Excel 2010 Intermediate
version 14.0 for Windows

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Course Code: WEX210-ONLINE-07/26/11

How To Use This Manual

 STEPS	Step-by-step directions for carrying out a particular command or task. Use the Procedure for later reference.
 Try It	Examples of how a procedure works. This is your guide during the hands-on exercises.
	A note indicates optional information and provides a more complete understanding of a particular procedure, command, or feature.
	A shortcut gives you a tip or a hint that you can use to make a command or procedure more efficient.
	A trap warns you about a menu choice, command, or keystroke that may result in an error or unexpected results.
Enter↵	A word inside a box represents a key on the keyboard.
Ctrl - D	This PC key combination indicates two keys which must be held down simultaneously. Hold down the first key, tap the second key, and then release both keys.
Home, End	This indicates a key sequence. Press the first key, release it, and then press the second key.
Program Manager	Any text in this typeface indicates the name of a folder, windows group, or icon.
Save	Any text in this typeface indicates a menu choice.
`First Qtr.`	Any text in this typeface indicates something that you will type as part of an exercise or part of a procedure.
If x>1 then	Any text in this typeface indicates program code that you will need to type in an exercise.
If x>1 then	Any text in this typeface and shading indicates program code which already exists. Use this as a reference for typing new code in programming exercises.
[argument]	A word in square brackets indicates it is optional. This is typically used in command syntax examples.
	This symbol indicates that a command, line, or program code is the continuation of the previous line.

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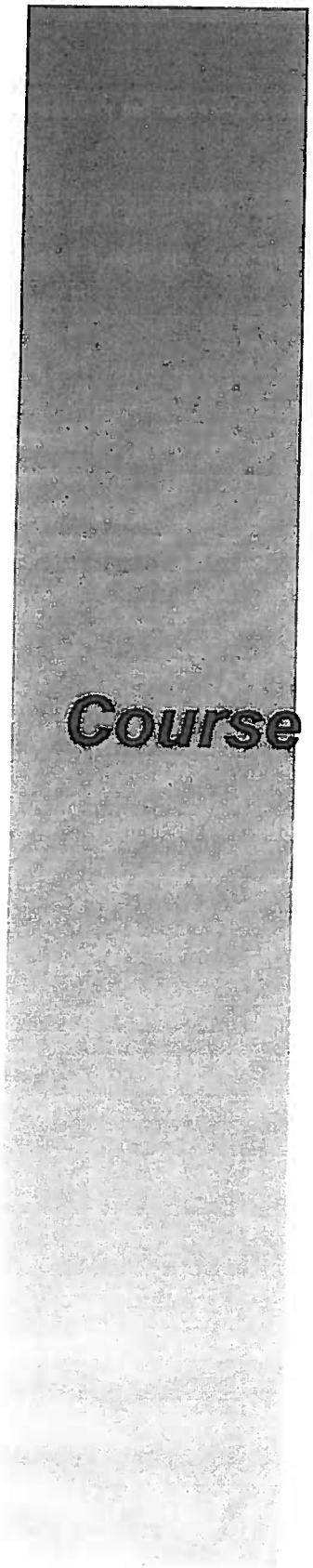


