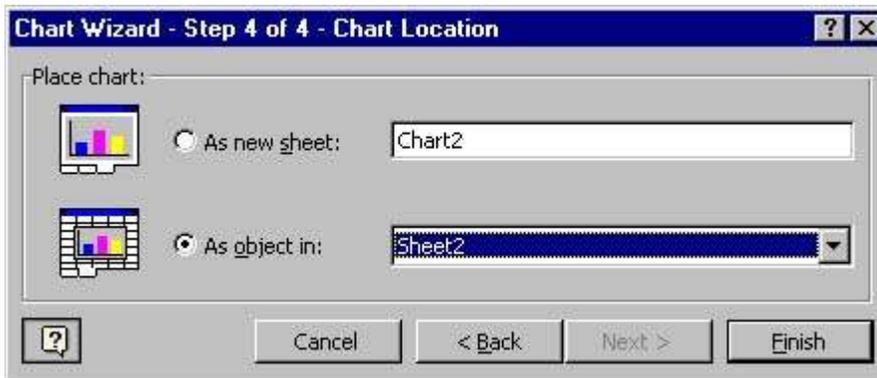
**Figure 13.** A data table is a grid that appears below a chart. The data table contains the data on which the chart is based. The **Data Table** tab lets you specify whether or not you want to include a data table with your chart.

When the preview chart is as you want it, click on the **Next** button.



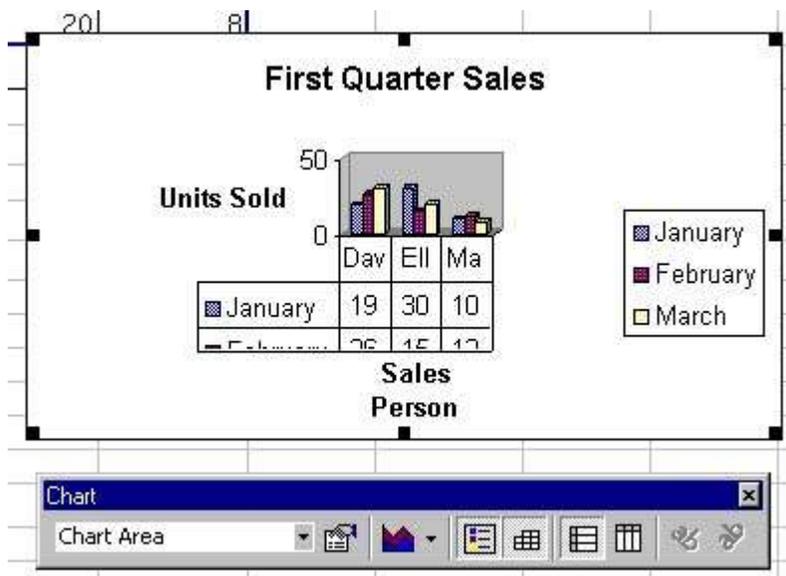
**Figure 14.** Excel then opens the **Chart Wizard - Step 4 of 4 - Chart Location** dialog box. In this step, you specify whether you want the chart to be embedded as an object on an existing worksheet, or as a new sheet that contains only the chart. In this example, we are inserting the chart as an object on **Sheet2** of our workbook.

When you have specified where you want the chart to go, click on the **Finish** button.



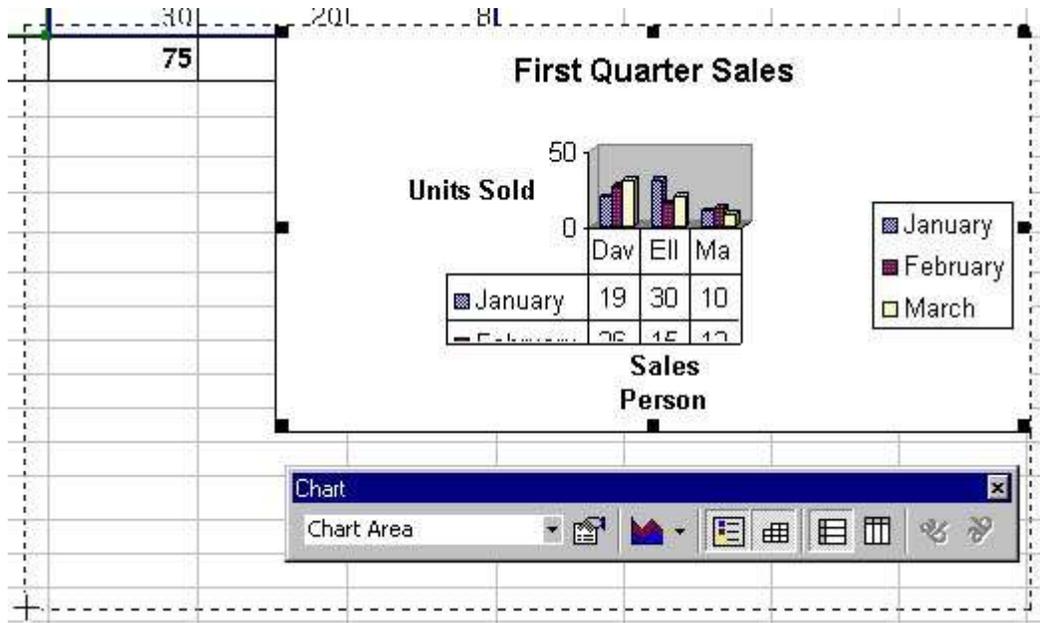
**Figure 15.** The Chart Wizard then creates the chart and opens the Chart toolbar. You can dock the Chart toolbar at any edge of the window, or leave it as a floating toolbar.

You can see in this figure that the chart is too small to display properly, so the first thing we want to do is resize it. To resize a chart, click on one of the sizing handles and drag.

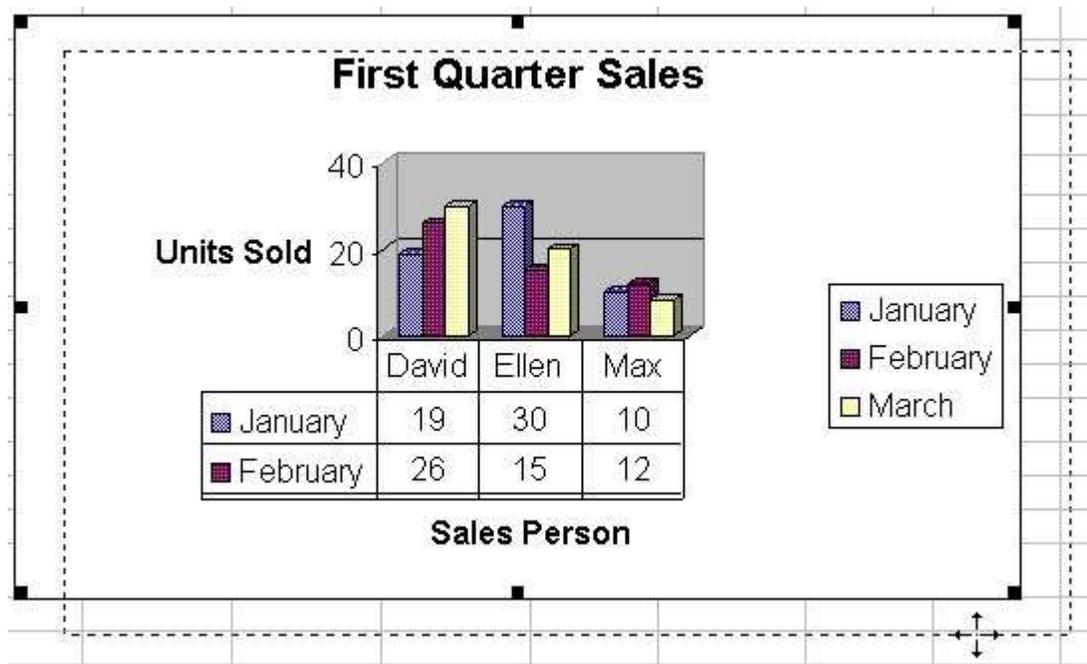


**Figure 16.** As you drag, a dashed outline shows the new size of the chart. When the outline is the size you want the chart, release the mouse button.

If you make the chart broader or taller, the shape of the graph will change proportionally, but the shape and size of the text in the chart labels will not be affected.

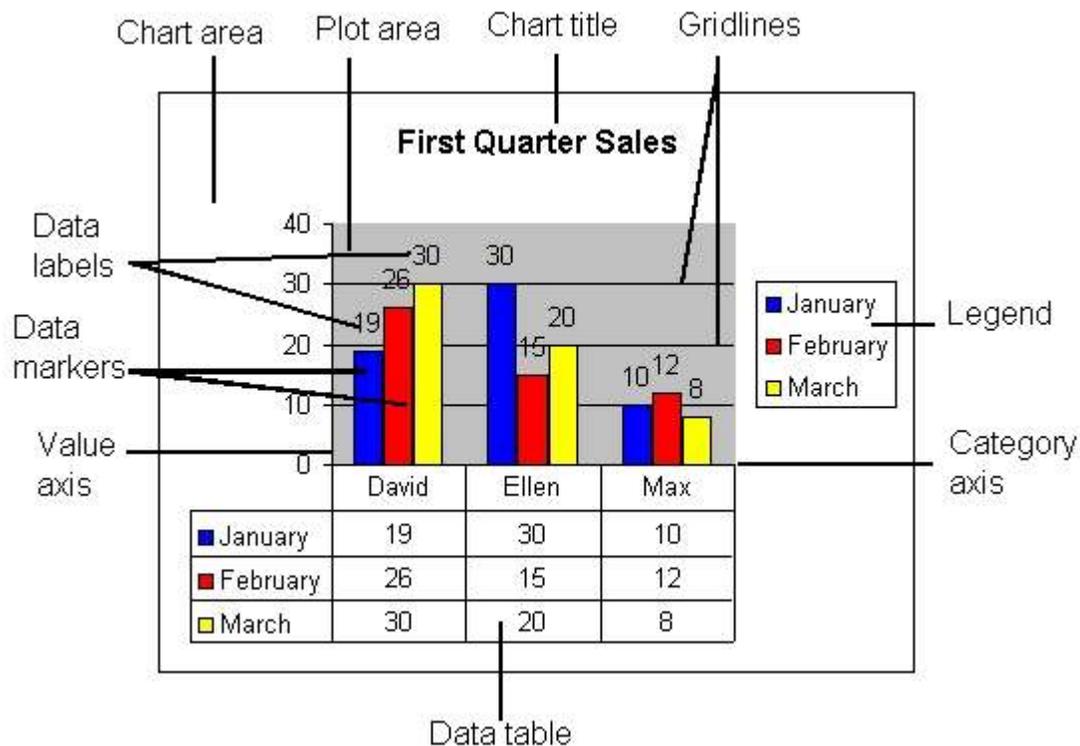


**Figure 17.** You can move the chart by dragging it to a new position. As you drag, a dashed outline shows the new position. When the chart is where you want it, release the mouse button.



### Chart Items

**Figure 18.** Now that we have created a chart, let's look at the items that make up the chart. You can edit, format, and hide most of these items.



### Challenge

- Type the following information on the worksheet:

In cell A2, type **January**

In cell A3, type **February**

In cell A4, type **March**

In cell B1, type **Bill**

In cell B2, type **3542**

In cell B3, type **7184**

In cell B4, type **6531**

In cell C1, type **Mary**

In cell C2, type **2943**

In cell C3, type **6542**

In cell C4, type **7137**

In cell D1, type **Bob**

In cell D2, type **3403**

In cell D3, type **7314**

In cell D4, type **6942**

- Create an **embedded Line Chart** showing the numbers on the Y-axis and the months on the X-axis.

# Modifying Charts

## LESSON 16

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### In This Lesson:

Selecting Chart Items

Changing the Chart Type

Changing Chart Options

Changing Chart Values

Adding Chart Data

Deleting Chart Data

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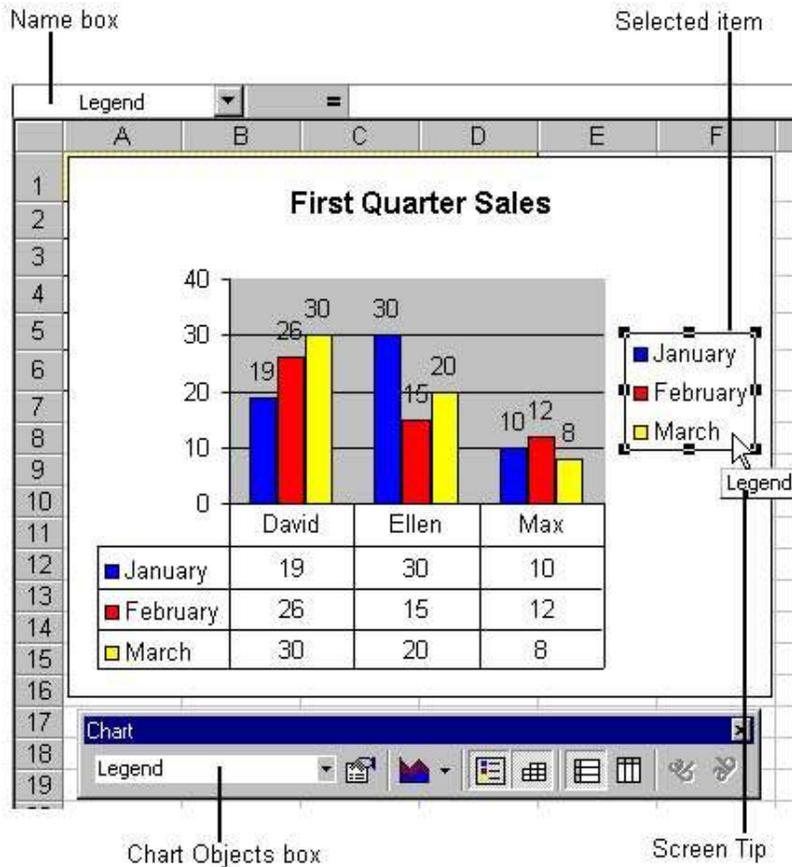
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Once you have created a chart, you can modify it in a number of ways. Sometimes the easiest way to modify a chart is to re-open the dialog boxes that you used in the Chart Wizard when creating the chart. There are also other ways to modify charts, but before you can change chart items, you must know how to select them.

## Selecting Chart Items

**Figure 1.** Before you can modify a chart item, you must select it. To do this, click on the chart item. In this example, we have clicked on the legend.

After you click on an item, the item's name is displayed in the name box and in the **Chart Objects** box on the Chart toolbar. To see the name of an item, move the mouse pointer over the item and leave it there for a few seconds. The item's name displays as a ScreenTip.

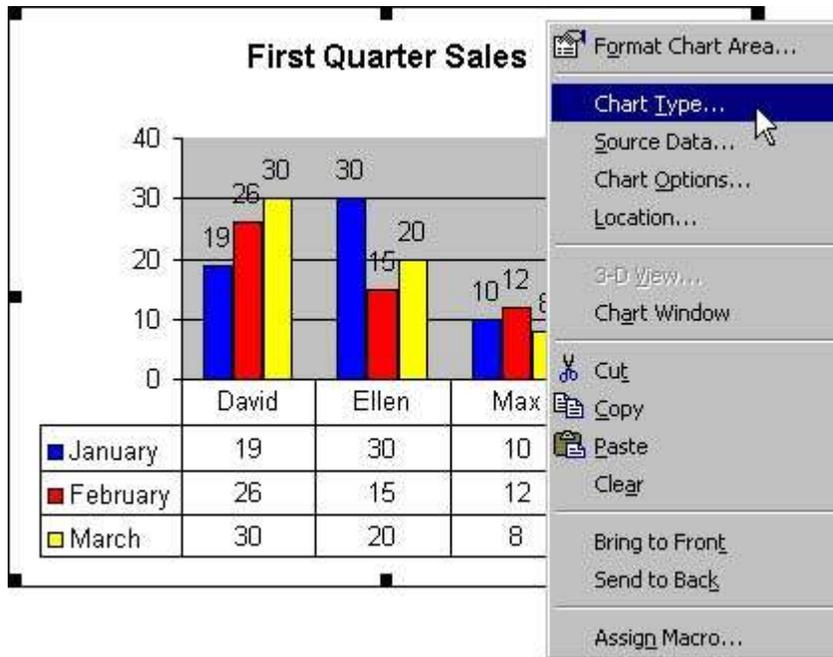


**Figure 2.** You can also select chart items using the **Chart Objects** box on the Chart toolbar. To do this, click on the chart, then click on the down arrow beside the **Chart Objects** box. This displays a list of the chart items. Select the item you want from the list.

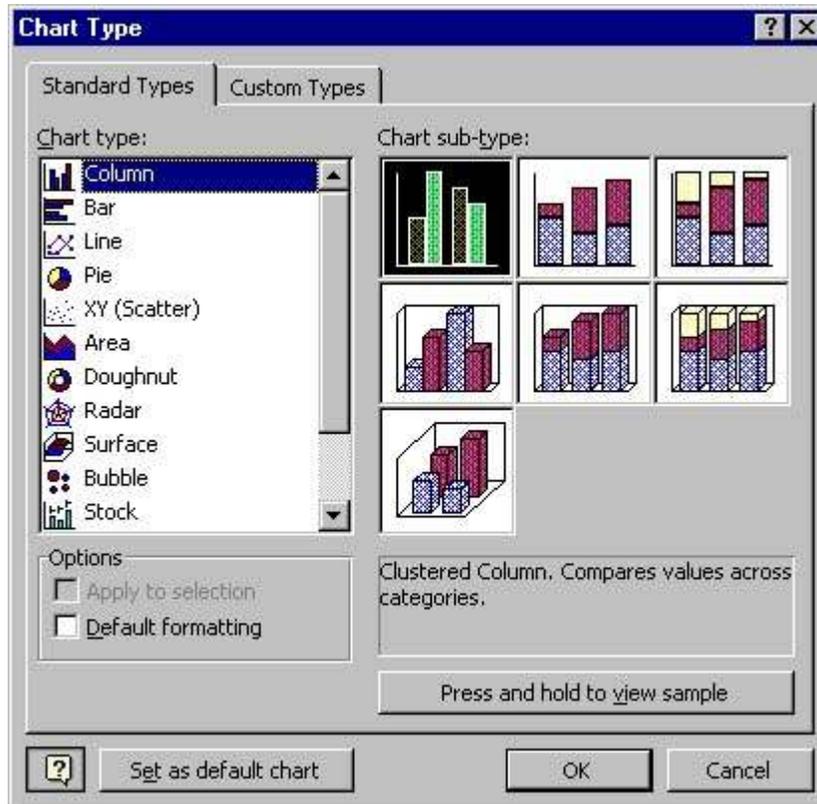


### Changing the Chart Type

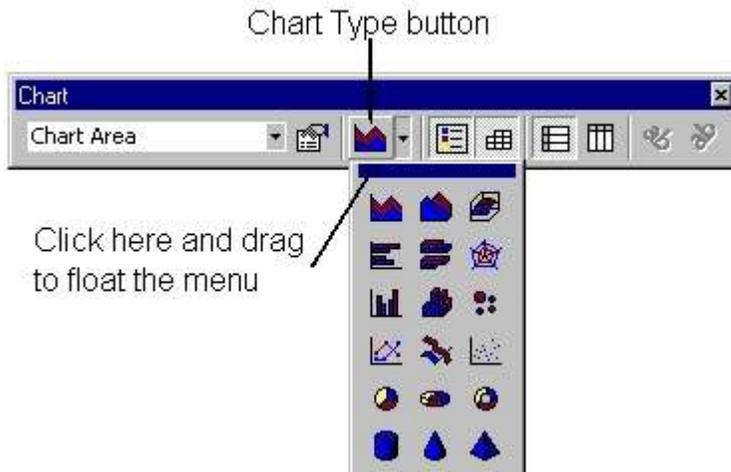
**Figure 3.** To change the chart type, right-click on the chart area, then from the submenu that appears select the **Chart Type** command.



**Figure 4.** Excel then opens the **Chart Type** dialog box. Choose the chart type you want, then click on the **OK** button.

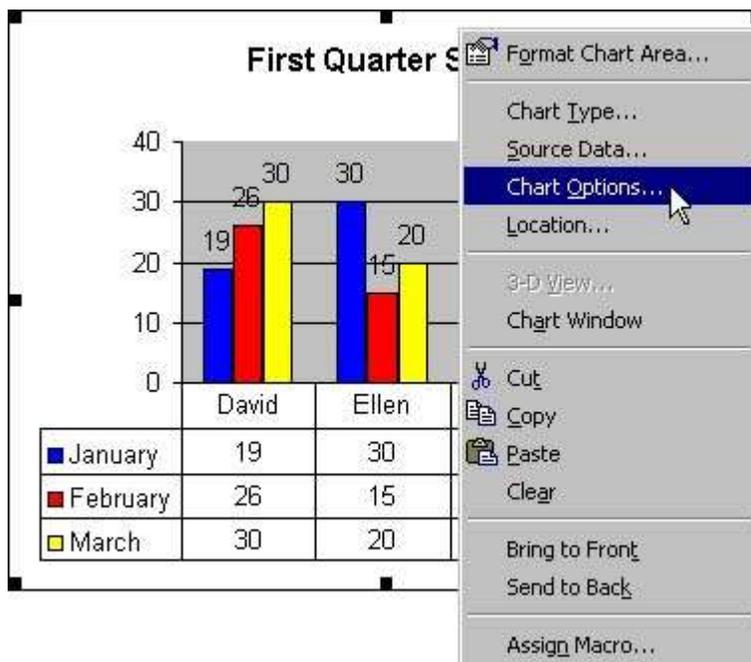


**Figure 5.** You can also change the chart type using the **Chart Type** button on the Chart toolbar. This displays a menu of chart type options. You can drag this menu away from the toolbar to leave it floating on the screen.

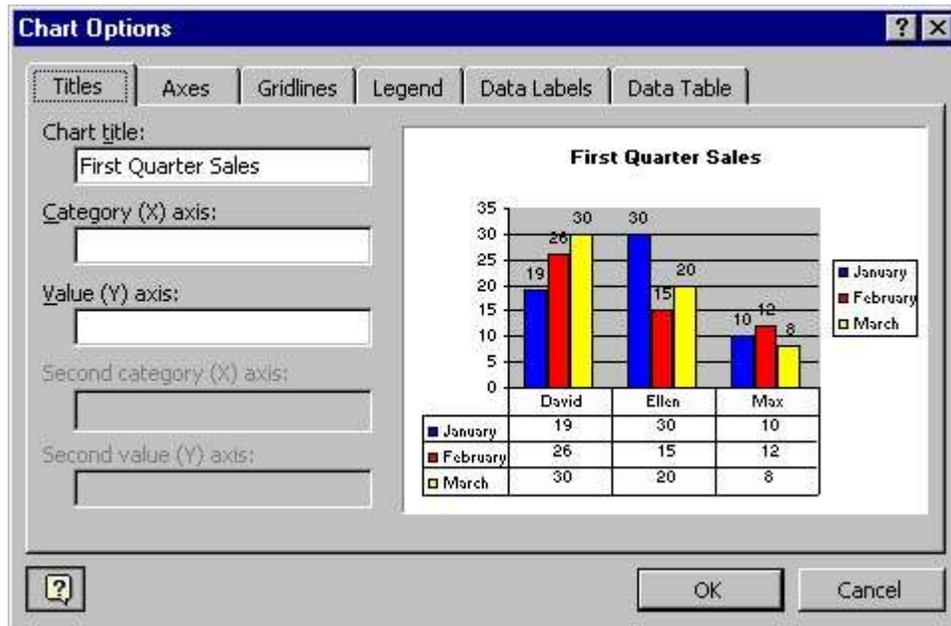


## Changing Chart Options

**Figure 6.** When you created your chart using the **Chart Wizard**, the **Chart Options** dialog box let you add various items, such as titles, gridlines, data labels, and a legend. You can add or remove these items after you have created the chart by re-opening the **Chart Options** dialog box. To do this, right-click on the chart area and from the shortcut menu that appears, select the **Chart Options** command.



**Figure 7.** This opens the **Chart Options** dialog box where you can add or remove chart items.



## Changing Chart Values

Excel automatically links charts to the source data used to create them, so it is very easy to change the values represented by the chart—all you have to do is edit the worksheet data on which the chart is based. As soon as you edit the worksheet data, Excel updates the chart. This ensures that charts constantly reflect current worksheet data.

## Adding Chart Data

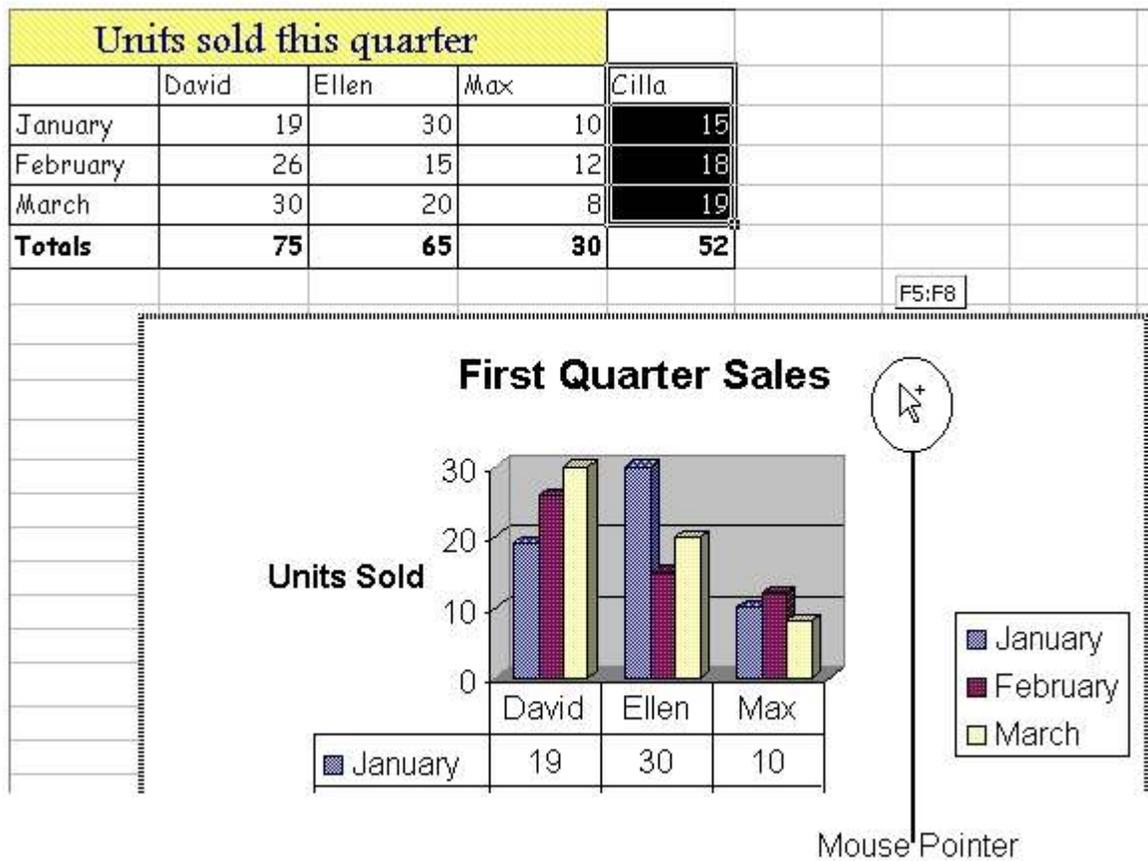
After you have created a chart you may find that you need to add more data to it. You can do this in a number of ways.

### Adding data using drag-and-drop

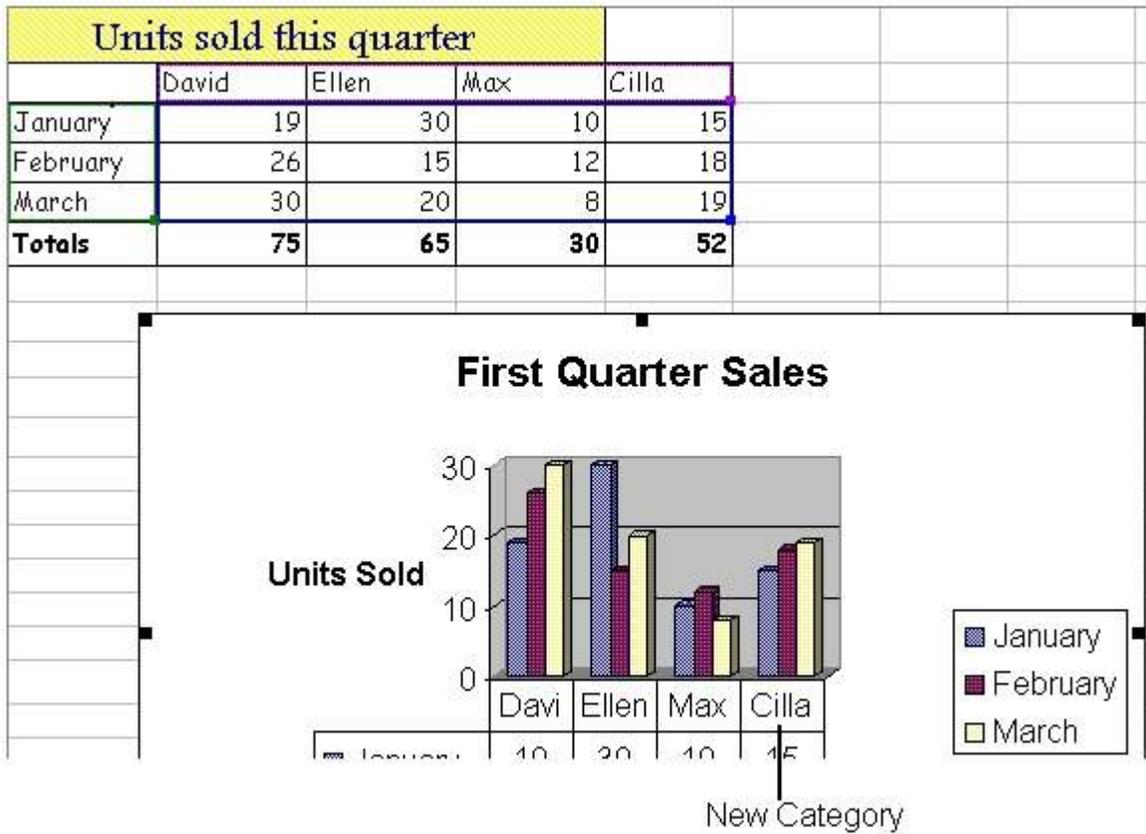
You can add data to embedded charts by dragging new source data from the worksheet onto the chart. The chart then automatically updates. You cannot use this method to update chart sheets.

**Figure 8.** In this example, our chart shows the number of home units sold by three real estate agents. We have added the sales for another agent to our worksheet data and want to add this to the chart. We can do this by dragging the data onto the chart.

Select the data in the worksheet, then move the mouse pointer over an edge of the selection until it becomes an arrow, then drag the selection onto the chart area. The mouse pointer then displays a small plus sign (+) to show that you are copying data onto the chart. To add the new data, release the mouse button.

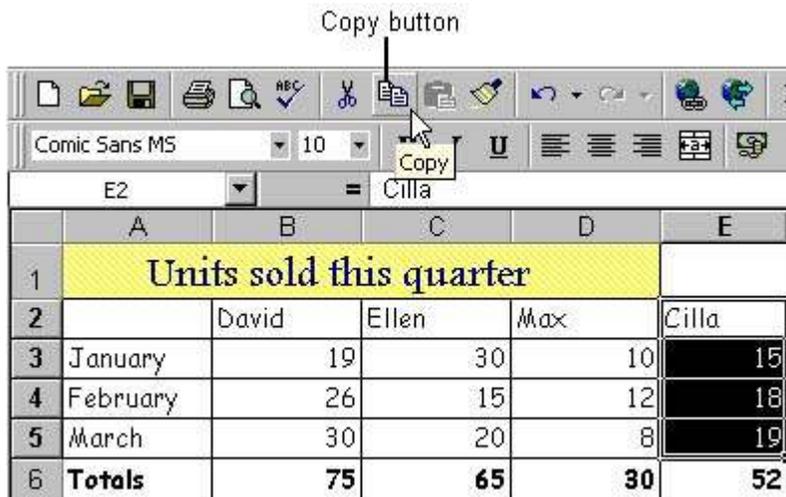


**Figure 9.** After you drop the new data onto the chart, Excel automatically updates it.



**Adding Data Using Copy and Paste**

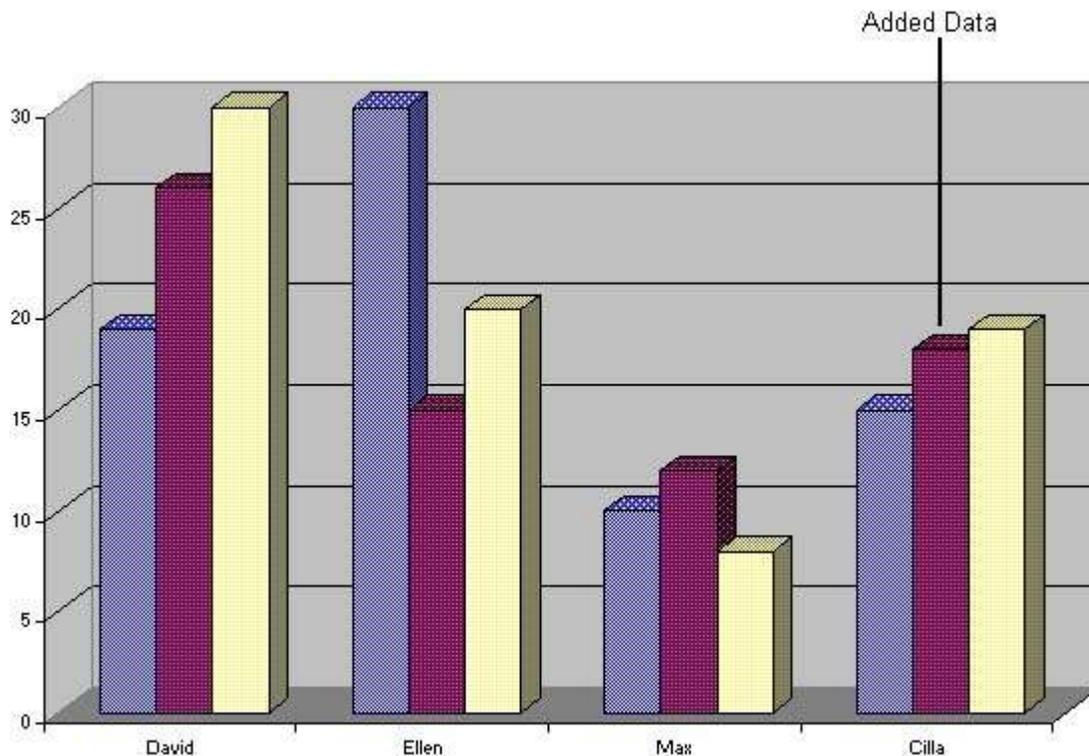
**Figure 10.** To add data to an embedded chart or a chart sheet, you can copy the data from the worksheet and paste it into the chart. To do this, select the data you want to add, then click on the **Copy** button on the Standard toolbar.



**Figure 11.** When you have copied the data, select the embedded chart, or switch to the chart sheet, and click on the **Paste** button on the Standard toolbar.



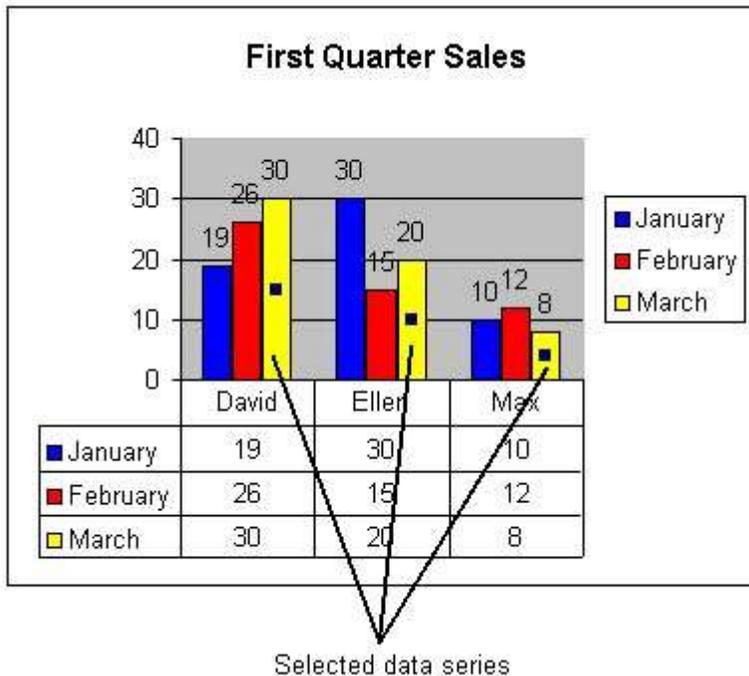
**Figure 12.** Excel then pastes the data into the chart. In this example, you can see that Excel has added the data to our chart sheet.



## Deleting Chart Data

To delete data from a chart, all you have to do is delete the corresponding data from the worksheet.

**Figure 13.** If you want to delete a data series from a chart but leave the corresponding data intact in the worksheet, select the data series on the chart, then press the Delete key.



### Challenge

- Type the following information on the worksheet:

In cell A2, type **Bill**  
 In cell A3, type **Bob**  
 In cell A4, type **Mary**  
 In cell B1, type **Phones**  
 In cell B2, type **7630**  
 In cell B3, type **2943**  
 In cell B4, type **2301**  
 In cell C1, type **Cables**  
 In cell C2, type **9873**  
 In cell C3, type **3745**  
 In cell C4, type **2019**  
 In cell D1, type **Internet**  
 In cell D2, type **8374**  
 In cell D3, type **2049**  
 In cell D4, type **4038**

- Create an embedded Bar Chart** that plots Bill, Bob and Mary on the Y- axis. The Legend will comprise Phones, Cables and Internet.
- Change any of the numbers in the Data **Source** (cells B2, B3, B4, C2, C3, C4, D2, D3 or D4) and notice how the chart changes.
- Change any **Data Series Name** (Bill, Bob or Mary) or Legend Value (Phones, Cable or Internet) and notice how the chart changes.
- Change the **Chart Type** from a Bar Chart to a Line Chart.

# Formatting Charts

## LESSON 17

+ + + +

In This Lesson:

Common Formatting

Special Formatting

Hiding and Displaying Chart Items

+ + + +

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After you have created a chart, you can format its items to improve its appearance and emphasize data.

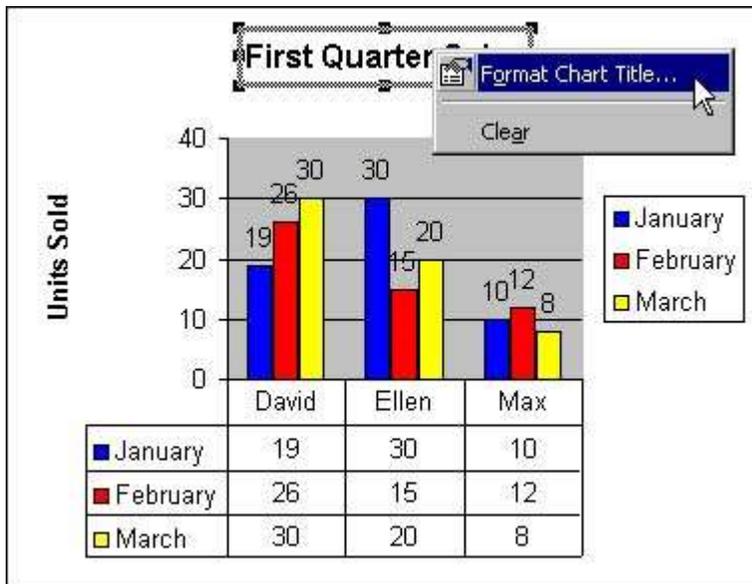
Many chart items share common formatting options, for example, the formatting dialog boxes for data labels, data tables, and chart titles all contain a **Font** tab which lets you format the text associated with those chart items. The formatting features which are common to more than one chart item are covered in this lesson under the heading **Common Formatting**.

Some chart items, such as the chart area and data series, have special formatting that applies only to that item. These formatting features are covered in this lesson under the heading **Special Formatting**.

## Common Formatting

To format a chart item, you open a dialog box that contains tabs with formatting options which are relevant to that item. The **Patterns**, **Font**, **Number**, **Alignment**, and **Scale** tabs are all relevant to more than one chart item, so we have grouped them together as common formatting features.

**Figure 1.** To open a chart item's formatting dialog box, right-click on the item and then choose the **Format** command from the shortcut menu. The **Format** command includes the name of the item; in this example, we clicked on the chart title, so we choose the **Format Chart Title** command from the shortcut menu.



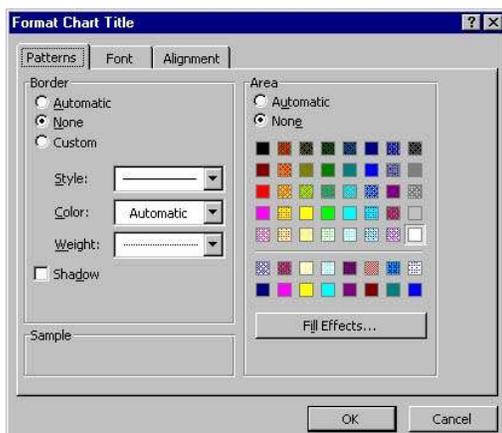
## Patterns

The **Patterns** tab of the **Format** dialog box lets you add borders, colors, and fill effects to the following chart items:

- the chart area;
- the plot area;
- the data table;
- the legend;
- data series;
- data labels;
- chart titles;
- gridlines;
- axes.

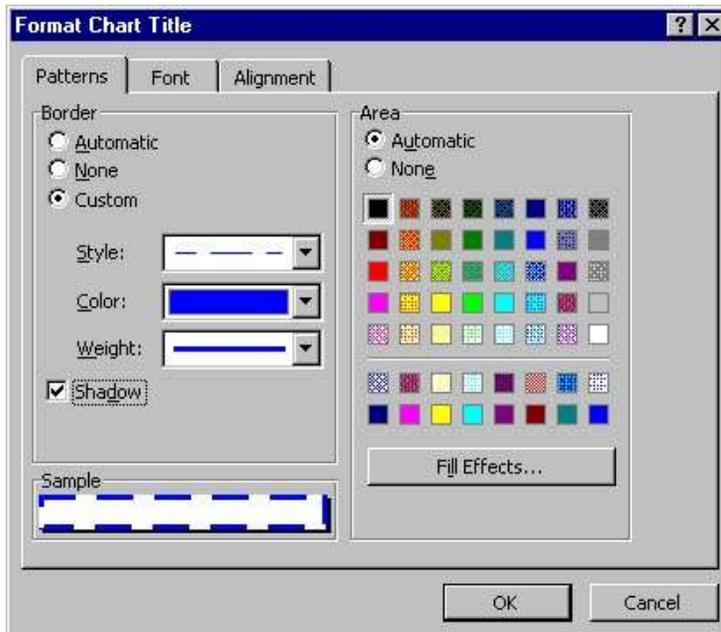
To format one of these chart items with borders, colors, or fill effects, right-click on the item and select the **Format** command.

**Figure 2.** After you select an item's **Format** command, Excel opens the **Format** dialog box. Now click on the **Patterns** tab to display it. In this example, we have opened the **Patterns** tab of the **Format Chart Title** dialog box.



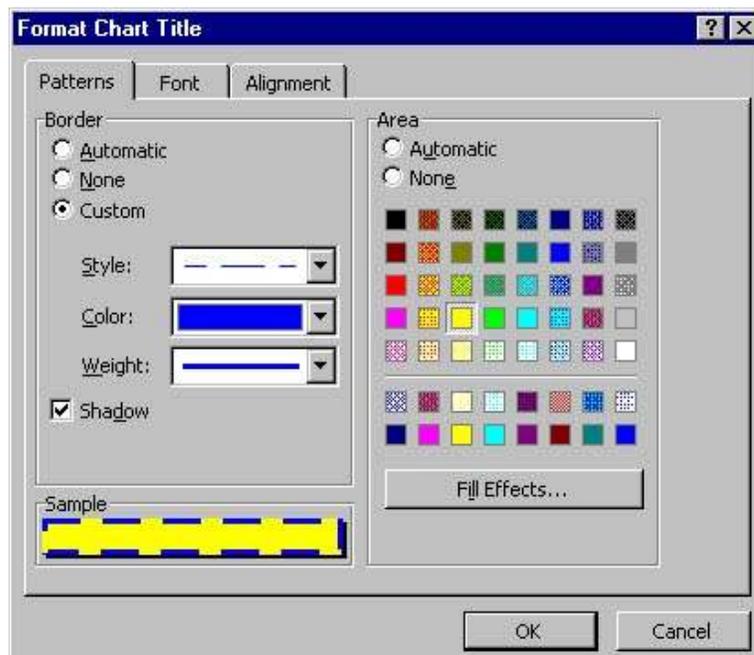
## Borders

**Figure 3.** The **Border** section of the **Format** dialog box lets you add a border to the selected chart item. You can choose the style, color, and weight of the border. The **Sample** section of the dialog box shows what the border will look like if you apply the current options to the chart item.



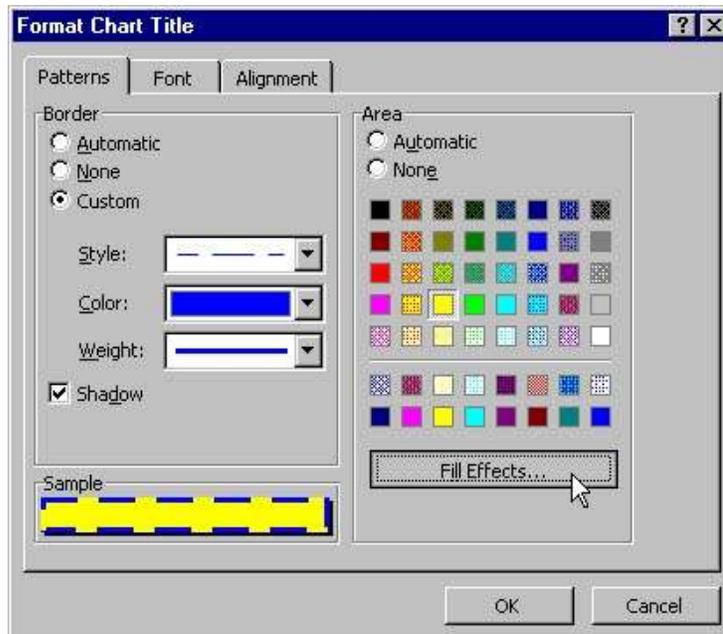
## Colors

**Figure 4.** The **Area** section lets you fill the area of the selected chart item with color. Click on the color you want.



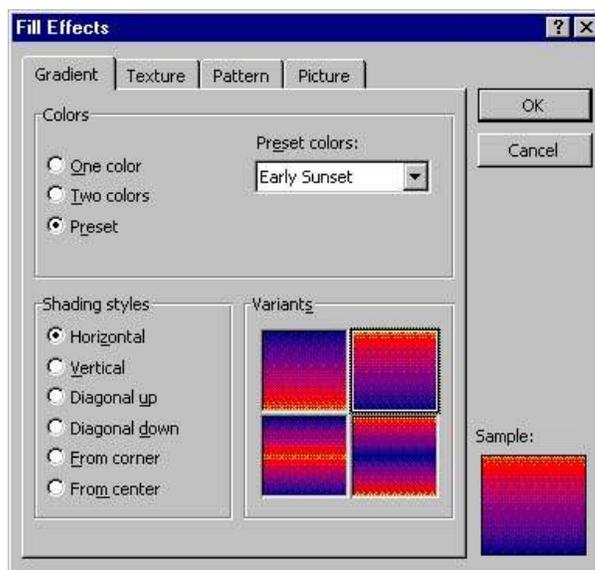
## Fill effects

**Figure 5.** You can add special textures and gradient fills to the area of the selected chart item. To do this, click on the **Fill Effects** button.



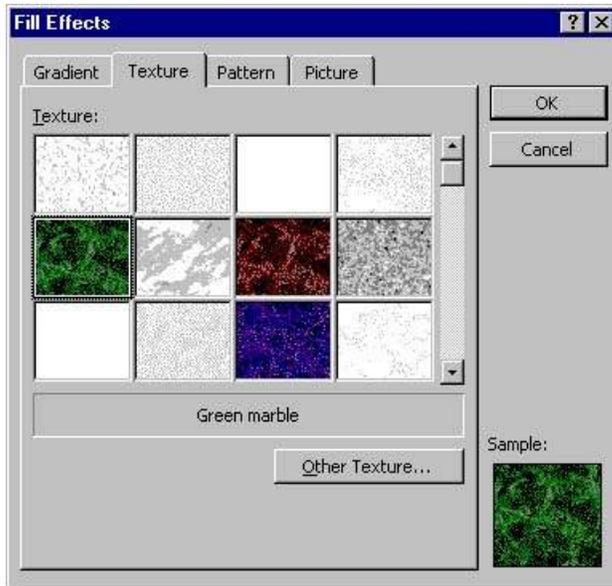
**Figure 6.** After you click on the **Fill Effects** button, Excel opens the **Fill Effects** dialog box. This lets you add a gradient fill, texture, pattern, or picture to the selected chart item.

The **Gradient** tab lets you add a gradient, or gradually shaded fill, to the selected chart item. From the **Colors** section, choose whether you want a one-color, two-color, or preset fill. In this example, we have clicked on the **Preset** radio button and chosen the **Early Sunset** option from the **Preset colors** box. Next, choose an option from the **Shading styles** section, then choose one of the options from the **Variants** section. The **Sample** section shows what your chart item will look like if you apply the currently selected options.



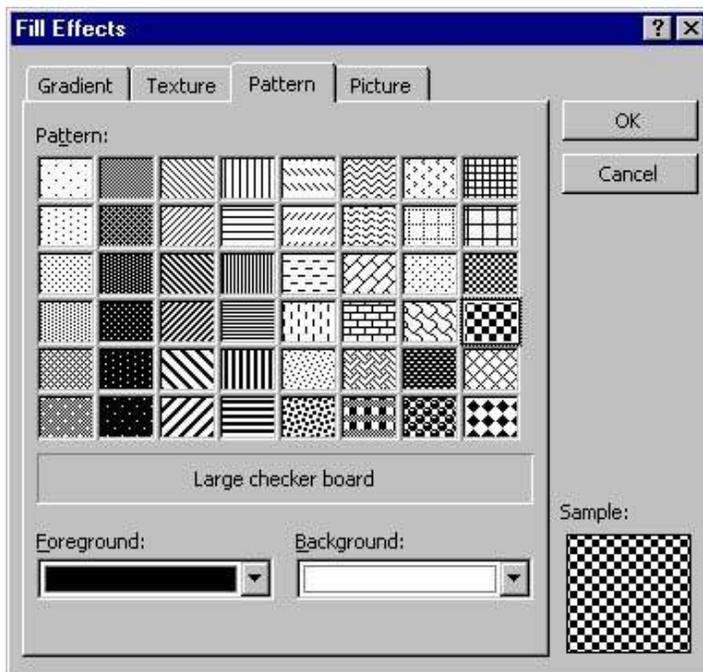
**Figure 7.** The **Texture** tab of the **Fill Effects** dialog box lets you add a texture to the selected chart item. You can choose from the built-in textures, or if you have your own texture you can open that by clicking on the **Other Texture** button.

The **Sample** section shows what your chart item will look like if you apply the currently selected texture.



**Figure 8.** The **Pattern** tab of the **Fill Effects** dialog box lets you add a pattern to the selected chart item. From the **Pattern** options, choose the pattern you want, then from the **Foreground and Background** boxes choose the colors you want.

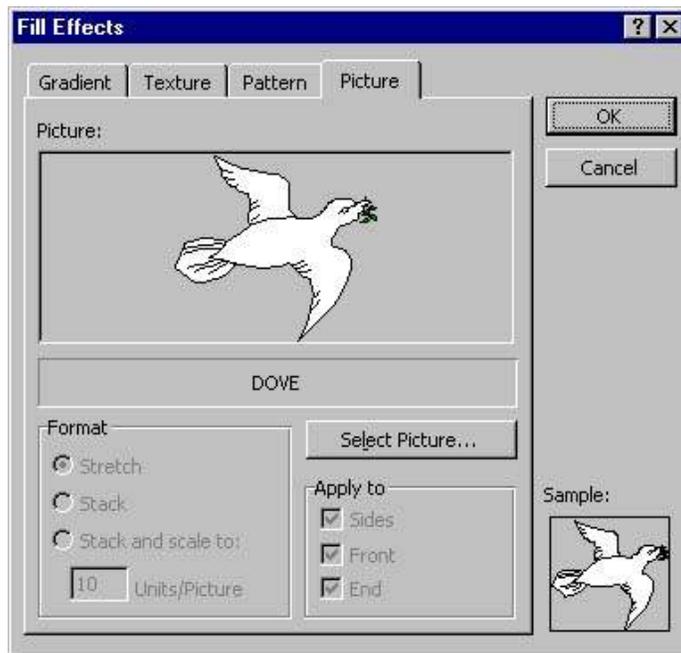
The **Sample** section shows what your chart item will look like if you apply the currently selected pattern.



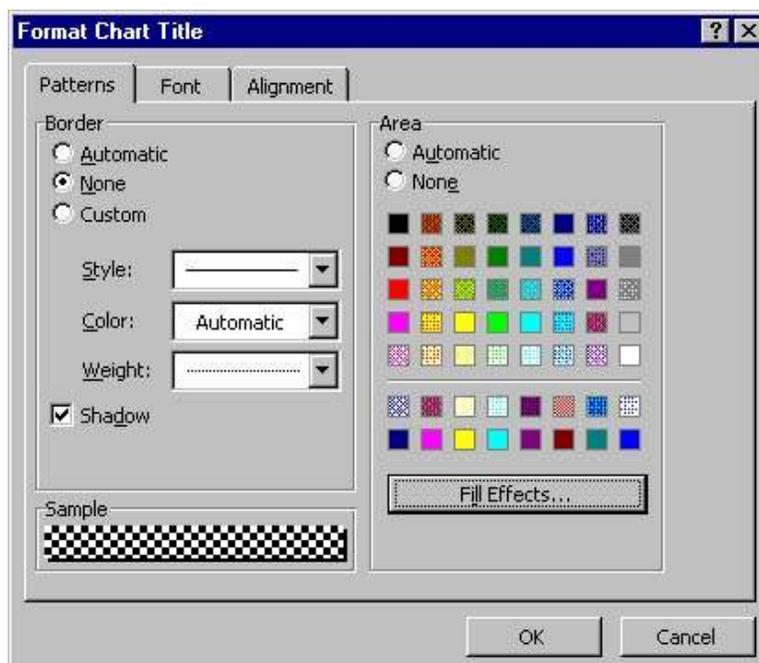
**Figure 9.** The **Picture** tab of the **Fill Effects** dialog box lets you use a picture as a fill for the selected chart item. The picture will stretch to fill the chart item.

To add a picture, click on the **Select Picture** button, then from your own files, select the picture you want to use as a fill. The **Sample** section shows what your chart item will look like if you apply the currently selected picture.

When you have chosen the fill effect you want, click on the **OK** button in the **Fill Effects** dialog box.



**Figure 10.** Excel then returns you to the **Format** dialog box. To apply the formatting options you chose, click on the **OK** button.



## Font

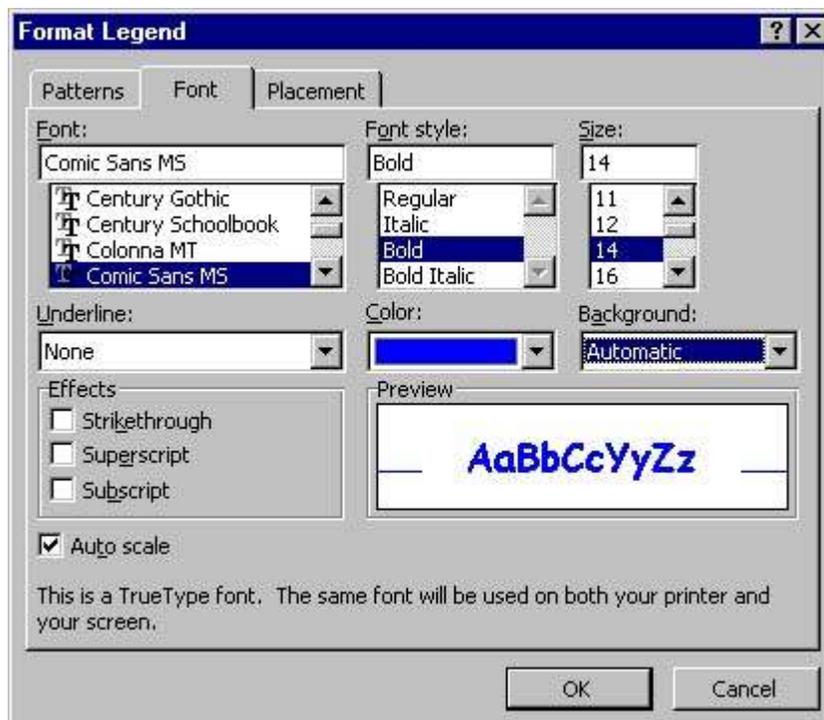
The **Font** tab of the **Format** dialog box lets you format the text of the following chart items:

- the chart area;
- the data table;
- the legend;
- data labels;
- chart titles;
- axes.

To format the text of one of these chart items, right-click on the item and select the **Format** command.

**Figure 11.** After you select an item's **Format** command, Excel opens the **Format** dialog box. In this example, we have opened the **Format Legend** dialog box. Now click on the **Font** tab to display it.

Select the options you want for the text of the selected chart item. The **Preview** section shows what the text will look like if you apply the currently selected options to the chart item. To apply the options, click on the **OK** button.



## Alignment

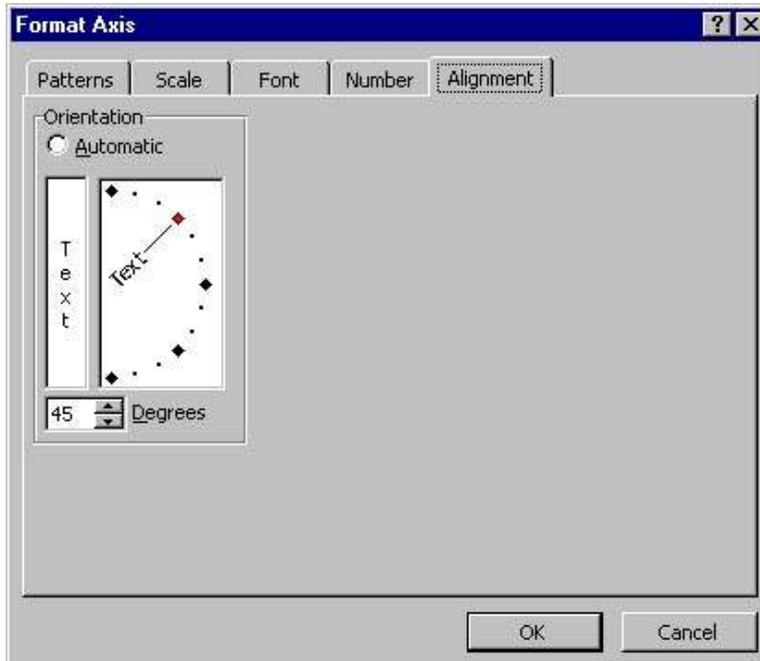
The **Alignment** tab of the **Format** dialog box lets you align the text of the following chart items:

- chart titles;
- data labels;
- axes.

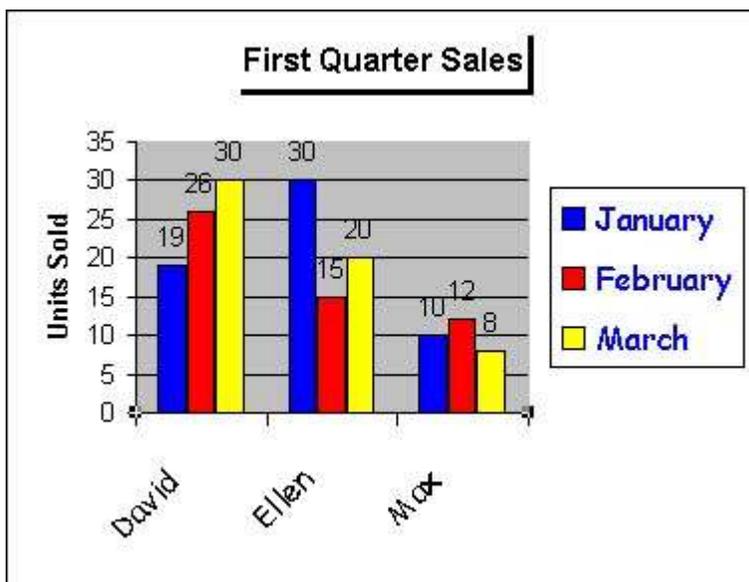
To align the text of one of these chart items, right-click on the item and select the **Format** command.

**Figure 12.** After you select an item's **Format** command, Excel opens the **Format** dialog box. In this example, we have opened the **Format Axis** dialog box. Now click on the **Alignment** tab to display it.

The alignment options vary depending on which chart item you are formatting. In this example, we have used the **Degrees** spin box to rotate the text of the category axis. Let's now see what happens when we click on the **OK** button.



**Figure 13.** You can see that Excel has rotated the text on the category axis.



## Number

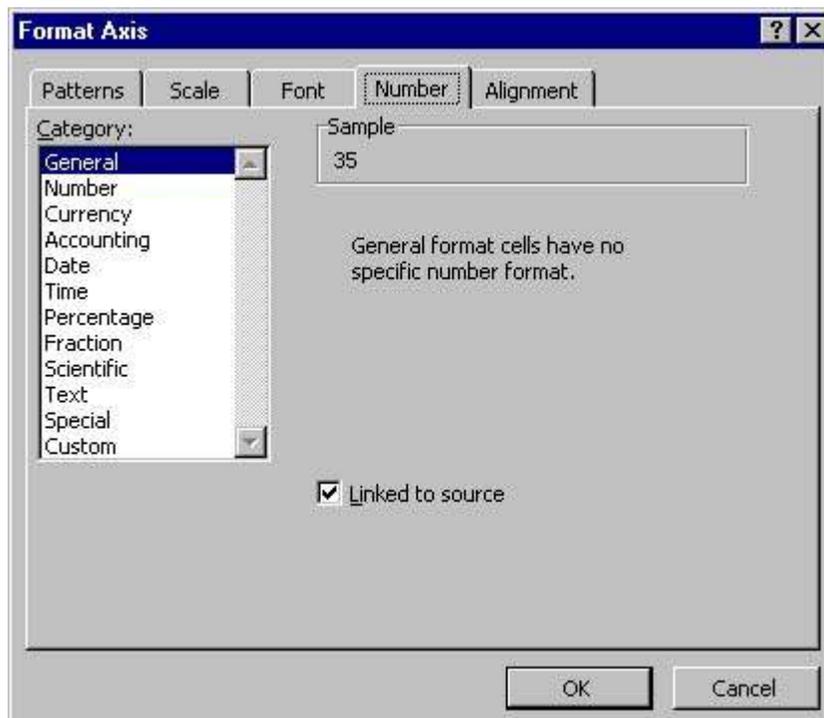
The **Number** tab of the **Format** dialog box lets you format the numbers of the following chart items:

- data labels;
- axes.