Course Objectives

Learn to rename, insert, delete, move, and copy worksheets

Create linked formulas

Understand named ranges and relative names

Work with various function commands

Use conditional formatting and data validation

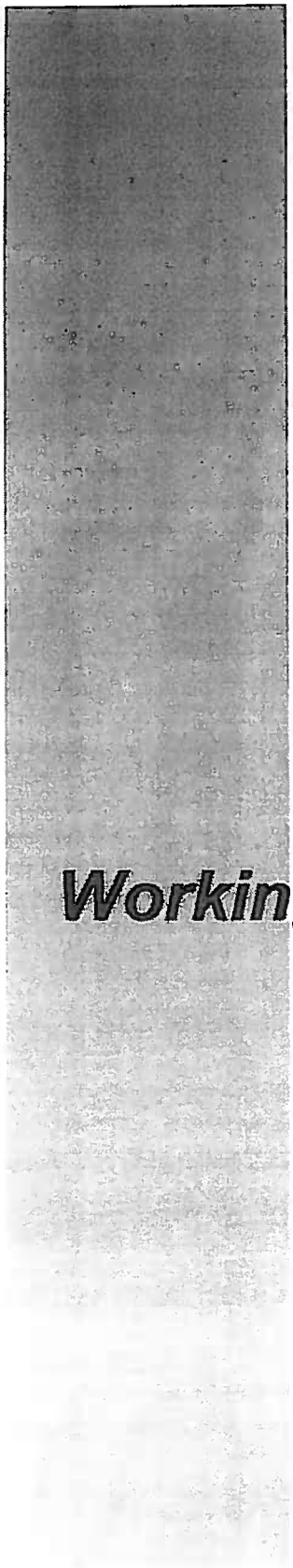
Understand auditing and error checking tools

Create, modify, and format charts

Understand table features

Create and use styles and templates

Learn to protect and share workbooks and worksheets



1

Working with Worksheets

Viewing, renaming, and color-coding worksheets

Editing a group

Manipulating worksheets

Creating linked formulas

Using 3-D references

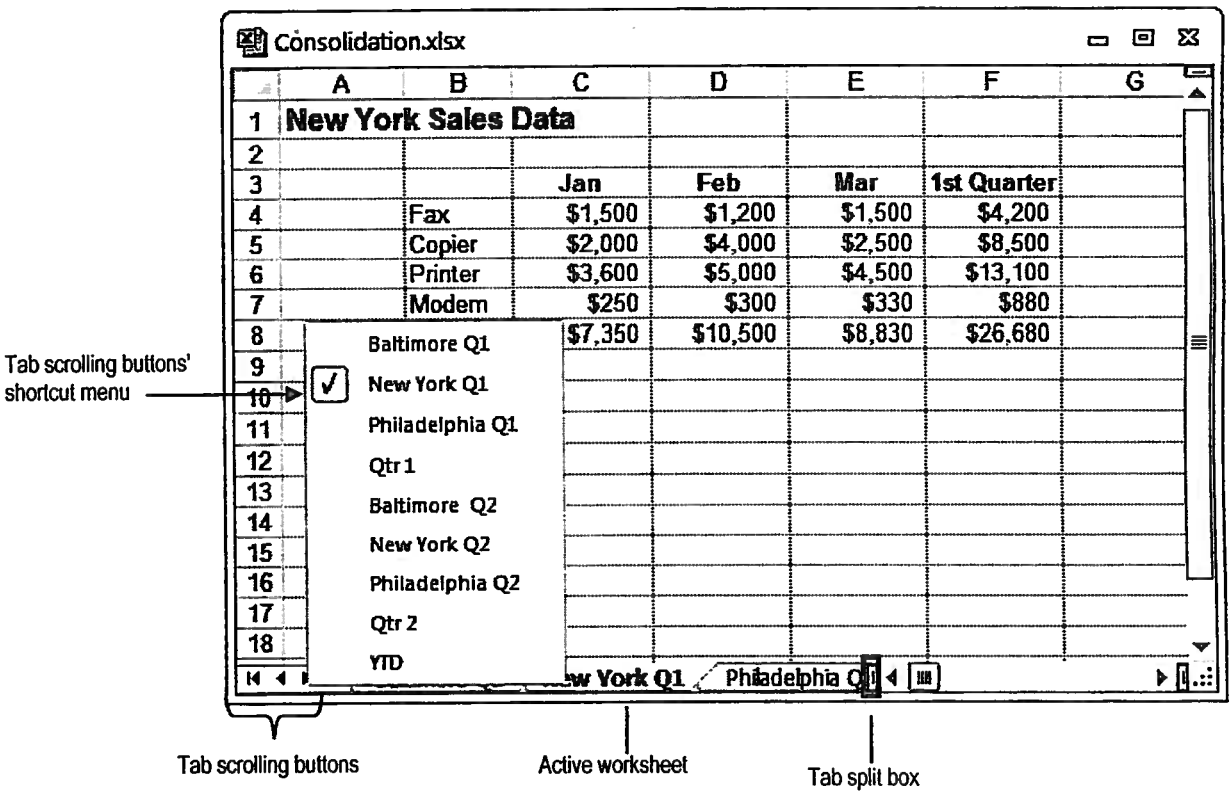
Viewing, Renaming, and Color-coding Worksheets