To format the numbers of one of these chart items, right-click on the item and select the **Format** command.

**Figure 14.** After you select an item's **Format** command, Excel opens the **Format** dialog box. In this example, we have opened the **Format Axis** dialog box. Now click on the **Number** tab to display it.

You can select a different number format from the category list. When you select a different category, the link between the chart and the worksheet data is broken, and the **Linked to source** check box is cleared. To re-establish the link, select the **Linked to source** check box. Choose the options you want, then click on the **OK** button.



## Scale

The **Scale** tab of the **Format** dialog box lets you adjust the scale of the following chart items:

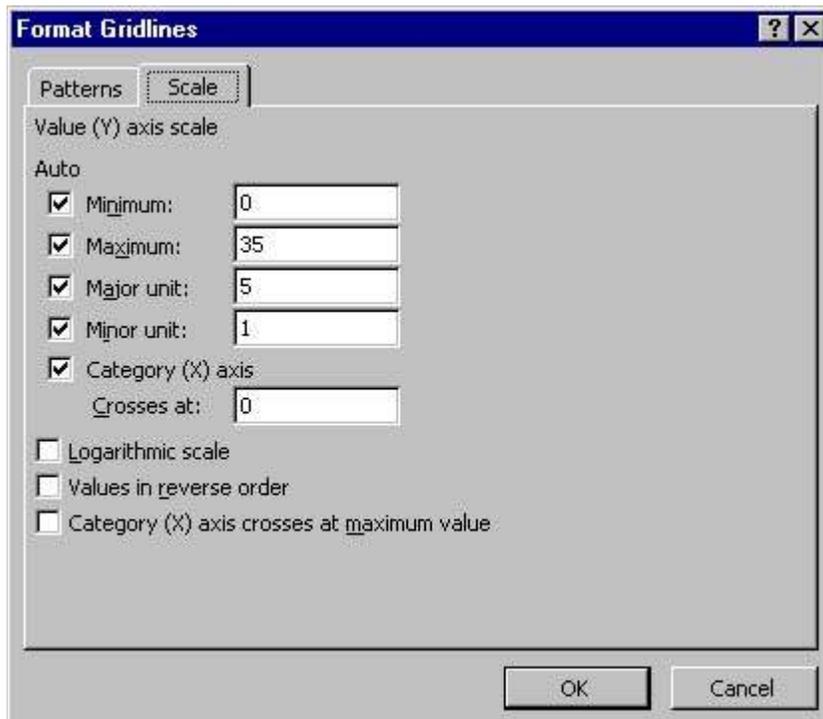
- gridlines;
- axes.

To adjust the scale of one of these chart items, right-click on the item and select the **Format** command.

**Figure 15.** After you select an item's **Format** command, Excel opens the **Format** dialog box. In this example, we have opened the **Format Gridlines** dialog box. Now click on the *Scale* tab to display it.

The options on the **Scale** tab of the **Format Axis** dialog box vary depending on which axis you select.

Change the options you want to change, then click on the **OK** button.



## Special Formatting

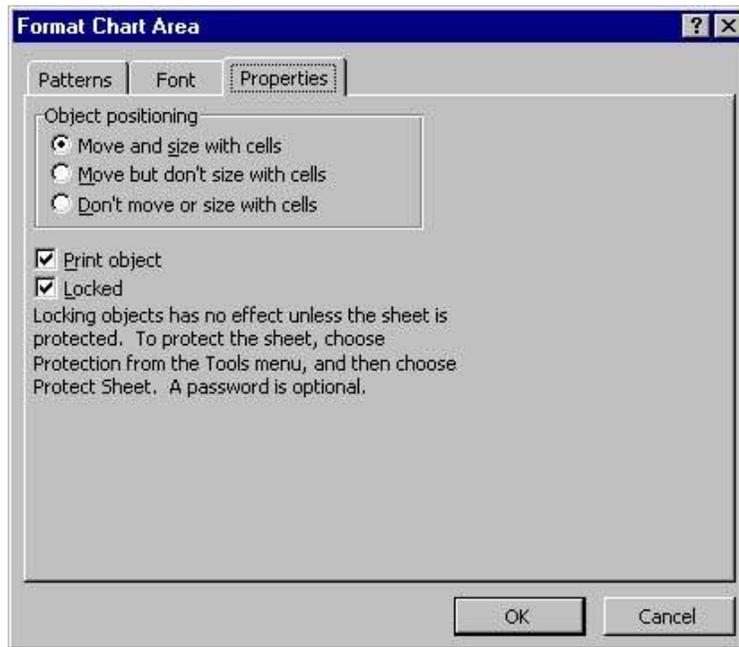
So far we have looked at the formatting options which are relevant to more than one chart item. Some chart items have their own special formatting options. These special options are discussed below. Remember that to open an item's **Format** dialog box, right-click on the item and from the submenu that appears, select the **Format** command.

### Chart area

**Figure 16.** This figure shows the **Format Chart Area** dialog box. For information about the first two tabs, see **Patterns** and **Font** earlier in this chapter. The options on the **Properties** tab are described here.

The **Object positioning** section lets you specify how you want the chart to be positioned in relation to the worksheet. If you want the chart to print when you print the worksheet, select the **Print object** check box.

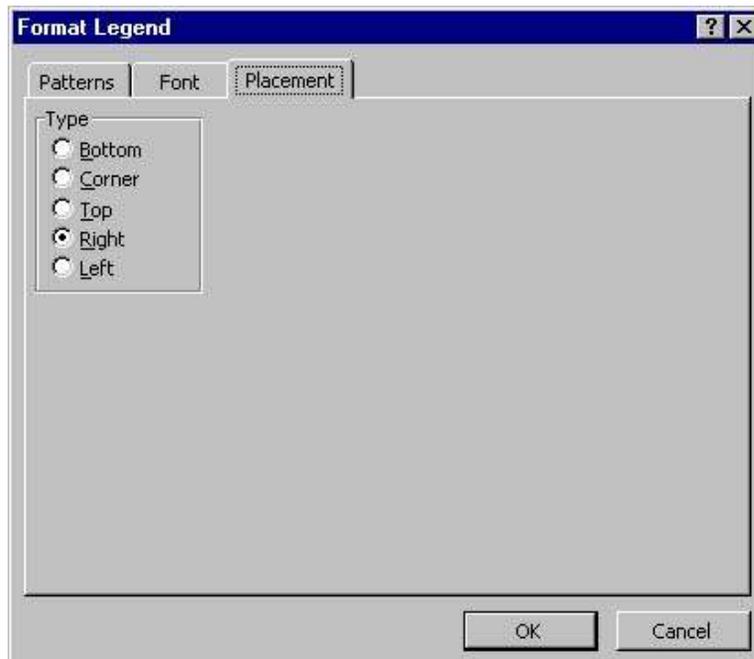
The **Locked** check box lets you protect the chart from changes. When you have selected the options you want, click on the **OK** button.



## Legend

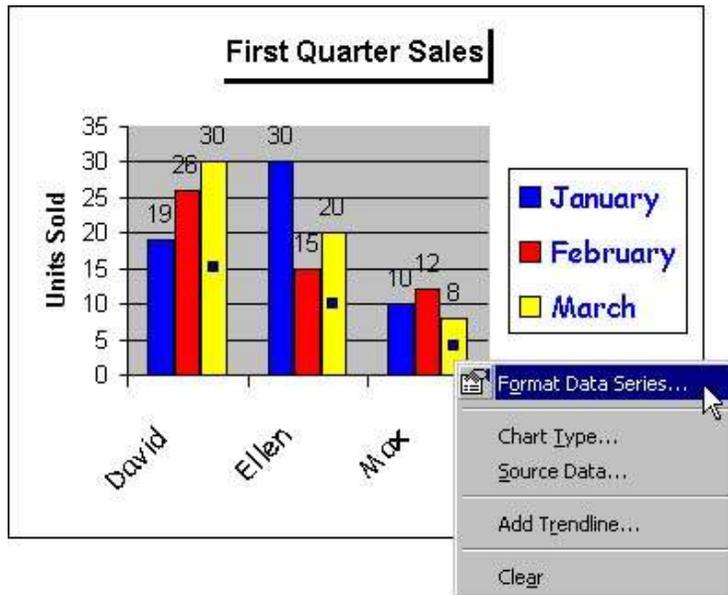
**Figure 17.** This figure shows the **Format Legend** dialog box. For information about the first two tabs, see **Patterns** and **Font** earlier in this chapter.

The options on the **Placement** tab let you position the legend where you want it. Choose an option from the **Type** section, then click on the **OK** button.

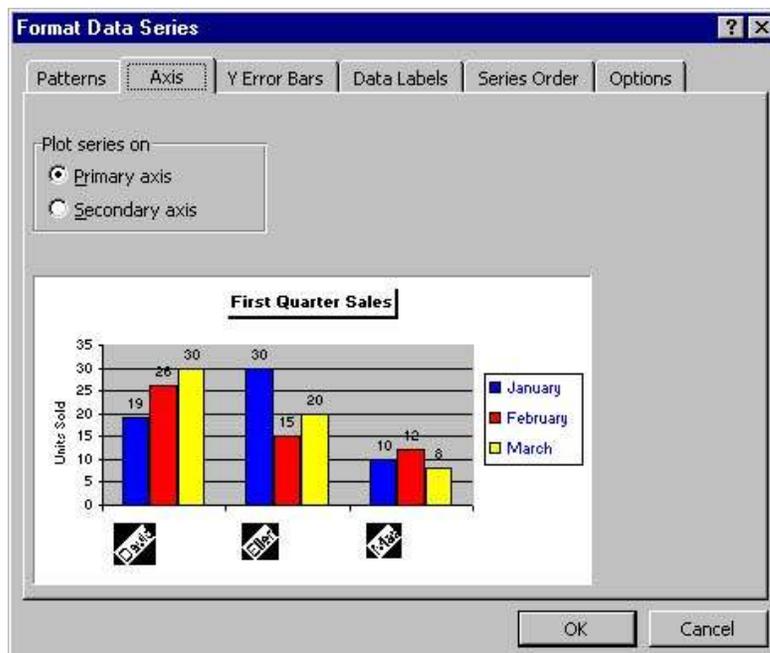


## Data series

**Figure 18.** There are a number of formatting options that are unique to the data series in your charts. To format a data series, right-click on one of its data markers, then from the submenu that appears, select the **Format Data Series** command.

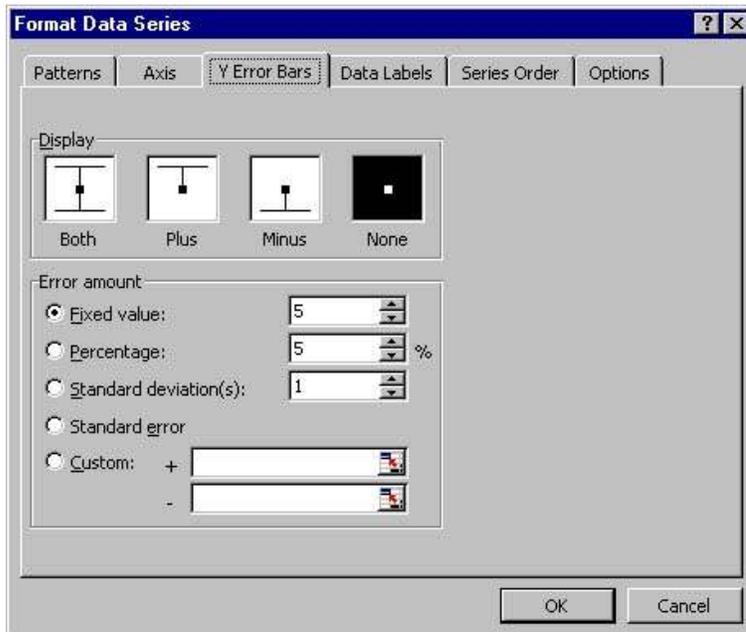


**Figure 19.** This figure shows the **Format Data Series** dialog box. For information about the first tab, see **Patterns** earlier in this chapter. The **Axis** tab lets you plot the data on the primary axis, or a secondary axis. The sample chart shows the effect of each option when you select it.



**Figure 20.** The **Y Error Bars** tab lets you add lines that illustrate potential error amounts for a data series. Choose the options you want, then click on the **OK** button.

For help with an option, click on the question-mark button in the top-right corner of the dialog box, then click on the option.



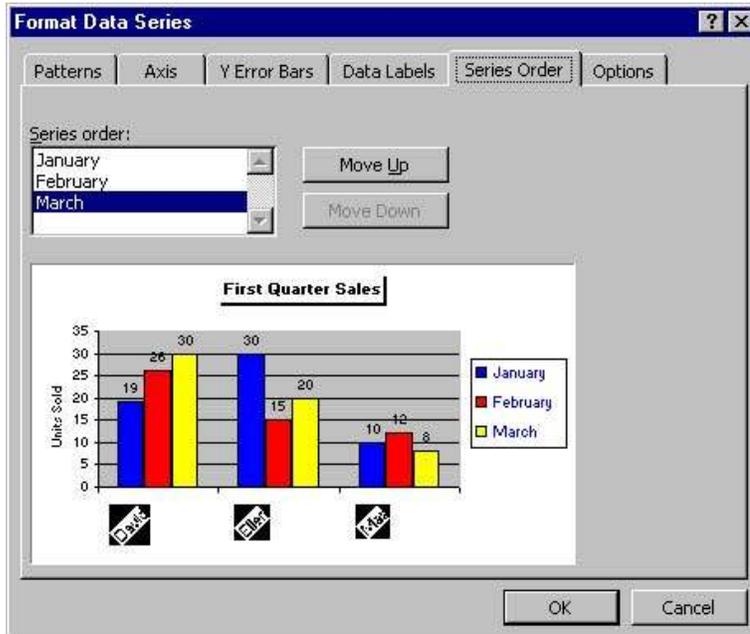
**Figure 21.** The **Data Labels** tab lets you customize data labels in a chart. Choose the options you want, then click on the **OK** button.

For help with an option, click on the question-mark button in the top-right corner of the dialog box, then click on the option.



**Figure 22.** The **Series Order** tab lets you change the order of the data series in a chart. From the **Series order** list box, select the series you want to move, then click on the **Move Up** or

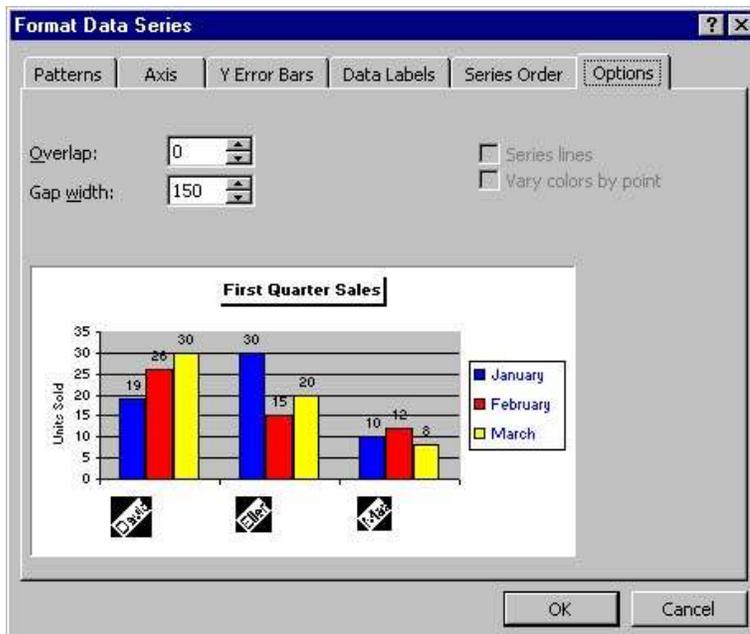
**Move Down** button. The sample chart shows what your chart will look like if you apply the selected options.



**Figure 23.** The **Options** tab lets you change the way the data markers of a series are displayed. For example, you can make the markers overlap and you can increase the amount of space between the markers.

For help with an option, click on the question-mark button in the top-right corner of the dialog box, then click on the option.

When the sample chart is as you want it, click on the **OK** button to apply the changes.

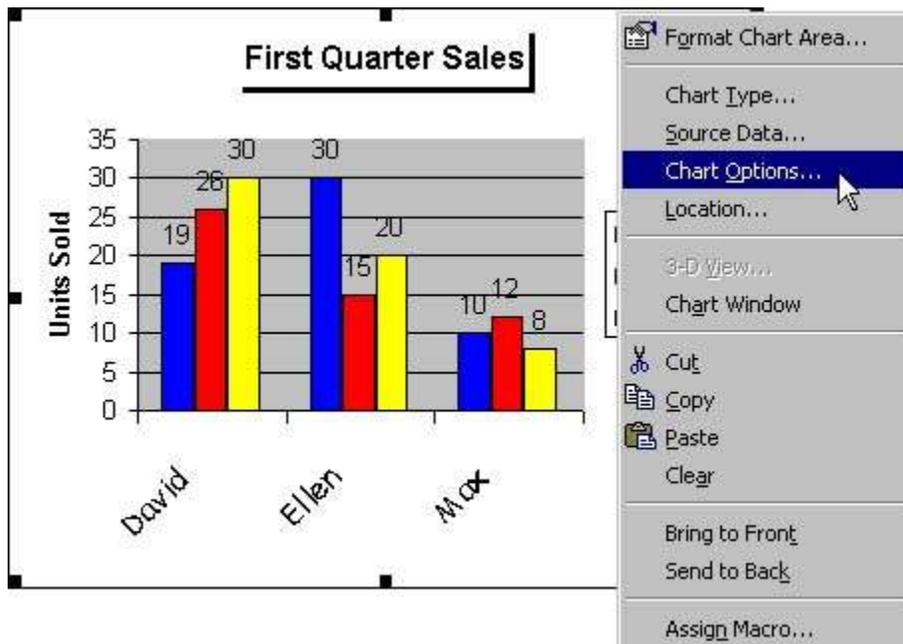


## Hiding and Displaying Chart Items

**Figure 24.** You have the option of displaying or hiding most chart items, including titles, axes, gridlines, data labels, the legend, and the data table. To hide an item, right-click on it and from the shortcut menu that appears select the **Clear** command.



**Figure 25.** To display an item, right-click on the chart area and from the shortcut menu that appears select the **Chart Options** command. Excel then opens the **Chart Options** dialog box where you can choose the items you want to display.



# Working with Multiple Worksheets

## LESSON 18

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### In This Lesson:

Naming Worksheets

Inserting Worksheets

Deleting Worksheets

Grouping and Ungrouping Worksheets

Moving Worksheets

Copying Worksheets

Moving and Copying Worksheets

Deleting Worksheets

Coloring Tabs

Protecting a Worksheet

Protecting Entire Workbook

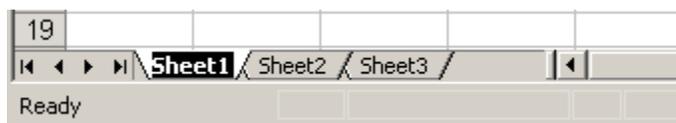
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## Naming Worksheets

At the beginning of this course, we learned that the tabs displayed at the bottom of the screen are named Sheet1, Sheet2 and Sheet3. These are not very informative names. Excel XP allows you to define a meaningful name for each worksheet in a workbook-Checkbook, Reports, Accounts-so you can quickly locate information.

### To Name a Worksheet:

- Double-click the **sheet tab** to select it. The text is highlighted by a black box.



- Type a **new name** for the worksheet.



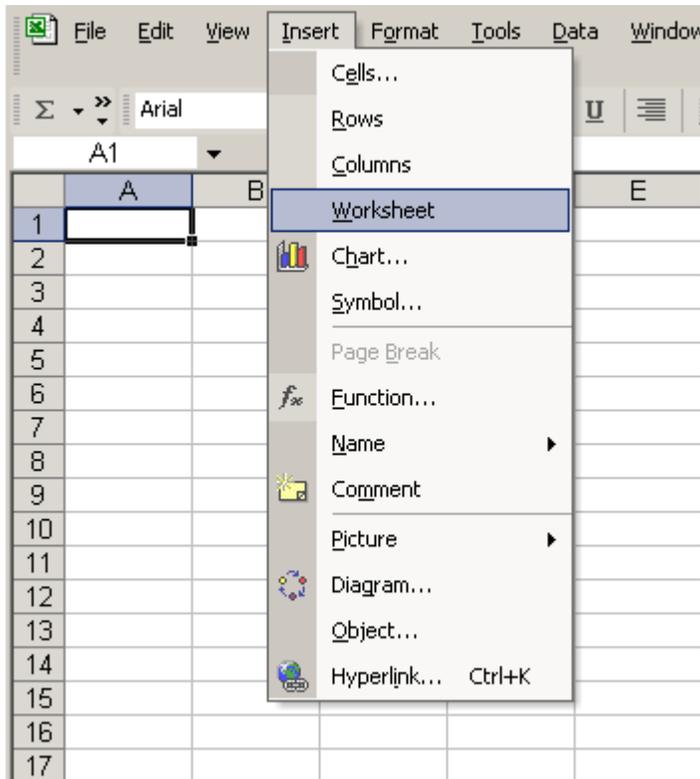
- Press the **Enter** key.
- The worksheet now assumes the descriptive name defined.

## Inserting Worksheets

By default, each new workbook in Excel XP defaults to three worksheets named Sheet1, Sheet2 and Sheet3. You have the ability to **insert new worksheets** if needed or delete others you no longer want.

### To Insert a New Worksheet:

- Choose **Insert** → **Worksheet** from the menu bar.



- A new worksheet tab is added to the bottom of the screen. It will be named Sheet4, Sheet5 or whatever the next sequential sheet number may be in the workbook.

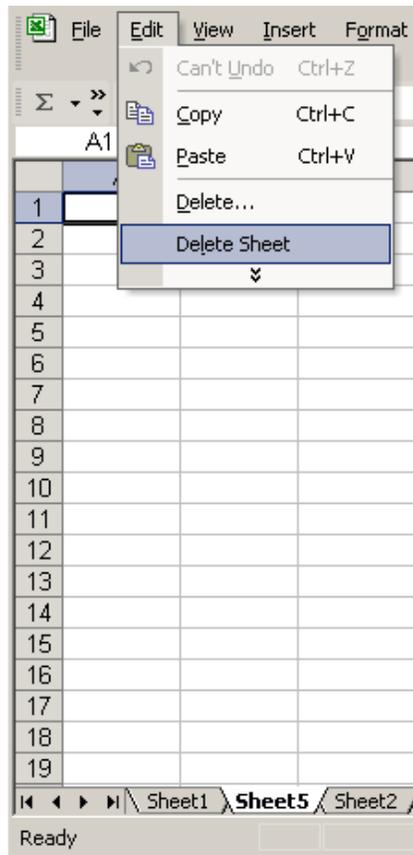
## Deleting Worksheets

Any worksheet can be **deleted** from a workbook, including those that have data in it. Remember, a workbook must contain at least one worksheet.

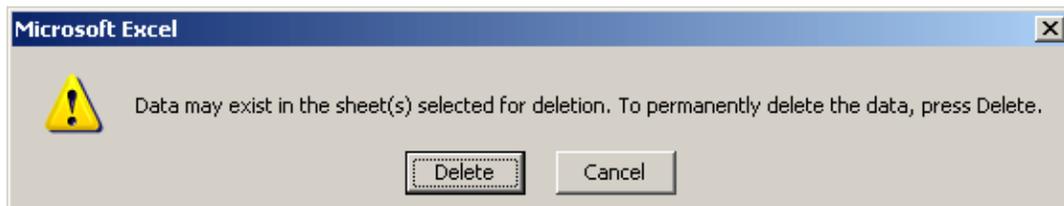
### To Delete One or More Worksheets:

- Click on the sheet(s) you want to delete.

- Choose **Edit** → **Delete Sheet** from the menu bar.

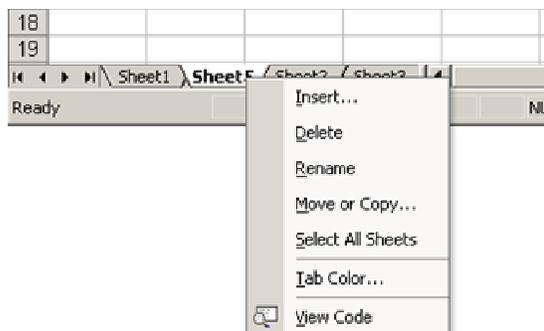


- The following dialog box appears if the sheet being deleted contains information on it.



- Click the **Delete** button to remove the worksheet and all the data in it.

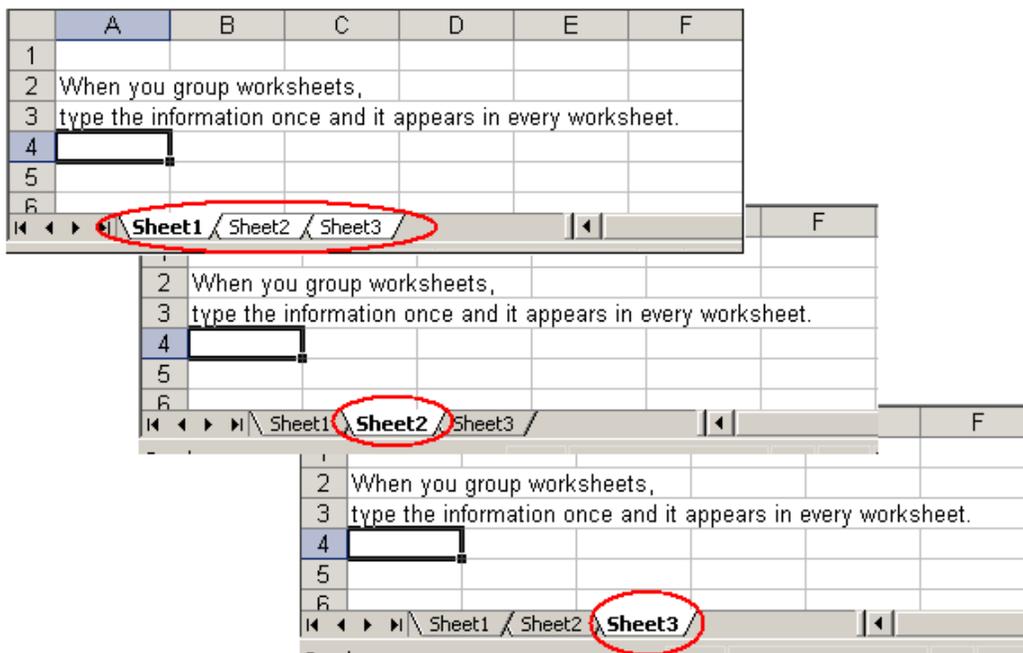
✓ Another way to delete or insert a worksheet is to right-click on the sheet to be deleted and then select **Delete** or **Insert** from the shortcut menu.



## Grouping and Ungrouping Worksheets

A **workbook** is a multi-page Excel document that contains multiple **worksheets**. Sometimes you will want to work with the worksheets one at a time as if each is a single unit. Other times, the same information or formatting may need to be added to every worksheet. You can type and retype the same information in each worksheet, or apply identical formatting, or you can group the worksheet and enter the information once.

Worksheets can also be combined together into a group. **Grouping** worksheets allows you to apply identical formulas and/or formatting across all the worksheets in the group. When you group worksheets, any changes made to one worksheet will also be changed in any other worksheets in the group. If many worksheets are to have the same data--regions, departments, quarters, months, weeks and days, for example--then you type it once and it will appear on every worksheet included in the grouping.



### To Group Worksheets:

- To select one worksheet, click on the sheet tab.
- To select more than one worksheet, hold the **Control key** down and click on one or more worksheet tabs in the workbook.
- To select all worksheets in a workbook, right-click on any worksheet tab and choose **Select All Sheets** from the shortcut menu.

When finished entering, moving, copying or formatting the data, you will need to **ungroup** worksheets. If you do not ungroup the sheets, any work you do in one sheet will be duplicated in all the others.

### To Ungroup Worksheets:

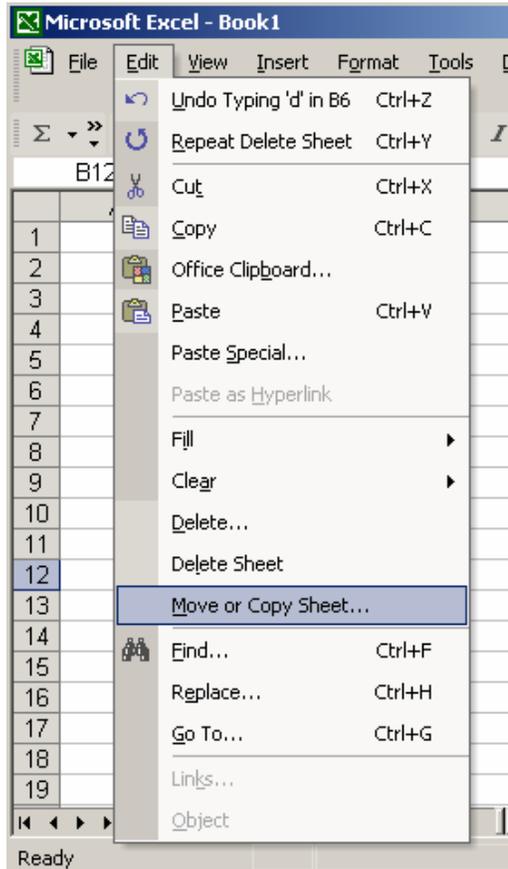
- Right-click on any of the selected worksheet tabs.
- Choose **Ungroup Sheets** from the shortcut menu.

## Moving Worksheets

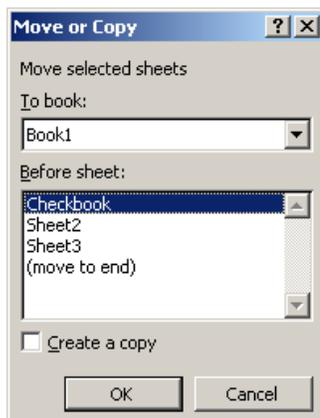
When you **move a sheet**, you are moving it to a new location in this or another workbook.

### To Move a Workbook:

- Select the worksheet you want to move/copy.
- Choose **Edit → Move or Copy** from the menu bar.



- In the **Move or Copy** dialog box, use the drop down boxes to select the name of the workbook you will move the sheet to (the current workbook is the default). Also define where you want the sheet positioned in the workbook.



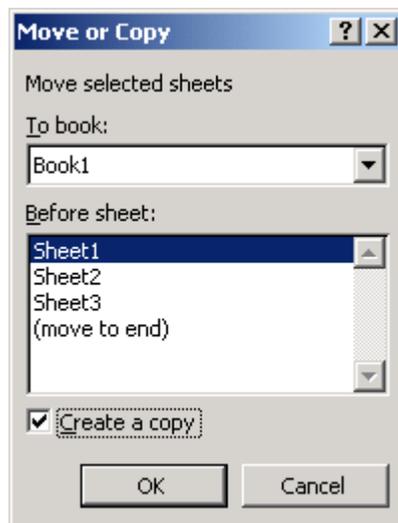
- Check **Create a copy** to copy it.
- Click the **OK** button to move the worksheet to its new location.

## Copying Worksheets

When you **copy** a sheet, you make an exact copy of it.

### To Copy a Worksheet:

- Select the worksheet you want to move/copy.
- Choose **Edit → Move or Copy** from the menu bar.
- In the **Move or Copy** dialog box, use the drop down boxes to select the name of the workbook you will copy the sheet to (the current workbook is the default). Also define where you want the sheet positioned in the workbook.
- Click the **Create a copy** checkbox.

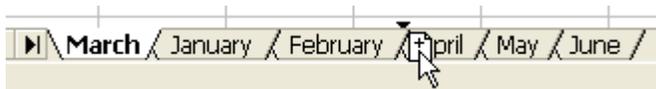


- Click OK to create an exact copy of the worksheet and move it to the location specified.

## Moving and Copying Worksheets

To move a worksheet to a new location in the current workbook, use your mouse to drag and drop the sheet tab:

1. Press and hold the mouse button over the sheet tab for the worksheet you want to move.
2. Holding down the mouse button, drag the mouse to the new location.



3. Release the mouse button.

The sheet tab for the worksheet appears in the new location.



You can also copy the worksheet to a new location by holding down **Ctrl** key while you drag the sheet tab. To copy multiple sheets, press **Ctrl** while you select each sheet and then **release the Ctrl key**. Then press the **Ctrl** key again and, holding it down, drag the group of sheet tabs to the new location.



Finally, release the mouse button, and then release the **Ctrl** key. The sheets are copied to the new location.



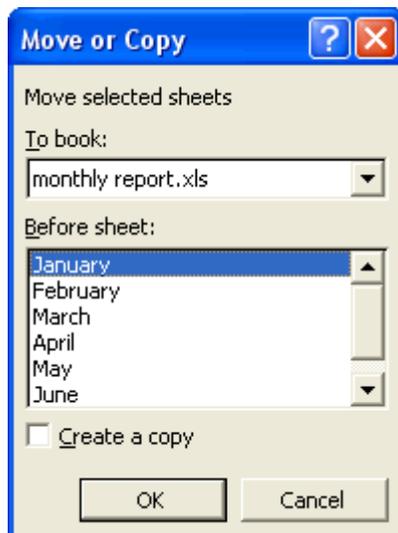
#### To move or copy worksheets to a different workbook:

1. Open both workbooks—the one that currently contains the worksheets and the one that you want to move or copy the worksheets to.
2. Activate the workbook that currently contains the worksheets by clicking its button on the Windows taskbar.



3. Select the sheets you want to move or copy.
4. From the **Edit** menu, select **Move or Copy Sheet**, or right-click the appropriate sheet tab (or group of selected tabs) and select **Move or Copy** from the shortcut menu.

The **Move or Copy** dialog opens.



- From the **To book** drop-down menu, select the workbook you want to move or copy the worksheet(s) to.

**Tip:**

You can move or copy the sheets to a new workbook by selecting **(new book)** instead.

- Under **Before sheet**, select the location in the workbook where you want to move or copy the sheets. The sheets will appear before the worksheet you select here.
- To copy the worksheets to the new location, check the **Create a copy** checkbox, and then click **OK**.

To move the worksheets, leave the box unchecked and simply click **OK**.

## Coloring Tabs

### Changing the Tab Color: Menu Option

- From the *Format* menu, select **Sheet » Tab Color...**

The *Format Tab Color* dialog box appears.



- Select the desired color
- Click **OK**

### Changing the Tab Color: Mouse Option

- Right click the appropriate **SHEET** tab » select **Tab Color...**

⏪ ◀ ▶ ⏩ | \my sheet / Sheet2 / Sheet3 /

The *Format Tab Color* dialog box appears.

2. Select the desired color
3. Click OK

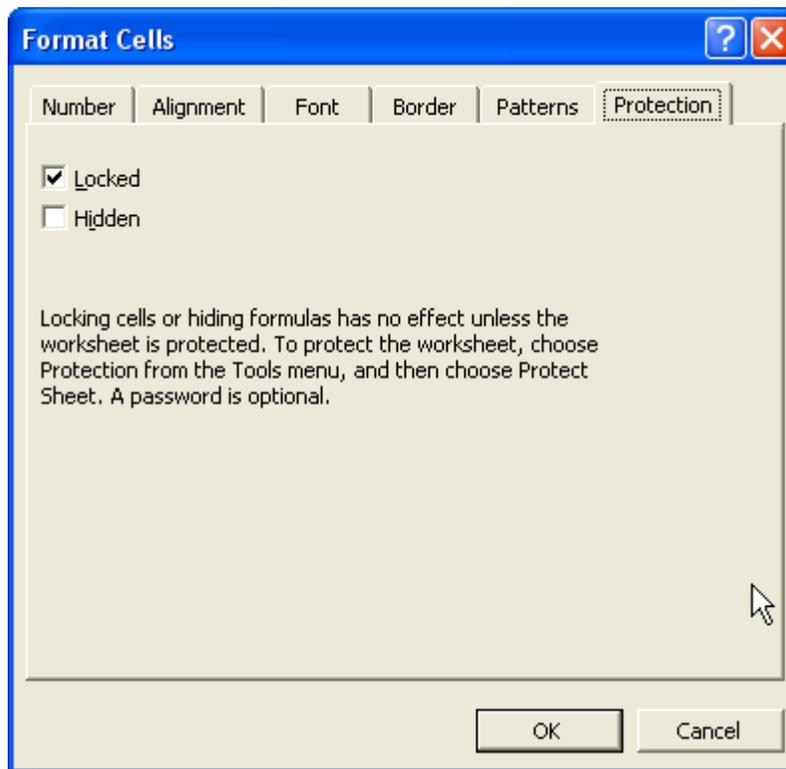
## Protecting a Worksheet

When you protect a worksheet, you prevent users from viewing or making changes to the contents, depending on the protection options you use:

- If you want to prevent users from viewing certain rows or columns, hide them before you protect the worksheet using the **Hide** command in the **Format Rows** or **Columns** submenu.
- If you want to prevent users from viewing formulas in particular cells:
  1. Select the cells whose formulas you want to hide.
  2. From the **Format** menu, select **Cells**.

The **Format Cells** dialog opens.

3. Select the **Protection** tab.

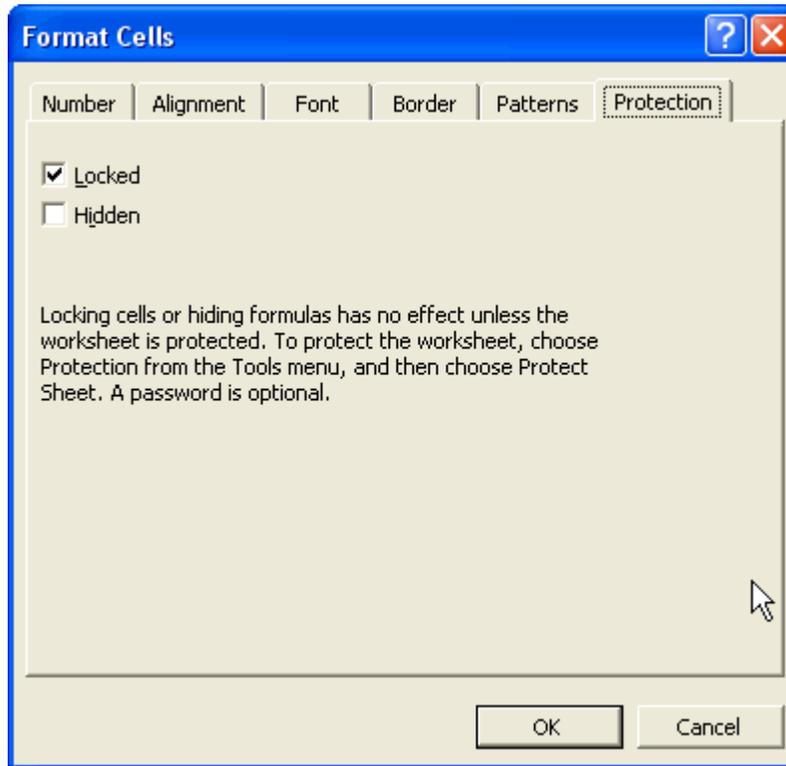


4. Check the **Hidden** checkbox.
5. Click **OK**.

- If you want users to be able to enter or edit data into certain cells, but not others, you must *unlock* those cells you want them to be able to use before you protect the worksheet:
  1. Select the cells you want users to be able to edit.
  2. From the **Format** menu, select **Cells**.

The **Format Cells** dialog opens.

3. Select the **Protection** tab.



4. Uncheck the **Locked** checkbox.
5. Click **OK**.

Once you've set the properties you want for the individual rows, columns, and cells in the worksheet, you can protect the worksheet. To do so:

3. From the **Tools** menu, select **Protection**, and then select **Protect Sheet** from the submenu.

The **Protect Sheet** dialog opens.



2. To protect the contents of the worksheet, with the exception of any cells you unlocked, make sure the **Contents** checkbox is checked.
3. Selecting **Objects** protects graphics, charts, and comments in the worksheet.
4. Selecting **Scenarios** prevents users from changing and deleting scenarios.
5. To password-protect the worksheet, enter a password into the **Password** field.

You'll be prompted to re-enter the password. Do so to confirm the password and click **OK**.

6. Click **OK**.

To remove protection from a worksheet, select **Protection** and then **Unprotect Sheet** from the **Tools** menu. If you entered a password when you protected the sheet, you'll be prompted to re-enter it now. Do so, and then click **OK**.

### Protecting Entire Workbook

You can also protect the entire workbook, including all sheets and the window size.

1. Click on **Tools, Protection, Workbook**.
2. Enter desired password.
3. Click on **OK**.
4. A new window appears to re-enter your password and type again the password.
5. Click **OK**.
6. Save the file to update changes.

# Freezing Panes and Grouping Columns and Rows

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## LESSON 19

+ + + +

In This Lesson:

Freezing the Panes

Unfreezing the Panes

Grouping and Ungrouping  
Columns and Rows

+ + + +

### Freezing the Panes

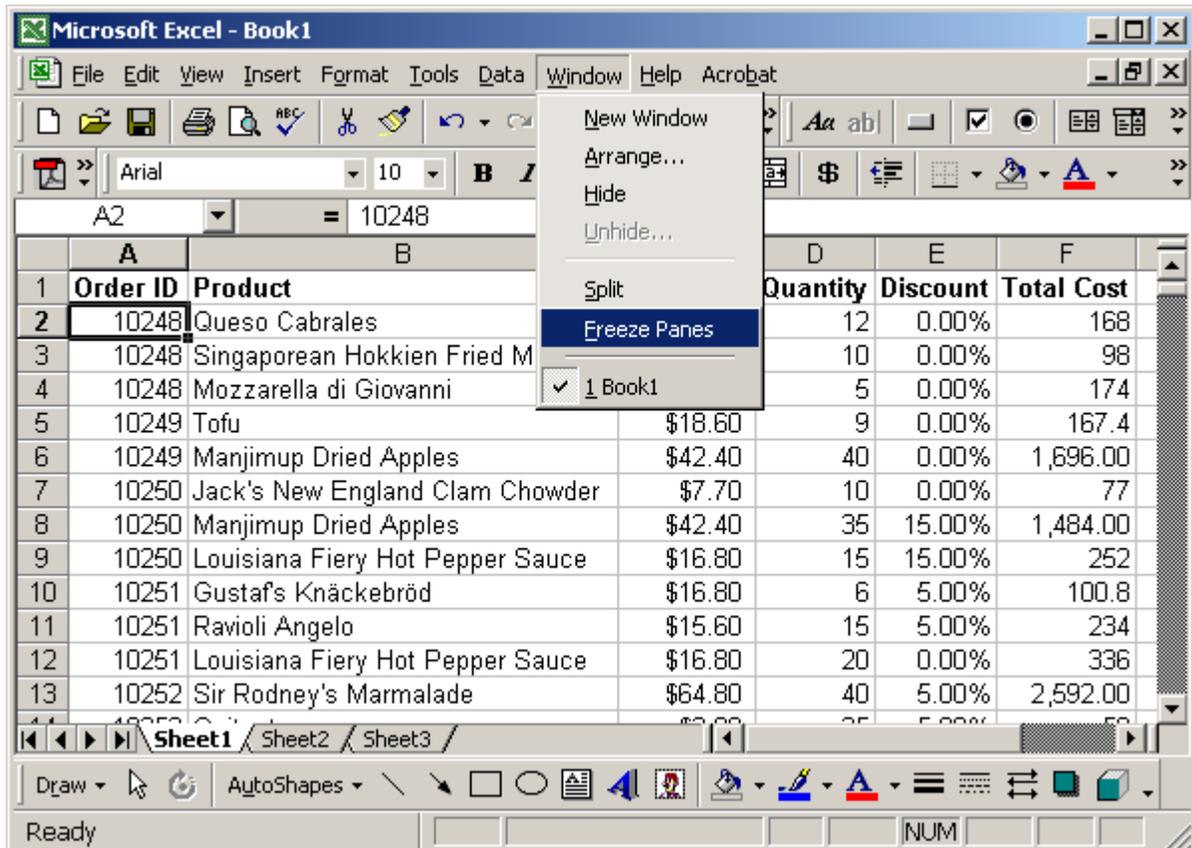
The *Freeze Panes* option is often used when you have several columns or rows grouped together. In this situation, if you go beyond one screen of information, you generally lose the row or column headings so you may not know what the information that you are looking at refers to. With the *Freeze Panes* option, you can freeze either, or both, the rows or the columns. This means that, regardless of where you are in the worksheet, you can see the information in that row and/or column at all times.

1. Select the first cell that you want to freeze  
This should be the cell immediately below the last row of the title and to the right of the last column of the title.
2. From the *Window* menu, select **Freeze Panes**

### Unfreezing Panes

1. From the *Window* menu, select **Unfreeze Panes**

In our example, we've selected cell A2 which is just below the "Order ID" heading.



Now when you scroll down, you should still continue to see the column headings.

## Grouping and Ungrouping Columns and Rows

Grouping columns and Widths are ways to cover data in a worksheet.

### To group columns:

1. Highlight the desired column headers.
2. Select **Data >> Group and Outline >> Group**.  
Each dot appears above the selected column headers and above it is a bar with a " – " sign.
3. Click the " – " sign to cover data.  
The column headers are now covered and the " – " sign becomes " + " sign that when clicked will open up to its previous view.

### To ungroup columns:

1. Open up the covered columns.
2. Highlight the columns headers.
3. Select **Data >> Group and Outline >> Ungroup**.  
The dots and bar disappears.

Example: After following directions in **To group columns** section, notice the each dot above Column Headers B to D and the bar above it.

|    | A | B | C | D | E     | F | G |
|----|---|---|---|---|-------|---|---|
| 1  |   |   |   |   | Total |   |   |
| 2  |   | 5 | 7 | 8 | 20    |   |   |
| 3  |   | 5 | 7 | 8 | 20    |   |   |
| 4  |   | 5 | 7 | 8 | 20    |   |   |
| 5  |   | 5 | 7 | 8 | 20    |   |   |
| 6  |   | 5 | 7 | 8 | 20    |   |   |
| 7  |   | 5 | 7 | 8 | 20    |   |   |
| 8  |   | 5 | 7 | 8 | 20    |   |   |
| 9  |   | 5 | 7 | 8 | 20    |   |   |
| 10 |   | 5 | 7 | 8 | 20    |   |   |
| 11 |   |   |   |   |       |   |   |
| 12 |   |   |   |   |       |   |   |

Clicking the " - " sign will result into this.

|    | A | E     | F | G | H | I |
|----|---|-------|---|---|---|---|
| 1  |   | Total |   |   |   |   |
| 2  |   | 20    |   |   |   |   |
| 3  |   | 20    |   |   |   |   |
| 4  |   | 20    |   |   |   |   |
| 5  |   | 20    |   |   |   |   |
| 6  |   | 20    |   |   |   |   |
| 7  |   | 20    |   |   |   |   |
| 8  |   | 20    |   |   |   |   |
| 9  |   | 20    |   |   |   |   |
| 10 |   | 20    |   |   |   |   |
| 11 |   |       |   |   |   |   |

Ungrouping the columns will return to its previous view.

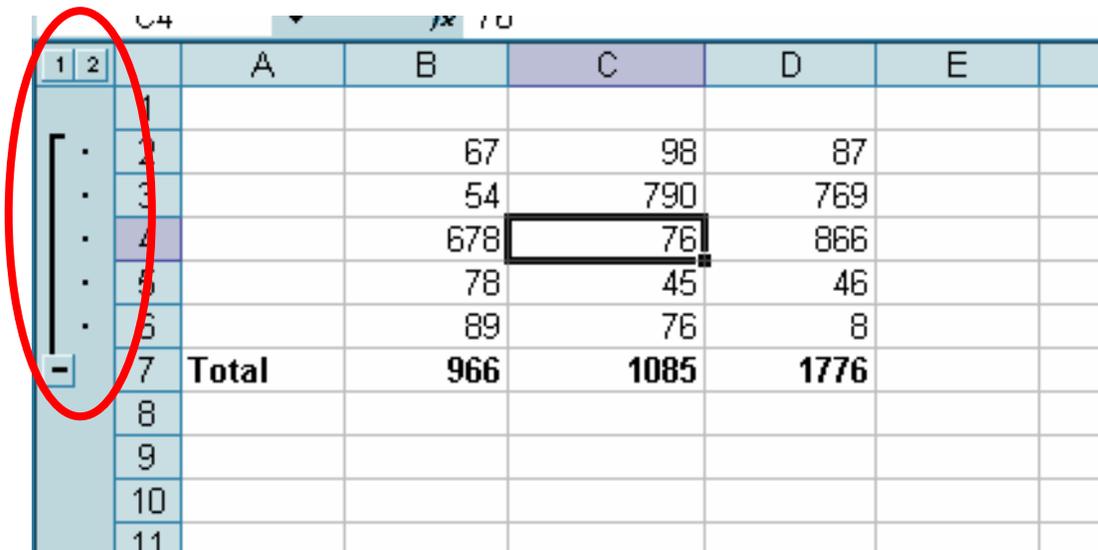
**To group rows:**

- Highlight the desired row guides.
- Select **Data >> Group and Outline >> Group**.  
Each dot appears beside the selected row guides and beside it is a bar with a " - " sign.
- Click the " - " sign to cover data.  
The row guides are now covered and the " - " sign becomes " + " sign that when clicked will open up to its previous view.

**To ungroup rows:**

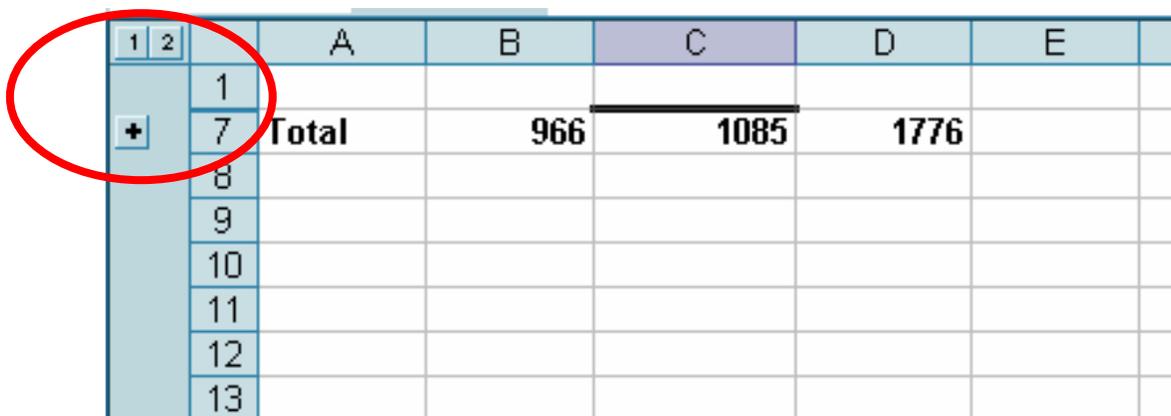
- Open up the covered columns.
  - Highlight the row guides.
- Select **Data >> Group and Outline >> Ungroup**.  
The dots and bar disappears.

Example: After following directions in **To group rows** section, notice the each dot beside Row Guides 2 to 6 and the bar beside it.



|    | A            | B          | C           | D           | E |
|----|--------------|------------|-------------|-------------|---|
| 1  |              |            |             |             |   |
| 2  |              | 67         | 98          | 87          |   |
| 3  |              | 54         | 790         | 769         |   |
| 4  |              | 678        | 76          | 866         |   |
| 5  |              | 78         | 45          | 46          |   |
| 6  |              | 89         | 76          | 8           |   |
| 7  | <b>Total</b> | <b>966</b> | <b>1085</b> | <b>1776</b> |   |
| 8  |              |            |             |             |   |
| 9  |              |            |             |             |   |
| 10 |              |            |             |             |   |
| 11 |              |            |             |             |   |

Clicking the " - " sign will result into this.



|    | A            | B          | C           | D           | E |
|----|--------------|------------|-------------|-------------|---|
| 1  |              |            |             |             |   |
| 7  | <b>Total</b> | <b>966</b> | <b>1085</b> | <b>1776</b> |   |
| 8  |              |            |             |             |   |
| 9  |              |            |             |             |   |
| 10 |              |            |             |             |   |
| 11 |              |            |             |             |   |
| 12 |              |            |             |             |   |
| 13 |              |            |             |             |   |

Ungrouping the rows will return to its previous view.

# Linking Sheets

## LESSON 20

+ + + +

### In This Lesson:

**Writing Formulas for Multiple Worksheets**

**Creating a Link to Another Worksheet (same file)**

**Creating a Link to More Than One Worksheet (same file)**

**Writing Formulas for Other Workbook Files**

+ + + +

Formulas can be used not only for small mathematical operations within cells and worksheets but also to link to other worksheets and other workbook files.

## Writing Formulas for Multiple Worksheets

While multiple worksheets can make working with your workbook more manageable, writing formulas that include information on different worksheets is a little complicated. However, when writing formulas, you can create a link between cells on one or more different worksheets within the same workbook.

## Using Special Characters

Five symbols can be used when creating a formula that links two separate worksheets. Each of these symbols can be placed directly into the formula to complete its respective function.

| Character | Function  |
|-----------|---|
| !         | Place between the worksheet name and cell reference   |
| '         | Place around the file name and sheet name or when a sheet name contains a space ('Budget 2001'!C4:C8) |
| [ ]       | Place around a file name  |
| :         | Signifies a range (B3:C2 means B3 through C2)   |
| +         | Signifies a range (B3+C2 means B3 and C2)   |

## Creating a Link to Another Worksheet (same file)

Excel allows you to create links to other worksheets. To do this, use the following steps:

1. Select the cell where you want the formula to appear
2. To create the formula, type the following:

**=function\_name(worksheet\_name!cell\_reference)**

**EXAMPLE:** =SUM(Budget!C4:C8)

**EXAMPLE:** (with space in sheet name) =SUM('Budget 2003'!C4:C8)

3. To accept the formula, press [**Enter**]

## Creating a Link to More Than One Worksheet (same file)

Excel allows you to create links to more than one worksheet at a time. To do this, use the following steps:

1. Select the cell where you want the formula to appear
2. To create the formula, type the following:

**=function\_name(worksheet range!cell\_reference)**

**EXAMPLE:** =SUM(Budget:Salary!D2:D10)

**EXAMPLE:** (with space in sheet name) =SUM('July 2003:June 2004'!C4:C8)

**NOTE:** Be sure to include a plus sign (+) or colon (: ) between the worksheet range.

3. To accept the formula, press [**Enter**]

## Writing Formulas for Other Workbook Files

You can create a formula to reference cells between workbook files:

1. Select the cell where you want the formula to appear
2. To create the formula, type the following:

**=function\_name('[workbook\_name]worksheet\_name!cell\_reference)**

**EXAMPLE:** =SUM('[03Budget.xls]Salary'!D2:D10)

**NOTES:** If the two files you are working with are in different directories, you must include the file path in your formula.

**=function\_name('[file\_path\workbook\_name]worksheet\_name!cell\_reference)**

**EXAMPLE:** =SUM('[E:\Accounting\03Budget.xls]Salary'!D2:D10)

**NOTE:** There is no difference in the formula if your sheet name contains a space.

- To accept the formula, press [**Enter**]

### Linking Sheets Example:

- Create this worksheet on Sheet1 of a new workbook.

|   | A      | B          | C          | D          |
|---|--------|------------|------------|------------|
| 1 | Region | 1997 Sales | 1998 Sales | 1999 Sales |
| 2 | North  | 105        | 110        | 107        |
| 3 | South  | 75         | 80         | 85         |
| 4 | East   | 185        | 175        | 150        |
| 5 | West   | 65         | 75         | 85         |
| 6 | Total  | 430        | 440        | 427        |

The formula in cell B6 is =SUM(B2:B5), C6 is =SUM(C2:C5); and D6 is =SUM(D2:D5).

- Click on Sheet2 in the same workbook and create this worksheet:

|   | A          | B          | C          |
|---|------------|------------|------------|
| 1 | 1997 Sales | 1998 Sales | 1999 Sales |
| 2 |            |            |            |
| 3 |            |            |            |

- We're going to link cell A2 on sheet 2 to cell B6 on sheet 1. Click on in Cell A2 of Sheet2, key in an =.
- Change to Sheet1. Click on cell B6. The marquee will appear. Press enter. Your link should appear in cell Sheet2!A2.

|   | A               | B          | C          |
|---|-----------------|------------|------------|
| 1 | 1997 Sales      | 1998 Sales | 1999 Sales |
| 2 | =SUM(Sheet1!B6) |            |            |
| 3 |                 |            |            |

Test the link. Change any of the numbers in cells B2:B5 on Sheet1. Be sure to press the enter key after you key in the new number. The total in cell Sheet1!B6 should change as well as the total in cell Sheet2!A2.

- To complete the remainder of the links for Sheet2!B2 and B3, you could repeat the process above. You can also:
- Click on Sheet2!A2. Select A2:C2.
- Click on Edit, Fill, Right. The remaining links should be pasted into place.

Always double-check that the correct cells have been linked. When you link between different workbooks, the cell references will be absolute. Edit, Fill Right will work, and will save you a lot of time, but you may need to edit each linked cell to correct the cell address. For instance, if our Sheet1 above was actually in a different workbook named Sales, and Sheet2 was in a workbook named Total Sales, when you used Edit, Fill, Right, the links would be like this:

|   | A                         | B                         | C                         |
|---|---------------------------|---------------------------|---------------------------|
| 1 | 1997 Sales                | 1998 Sales                | 1999 Sales                |
| 2 | =[Sales.xls]Sheet1!\$B\$6 | =[Sales.xls]Sheet1!\$B\$6 | =[Sales.xls]Sheet1!\$B\$6 |

Notice that all 3 cells are linked to the same B6 cell. Edit the formulas:

|   | A                         | B                         | C                         |
|---|---------------------------|---------------------------|---------------------------|
| 1 | 1997 Sales                | 1998 Sales                | 1999 Sales                |
| 2 | =[Sales.xls]Sheet1!\$B\$6 | =[Sales.xls]Sheet1!\$C\$6 | =[Sales.xls]Sheet1!\$D\$6 |

and the links will now work correctly.

# Defining Page Setup Options

## LESSON 21

+ + + +

In This Lesson:

Setting Page Margins

Changing the Page Orientation and Paper Size

Creating Headers and Footers

Creating Sheet Settings

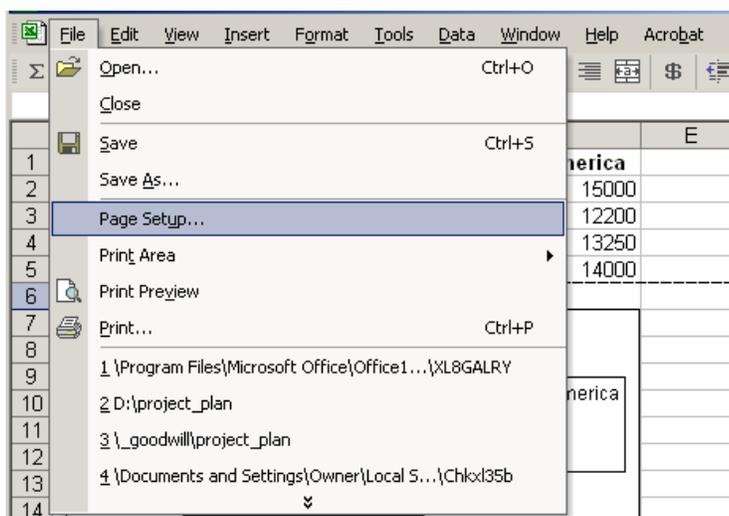
+ + + +

## Setting Page Margins

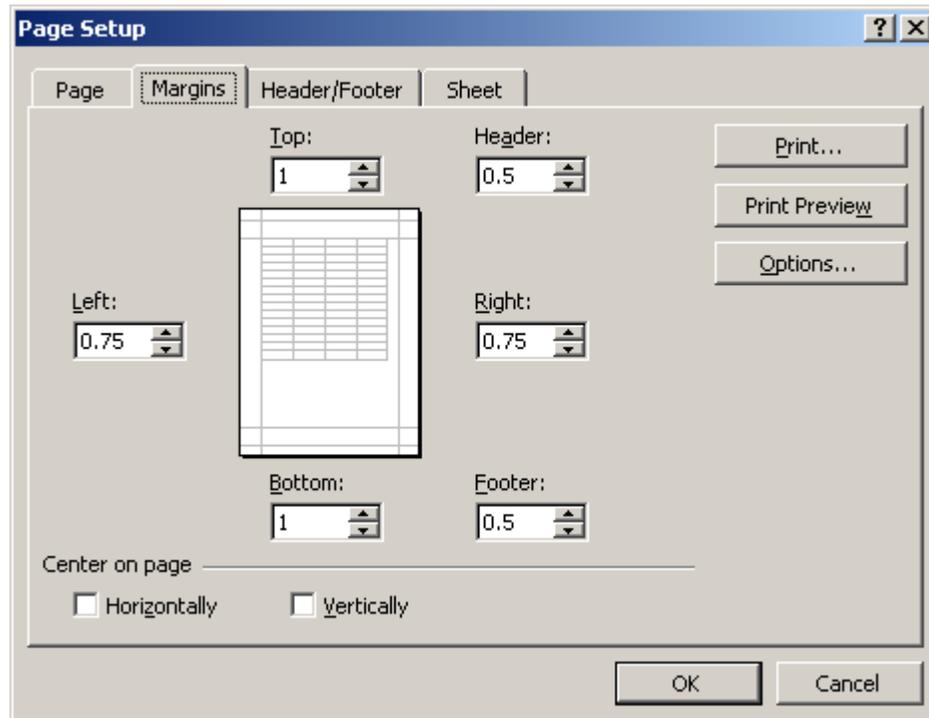
The **Page Margins** define where on the page Excel will print the worksheet. By default, the top and bottom margins are set at 1 inch in Excel XP. The left and right margins are set at .75 inch. Margin settings can be changed to whatever you want. Different margins can be defined for each worksheet in the workbook.

### To Change the Margins in the Page Setup Dialog Box:

- Select the correct worksheet.
- Choose **File** → **Page Setup** from the menu bar.



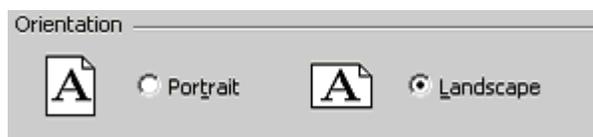
- Select the **Margins** tab.



- Use the spin box controls to define the settings for each page margin-**Top, Bottom, Left, Right, Header** and **Footer**.
- Click the OK button to change the margin settings.