Viewing Worksheets

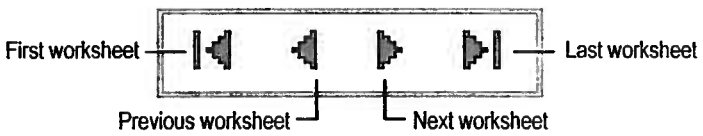
When you need to view a worksheet, you can click the appropriate worksheet tab at the bottom of the workbook window to make it the active worksheet. The active worksheet name appears in bold with a white, rather than shaded, background.

If the workbook has numerous worksheets, all of the tabs may not be visible, so Excel has several methods to select and move between worksheets. One way is to drag the tab split box to the right to reveal more worksheet tabs. Another way is to use the tab scrolling buttons in the lower left corner of the workbook window to scroll the tabs and display different ones. A third method is to right-click any one of the four tab scrolling buttons to view a menu of all tabs in the workbook.

A workbook with multiple worksheets is illustrated below showing the position of the tab scrolling buttons, as well as its shortcut menu, and the tab split box in the workbook window:



The illustration below details how the tab scrolling buttons work to scroll through worksheet tabs when not all of the tabs are visible:



Viewing, Renaming, and Color-coding Worksheets, continued:

Renaming Worksheets

In a new workbook, Excel assigns the default name "Sheet" with a sequential number, such as Sheet1 or Sheet2, to each worksheet. You can rename the worksheets to organize the workbook. Worksheet names can be up to 31 characters long and can include spaces.

If you assign a distinguishing name to each sheet, you will be able to identify the contents without having to display the worksheet. This is especially useful when you have numerous worksheets in a workbook.

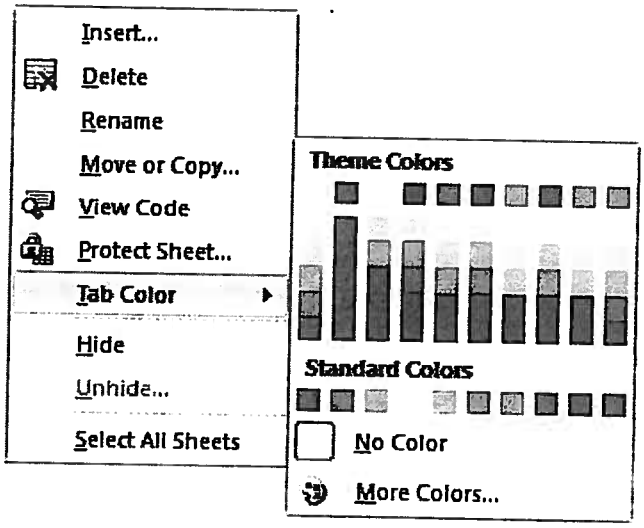
When you rename a worksheet, its tab is highlighted with a black background as shown below, and you type the new name directly on the tab to replace the old name:

Named worksheet tab

Worksheet tab ready to be renamed

Color-coding Worksheets

Besides renaming worksheets, you can also organize a workbook by changing the color of the sheet tabs. Color-coding worksheet tabs is useful when you need to be able to quickly locate certain information in a workbook. For example, if you want to easily identify all of the summary worksheets in a workbook, you can assign each of those sheets the same tab color.