### Changing the Page Orientation and Paper Size

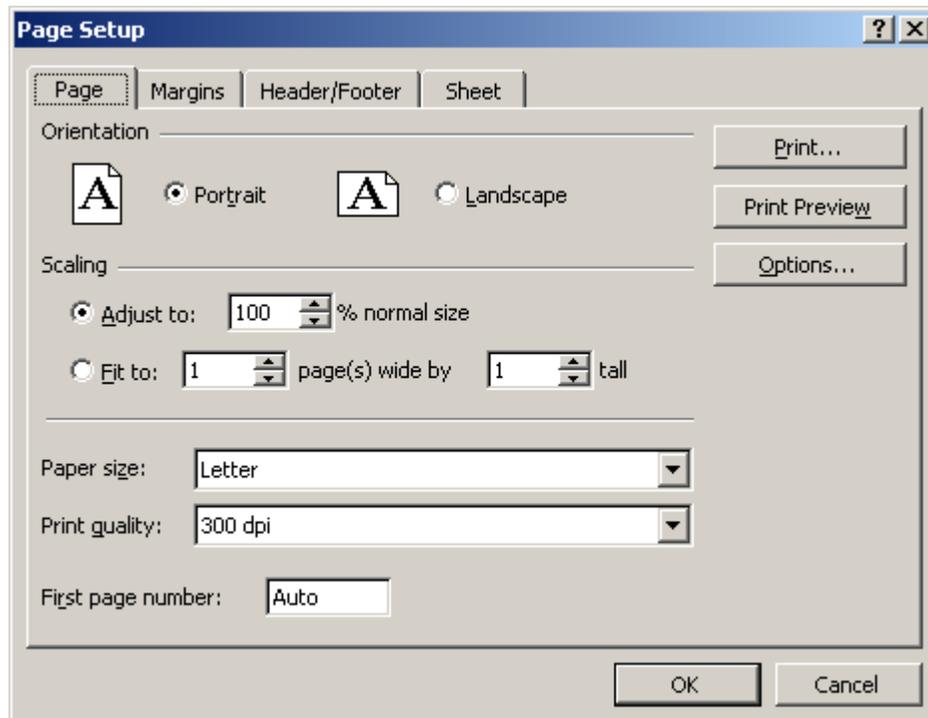
The **Page** tab of the **Page Setup** dialog box lets you change page **orientation** (portrait or landscape) or **paper size** (e.g., letter size or legal size). The default paper size in Excel XP is 8.5 X 11 inches, with a portrait orientation (prints up and down on the long side of the page). A landscape orientation, on the other hand, prints up and down on the short side of the page.



#### To Change Page Orientation:

- Select the correct worksheet.
- Choose **File** → **Page Setup** from the menu bar.

- Click on the **Page** tab.



- Choose an **Orientation** (Portrait or Landscape) for the worksheet.
  - Select a **Paper Size** from the list of available paper size options that appear in the list box.
  - Click on the **paper size**.
  - Click the OK button to accept the page settings.
- ✓ The Page tab of the Page Setup dialog box lets you **shrink** the spreadsheet data so it fits on a specified number of pages when you print. Click the **Fit to:** option button and enter the desired number of pages wide and pages tall.
- ✓ The Page tab of the Page Setup dialog box lets define the resolution of the print job. **Print Quality** is measured in **dpi**, or dots per inch. High dpi provides a better print quality.

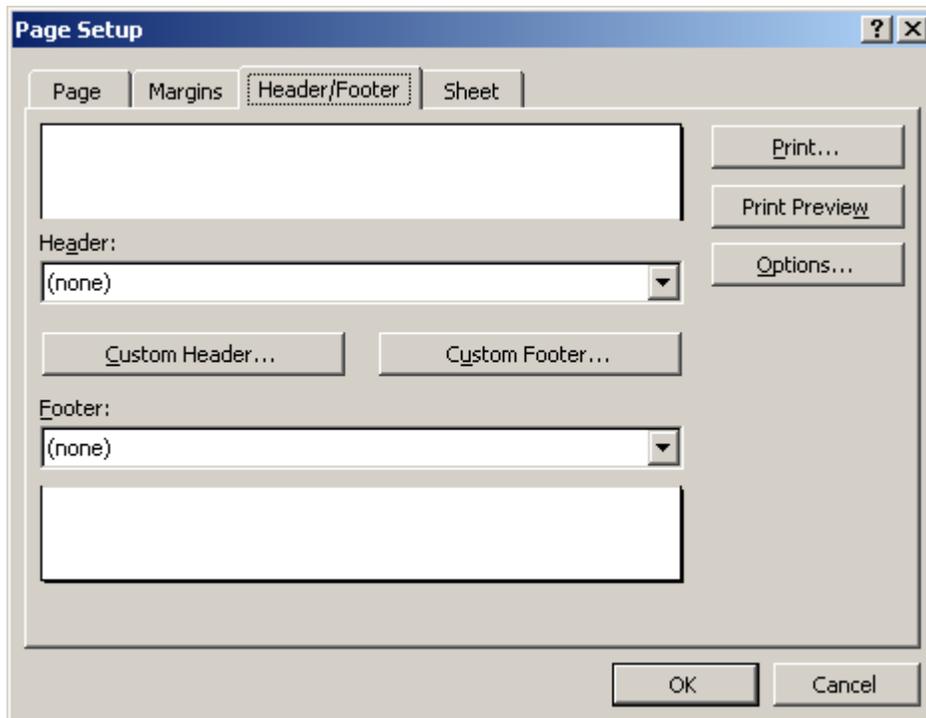
## Creating Headers and Footers

Headers and Footers can be added to any worksheet, although not required. A **Header** is any information that appear at the top of each page. A **Footer** prints at the bottom of the page. If you want a header or footer inserted onto a page then you will have to define them. Excel XP defaults to no header and no footer.

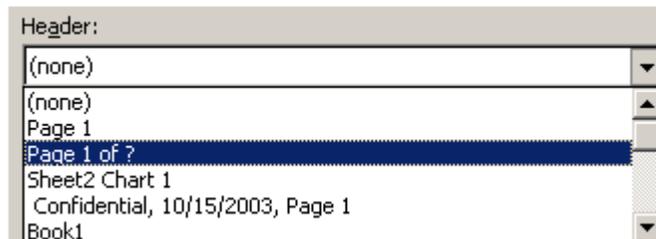
### To Create a Header:

- Choose **File** → **Page Setup** from the menu bar.

- Select the **Header/Footer** tab in the **Page Setup** dialog box.

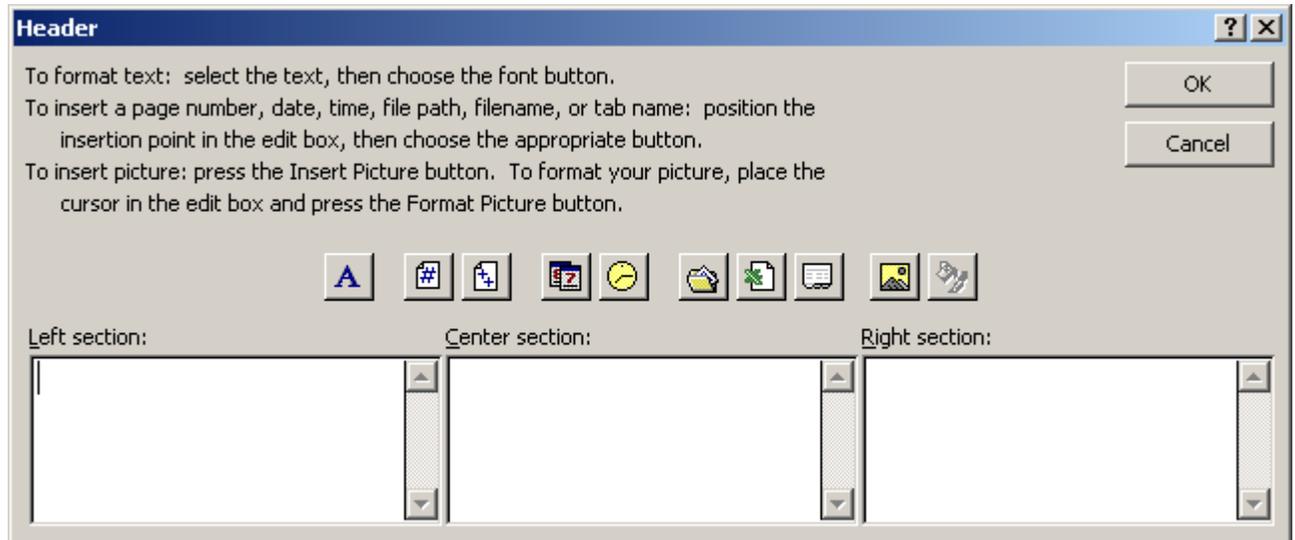


- Click the **Header** drop down list and select one of the predefined headers:



OR

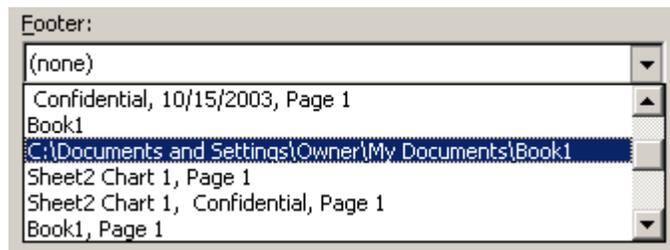
click the **Custom Header** button to create your own header. Follow the instructions in the Header dialog box to make your entry.



- Click the **OK** button to return to the Page Setup dialog box.

#### To Create a Footer:

- Choose **File** → **Page Setup** from the menu bar.
- Select the **Header/Footer** tab in the **Page Setup** dialog box.
- Click the **Footer** drop down list and select one of the predefined footers.



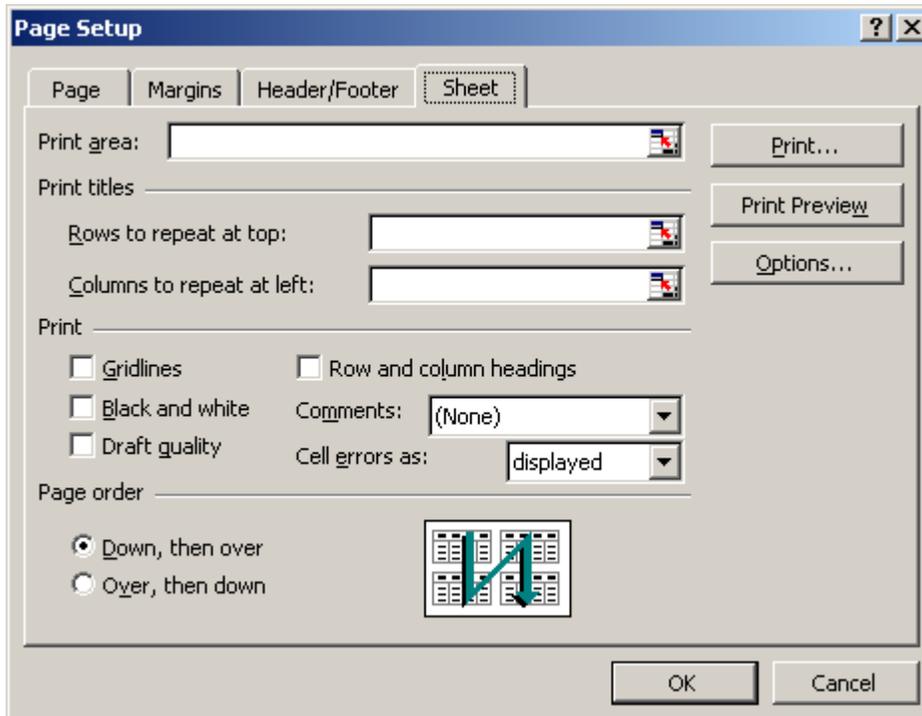
OR

Click the **Custom Footer** button to create your own footer. Follow the instructions in the Footer dialog box to make your entry.

- ✓ You can insert **Placeholder** buttons into both the header and footer to format text, insert page numbers, date, time, filename, or tab name. Excel replaces those placeholders with the information each represents when the worksheet is printed. Follow the instructions in the Header and Footer dialog boxes.

#### Creating Sheet Settings

The **Sheet** tab in the **Page Setup** dialog box provides additional print options you may want to add to your worksheet.



### Print Area

By default, Excel prints from the A1 to the last occupied cell in a worksheet. You can specify a different range of cells to print.

### Print Titles

Prints column and row labels on each page of the printout. Specify these rows or columns in the **Rows to Repeat at Top** and **Columns to Repeat at Left** textboxes.

### Print - Gridlines

Determines whether gridlines are printed. However, turning off gridlines does not affect their appearance in Normal View.

### Print - Black and White

If you used colors in your worksheet but don't want to waste the ink in your color printer, use black and white.

### Print - Draft Quality

Choose draft quality to print the worksheet without gridlines or graphics.

### Print - Row and Column Headings

Click this option to include row numbers and columns letters in your printed document.

## Page Order

Determines the order in which worksheets are printed.

## Challenge

- **Create a spreadsheet** with whatever information you want to include on it.
- Set the **Print Margins** to print 0.5" from the Top, 0.5" from the Bottom, 0.5" from the Left and 0.5" from the Right.
- Change the **Print Orientation** to portrait.
- Change the **Paper Size** to Legal.
- Create a **Header** that shows a page number.
- Create a **Custom Footer** that shows the date in the Center Section.
- Set **Print Gridlines** for the sheet to "yes."

# Print Management

# LESSON 22

+ + + +

In This Lesson:

Specifying a Print Area

Previewing a Page Before Printing

Inserting and Removing Page a Break

Printing a Worksheet or a Workbook

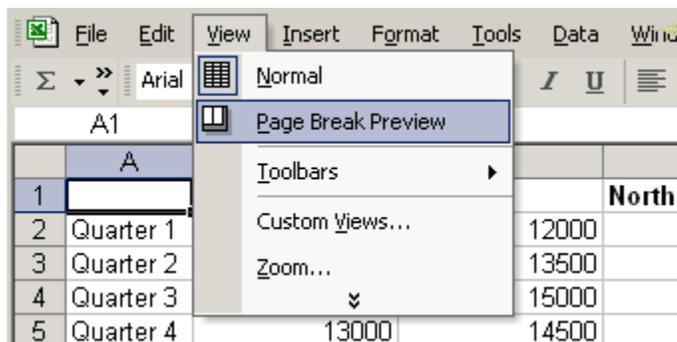
+ + + +

## Specifying a Print Area

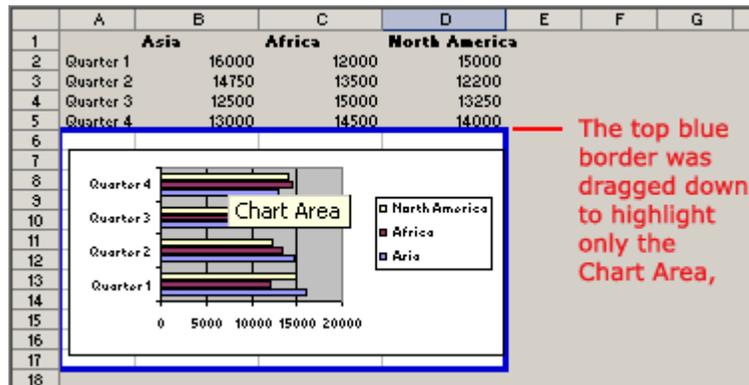
In Excel XP you can print an entire workbook, a worksheet, a cell range or a cell. Excel defaults to printing the entire worksheet. But if you want to print only a certain area of a spreadsheet then you can define a **print area**.

### To Specify a Print Area:

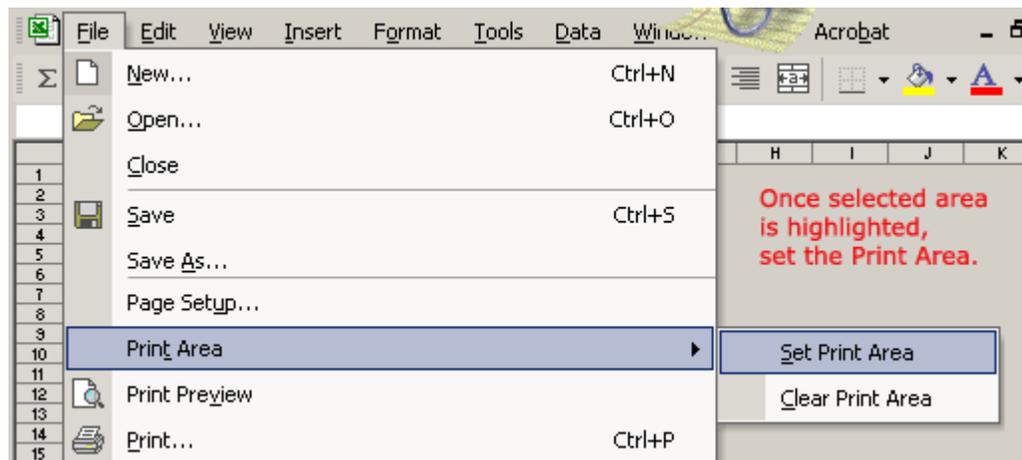
- Choose **View** → **Page Break Preview** from the menu bar.



- A reduced image of the chart is displayed on the screen.
- Click on one of four blue-colored borders and drag to highlight and select the area to print.



- Choose **File** → **Print Area** → **Set Print Area** on the menu bar.



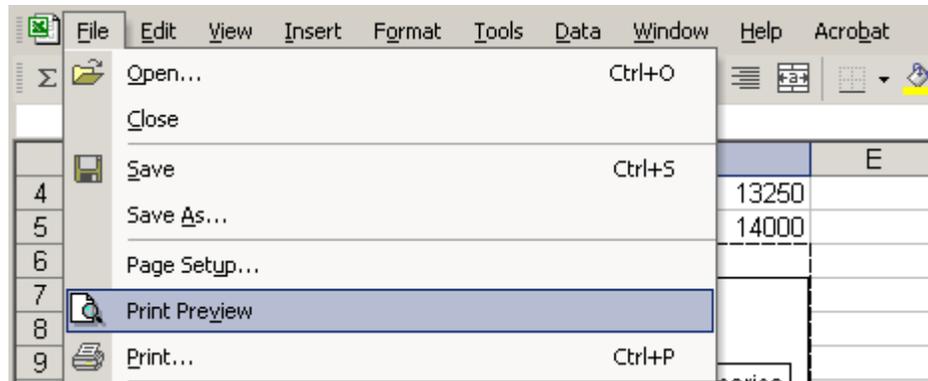
Only that area you defined in the print range will print when the worksheet is submitted to the printer for printing.

### Previewing a Page Before Printing

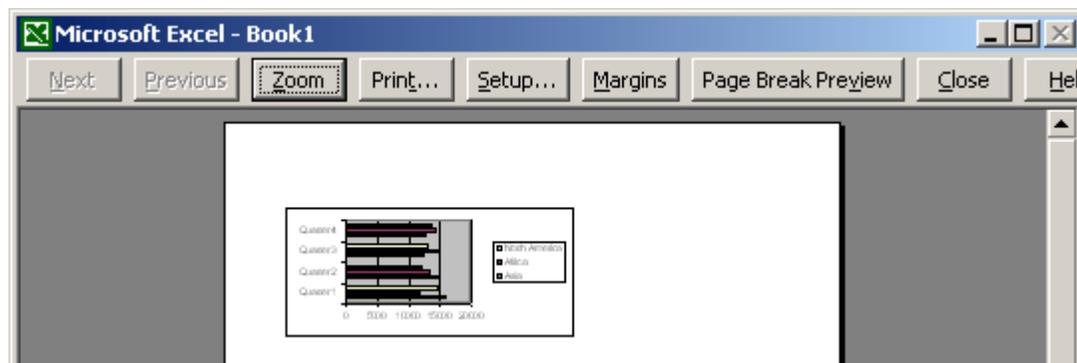
Excel XP provides a **Print Preview** capability that shows a smaller picture of the printed page directly on the computer screen. Print Preview is a good way for you to review the formatting and make sure the columns, rows and margins appear exactly where you want them.

#### To Print Preview:

- Choose **File** → **Print Preview** on the menu bar, or
- Click the **Print Preview** button on the standard toolbar.



- In **Print Preview** window, the document is sized so the entire page is visible on the screen. Simply check the spreadsheet for overall formatting and layout.



- ✓ The Zoom button in Print Preview will enlarge the data so it can be read.

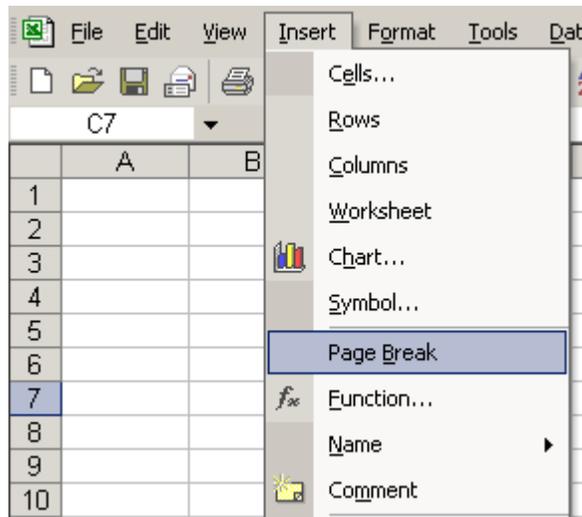
### Inserting and Removing a Page Break

There are two different kinds of page breaks in Excel: soft page breaks and hard page breaks. A soft page break is automatically inserted into a spreadsheet when there is too much data to fit on one page. A hard page break is one that you can insert into a spreadsheet, wherever you want it to appear.

#### To Insert a Page Break:

- Move the cursor to the row where a page break needs to be inserted. This row will be the first row on the new page.

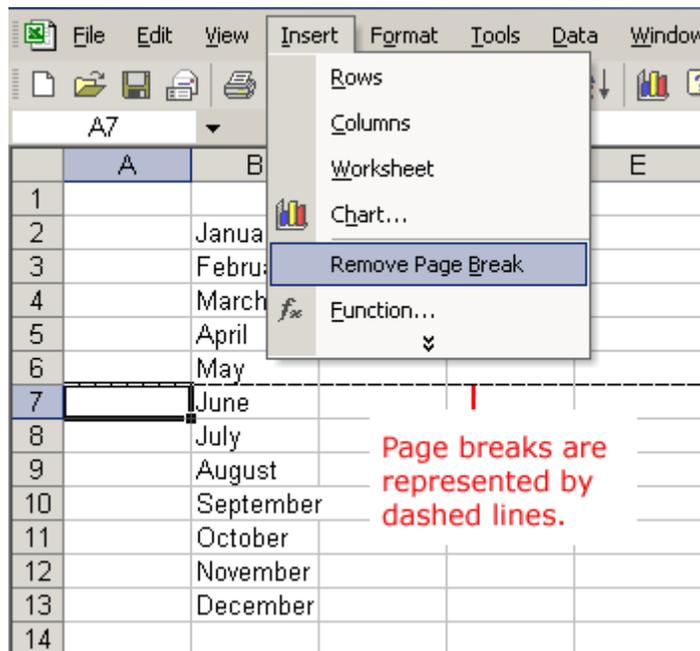
- Choose **Insert** → **Page Break** from the menu bar.



- A page break, indicated by a dashed line, is inserted into the worksheet.

#### To Delete a Page Break:

- Move the cursor to the row where a page break appears
- Choose **Insert** → **Remove Page Break** from the menu bar.



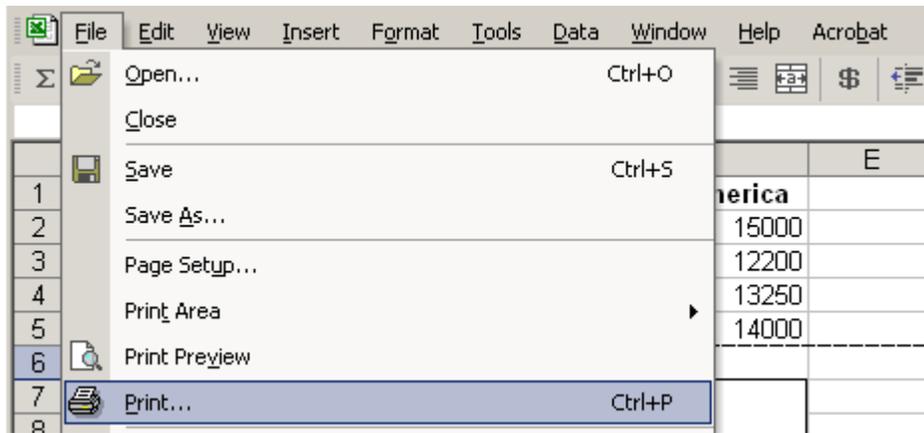
- The page break (represented by a dashed line) is removed from the page.

#### Printing a Worksheet or Workbook

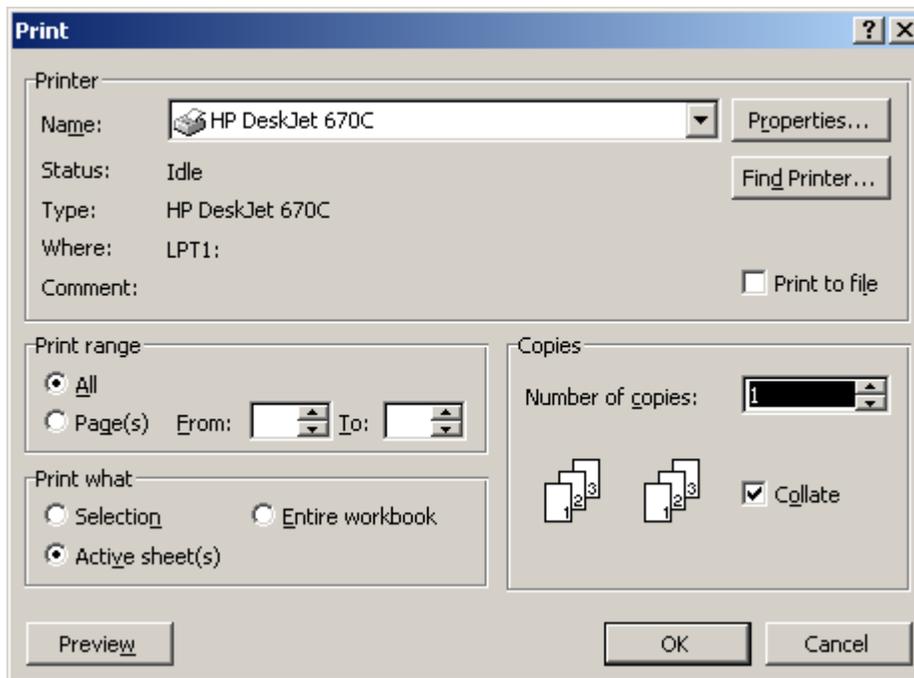
**Printing** in Excel is much like printing in other Office applications like Microsoft Word. As previously mentioned, Excel defaults to printing the entire worksheet.

#### To Print a Worksheet:

- Choose **File** → **Print** from the menu bar.



- The **Print** dialog box opens.



- Specify the Printer **Name** where the spreadsheet will print. If you only have one printer in your home or office, Excel will default to that printer.
- In **Print Range**, choose whether to print **All** or a certain range of pages (**Pages From n to y**, where n and y are the beginning and ending page numbers).
- In **Print what**, choose whether to print a **Selection**, the **Active sheet** or the **Entire Workbook** (all worksheets in the workbook). Excel defaults to the Active Sheet.
- Choose the **Number of Copies** to print by clicking on the up or down arrows.
- Click the OK button to print the worksheet.

✓ Don't print your Excel spreadsheet without checking spelling first! Excel includes two tools to help correct spelling errors: **AutoCorrect** and **Spelling**.

## Challenge

- Type the following information on the worksheet:

In cell A2, type **January**  
In cell A3, type **February**  
In cell A4, type **March**  
In cell B1, type **Bill**  
In cell B2, type **3542**  
In cell B3, type **7184**  
In cell B4, type **6531**  
In cell C1, type **Mary**  
In cell C2, type **2943**  
In cell C3, type **6542**  
In cell C4, type **7137**  
In cell D1, type **Bob**  
In cell D2, type **3403**  
In cell D3, type **7314**  
In cell D4, type **6942**

- Create an **embedded Area Chart** as discussed in Lesson 16.
- Define a **Print Range** that includes only the Area Chart and not the Source Data.
- Use **Print Preview** to preview the chart prior to printing.
- Reset the **Print Range** to include both the Source Data and the Area Chart.
- Insert a **Page Break** between the Source Data and the embedded Area Chart.
- Send two **copies** of the two-page worksheet to print at the default **Printer Name**.

# Working with Excel's List Features

## LESSON 23

+ + + +

**In This Lesson:**

**Creating Lists**

**Sorting and Filtering Lists**

**Using Data Forms with Lists**

**Adding Subtotals to Lists**

+ + + +

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Excel has features that let you create and sort lists of related information; in essence, this means that you can use Excel as a database program. In this chapter, we will show you how to create a list and then how to sort and filter the information to display only the details you want to see.

## Creating Lists

It is very easy to create a list that you can use as a database in Excel. All you have to do is type the list data into your worksheet. When you do this, keep the following points in mind:

- Some of Excel's database capabilities can be used on only one list at a time, so you should create each list on a different worksheet.
- Excel uses blank rows to detect lists, so you should have at least one blank row between your list and any other worksheet data. Also, you should not put any blank rows or columns within the list.
- The first row of your list should contain column labels that are formatted differently to the list data; these labels become the field names in your database and Excel uses them to find and sort the information in the list. You must not use a blank row to separate the column labels from the first row of data in the list.
- When you enter your list data, make sure that the rows contain similar items in each column. Also, do not put spaces at the beginning of cells-this affects some of the database capabilities.

**Figure 1.** Here is a list that we have created. Notice that the formatting of the column labels differs from the formatting of the list data.

|    | A                     | B           | C           | D                       | E          | F        |       |
|----|-----------------------|-------------|-------------|-------------------------|------------|----------|-------|
| 1  | MODERN MEDIA PRODUCTS |             |             |                         |            |          |       |
| 2  | PURCHASE LIST         |             |             |                         |            |          |       |
| 3  |                       |             |             |                         |            |          |       |
| 4  | DATE                  | DEPARTMENT  | NAME        | DESCRIPTION OF PURCHASE | UNIT COST  | QUANTITY | TOTAL |
| 5  | January 1, 1997       | Sales       | Orlovic, P. | Electronic diaries      | \$99.00    | 4        |       |
| 6  | January 1, 1997       | Sales       | Simms, A.   | Presentation folders    | \$10.00    | 50       |       |
| 7  | January 2, 1997       | Publishing  | Hanna, G.   | Maps                    | \$1.99     | 10       |       |
| 8  | January 3, 1997       | Warehouse   | Allan, C.   | Storage pallets         | \$5.75     | 10       |       |
| 9  | January 4, 1997       | Training    | Pearce, H.  | Record books            | \$12.99    | 2        |       |
| 10 | January 4, 1997       | Training    | Pearce, H.  | Software                | \$89.00    | 1        |       |
| 11 | January 4, 1997       | Training    | Zoran, B.   | Overhead projector      | \$299.00   | 1        |       |
| 12 | January 4, 1997       | Publishing  | Hanna, G.   | Books                   | \$12.99    | 1        |       |
| 13 | January 4, 1997       | Publishing  | Roberts, T. | Books                   | \$69.95    | 1        |       |
| 14 | January 7, 1997       | Accounts    | Witney, S.  | Software                | \$899.00   | 2        | \$    |
| 15 | January 12, 1997      | Publishing  | Hanna, G.   | Books                   | \$24.00    | 1        |       |
| 16 | January 12, 1997      | Programming | Briscoe, F. | Software                | \$1,299.00 | 2        | \$    |
| 17 | January 12, 1997      | Programming | Briscoe, F. | Software                | \$865.00   | 1        |       |
| 18 | January 12, 1997      | Sales       | Orlovic, P. | Books                   | \$36.45    | 4        |       |
| 19 | January 12, 1997      | Sales       | Orlovic, P. | Business card holders   | \$49.99    | 4        |       |
| 20 | January 13, 1997      | Publishing  | Hanna, G.   | Books                   | \$76.00    | 2        |       |
| 21 | January 14, 1997      | Warehouse   | Allan, C.   | Storage pallets         | \$5.75     | 12       |       |

## Sorting and Filtering Lists

The most useful databases, or lists, are those that let you sort and extract information so that it can be used for a number of different purposes. For example, the list in the previous figure contains records of a company's purchases. Each record contains a description of what was bought, the department that bought it, the name of the person who bought it, how much it cost, and which project it was for. The list is for January, and the records are organized in order according to the date. Different people in the company would need to access this information differently.

If you were a department manager, you might want to sort the records so that each department's purchases were listed together and you could see how much your department had spent over the month. If you were a project manager, you might want to sort the list according to project numbers so that you could see how much each project cost in January. Excel's sorting and filtering capabilities let you do this. You can sort lists to display the information in a different order, and you can filter lists to display some information and hide the rest.

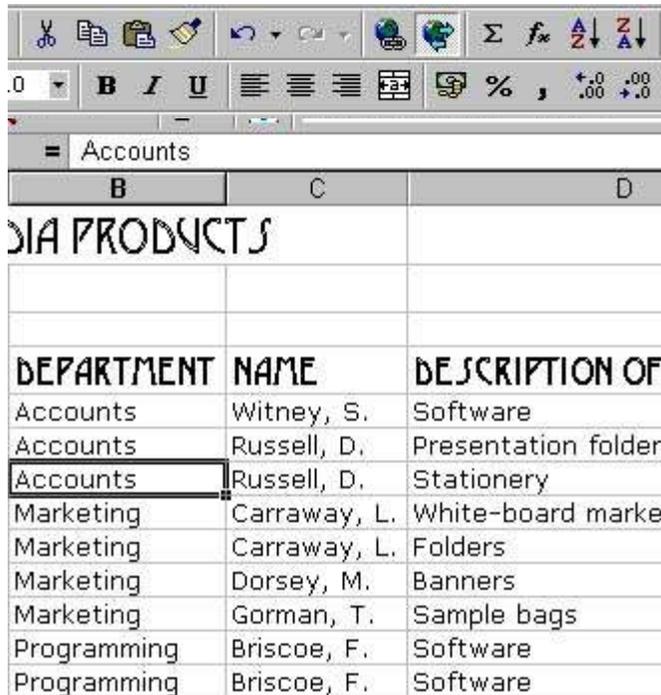
### Sorting Lists

**Figure 2.** Sometimes you may need to perform a simple sort, such as sorting a list based on the contents of one column. To do this, you click on a cell in the column you want to sort, then click on either the *Sort Ascending* or *Sort Descending* button on the Standard toolbar. The *Sort Ascending* button sorts the list in ascending order (A-Z, 1-9) and the *Sort Descending* button sorts the list in descending order (Z-A, 9-1).

In this example, we want to sort the list alphabetically, based on the contents of the Department column, so that we can group the purchases for each department. To do this, we must click on a cell in the Department column, then click on the *Sort Ascending* button.



**Figure 3.** After you click on the *Sort Ascending* or *Sort Descending* button, Excel detects and selects the list, then rearranges the list based on the column you specified. In this example, Excel has sorted the Department column in ascending alphabetical order. We can now see all the purchases for each department grouped together.

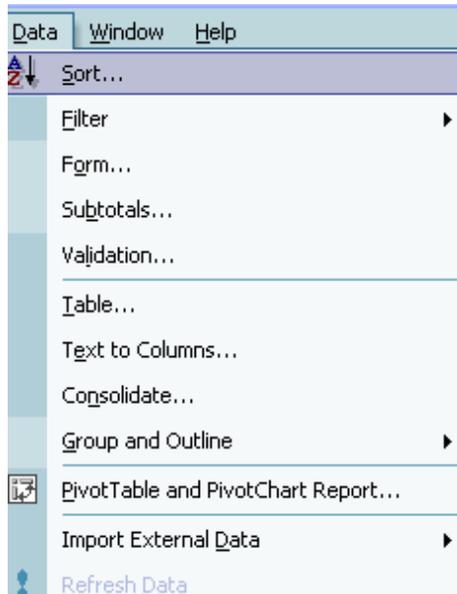


| DEPARTMENT  | NAME         | DESCRIPTION OF       |
|-------------|--------------|----------------------|
| Accounts    | Witney, S.   | Software             |
| Accounts    | Russell, D.  | Presentation folder: |
| Accounts    | Russell, D.  | Stationery           |
| Marketing   | Carraway, L. | White-board marke    |
| Marketing   | Carraway, L. | Folders              |
| Marketing   | Dorsey, M.   | Banners              |
| Marketing   | Gorman, T.   | Sample bags          |
| Programming | Briscoe, F.  | Software             |
| Programming | Briscoe, F.  | Software             |

**Figure 4.** Sometimes you will want to sort your list based on the contents of more than one column. Here you can see our sample list. Let's look at how to sort it based on the Department column, then the Name column, then the Total Cost column. This way we will be able to see what each department is spending, and who is spending the most in each department.

| DEPARTMENT  | NAME         | DESCRIPTION OF PURCHASE | UNIT COST  | QUANTITY | TOTAL COST |
|-------------|--------------|-------------------------|------------|----------|------------|
| Accounts    | Witney, S.   | Software                | \$899.00   | 2        | \$1,798.00 |
| Accounts    | Russell, D.  | Presentation folders    | \$10.00    | 2        | \$20.00    |
| Accounts    | Russell, D.  | Stationery              | \$45.00    | N/A      | \$45.00    |
| Marketing   | Carraway, L. | White-board markers     | \$1.99     | 5        | \$9.95     |
| Marketing   | Carraway, L. | Folders                 | \$4.99     | 4        | \$19.96    |
| Marketing   | Dorsey, M.   | Banners                 | \$29.95    | 6        | \$179.70   |
| Marketing   | Gorman, T.   | Sample bags             | \$2.99     | 500      | \$1,495.00 |
| Programming | Briscoe, F.  | Software                | \$1,299.00 | 2        | \$2,598.00 |
| Programming | Briscoe, F.  | Software                | \$865.00   | 1        | \$865.00   |
| Publishing  | Hanna, G.    | Maps                    | \$1.99     | 10       | \$19.90    |
| Publishing  | Hanna, G.    | Books                   | \$12.99    | 1        | \$12.99    |
| Publishing  | Roberts, T.  | Books                   | \$69.95    | 1        | \$69.95    |
| Publishing  | Hanna, G.    | Books                   | \$24.00    | 1        | \$24.00    |

**Figure 5.** To sort a list based on more than one column, click on a cell in the list that you want to sort, then from the **Data** menu select the *Sort* command.



**Figure 6.** Excel then opens the **Sort** dialog box. In the *Sort by* section, select the first column you want to sort by, then click on either the *Ascending* or *Descending* radio button to specify the sort order you want to use. In this example, we are sorting in ascending order based on the Department column, then in ascending order based on the Name column, then in descending order based on the Total Cost column.

The *My list has* section lets you tell Excel whether or not your list has column labels, called a header row.

When you have made your choices, click on the *OK* button to sort the list.

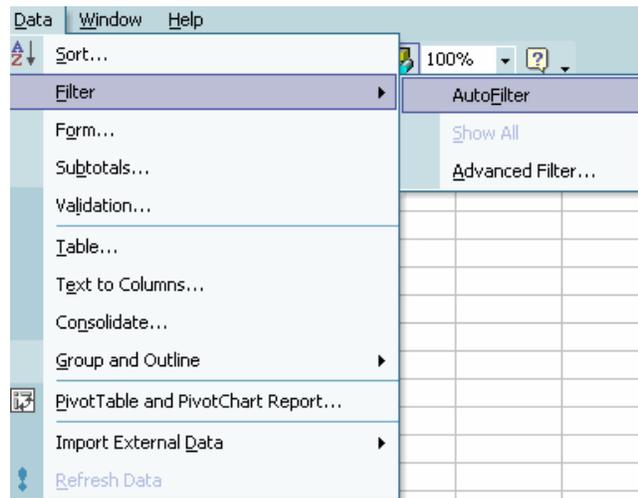


**Figure 7.** Excel has sorted the list according to the columns we specified in the **Sort** dialog box. We can now see the information we wanted, but there is still a lot of superfluous information on the screen. We can go one step further and filter the list to display only the information we want to see.

| DEPARTMENT  | NAME         | DESCRIPTION OF PURCHASE | UNIT COST  | QUANTITY | TOTAL COST |
|-------------|--------------|-------------------------|------------|----------|------------|
| Accounts    | Russell, D.  | Stationery              | \$45.00    | N/A      | \$45.00    |
| Accounts    | Russell, D.  | Presentation folders    | \$10.00    | 2        | \$20.00    |
| Accounts    | Witney, S.   | Software                | \$899.00   | 2        | \$1,798.00 |
| Marketing   | Carraway, L. | Folders                 | \$4.99     | 4        | \$19.96    |
| Marketing   | Carraway, L. | White-board markers     | \$1.99     | 5        | \$9.95     |
| Marketing   | Dorsey, M.   | Banners                 | \$29.95    | 6        | \$179.70   |
| Marketing   | Gorman, T.   | Sample bags             | \$2.99     | 500      | \$1,495.00 |
| Programming | Briscoe, F.  | Software                | \$1,299.00 | 2        | \$2,598.00 |
| Programming | Briscoe, F.  | Software                | \$865.00   | 1        | \$865.00   |
| Publishing  | Hanna, G.    | Books                   | \$76.00    | 2        | \$152.00   |
| Publishing  | Hanna, G.    | Books                   | \$24.00    | 1        | \$24.00    |
| Publishing  | Hanna, G.    | Maps                    | \$1.99     | 10       | \$19.90    |
| Publishing  | Hanna, G.    | Books                   | \$12.99    | 1        | \$12.99    |

### Filtering Lists

**Figure 8.** The easiest way to filter a list is to select a cell in the list, then open the **Data** menu and select the *Filter* command, then choose the *AutoFilter* command.



**Figure 9.** Excel then adds AutoFilter arrows to each column in the list. You use these arrows to filter out the information you don't need.

Here is our sample list again; you may have noticed that we have hidden columns D, E, and F so that you can see the relevant figures more easily.

Autofilter arrows

| DATE             | DEPARTMENT  | NAME         | TOTAL COST | PROJECT NUMBER |
|------------------|-------------|--------------|------------|----------------|
| January 28, 1997 | Accounts    | Russell, D.  | \$45.00    | N/A            |
| January 21, 1997 | Accounts    | Russell, D.  | \$20.00    | 411            |
| January 7, 1997  | Accounts    | Witney, S.   | \$1,798.00 | N/A            |
| January 15, 1997 | Marketing   | Carraway, L. | \$19.96    | 411            |
| January 15, 1997 | Marketing   | Carraway, L. | \$9.95     | 411            |
| January 22, 1997 | Marketing   | Dorsey, M.   | \$179.70   | 332            |
| January 23, 1997 | Marketing   | Gorman, T.   | \$1,495.00 | 196            |
| January 12, 1997 | Programming | Briscoe, F.  | \$2,598.00 | 411            |
| January 12, 1997 | Programming | Briscoe, F.  | \$865.00   | 411            |
| January 13, 1997 | Publishing  | Hanna, G.    | \$152.00   | 411            |
| January 12, 1997 | Publishing  | Hanna, G.    | \$24.00    | 411            |
| January 2, 1997  | Publishing  | Hanna, G.    | \$19.90    | 411            |
| January 4, 1997  | Publishing  | Hanna, G.    | \$12.99    | 332            |
| January 4, 1997  | Publishing  | Roberts, T.  | \$69.95    | 332            |
| January 1, 1997  | Sales       | Orlovic, P.  | \$396.00   | N/A            |
| January 28, 1997 | Sales       | Orlovic, P.  | \$359.80   | 411            |
| January 12, 1997 | Sales       | Orlovic, P.  | \$199.96   | N/A            |
| January 28, 1997 | Sales       | Orlovic, P.  | \$199.80   | N/A            |
| January 12, 1997 | Sales       | Orlovic, P.  | \$145.80   | 332            |

**Figure 10.** Click on the AutoFilter arrow of the first column you want to filter. In this example, we want to see only the sales department's purchases, so we select the *Sales* option from the list.

| DEPARTMENT  | NAME         | TOTAL COST |
|-------------|--------------|------------|
| (All)       | Russell, D.  | \$45.00    |
| (Top 10...) | Russell, D.  | \$20.00    |
| (Custom...) | Witney, S.   | \$1,798.00 |
| Accounts    | Carraway, L. | \$19.96    |
| Marketing   | Carraway, L. | \$9.95     |
| Programming | Dorsey, M.   | \$179.70   |
| Publishing  | Gorman, T.   | \$1,495.00 |
| Sales       | Briscoe, F.  | \$2,598.00 |
| Training    | Briscoe, F.  | \$865.00   |
| Warehouse   | Hanna, G.    | \$152.00   |
| Programming | Hanna, G.    | \$152.00   |
| Publishing  | Hanna, G.    | \$152.00   |

**Figure 11.** You can see that Excel has filtered the Department column and now displays only those records for the sales department.

|    | DATE             | DEPARTMENT | NAME  |
|----|------------------|------------|-------|
| 4  |                  |            |       |
| 19 | January 1, 1997  | Sales      | Orlov |
| 20 | January 28, 1997 | Sales      | Orlov |
| 21 | January 12, 1997 | Sales      | Orlov |
| 22 | January 28, 1997 | Sales      | Orlov |
| 23 | January 12, 1997 | Sales      | Orlov |
| 24 | January 1, 1997  | Sales      | Simm  |

**Figure 12.** Now click on the AutoFilter arrow of the next column you want to filter. In our example, we want to see only those records for the name "Orlovic, P.", so we select this option from the list.

| DEPARTMENT | NAME        | TOTAL COST |
|------------|-------------|------------|
| Sales      | (All)       | \$396.00   |
| Sales      | (Top 10...) | \$359.80   |
| Sales      | (Custom...) | \$199.96   |
| Sales      | Orlovic, P. | \$199.80   |
| Sales      | Simms, A.   | \$145.80   |
| Sales      | Orlovic, P. | \$145.80   |
| Sales      | Simms, A.   | \$500.00   |

**Figure 13.** Excel has filtered out all names except "Orlovic, P.".

| DEPARTMENT | NAME        | TOTAL COST |
|------------|-------------|------------|
| Sales      | Orlovic, P. | \$396.00   |
| Sales      | Orlovic, P. | \$359.80   |
| Sales      | Orlovic, P. | \$199.96   |
| Sales      | Orlovic, P. | \$199.80   |
| Sales      | Orlovic, P. | \$145.80   |

**Figure 14.** Finally, we want the Total Cost column to show only those records which are greater than \$200. To do this, we click on the AutoFilter arrow and choose the *Custom* option from the list.

| DEPARTMENT | NAME        | TOTAL COST  |
|------------|-------------|-------------|
| Sales      | Orlovic, P. | (All)       |
| Sales      | Orlovic, P. | (Top 10...) |
| Sales      | Orlovic, P. | (Custom...) |
| Sales      | Orlovic, P. | \$145.80    |
| Sales      | Orlovic, P. | \$199.80    |
| Sales      | Orlovic, P. | \$199.96    |
| Sales      | Orlovic, P. | \$359.80    |
| Sales      | Orlovic, P. | \$396.00    |

**Figure 15.** Excel then opens the **Custom AutoFilter** dialog box where you can specify how you want to filter the column. From the first box we selected the *is greater than* option, and in the second box we typed **200** because we want to show only those records that are greater than \$200. After you select the options you want, click on the *OK* button.

**Figure 16.** Excel has again filtered the information. We can now see that P. Orlovic from the sales department has made two purchases over \$200.

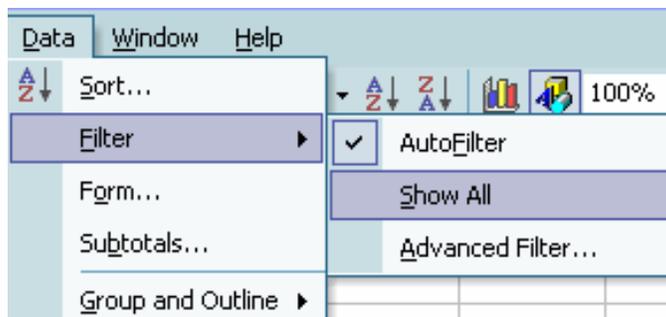
| DEPARTMENT | NAME        | TOTAL COST |
|------------|-------------|------------|
| Sales      | Orlovic, P. | \$396.00   |
| Sales      | Orlovic, P. | \$359.80   |

### Removing filters

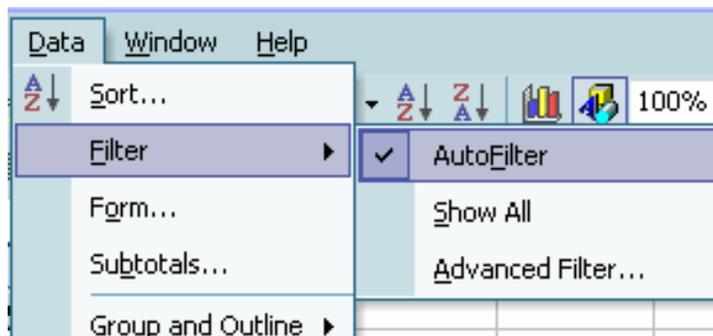
**Figure 17.** To remove a filter from a column, click on the AutoFilter arrow and select the *All* option.

| DEPARTMENT  | NAME        | TOTAL COST |
|-------------|-------------|------------|
| (All)       | Orlovic, P. | \$396.00   |
| (Top 10...) | Orlovic, P. | \$359.80   |
| (Custom...) | Orlovic, P. | \$199.96   |
| Accounts    | Orlovic, P. | \$199.80   |
| Marketing   | Orlovic, P. | \$145.80   |
| Programming | Orlovic, P. | \$500.00   |
| Publishing  | Simms, A.   |            |
| Sales       |             |            |
| Training    |             |            |
| Warehouse   |             |            |

**Figure 18.** To remove filters from all columns in a list, but leave the AutoFilter arrows, open the **Data** menu and select the *Filter* command, then from the submenu select the *Show All* command.



**Figure 19.** To remove the AutoFilter arrows from the columns in a list, open the **Data** menu and select the *Filter* command, then from the submenu select the *AutoFilter* command.

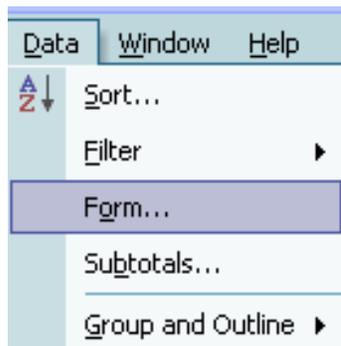


## Using Data Forms with Lists

Long, detailed lists are often difficult to navigate because of their size. It can be very frustrating to scroll across many columns just to see all of the information in a single record. To overcome this difficulty, you can use data forms. A data form looks like a dialog box, but it contains the column labels from your list rather than dialog box options. You can use data forms to view the records in a list one at a time. You can also use data forms to add records to and delete them from a list.

### Viewing Records in a list

**Figure 20.** To view records using a data form, click on a cell in the list, then from the **Data** menu select the *Form* command.



**Figure 21.** Excel then opens a data form. You can see the first record in the current list. To view the next record in the list, click on the *Find Next* button, and to view the previous record in the list, click on the *Find Prev* button.

You can use the data form to search for records that match criteria you specify. To do this, click on the *Criteria* button.

**Figure 22.** After you click on the *Criteria* button, Excel clears the data form so that you can specify the criteria you want the records to match. Notice that the word *Criteria* appears in the top-right corner of the dialog box, and the *Criteria* button has become the *Form* button. You can leave the criteria search by clicking on the *Form* button.

In this example, we are searching for records whose total cost is greater than \$1000. To find records that match this criterion, we must type **>1000** into the appropriate text box and click on the *Find Next* button.

The screenshot shows the 'Criteria' dialog box in Excel. The title bar reads 'Sheet1'. On the left, there are input fields for: Date, Department, Name, Description of purchase, Unit Cost, Quantity, Total Cost (containing '>1000'), and Project Number. On the right, there is a vertical stack of buttons: 'Criteria', 'New', 'Clear', 'Restore', 'Find Prev', 'Find Next', 'Form' (highlighted), and 'Close'.

**Figure 23.** Excel then displays the first record whose total cost is greater than \$1000. At the top-right of the dialog box, we can see that this is record number 10 of 27 records. To view the next record that matches the criterion, we can click on the *Find Next* button again.

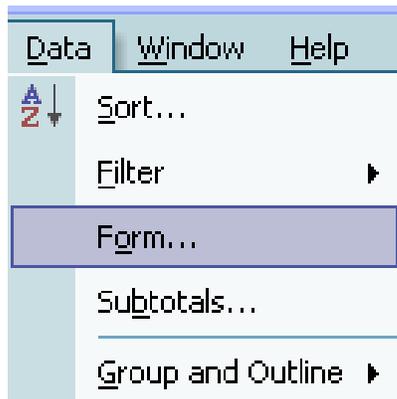
To close the data form, click on the *Close* button.

The screenshot shows the 'Criteria' dialog box in Excel, now displaying the first record found. The title bar reads 'Sheet1'. The input fields on the left now contain: Date: 07/01/1997, Department: Accounts, Name: Witney, S., Description of purchase: Software, Unit Cost: 899, Quantity: 2, Total Cost: \$1,798.00, and Project Number: N/A. On the right, the top-right corner shows '10 of 27'. The buttons are: 'New', 'Delete', 'Restore', 'Find Prev', 'Find Next' (highlighted), 'Criteria', and 'Close'.

### Adding Records to a List

**Figure 24.** You can add records to a list by typing them in on the worksheet, but it is often easier to use a data form.

To add a new record to your list using a data form, click on a cell in the list, then open the **Data** menu and select the *Form* command.



**Figure 25.** Excel opens the data form. You can see the first record in the list. To add a new record, click on the *New* button.

 A screenshot of the 'Data Form' dialog box in Excel. The title bar says 'Sheet1'. The form contains several fields: 'Date' (01/01/1997), 'Department' (Sales), 'Name' (Orlovic, P.), 'Description of purchase' (Electronic diaries), 'Unit Cost' (99), 'Quantity' (4), 'Total Cost' (396), and 'Project Number' (N/A). On the right side, there are buttons for 'New', 'Delete', 'Restore', 'Find Prev', 'Find Next', 'Criteria', and 'Close'. A vertical scrollbar is visible on the right side of the form.

**Figure 26.** After you click on the *New* button, Excel opens a new form so that you can type in the information for the new record. To move from one field to the next, press the Tab key, or use the mouse to click in the field.

When a column in the list contains a formula, you cannot type information on the form for the corresponding field because its contents will depend on other field values. In this example, the Total Cost column in our list contains a formula, so we can't type information in the Total Cost field on the form. The value in this field is calculated automatically after we type in the values for the Unit Cost and Quantity fields, which are the arguments of the formula.

The screenshot shows a dialog box titled "Sheet1" with a standard Windows window title bar (minimize, maximize, close). On the left side, there are eight input fields with labels: "Date:", "Department:", "Name:", "Description of purchase:", "Unit Cost:", "Quantity:", "Total Cost:", and "Project Number:". All fields are currently empty. On the right side, there is a vertical stack of buttons under the heading "New Record": "New", "Delete", "Restore", "Find Prev", "Find Next", "Criteria", and "Close". A vertical scrollbar is located between the input fields and the buttons.

**Figure 27.** After you have typed the new record, you can add it to the list by pressing the Enter key. Excel then opens a blank form, ready for you to type another record.

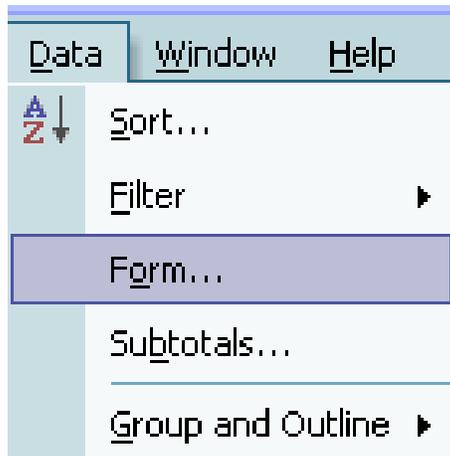
To add the new record to the list and close the data form at the same time, click on the *Close* button.

This screenshot is identical to the one in Figure 27, but the input fields now contain data: "Date:" is "04/01/97", "Department:" is "Sales", "Name:" is "Horace, P.", "Description of purchase:" is "Software", "Unit Cost:" is "199", "Quantity:" is "1", and "Project Number:" is "144". The buttons on the right remain the same.

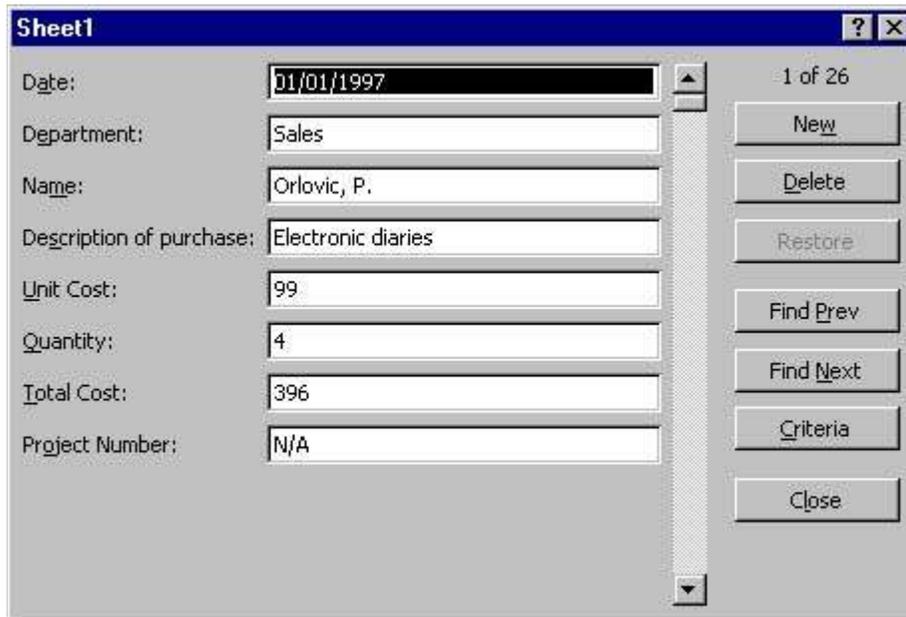
### Deleting Records from a List

**Figure 28.** You can remove records from a list by deleting them on the worksheet, but it is often easier to use a data form.

To delete a record from your list using a data form, click on a cell in the list, then open the **Data** menu and select the *Form* command.



**Figure 29.** Excel opens the data form. You can see the first record in the list. Use the *Find Next* and *Find Prev* buttons to display the record you want to delete, then click on the *Delete* button. When you delete a record using a data form, the deletion is permanent and it cannot be undone.



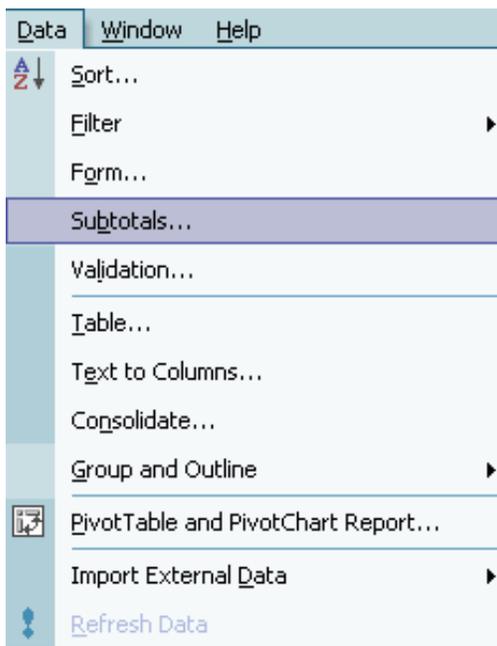
## Adding Subtotals to Lists

Sometimes you may want to summarize data in a list by showing subtotals for particular fields. You can do this using the *Subtotals* command on the **Data** menu.

**Figure 30.** Before you can add subtotals to a list, you must sort the list based on the column for which you want the subtotals. In this example, we want subtotals for each department. To do this, we click on a cell in the Department column, then click on the *Sort Ascending* button to sort the departments in ascending alphabetical order. (For more information about sorting a list, see **Sorting Lists** earlier in this chapter.)

| 4  | DATE             | DEPARTMENT  | TOTAL COST |
|----|------------------|-------------|------------|
| 5  | January 7, 1997  | Accounts    | \$1,798.00 |
| 6  | January 21, 1997 | Accounts    | \$20.00    |
| 7  | January 28, 1997 | Accounts    | \$45.00    |
| 8  | January 15, 1997 | Marketing   | \$19.96    |
| 9  | January 15, 1997 | Marketing   | \$9.95     |
| 10 | January 22, 1997 | Marketing   | \$179.70   |
| 11 | January 23, 1997 | Marketing   | \$1,495.00 |
| 12 | January 12, 1997 | Programming | \$2,598.00 |
| 13 | January 12, 1997 | Programming | \$865.00   |
| 14 | January 2, 1997  | Publishing  | \$19.90    |
| 15 | January 4, 1997  | Publishing  | \$12.99    |
| 16 | January 4, 1997  | Publishing  | \$69.95    |
| 17 | January 12, 1997 | Publishing  | \$24.00    |

**Figure 31.** After you have sorted your list, you can add subtotals to it. To do this, click on a cell in the list, then from the **Data** menu select the *Subtotals* command.



**Figure 32.** Excel then opens the **Subtotal** dialog box. In our example, we want to add the subtotals for each department, so from the *At each change in* list box, we selected the *Department* option.

We want to add the values to produce subtotals, so from the *Use function* list box, we selected the *Sum* option.

We want to include the subtotals at the bottom of the Total Cost column, so from the *Add subtotal to* section we selected the *Total Cost* check box.

The check boxes at the bottom of the dialog box let you choose further options for the subtotals. When you have selected the options you want, click on the *OK* button.

**Subtotal** [?] [X]

At each change in:  
 Department [v]

Use function:  
 Sum [v]

Add subtotal to:  
 Quantity  
 Total Cost  
 Project Number

Replace current subtotals  
 Page break between groups  
 Summary below data

Buttons: OK, Cancel, Remove All

**Figure 33.** Excel then adds the subtotals and an outline to your worksheet.

To remove subtotals from a list, click on the *Remove All* button in the **Subtotal** dialog box (see Figure 32).

|    | A                     | B                        | G          |
|----|-----------------------|--------------------------|------------|
| 1  | MODERN MEDIA PRODUCTS |                          |            |
| 2  | PURCHASE LIST         |                          |            |
| 3  |                       |                          |            |
| 4  | DATE                  | DEPARTMENT               | TOTAL COST |
| 5  | January 7, 1997       | Accounts                 | \$1,798.00 |
| 6  | January 21, 1997      | Accounts                 | \$20.00    |
| 7  | January 28, 1997      | Accounts                 | \$45.00    |
| 8  |                       | <b>Accounts Total</b>    | \$1,863.00 |
| 9  | January 15, 1997      | Marketing                | \$19.96    |
| 10 | January 15, 1997      | Marketing                | \$9.95     |
| 11 | January 22, 1997      | Marketing                | \$179.70   |
| 12 | January 23, 1997      | Marketing                | \$1,495.00 |
| 13 |                       | <b>Marketing Total</b>   | \$1,704.61 |
| 14 | January 12, 1997      | Programming              | \$2,598.00 |
| 15 | January 12, 1997      | Programming              | \$865.00   |
| 16 |                       | <b>Programming Total</b> | \$3,463.00 |
| 17 | January 2, 1997       | Publishing               | \$19.90    |
| 18 | January 4, 1997       | Publishing               | \$12.99    |

# More Functions

## LESSON 24

+ + + +

In This Lesson:

Excel Logic Functions

Excel Math Functions

Excel Lookup Functions

+ + + +

---

## Excel Logic Functions

**Excel logic functions** give Excel the ability to think...Sort of.

Logic functions are used when a decision has to be made, usually when we are comparing our data against several different possibilities.