Viewing, Renaming, and Color-coding Worksheets

STEPS

1. To view a different worksheet using the mouse, do one of the following:
   - If necessary, use the tab scrolling buttons to display the desired worksheet tab; click the tab of the desired sheet.
   - Right-click a tab scrolling button and select the desired worksheet from the shortcut menu.
2. To view a different worksheet using the keyboard, do one of the following:
   - Press Ctrl – Page Up to select the previous sheet.
   - Press Ctrl – PageDown to select the next sheet.
3. To rename a worksheet:
   - Double-click the desired worksheet tab;
   - Type the new name and press Enter.
4. To color-code a worksheet:
   - Right-click the desired worksheet tab;
   - Point to *Tab Color;*
   - Select the desired color in the Tab Color palette.

To display additional worksheet tabs, position the mouse pointer on the tab split box so that the pointer becomes a ⇿ and drag the tab split box to the right; to increase the size of the horizontal scroll bar, drag the tab split box to the left. Double-click the tab split box to return it to the default position.

When renaming a worksheet tab, you can edit the existing text rather than typing over it. Use the left ← and right → arrow keys and the Home and End keys to move within the text.

When you initially format the color of a worksheet tab and the worksheet is still active, the tab displays as white and the color appears only to underline the worksheet name. Once another sheet becomes the active sheet, the color displays on the entire worksheet tab.

To remove the color from a worksheet tab, access the Tab Color palette and choose *No Color.*

The shortcut menu of the tab scrolling buttons lists worksheets in the order in which they appear in the workbook.

If you have a workbook with many sheets, you can scroll a few sheets at a time by pressing Shift while clicking one of the middle tab scrolling buttons.

Use the Undo feature if you change the color of a worksheet tab and want to quickly reverse the change.

To rename a worksheet, right-click the tab and select *Rename*. Type a new name and press Enter.

Once a worksheet has been renamed, you cannot use Undo to revert to the previous name. You can, however, rename it again.

Viewing, Renaming, and Color-coding Worksheets

1. Open the **Consolidation** workbook.
2. Click the Qtr 1 worksheet tab to make it the active sheet.
3. Use ⏭ to display the last worksheet tab.
4. Click the Qtr 2 worksheet tab to view the contents of the sheet.
5. Right-click any tab scrolling button and select *Qtr 1* from the shortcut menu.
6. Click the ⏮ tab scrolling button to display the first worksheet tab.
7. If necessary, drag the Tab Split box to the right to display all worksheet tabs.
8. To rename the Qtr 1 worksheet:
   - Double-click the Qtr 1 worksheet tab;
   - Type `1st Quarter` as the new name;
   - Press Enter.
9. Rename the Qtr 2 worksheet tab to `2nd Quarter`.
10. To color-code a worksheet:
    - Right-click the 1st Quarter worksheet tab and point to *Tab Color*;
    - Click one of the green color boxes that appears under Theme Colors.
11. Change the color of the 2nd Quarter worksheet tab to the same shade of green as the 1st Quarter worksheet tab.
12. Save the workbook.