**IF Function** - Returns one value **if** a condition you specify is TRUE and another **if** it isn't. (see **Using the IF Function in Lesson 10 - Functions**)

**AND Function** - Tests multiple arguments and returns TRUE if ALL these arguments are TRUE and FALSE if ANY of them are not true.

**OR Function** - Tests multiple arguments and returns TRUE if ANY of the arguments are TRUE.

**NOT Function** - Reverses the logic of its argument: returns FALSE for a TRUE argument and TRUE for a FALSE argument.

### Excel AND Function

This Excel function returns a logical value, either TRUE or FALSE depending on the logical value of each of its arguments.

The **AND function** can contain up to 30 separate arguments and if ALL of those arguments are TRUE, the AND function returns TRUE, but if ANY of those arguments are FALSE, the AND function returns FALSE.

The syntax (the order and sequence) for the AND function is

**=AND(logical1,logical2...)**

where:

**logical1** through to **logical30** are conditions you want to test that can be either TRUE or FALSE and can be logical values, arrays or references.

### Plain English Zone

In plain English the Excel AND function syntax can be read as:

AND(this is TRUE, so is this, and this as well) returns TRUE

AND(this is TRUE, so is this, this is not) returns FALSE

### AND Function Example

Usually you will find that you will use the AND function in conjunction with the **Excel IF function**, or as part of another Excel formula.

That is exactly what we're going to do here.

This is a small class of very bright pupils and they have undertaken exams in Maths, Physics and Chemistry.

In order to be a Science Prize Winner they had to score greater than 75% for Maths, greater than 75% for Physics and, because it was felt that the Chemistry exam was a little too easy this year, they were required to score in excess of 80%.

|  | B              | C     | D       | E         | F            |
|--|----------------|-------|---------|-----------|--------------|
|  |                |       |         |           |              |
|  | Name           | Maths | Physics | Chemistry | Prize Winner |
|  | Ian Worrall    | 82%   | 76%     | 77%       | No           |
|  | John Smith     | 89%   | 82%     | 80%       | No           |
|  | Michael Green  | 75%   | 78%     | 79%       | No           |
|  | Ted Nicholas   | 68%   | 76%     | 81%       | No           |
|  | Dan Kennedy    | 88%   | 81%     | 80%       | No           |
|  | Gary Halbert   | 82%   | 95%     | 79%       | No           |
|  | Gareth Edwards | 83%   | 77%     | 84%       | Yes          |

As you can see in the example above, we have placed our AND function in cell F3, then subsequently copied it down through to cell F9.

What we want to do is discover if any of the pupils have scored consistently high enough to be a prizewinner.

In cell F3 IF **ALL** of our AND conditions are **TRUE** we want to return the text string "**Yes**", but if **ANY** of our AND conditions are **FALSE** we want to return the text string "**No**."

Using our syntax let's work through the formula.

The **logical\_test** asks is the value held in cell C3 greater than 75%

#### **AND**

is the value held in cell D3 greater than 75%

#### **AND**

is the value held in cell E3 greater than 80%

**value\_if\_true** says "All those conditions are true! Enter "Yes" in the cell."

**value\_if\_false** says "One or more of those conditions are FALSE. Enter "No" in the cell"

### **Excel OR Function**

The **Excel OR function** is similar in operation to the **Excel AND function** and returns a logical value, either TRUE or FALSE depending on the logical value of each of its arguments.

The **OR** function can contain up to 30 separate arguments and if **ANY** of those arguments are **TRUE**, the OR function returns TRUE, but if **ALL** of those arguments are **FALSE**, the OR function returns FALSE.

The syntax (the order and sequence) for the OR function is

**=OR(logical1,logical2...)**

where:

**logical1** through to **logical30** are conditions you want to test that can be either TRUE or FALSE and can be logical values, arrays or references.

**Excel OR Function Example**

As with the Excel AND function you will normally find that you will use the OR function in conjunction with the IF function, or as part of another Excel formula.

Let's take our group of school children again.

This is a small class of very bright pupils and they have undertaken exams in Maths, Physics and Chemistry.

This time we want to reward our pupils with a certificate of excellence if they have managed to achieve a pass mark of greater than 85% in any of their three exams.

|  | B              | C     | D       | E         | F                         |
|--|----------------|-------|---------|-----------|---------------------------|
|  |                |       |         |           |                           |
|  | Name           | Maths | Physics | Chemistry | Certificate of Excellence |
|  | Ian Worrall    | 82%   | 76%     | 77%       | No                        |
|  | John Smith     | 89%   | 82%     | 80%       | Yes                       |
|  | Michael Green  | 75%   | 78%     | 79%       | No                        |
|  | Ted Nicholas   | 68%   | 76%     | 81%       | No                        |
|  | Dan Kennedy    | 88%   | 81%     | 80%       | Yes                       |
|  | Gary Halbert   | 82%   | 95%     | 79%       | Yes                       |
|  | Gareth Edwards | 83%   | 77%     | 84%       | No                        |

As you can see in the example above, we have placed our OR function in cell F3, then subsequently copied it down through to cell F9.

What we want to do is discover if any of the pupils have scored over 85% in any of their exams. If they have we want to place a "Yes" text string in the cell, and if they haven't we want to place a "No" text string in the cell.

Using our syntax let's work through the formula.

The **logical\_test** asks is the value held in cell C3 greater than 85%

**OR**

is the value held in cell D3 greater than 85%

**OR**

is the value held in cell E3 greater than 85%

**value\_if\_true** says "One or more of those conditions are true! Enter "Yes" in the cell."

**value\_if\_false** says "All of those conditions are FALSE. Enter "No" in the cell"

### Excel NOT Function

In Excel, the **Not** function returns the reversed logical value.

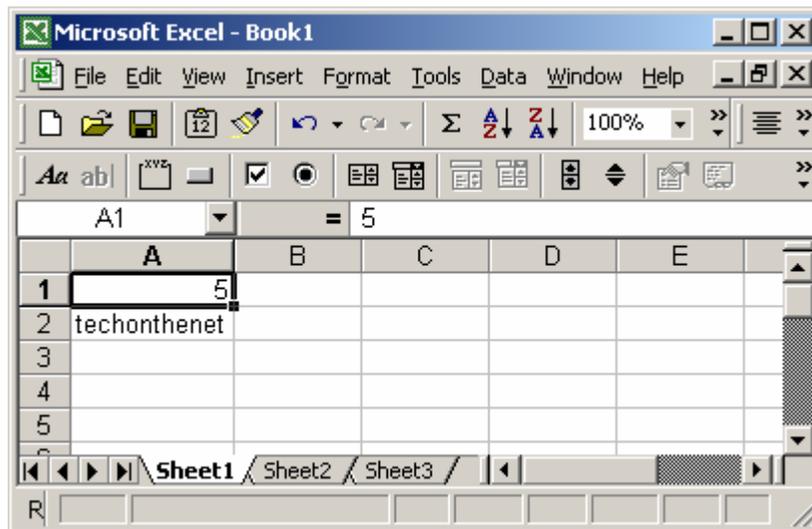
The syntax for the **Not** function is:

#### **Not( logical\_value )**

*logical\_value* is an expression that either evaluates to TRUE or FALSE. If the Not function is used with an expression of TRUE, then FALSE is returned. If the Not function is used with an expression of FALSE, then TRUE is returned.

For example:

Let's take a look at an example:



Based on the Excel spreadsheet above:

|                                |                     |
|--------------------------------|---------------------|
| <b>=Not(TRUE)</b>              | would return FALSE. |
| <b>=Not(FALSE)</b>             | would return TRUE.  |
| <b>=Not(A1&lt;10)</b>          | would return FALSE. |
| <b>=Not(A2="Microsoft")</b>    | would return TRUE.  |
| <b>=Not(A2="techonthenet")</b> | would return FALSE. |
| <b>=Not(5+1=7)</b>             | would return TRUE.  |

## Excel Math Functions

Aside from the usual functions that are discussed in Lesson 10, Excel offers lots of Math functions. Here are some of the Math functions.

### Count cells that match criteria – COUNTIF Function

#### Match criterion exactly – COUNTIF Function

You can count cells that meet a specific criterion. In this example only the Pen orders will be counted.

1. Select the cell in which you want to see the count (cell A12 in this example)
2. Type an equal sign (=) to start the formula
3. Type: COUNTIF(
4. Select the cells that contain the values to check for the criterion. In this example, cells A1:A10 will be checked
5. Type a comma, to separate the arguments
6. Type the criterion. In this example, you're checking for text, so type the word in double quotes: "Pen"

*Note: upper and lower case are treated equally*

7. Type a closing bracket
- The completed formula is: **=COUNTIF(A1:A10,"Pen")**
8. Press the Enter key to complete the entry
9. The result will be 4, the number of cells that contain "Pen"

|    | A                        | B   | C | D |
|----|--------------------------|-----|---|---|
| 1  | Item                     | Qty |   |   |
| 2  | Pen                      | 5   |   |   |
| 3  | Pencil                   | 9   |   |   |
| 4  | Binder                   | 9   |   |   |
| 5  | Pen                      | 6   |   |   |
| 6  | Pen                      | 15  |   |   |
| 7  | Binder                   | 12  |   |   |
| 8  | Pencil                   | 10  |   |   |
| 9  | Binder                   | 6   |   |   |
| 10 | Pen                      | 11  |   |   |
| 11 |                          |     |   |   |
| 12 | =COUNTIF(A1:A10,"Pen")   |     |   |   |
| 13 | COUNTIF(range, criteria) |     |   |   |

#### Match criterion in a string – COUNTIF Function

You can count cells that contain a criterion as part of the cell's contents. In this example all Pen, Gel Pen, and Pencil orders will be counted, because they contain the string "pen".

1. Select the cell in which you want to see the count (cell A12 in this example)
2. Type an equal sign (=) to start the formula
3. Type: COUNTIF(
4. Select the cells that contain the values to check for the criterion. In this example, cells A1:A10 will be checked

5. Type a comma, to separate the arguments
6. Type the criterion. In this example, you're checking for text, so type the word in double quotes, with one or more asterisk (\*) wildcard characters: `"*Pen*"`  
*Note: upper and lower case are treated equally*
7. Type a closing bracket  
The completed formula is: **=COUNTIF(A1:A10,"\*Pen\*")**
8. Press the Enter key to complete the entry
9. The result will be 6, the number of cells that contain the string, "Pen"

**Note:** Instead of typing the criterion in a formula, you can refer to a cell. For example, the formula in step 7 above could be changed to: **=COUNTIF(A1:A10,"\*" & B12 & "\*")** if cell B12 contained the text — **pen**.

|    | A                        | B   | C | D |
|----|--------------------------|-----|---|---|
| 1  | Item                     | Qty |   |   |
| 2  | Pen                      | 5   |   |   |
| 3  | Pencil                   | 9   |   |   |
| 4  | Binder                   | 9   |   |   |
| 5  | Pen                      | 6   |   |   |
| 6  | Gel Pen                  | 12  |   |   |
| 7  | Binder                   | 12  |   |   |
| 8  | Pencil                   | 10  |   |   |
| 9  | Binder                   | 6   |   |   |
| 10 | Pen                      | 11  |   |   |
| 11 |                          |     |   |   |
| 12 | =COUNTIF(A1:A10,"*Pen*") |     |   |   |
| 13 | COUNTIF(range, criteria) |     |   |   |

### Criterion and operator – COUNTIF Function

You can use an operator with a criterion. In this example only the rows where the quantity is greater than or equal to ten will be counted.

1. Select the cell in which you want to see the count (cell A12 in this example)
2. Type an equal sign (=) to start the formula
3. Type: COUNTIF(
4. Select the cells that contain the values to check for the criterion. In this example, cells B1:B10 will be checked
5. Type a comma, to separate the arguments
6. Type the criterion. In this example, you're checking for rows where the quantity is greater than or equal to 10. The >= operator is used before the number, and the entire criterion is enclosed in double quotes: `">=10"`  
*Note: Even though this is a numerical criterion, it must be enclosed in double quote marks.*
7. Type a closing bracket
8. The completed formula is:  
**=COUNTIF(B1:B10,">=10")**
9. Press the Enter key to complete the entry

**Note:** Instead of typing the criterion in a formula, you can refer to a cell. For example, the formula in step 8 above could be changed to: **=COUNTIF(B1:B10,">=" & B12)** if cell B12 contained the number — **10**.

Or, you could use a function as part of the criterion.

For example: **=COUNTIF(A1:A10,"<"&TODAY())**

|    | A                                 | B   | C | D |
|----|-----------------------------------|-----|---|---|
| 1  | Item                              | Qty |   |   |
| 2  | Pen                               | 5   |   |   |
| 3  | Pencil                            | 9   |   |   |
| 4  | Binder                            | 9   |   |   |
| 5  | Pen                               | 6   |   |   |
| 6  | Pen                               | 15  |   |   |
| 7  | Binder                            | 12  |   |   |
| 8  | Pencil                            | 10  |   |   |
| 9  | Binder                            | 6   |   |   |
| 10 | Pen                               | 11  |   |   |
| 11 |                                   |     |   |   |
| 12 | <b>=COUNTIF(B1:B10,"&gt;=10")</b> |     |   |   |
| 13 | COUNTIF(range, criteria)          |     |   |   |

### Match criteria in a range – COUNTIF Function

You can combine COUNTIF formulas, to count rows that are within a range of values. In this example, the formula will count rows where the quantity is between 5 and 10 (inclusive).

1. Select the cell in which you want to see the count (cell A12 in this example)
2. Type a formula to count rows greater than or equal to 5:  
**=COUNTIF(B1:B10,">=5")**
3. Type a minus sign
4. Type a formula to count rows greater than 10:  
**COUNTIF(B1:B10,">10")**
5. The completed formula is:  
**=COUNTIF(B1:B10,">=5")-COUNTIF(B1:B10,">10")**
6. Press the Enter key to complete the entry

**Note:** Instead of typing the criterion in a formula, you can refer to a cell. For example, the formula in step 8 above could be changed to: **=COUNTIF(B1:B10,">=" & B12) - COUNTIF(B1:B10,">" & C12)** if cell B12 contained the number — **5** and cell C12 contained the number — **10**.

### Excel SUMIF Function

The **Excel SUMIF function** is an extension of the standard **Excel SUM function**.

What the **Excel SUMIF function** allows you to do is SUM data only **if** it meets certain criteria that you have specified.

Let's say that you had a very small clothing store with only four departments, Sportswear, Evening Wear, Swimwear and Children's clothes.

You have been provided with a list of sales, by department and month, for the first quarter of the year, and what you would like to do is add up the sales for the quarter for the department that you specify.

The syntax, or structure, for the **SUMIF function** is as follows:

***SUMIF(Range,Criteria,Sum\_range)***

Where...

**Range** = the range of cells that you are evaluating for specific criteria

**Criteria** = the criteria you are looking for, and

**Sum\_Range** = the range of cells that are to be summed if the criteria is met.

Now, when you are using this function this is what you are telling Excel to do.

1. Look in the range of cells that we did.
2. If any of the cells that we've match the criteria that we specified...then
3. Add up the corresponding cells in the second range and return the result.

Let's have a look at the example.

|    | A     | B            | C       | D | E | F |
|----|-------|--------------|---------|---|---|---|
| 1  | Month | Department   | Sales   |   |   |   |
| 2  | Jan   | Sportswear   | 15,324  |   |   |   |
| 3  | Jan   | Evening Wear | 67,413  |   |   |   |
| 4  | Jan   | Swimwear     | 35,782  |   |   |   |
| 5  | Jan   | Children's   | 102,354 |   |   |   |
| 6  | Feb   | Sportswear   | 16,090  |   |   |   |
| 7  | Feb   | Evening Wear | 70,784  |   |   |   |
| 8  | Feb   | Swimwear     | 37,571  |   |   |   |
| 9  | Feb   | Children's   | 107,472 |   |   |   |
| 10 | Mar   | Sportswear   | 16,895  |   |   |   |
| 11 | Mar   | Evening Wear | 74,323  |   |   |   |
| 12 | Mar   | Swimwear     | 39,450  |   |   |   |
| 13 | Mar   | Children's   | 112,846 |   |   |   |
| 14 |       |              |         |   |   |   |
| 15 |       |              |         |   |   |   |
| 16 |       |              | 112,803 |   |   |   |

You can see from the formula in the above example that we have looked for any instances of the word "Swimwear" in the range B1:B13.

Where this has occurred we have summed the sales figures from the range C1:C13, giving a total sales figure for the Swimwear department of 112,803 for the quarter.

### Excel SUMPRODUCT Function

Once you've been introduced to the **Excel SUMPRODUCT Function** you'll never look back.

This a little known but power packed Excel function.

As implied by its name the **SUMPRODUCT function** combines two of Excel's other, better known, functions, SUM and PRODUCT.

Rather than waffle on too much let us dive straight into an example:

|   | A                    | B                       |
|---|----------------------|-------------------------|
| 1 | <b>Cost Per Unit</b> | <b>No.of Units Sold</b> |
| 2 | 10                   | 150                     |
| 3 | 17                   | 163                     |
| 4 | 19                   | 282                     |
| 5 | 12                   | 57                      |
| 6 | 21                   | 56                      |

As you can see from the illustration above we have two columns **Cost Per Unit** and **No. of Units Sold**. What we would like to know is the total cost of **ALL** the units sold.

Normally to achieve this we would insert an extra column, let's call it **Total Cost** and insert the product function in the first cell and copy it down to the remaining cells.

|   | A                    | B                       | C                 |
|---|----------------------|-------------------------|-------------------|
| 1 | <b>Cost Per Unit</b> | <b>No.of Units Sold</b> | <b>Total Cost</b> |
| 2 | 10                   | 150                     | 1500              |
| 3 | 17                   | 163                     | 2771              |
| 4 | 19                   | 282                     | 5358              |
| 5 | 12                   | 57                      | 684               |
| 6 | 21                   | 56                      | 1176              |

After doing that we would then SUM this third column to obtain the answer we were looking for.

|    |                      |                         |                   |
|----|----------------------|-------------------------|-------------------|
| C8 |                      | =SUM(C2:C6)             |                   |
|    | A                    | B                       | C                 |
| 1  | <b>Cost Per Unit</b> | <b>No.of Units Sold</b> | <b>Total Cost</b> |
| 2  | 10                   | 150                     | 1500              |
| 3  | 17                   | 163                     | 2771              |
| 4  | 19                   | 282                     | 5358              |
| 5  | 12                   | 57                      | 684               |
| 6  | 21                   | 56                      | 1176              |
| 7  |                      |                         |                   |
| 8  | <b>Total</b>         |                         | <b>11489</b>      |

Instead of doing that we are going to use **SUMPRODUCT** to provide us with the same answer in a fraction of the time it took to perform the previous actions.

The SUMPRODUCT syntax is as follows:

=SUMPRODUCT(Array1,Array2,Array3...,) up to a maximum of 30 Array dimensions.

In our example we only have two arrays, which are the cell ranges **A2:A6** and **B2:B6** under the respective columns headed **Cost Per Unit** and **No. Of Units Sold**.

In cell **B8** type **=SUMPRODUCT(A2:A6,B2:B6)**

|    |                      |                          |   |
|----|----------------------|--------------------------|---|
| B8 |                      | =SUMPRODUCT(A2:A6,B2:B6) |   |
|    | A                    | B                        | C |
| 1  | <b>Cost Per Unit</b> | <b>No.of Units Sold</b>  |   |
| 2  | 10                   | 150                      |   |
| 3  | 17                   | 163                      |   |
| 4  | 19                   | 282                      |   |
| 5  | 12                   | 57                       |   |
| 6  | 21                   | 56                       |   |
| 7  |                      |                          |   |
| 8  | <b>Total</b>         | <b>11489</b>             |   |

The **SUMPRODUCT function** returns the same answer that we arrived at earlier.

If that was the only ability it had, it would still be pretty useful, however this function has some other, much more productive capabilities.

The **SUMPRODUCT function** also has the ability to:

1. Act like the SUMIF function's elder brother on steroids.
2. Be used in a formula to instantly calculate weighted averages.

To find out how to perform SUMIF like functions with multiple criteria then read on:

Shown below is our criteria. As usual we will use a simple example.

|   | A             | B              | C               | D            |
|---|---------------|----------------|-----------------|--------------|
| 1 | <b>Region</b> | <b>Country</b> | <b>Division</b> | <b>Units</b> |
| 2 | North         | UK             | Sales           | 1            |
| 3 | South         | UK             | Sales           | 2            |
| 4 | East          | UK             | Sales           | 3            |
| 5 | West          | UK             | Sales           | 4            |
| 6 | North         | US             | Sales           | 5            |
| 7 | South         | US             | Sales           | 6            |
| 8 | East          | US             | Sales           | 7            |
| 9 | South         | US             | Sales           | 8            |

We have three criteria to match in this example, Region, Country and Division.

When all three criteria are matched we want to bring back the number of units.

The easiest way to do this is to copy the headings and place them below the data. Obviously, in this example, this is easy to do because there aren't many lines of data. If, however, you have thousands of lines of data then just place your headings in a convenient place.

|    | A             | B              | C               | D            |
|----|---------------|----------------|-----------------|--------------|
| 1  | <b>Region</b> | <b>Country</b> | <b>Division</b> | <b>Units</b> |
| 2  | North         | UK             | Sales           | 1            |
| 3  | South         | UK             | Sales           | 2            |
| 4  | East          | UK             | Sales           | 3            |
| 5  | West          | UK             | Sales           | 4            |
| 6  | North         | US             | Sales           | 5            |
| 7  | South         | US             | Sales           | 6            |
| 8  | East          | US             | Sales           | 7            |
| 9  | South         | US             | Sales           | 8            |
| 10 |               |                |                 |              |
| 11 |               |                |                 |              |
| 12 | <b>Region</b> | <b>Country</b> | <b>Division</b> | <b>Units</b> |
| 13 | South         | US             | Sales           | 14           |

This is where the magic occurs:

In cell **D13** type

```
=SUMPRODUCT((A2:A9=$A$13)*(B2:B9=$B$13)*(C2:C9=$C$13)*(D2:D9))
```

What we are saying in this formula is

Find the rows where all of the following are correct;

**South** is in the cell range **A2:A9**,

**US** is in the cell range **B2:B9**, and

**Sales** is in the range **C2:C9**

and then SUM the units.

In this case our criteria was matched in rows 7 and 9 and the total number of units was 14.

Once you have set your spreadsheet up like this, you just adjust the criteria in cells A13,B13, and C13 accordingly.

### Excel ROUND Function

Rounding numbers or the results of calculations in **Excel** is simple when you use the **ROUND function**.

Let's say we had numbers in cells A1 and B1 and we wish to multiply them together and put the result, rounded to 2 decimal places, into cell C1.

The structure of the Excel ROUND function is:

***=ROUND(number,num\_digits)***

where ***number*** is the number or result of a calculation or reference to a cell where the result is held

and ***num\_digits*** is the number of digits to which you wish to round

In our example we would write the formula as:

***=ROUND(A1\*B1,2)***

|   |       |       |                 |   |
|---|-------|-------|-----------------|---|
|   | C1    | =     | =ROUND(A1*B1,2) |   |
|   | A     | B     | C               | D |
| 1 | 5.234 | 9.123 | 47.75           |   |

On occasions you might want to force your result to either round up or round down rather than allow Excel to dictate which way the result should be rounded.

In those instances you can use either the ROUNDUP or the ROUNDDOWN function. The syntax or structure of these functions is exactly the same as for the ROUND function.

Taking the same numbers as above, if we used the ROUNDDOWN function and rounded to two decimal places again we would have the result of 47.74 returned.

### ***How to quickly round to the nearest 10***

Very often Excel users have the need to round to the nearest 10, 100 or 1000 etc.

Use the Excel ROUND function and use a negative number for the ***num\_digits*** argument.

Using the same numbers as in the previous examples, we decide to round to the nearest 10, so we are going to use -1 as my *num\_digits* argument.

|    |       |       |    |   |                  |
|----|-------|-------|----|---|------------------|
| C1 |       | =     |    |   | =ROUND(A1*B1,-1) |
|    | A     | B     | C  | D |                  |
| 1  | 5.234 | 9.123 | 50 |   |                  |

If we wanted to round to the nearest 100 we would use -2.

### ***Rounding to numbers other than multiples of 10***

To round to numbers other than multiples of 10 using Excel's ROUND function is also reasonably straightforward.

Again we will use the same numbers as above but this time we will round to the nearest 6.

We know that the result of the initial calculation was 47.749782, so rounding this to the nearest multiple of 6 will give us the answer 48.

This is how we do it.

***=ROUND((A1\*B1)/6,0)\*6***

Strictly speaking it is not necessary to have A1\*B1 in parentheses due to the order of calculations in Excel, but we like to add them just for neatness. The screenshot below shows the formula without the parentheses.

|    |       |       |    |   |                     |
|----|-------|-------|----|---|---------------------|
| C1 |       | =     |    |   | =ROUND(A1*B1/6,0)*6 |
|    | A     | B     | C  | D |                     |
| 1  | 5.234 | 9.123 | 48 |   |                     |

### ***Rounding Up or Down to multiples other than 10***

It is possible to use the above formula in conjunction with either ROUNDUP or ROUNDDOWN, but the formulas start to get unnecessarily messy, especially when there is no need to do it.

Excel has provided two functions that do just that and they are the Excel CEILING function and the Excel FLOOR function.

#### **Excel CEILING Function**

Excel provides the **CEILING function** which returns a number rounded **up** based on a multiple of significance.

We are going to use the same numbers that we used in the ROUND function examples.

The syntax or structure of the CEILING function is:

**=CEILING(number,significance)**

where **number** is the number or result of a calculation or reference to a cell where the result is held

and **significance** is the multiple of significance to which you wish to round up.

In this case we want to round up to the nearest multiple of 6, so my formula is

**=CEILING(A1\*B1,6)**

which gives us the result of 48.

|   |       |       |    |                   |
|---|-------|-------|----|-------------------|
|   | C1    |       | =  | =CEILING(A1*B1,6) |
|   | A     | B     | C  | D                 |
| 1 | 5.234 | 9.123 | 48 |                   |

### Excel FLOOR Function

Excel provides the **FLOOR function** which returns a number rounded **down** based on a multiple of significance.

We are going to use the same numbers that we used in the ROUND function examples.

The syntax or structure of the FLOOR function is:

**=FLOOR(number,significance)**

where **number** is the number or result of a calculation or reference to a cell where the result is held

and **significance** is the multiple of significance to which you wish to round down.

In this case we want to round down to the nearest multiple of 6, so my formula is

**=FLOOR(A1\*B1,6)**

which gives us the result of 42.

|   |       |       |    |                 |
|---|-------|-------|----|-----------------|
|   | C1    |       | =  | =FLOOR(A1*B1,6) |
|   | A     | B     | C  | D               |
| 1 | 5.234 | 9.123 | 42 |                 |

## Excel Lookup Functions

**Excel lookup functions** are mainly used when are dealing with lists of data, or when you need to return a value.

Out of the seventeen functions that are categorized as **Lookup and Reference** we are featuring just a handful here.

**VLOOKUP Function** - the VLOOKUP function works in the same manner that you would use to find someone's number in the phone book.

It searches down the leftmost column of the data range you are searching, then reads across, bringing back the data from the column you specified.

**HLOOKUP Function** - Works exactly the same way as the VLOOKUP function but turned 90 degrees. This time we search across the top row, then read downwards.

**INDEX Function** - at first site seems completely useless, but when combined with MATCH or other functions you get awesome results.

The index function returns the value from a range when you specify the column and row number.

**MATCH Function** - Returns the position within a range of cells where your specified value is held. This can be either a row or a column of data.

**OFFSET Function** - Returns a reference to a range that is a specified number of rows and columns from an initial starting point.

### Excel VLOOKUP Function

The **VLOOKUP function** is likely to become very familiar to you if you use Excel for any length of time.

Along with SUM and SUMIF, VLOOKUP is one of the most used Excel functions.

The **VLOOKUP function** works by searching down the leftmost column of your data and then reads across the row to find the value in the column you specify.

If you think of the process as similar to that which you would adopt when searching for a phone number in a directory, you won't go far wrong.

In fact, let's use the phone directory scenario to illustrate the Excel VLOOKUP function in action.

Below is a list of names and their corresponding phone numbers. We would like to be able to type in a name and have the phone number automatically returned.

|    | A             | B             |
|----|---------------|---------------|
| 1  | <b>Name</b>   | <b>Number</b> |
| 2  | John McDonald | 555-123-456   |
| 3  | Jim Roberts   | 555-133-612   |
| 4  | Sarah Harding | 555-123-457   |
| 5  | David Ogilvy  | 555-133-613   |
| 6  | Chris Cringle | 555-123-458   |
| 7  | David Beckham | 555-133-614   |
| 8  | Tim Henman    | 555-123-459   |
| 9  | Louise Harris | 555-133-615   |
| 10 | Debbie Harry  | 555-123-460   |

For this particular example we are going to use two cells, one for inputting the name of the person whose number we want, and the second cell will be where we enter the VLOOKUP function which will return the phone number.

1. Click in cell B12 and type "David Beckham". (without the quotes)
2. Click in cell C12 and type "=VLOOKUP"
3. On the formula bar click on the = sign.

|    | A             | B             | C        | D |
|----|---------------|---------------|----------|---|
| 1  | <b>Name</b>   | <b>Number</b> |          |   |
| 2  | John McDonald | 555-123-456   |          |   |
| 3  | Jim Roberts   | 555-133-612   |          |   |
| 4  | Sarah Harding | 555-123-457   |          |   |
| 5  | David Ogilvy  | 555-133-613   |          |   |
| 6  | Chris Cringle | 555-123-458   |          |   |
| 7  | David Beckham | 555-133-614   |          |   |
| 8  | Tim Henman    | 555-123-459   |          |   |
| 9  | Louise Harris | 555-133-615   |          |   |
| 10 | Debbie Harry  | 555-123-460   |          |   |
| 11 |               |               |          |   |
| 12 |               | David Beckham | =VLOOKUP |   |

As soon as you have clicked on the "=" sign the following dialog box appears.

VLOOKUP

**Lookup\_value** B12 = "David Beckham"

**Table\_array** A1:B10 = {"Name", "Number";".

**Col\_index\_num** 2 = 2

**Range\_lookup** false = FALSE

= "555-133-614"

Searches for a value in the leftmost column of a table, and then returns a value in the same row from a column you specify. By default, the table must be sorted in an ascending order.

**Range\_lookup** is a logical value: to find the closest match in the first column (sorted in ascending order) = TRUE or omitted; find an exact match = FALSE.

Formula result = 555-133-614

OK Cancel

If the dialog box has covered the data just left click near the top of the box and drag it out of the way so you can once again see the data.

The cursor will be flashing in the **Lookup\_value** box.

4. Now, because we are going to use cell **B12** as the data entry box for the name of the person who's number we are looking up we will enter B12. This can be typed in or alternatively you can use your mouse and click on cell B12.
5. Click in the **Table\_array** box and then select the range of cells from A1 to B10.
6. Click in the **Col\_index\_num** box and type the number 2.
7. Click in the **Range\_lookup** box and type in "False". In this example we wish to find an exact match for the value we specified in the **Lookup\_value** box. Had we been looking for the closest match then we could have used "True" instead.
8. Click on the "OK" button.
9. The phone number 555-133-614 is returned. We can verify that this is correct by looking in cell B7.

### **Plain English Zone**

In plain English this is what the Excel VLOOKUP function says:

Look down the Leftmost column within the data we have specified until you find the name "David Beckham".

Now you've located "David Beckham", move along the row until you get to the second column and return the value that is in that cell.

### **Excel HLOOKUP Function**

The **HLOOKUP function** works exactly the same way as the VLOOKUP function but turned clockwise 90 degrees.

HLOOKUP reads across the first or uppermost row of data searching for the column that contains the value you have specified.

When it finds the specified value it then moves down the rows and returns the value from the row number that you specified.

Let's look at an example of the Excel HLOOKUP function as this will make it clearer.

|   | A                     | B          | C        | D       |
|---|-----------------------|------------|----------|---------|
| 1 | <b>Name</b>           | Jim        | Tom      | Matthew |
| 2 | <b>Age</b>            | 36         | 21       | 11      |
| 3 | <b>Occupation</b>     | Pharmacist | Lawyer   | Student |
| 4 | <b>Marital Status</b> | Married    | Divorced | Single  |

In this simple table we have the field names in the first four rows and each record is kept in a single column.

We would like to type in a client's name and have returned that client's occupation.

The syntax for the HLOOKUP function is

**=HLOOKUP(Lookup\_value,Table\_array,Row\_index\_num,Range\_lookup)**

where

**Lookup\_value** is the value you are looking for in the first row of your array

**Table\_array** is the range of cells you are searching

**Row\_index\_num** is the rows number from which the value should be returned

**Range\_lookup** is an optional argument. Use FALSE to ensure you find an exact match or TRUE to find the nearest value. If omitted then TRUE is the default value)

In cells A7 and B7 we are going to enter the headings **Name** and **Occupation**.

Cell A8 is where we will type in our clients name.

In cell B8 we enter the formula **=HLOOKUP(A8,\$A\$1:\$D\$4,3,FALSE)**

|   |                       |                   |                                    |         |   |
|---|-----------------------|-------------------|------------------------------------|---------|---|
|   | B8                    | =                 | =HLOOKUP(A8,\$A\$1:\$D\$4,3,FALSE) |         |   |
|   | A                     | B                 | C                                  | D       | E |
| 1 | <b>Name</b>           | Jim               | Tom                                | Matthew |   |
| 2 | <b>Age</b>            | 36                | 21                                 | 11      |   |
| 3 | <b>Occupation</b>     | Pharmacist        | Lawyer                             | Student |   |
| 4 | <b>Marital Status</b> | Married           | Divorced                           | Single  |   |
| 5 |                       |                   |                                    |         |   |
| 6 |                       |                   |                                    |         |   |
| 7 | <b>Name</b>           | <b>Occupation</b> |                                    |         |   |
| 8 | Matthew               | Student           |                                    |         |   |

We typed "Matthew" in cell A8 and so we have the value "Student" returned.

The Excel HLOOKUP function in this example has taken the value from cell A8, looked for it in the top row of the range of cells \$A\$1:\$D\$4 then, when it has found it, has gone down to the third row in our range of cells and returned to us the value that is in that cell.

## INDEX Function

The Excel Index function is used in a similar way to how you would use a grid reference on a map.

Given the row number and the column number you know exactly which cell you are looking at or referencing. The grid structure of Excel naturally makes the Index function quite intuitive.

The syntax of the Excel Index function can take two forms. These are either:

**=INDEX(Array,Row\_num,Column\_num)**

where

**Array** is the range of cells that you are working with

**Row\_num** indicates the row you wish to use in your reference, and

**Column\_num** indicates the column you wish to use in your reference

or

**=INDEX(Reference,Row\_num,Column\_num,Area\_num)**

where

Reference is a reference to one or more cell ranges,

**Row\_num** indicates the row you wish to use in your reference,

**Column\_num** indicates the column you wish to use in your reference, and

**Area\_num** indicates which area within Reference that you wish to use

To clear up any confusion, use the first form of the formula if the range of cells you are working with are contained within one single block, and use the second form when the cells you are working with are split into several individual blocks.

We are going to use the first form of the Index function in our example.

In our example below we have named the range of cells B2:F11 "IndexData".

|    | A | B              | C        | D                                 | E        | F        |
|----|---|----------------|----------|-----------------------------------|----------|----------|
| 1  |   |                |          |                                   |          |          |
| 2  |   | Row 1/Column 1 | Column 2 | Column 3                          | Column 4 | Column 5 |
| 3  |   | Row 2          | 125      | 116                               | 150      | 141      |
| 4  |   | Row 3          | 107      | 139                               | 113      | 140      |
| 5  |   | Row 4          | 119      | 145                               | 146      | 127      |
| 6  |   | Row 5          | 128      | 127                               | 139      | 115      |
| 7  |   | Row 6          | 111      | 150                               | 101      | 100      |
| 8  |   | Row 7          | 139      | 101                               | 104      | 104      |
| 9  |   | Row 8          | 135      | 101                               | 100      | 115      |
| 10 |   | Row 9          | 113      | 149                               | 125      | 137      |
| 11 |   | Row 10         | 101      | 144                               | 134      | 122      |
| 12 |   |                |          |                                   |          |          |
| 13 |   |                |          |                                   |          |          |
| 14 |   | Row Number     | 5        |                                   |          |          |
| 15 |   | Column Number  | 4        |                                   |          |          |
| 16 |   | Result         | 139      | =INDEX(IndexData,\$C\$14,\$C\$15) |          |          |

In cells C14 and C15 we have placed the references for the row and column numbers respectively.

Cell C16 contains the formula =INDEX(IndexData,\$C\$14,\$C\$15) which is effectively saying,

"Within the array named IndexData, bring back the cell contents that are situated at the intersection of row 5 and column 4"

In this case the resulting value is 139 which we have highlighted within the array.

### Excel MATCH Function

Excel MATCH is a simple little function that returns the relative position of the cell within an array rather than returning the actual value contained within the cell.

The syntax or structure for the Excel MATCH function is:

**=MATCH(Lookup\_value,Lookup\_array,Match\_type)**

where

**Lookup\_value** is the value you are looking up and wish to match within the array,

**Lookup\_array** is the range of cells in which you are looking for the match, and

**Match-type** is either -1, 0, or 1

**-1** will find the smallest value that is equal to or greater than the lookup value. The array must have been sorted in descending order

**0** will find the exact match. The array does not need to be sorted in any order.

**1** will find the largest value that is equal to or less than the lookup value. The array must have been sorted in ascending order.

In the example below we have the months January through to May in an array which we have named "Months".

|                     |                     |          |       |       |     |
|---------------------|---------------------|----------|-------|-------|-----|
|                     | January             | February | March | April | May |
| <b>Lookup Value</b> | April               |          |       |       |     |
| <b>Result</b>       | 4                   |          |       |       |     |
| <b>Formula</b>      | =MATCH(C4,Months,0) |          |       |       |     |

We want to find out where "April" is positioned within the "Months" array so we enter "April" as the lookup value.

After entering our lookup value we type in the formula:

**=MATCH(C4,Months,0)**

We have used the Match type 0 because we wanted an exact match, and the value returned to us is 4.

This represents that April is the fourth value along in the array.

Knowing the position of a particular cell comes in useful when you combine it with other Excel functions.

For example you can combine the MATCH function with the INDEX function to perform lookups without having the limitations that are present when using VLOOKUP.

### Excel OFFSET Function

We use Excel's OFFSET function to return a reference to a cell or range of cells that is a specific number of columns and rows from a specific starting point.

Imagine you have an old crinkled up piece of parchment...a Pirate map, complete with instructions on how to find the buried treasure.

As with all good pirate maps you always start "on the spot marked with an X."

The instructions tell you to take three steps forward and one step sideways, to the right.

Now start digging, you scurvy landlubbers!

|                 |                   |                 |
|-----------------|-------------------|-----------------|
|                 |                   | Buried Treasure |
|                 |                   |                 |
|                 |                   |                 |
|                 |                   |                 |
|                 |                   |                 |
|                 |                   |                 |
|                 |                   |                 |
|                 |                   |                 |
|                 |                   |                 |
| Buried Treasure | =OFFSET(E12,-4,2) |                 |

This is exactly how Excel's Offset function works. You start at a particular cell, then move a specific number of rows up or down, then move a specific number of columns left or right.

You will notice in the formula from the example above that the number of rows is a negative 4. This is because, although it appears to us that we are moving upwards, as far as Excel is concerned, we are moving from row 12 to row 8, i.e. backwards.

For columns if you are referencing a column to the left of your starting point, that would be negative as well. In our case our column is to the right of our starting point and so is positive.

Let's look at the syntax of the Offset function and a quick and simple example.

The syntax is as follows:

**=OFFSET(Reference,Rows,Cols,Height,Width)**

where

**Reference** is the place from which you wish to start (your X marks the spot)

**Rows** is the number of rows you wish to move either up or down, and

**Cols** is the number of columns you wish to move either left or right.

The following two arguments are optional and are used when the resulting reference is greater than one cell.

*Height* is the number of rows high you want the result to be, and

*Width* is the number of columns wide you want the result to be.

Some of you may be saying to yourselves, why should we go to all that trouble when we can just link directly to the specific cell.

That is a great question...and we're going to show you an equally great answer.

Why Excel has included the Offset function and where it comes in handy is where you know the position of the cell in **relation** to another one, but you don't know the exact cell address.

Let's work through an example to make this crystal clear.

We are going to perform a reconciliation of data on two lists which we have extracted from different sources and placed in an Excel worksheet next to each other. We have sorted both lists in ascending order to make our tasks easier.

After placing these lists next to each other we have inserted an extra column and used Excel's EXACT function to test if the values in each set of data are indeed the same.

|    | A                         | B                 | C | D     | E | F                         | G                 |
|----|---------------------------|-------------------|---|-------|---|---------------------------|-------------------|
| 1  | <b>Natural Code</b>       | <b>Total Year</b> |   |       |   | <b>Natural Code</b>       | <b>Total Year</b> |
| 2  | 42020 Room Rent Ext       | 1215.87           |   | TRUE  |   | 42020 Room Rent Ext       | 1215.87           |
| 3  | 42110 Room Rents Internal | 6444.69           |   | TRUE  |   | 42110 Room Rents Internal | 6444.69           |
| 4  | 43200 Ups Provided        | 204050.86         |   | TRUE  |   | 43200 Ups Provided        | 204050.86         |
| 5  | 45000 Other Inc           | 11668.44          |   | TRUE  |   | 45000 Other Inc           | 11668.44          |
| 6  | 46000 Minibreak           | 26569.37          |   | TRUE  |   | 46000 Minibreak           | 26569.37          |
| 7  | 46200 Int Lead Gen rev    | 66855             |   | TRUE  |   | 46200 Int Lead Gen rev    | 66855             |
| 8  | 51930 Heating Oil         | 240               |   | TRUE  |   | 51930 Heating Oil         | 240               |
| 9  | 52310 Staff Uniforms      | 82.94             |   | FALSE |   | 53020 Sal Gr              | 68206.48          |
| 10 | 53020 Sal Gr              | 68206.48          |   | FALSE |   | 53030 National Insurances | 10196.81          |
| 11 | 53030 National Insurances | 10196.81          |   | FALSE |   | 53040 Bonuses             | 2101              |
| 12 | 53040 Bonuses             | 2101              |   | FALSE |   | 53050 Pensions            | 2515.84           |
| 13 | 53050 Pensions            | 2515.84           |   | FALSE |   | 53060 BUPA Life Ass       | 87.08             |
| 14 | 53060 BUPA Life Ass       | 87.08             |   | FALSE |   | 53100 Commissions         | 12792.4           |
| 15 | 53100 Commissions         | 12792.4           |   | FALSE |   | 53200 Staff Recruitment   | 24636.81          |
| 16 | 53200 Staff Recruitment   | 24636.81          |   | FALSE |   |                           |                   |
| 17 |                           |                   |   |       |   |                           |                   |

As you can see, when we get to 52310 Staff Uniforms on the left hand side list we discover that it is not present on the other side. This is one item that is causing the difference.

To enable us to continue checking we insert cells in the right hand list where the missing entry should be and move all the other entries down one cell.

|    | A                         | B                 | C | D     | E | F                         | G                 |
|----|---------------------------|-------------------|---|-------|---|---------------------------|-------------------|
| 1  | <b>Natural Code</b>       | <b>Total Year</b> |   |       |   | <b>Natural Code</b>       | <b>Total Year</b> |
| 2  | 42020 Room Rent Ext       | 1215.87           |   | TRUE  |   | 42020 Room Rent Ext       | 1215.87           |
| 3  | 42110 Room Rents Internal | 6444.69           |   | TRUE  |   | 42110 Room Rents Internal | 6444.69           |
| 4  | 43200 Ups Provided        | 204050.86         |   | TRUE  |   | 43200 Ups Provided        | 204050.86         |
| 5  | 45000 Other Inc           | 11668.44          |   | TRUE  |   | 45000 Other Inc           | 11668.44          |
| 6  | 46000 Minibreak           | 26569.37          |   | TRUE  |   | 46000 Minibreak           | 26569.37          |
| 7  | 46200 Int Lead Gen rev    | 66855             |   | TRUE  |   | 46200 Int Lead Gen rev    | 66855             |
| 8  | 51930 Heating Oil         | 240               |   | TRUE  |   | 51930 Heating Oil         | 240               |
| 9  | 52310 Staff Uniforms      | 82.94             |   | FALSE |   |                           |                   |
| 10 | 53020 Sal Gr              | 68206.48          |   | FALSE |   | 53020 Sal Gr              | 68206.48          |
| 11 | 53030 National Insurances | 10196.81          |   | FALSE |   | 53030 National Insurances | 10196.81          |
| 12 | 53040 Bonuses             | 2101              |   | FALSE |   | 53040 Bonuses             | 2101              |
| 13 | 53050 Pensions            | 2515.84           |   | FALSE |   | 53050 Pensions            | 2515.84           |
| 14 | 53060 BUPA Life Ass       | 87.08             |   | FALSE |   | 53060 BUPA Life Ass       | 87.08             |
| 15 | 53100 Commissions         | 12792.4           |   | FALSE |   | 53100 Commissions         | 12792.4           |
| 16 | 53200 Staff Recruitment   | 24636.81          |   | FALSE |   | 53200 Staff Recruitment   | 24636.81          |

We've now moved the entries on the right hand side down one cell and although we can see that they match, Excel is telling us that they don't. What's going on?

Take a look at the formula bar and you will see what the problem is. The formula bar is displaying the formula for cell D10 and clearly it is no longer looking at row 10 for both lists.

Because we shifted the cells down on the right hand list, the formula is now looking at row 10 on the left hand list but looking at row 11 on the right hand list.

We need to ensure that when we find discrepancies between the lists and we add rows, the formula will always look at both sides on the same row.

Changing the Excel formula to use the Offset function will accomplish what we want.

We change the formula in cell D2 to =EXACT(OFFSET(D2,0,-2),OFFSET(D2,0,3)) and then copy this down to all the relevant cells in column D.

Now, whenever we insert cells and move the others down the Exact function will always compare the cell two columns to it's left with the one 3 columns to its right.

| D10 |                           | =EXACT(OFFSET(D10,0,-2),OFFSET(D10,0,3)) |   |       |   |                           |                   |
|-----|---------------------------|--|---|-------|---|---------------------------|-------------------|
|     | A                         | B  | C | D     | E | F                         | G                 |
| 1   | <b>Natural Code</b>       | <b>Total Year</b>                        |   |       |   | <b>Natural Code</b>       | <b>Total Year</b> |
| 2   | 42020 Room Rent Ext       | 1215.87                                  |   | TRUE  |   | 42020 Room Rent Ext       | 1215.87           |
| 3   | 42110 Room Rents Internal | 6444.69                                  |   | TRUE  |   | 42110 Room Rents Internal | 6444.69           |
| 4   | 43200 Ups Provided        | 204050.86                                |   | TRUE  |   | 43200 Ups Provided        | 204050.86         |
| 5   | 45000 Other Inc           | 11668.44                                 |   | TRUE  |   | 45000 Other Inc           | 11668.44          |
| 6   | 46000 Minibreak           | 26569.37                                 |   | TRUE  |   | 46000 Minibreak           | 26569.37          |
| 7   | 46200 Int Lead Gen rev    | 66855                                    |   | TRUE  |   | 46200 Int Lead Gen rev    | 66855             |
| 8   | 51930 Heating Oil         | 240                                      |   | TRUE  |   | 51930 Heating Oil         | 240               |
| 9   | 52310 Staff Uniforms      | 82.94                                    |   | FALSE |   |                           |                   |
| 10  | 53020 Sal Gr              | 68206.48                                 |   | TRUE  |   | 53020 Sal Gr              | 68206.48          |
| 11  | 53030 National Insurances | 10196.81                                 |   | TRUE  |   | 53030 National Insurances | 10196.81          |
| 12  | 53040 Bonuses             | 2101                                     |   | TRUE  |   | 53040 Bonuses             | 2101              |
| 13  | 53050 Pensions            | 2515.84                                  |   | TRUE  |   | 53050 Pensions            | 2515.84           |
| 14  | 53060 BUPA Life Ass       | 87.08                                    |   | TRUE  |   | 53060 BUPA Life Ass       | 87.08             |
| 15  | 53100 Commissions         | 12792.4                                  |   | TRUE  |   | 53100 Commissions         | 12792.4           |
| 16  | 53200 Staff Recruitment   | 24636.81                                 |   | TRUE  |   | 53200 Staff Recruitment   | 24636.81          |

# Conditional Formatting

## LESSON 25

+ + + +

In This Lesson:

What is Conditional Formatting?

Conditional Formatting – Based on Another Cell

Conditional Formatting - Examples

+ + + +

## What is Conditional Formatting?

Conditional formatting allows you to set rules for cell formatting. If the rules (conditions) are met, then the formatting is applied. You can have up to 3 rules in a cell.

For example, you can set conditional formatting so that a cell turns blue if it contains a value higher than 75 and turns green if it contains a value lower than 50.

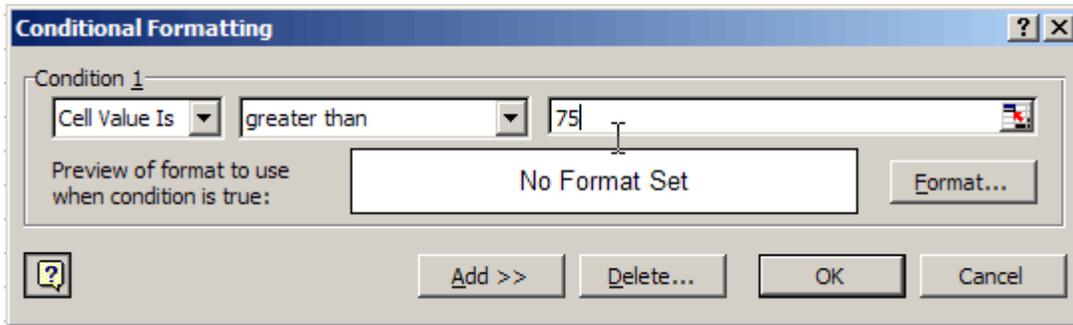
|   | A        | B     |
|---|----------|-------|
| 1 | Date     | Value |
| 2 | 5/5/2002 | 76    |
| 3 | 5/6/2002 | 60    |
| 4 | 5/7/2002 | 49    |

## Apply Conditional Formatting to a Cell

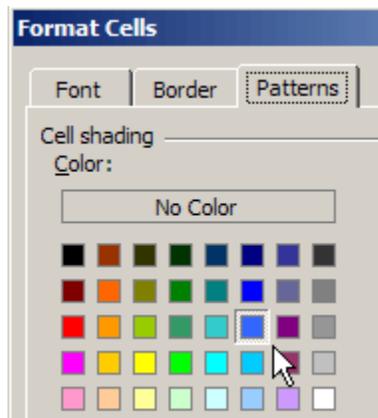
1. Select the cells to be formatted
2. Choose Format>Conditional Formatting...

|   | A        | B     |
|---|----------|-------|
| 1 | Date     | Value |
| 2 | 5/5/2002 | 76    |
| 3 | 5/6/2002 | 60    |
| 4 | 5/7/2002 | 49    |

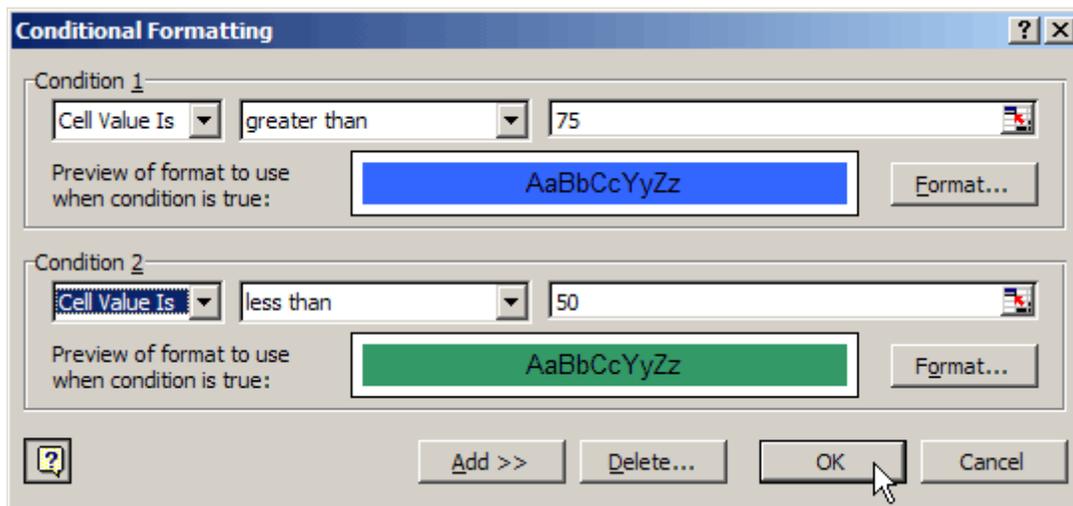
3. Leave the first drop-down box set to Cell Value Is
4. In the second drop-down box, choose one of the operators. In this example, choose 'greater than'
5. In the text box, type a number or a cell reference. In this example, type the value you want to check -- 75.



6. Click the Format button
7. On the Patterns tab, select a colour for the conditional formatting -- blue, in this example. You can also choose a Font format or a cell Border.
8. Click OK.



9. To add another conditional format, click the Add button.
10. Repeat steps 3 to 8, using the values and colours for the second conditional format.
11. Click OK, to return to the worksheet.



## Conditional Formatting - Based on Another Cell

### Apply Conditional Formatting to a Row

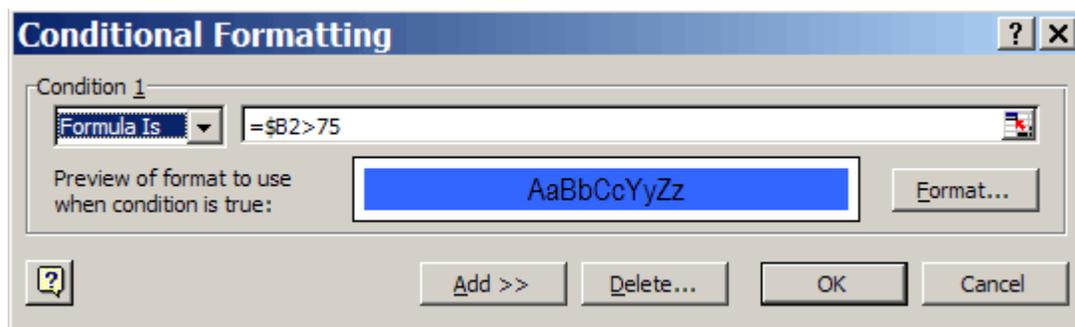
You can apply conditional formatting that checks the value in one cell, and applies formatting to other cells, based on that value. For example, you could color the entire row in a table, if the values in column B are over a set value.

|   | A        | B     | C    | D     |
|---|----------|-------|------|-------|
| 1 | Date     | Units | Cost | Total |
| 2 | 5/5/2003 | 71    | 29   | 2059  |
| 3 | 5/6/2003 | 85    | 30   | 2550  |
| 4 | 5/7/2003 | 41    | 77   | 3157  |

1. Select the cells to be formatted (A2:D4 in this example)
2. Choose **Format | Conditional Formatting...**
3. From the first drop-down list, choose Formula Is
4. In the text box, enter a formula that refers to the active cell in the selection.

In this example, the formula is: **= $\$B2>75$**

Use an absolute reference to column B ( **$\$B$** ), to ensure that the conditional formatting in all columns refers to the value in column B. Otherwise, the formula will be adjusted in each column, and won't work properly.



5. Click the Format button.
6. Select the formatting options, click OK
7. Click OK

## Conditional Formatting - Examples

### Hide Errors

You can use conditional formatting to check for errors, and change the font color to match the cell color. In this example, if column B contains a zero, the #DIV/0! error is displayed in column C.

|   | A    | B     | C       | D | E | F |
|---|------|-------|---------|---|---|---|
| 1 | Days | Units | Daily   |   |   |   |
| 2 | 7    | 71    | 10      |   |   |   |
| 3 | 0    | 0     | #DIV/0! |   |   |   |
| 4 | 4    | 58    | 15      |   |   |   |
| 5 | 9    | 29    | 3       |   |   |   |

| Conditional Formatting |              |
|------------------------|--------------|
| Condition 1            |              |
| Formula Is             | =ISERROR(C2) |

1. Select cells C2:C5
2. Choose **Format | Conditional Formatting**
3. From the first dropdown, choose *Formula Is*
4. For the formula, enter a formula that refers to the active cell in the selection:  
**=ISERROR(C2)**  
or, to hide only #N/A errors: **=ISNA(C2)**
5. Click the Format button.
6. Select a font color to match the cell color.
7. Click OK, click OK

### Hide Duplicate Values

In a table, each row should have all data entered, to enable sorting and filtering. However, you can hide the duplicate values, to make the list easier to read. In this example, when the table is sorted by Region, the second (and subsequent) occurrences of each region name will have white font color.

|   | A       | B    |
|---|---------|------|
| 1 | Region  | Name |
| 2 | Ontario | Ann  |
| 3 | Ontario | Ben  |
| 4 | Quebec  | Cam  |
| 5 | Quebec  | Dan  |

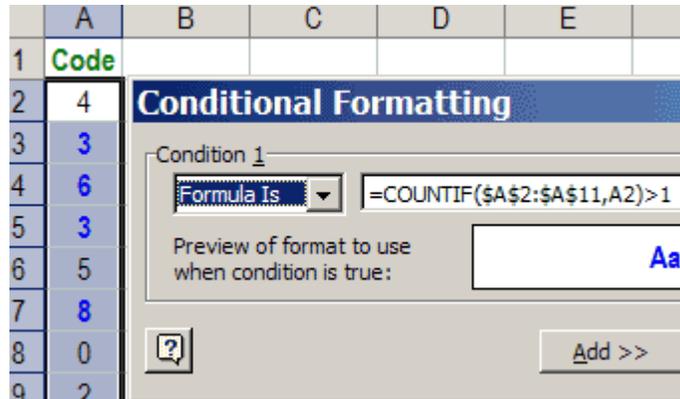
1. Select range A2:A5
2. Choose **Format | Conditional Formatting**
3. From the first dropdown, choose *Formula Is*
4. For the formula, enter **=A2=A1**
5. Click the Format button.
6. Select a font color to match the cell color.
7. Click OK, click OK

|   | A       | B    |
|---|---------|------|
| 1 | Region  | Name |
| 2 | Ontario | Ann  |
| 3 |         | Ben  |
| 4 | Quebec  | Cam  |
| 5 |         | Dan  |

### Highlight Duplicates in Column

Use conditional formatting to highlight duplicate entries in a column:

1. Select range A2:A11
2. Choose **Format | Conditional Formatting**
3. From the first dropdown, choose *Formula Is*
4. For the formula, enter **=COUNTIF(\$A\$2:\$A\$11,A2)>1**
5. Click the Format button.
6. Select a font color for highlighting.
7. Click OK, click OK



### Highlight Items in a List

Use conditional formatting to highlight items that are in a list on the worksheet.:

1. Create a list of items you want to highlight.
2. Select range A2:A7
3. Choose **Format | Conditional Formatting**
4. From the first dropdown, choose *Formula Is*
5. For the formula, enter **=COUNTIF(\$C\$2:\$C\$4,A2)**  
or, if the list is named, use the name in the formula:  
**=COUNTIF(CodeList,A2)**
6. Click the Format button.
7. Select a font color for highlighting.
8. Click OK, click OK

|   | A     | B | C     |
|---|-------|---|-------|
| 1 | Codes |   | Valid |
| 2 | AA    |   | AA    |
| 3 | BB    |   | BB    |
| 4 | GG    |   | CC    |
| 5 | AA    |   |       |
| 6 | FF    |   |       |
| 7 | CC    |   |       |

### Highlight Lottery Numbers

You can highlight the ticket numbers that have been drawn in a lottery. In this example the ticket numbers are in cells B2:G4, and the drawn numbers are entered in cells B6:G6

1. Select cells B2:G4
2. Choose **Format | Conditional Formatting**
3. From the first dropdown, choose *Formula Is*
4. For the formula, use the CountIf function:  
**=COUNTIF(\$B\$6:\$G\$6,B2)**
5. Click the Format button.
6. Select formatting options (green pattern, in this example), click OK
7. Click OK

|   | A       | B   | C   | D   | E   | F   | G   |
|---|---------|-----|-----|-----|-----|-----|-----|
| 1 |         | No1 | No2 | No3 | No4 | No5 | No6 |
| 2 | Ticket1 | 2   | 15  | 26  | 27  | 36  | 48  |
| 3 | Ticket2 | 1   | 12  | 13  | 15  | 24  | 34  |
| 4 | Ticket3 | 3   | 5   | 20  | 28  | 37  | 40  |
| 5 |         |     |     |     |     |     |     |
| 6 | Drawn   | 3   | 15  | 25  | 26  | 47  | 49  |

### Highlight Upcoming Expiry Dates

You can highlight payments that are due in the next thirty days. In this example, Due dates are entered in cells A2:A4.

1. Select cells A2:A4
2. Choose **Format | Conditional Formatting**
3. From the first dropdown, choose *Formula Is*
4. For the formula, use the Today function count the days:  
**=AND(A2-TODAY())>=0,A2-TODAY()<=30)**
5. Click the Format button.
6. Select formatting options (Bold, Blue font, in this example), click OK
7. Click OK

|   | A         | B    |
|---|-----------|------|
| 1 | Date      | Days |
| 2 | 21-Dec-02 | -1   |
| 3 | 22-Dec-02 | 0    |
| 4 | 23-Dec-02 | 1    |

### Hide Cell Contents When Printing

You can use conditional formatting to hide cells when printing. In this example, the contents of cells B2:F4 are changed to white font, if cell H1 contains an x.

To print with the cell contents hidden, type an x in cell H1. To display the cell contents, delete the x in cell H1.

1. Select cells B2:F4
2. Choose **Format | Conditional Formatting**
3. From the first dropdown, choose *Formula Is*
4. For the formula, enter `=$H$1="x"`
5. Click the Format button.
6. Select formatting options (white font, in this example)
7. Click OK, click OK

|   | A     | B | C | D | E | F | G | H |
|---|-------|---|---|---|---|---|---|---|
| 1 |       | M | T | W | T | F |   | x |
| 2 | Dept1 |   |   |   | X |   |   |   |
| 3 | Dept2 |   | X | X |   |   |   |   |
| 4 | Dept3 |   |   |   |   |   |   |   |