Editing a Group

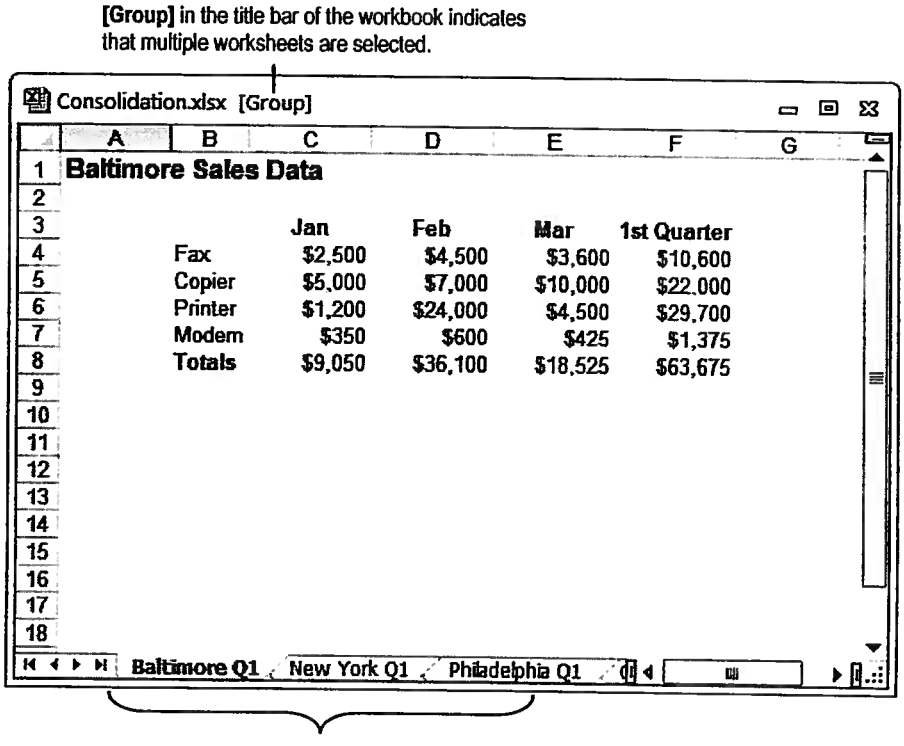
Editing worksheets as a group can save you time with entering, changing, and formatting worksheet information. Use this feature when you need to create or modify several similar worksheets.

For instance, if you need to set up several worksheets in the same manner, you can temporarily group blank worksheets together and create them simultaneously by entering the labels, numbers, and formulas that you want to appear on all sheets in the group. You can also alter column widths and row heights, change the appearance of text, and, in general, format the active worksheet the way you want all of the sheets to look.

Changes to the active worksheet are repeated in the corresponding cells of other worksheets in the group. If you want to view or enter changes on another worksheet in the group, you can click any sheet tab in the group to make it the active worksheet and the group will stay intact. If all the sheets in a workbook are part of the group, clicking another sheet tab will exit the group.

Once the worksheets are created, you can disband the group and work on the sheets individually. At any time, you can regroup the sheets or form another group using different worksheets whenever you need to add, edit, or format information in worksheets that look alike.

The illustration below shows a series of adjacent worksheets grouped for editing:



Editing a Group

STEPS

1. Select the first worksheet to be modified.
2. To group nonadjacent worksheets:
   - Hold down Ctrl;
   - Click the other worksheet tabs to be included in the group.
3. To group adjacent worksheets:
   - Hold down ⇧ Shift while clicking the last desired worksheet tab.
4. Make the desired modifications.
5. To exit group editing, use the appropriate method:
   - Click a worksheet tab not in the group.
   - If all worksheets are in the group, click any other worksheet tab.
   - Right-click a sheet tab in the group; choose *Ungroup Sheets*.

When several worksheets in a workbook are grouped, click any sheet tab in the group to make it the active sheet and retain the group.

If you close and save a workbook with multiple worksheets selected, the worksheets will still be grouped when you reopen the file.

Sheet tabs that are color-coded or appear with the default shading indicate that those worksheets are not part of a group.

To group all worksheets in a workbook, right-click the tab of the sheet you want to edit and choose *Select All Sheets* from the shortcut menu. If you want to make a different sheet active while maintaining all sheets in the group, right-click the desired sheet and choose *Select All Sheets*.

To quickly copy data from one worksheet to corresponding cells of other worksheets, select the worksheet that contains the data and the sheets to which you want to copy the data; select the cells containing the data you wish to copy. On the Home tab locate the Editing group; click Fill, and then select *Across Worksheets*. Make the desired selection from the Fill Across Worksheets dialog box and click OK.

If you delete cells, rows, or columns in the active worksheet, they will be deleted in all of the other worksheets in the group as well.

Essentially, all changes are repeated in all worksheets in a group. Entering data in cells in the active sheet will overwrite data in the corresponding cells of grouped worksheets.

When all sheets in a workbook are grouped, clicking any sheet other than the active sheet will ungroup all of the worksheets.

Editing a Group

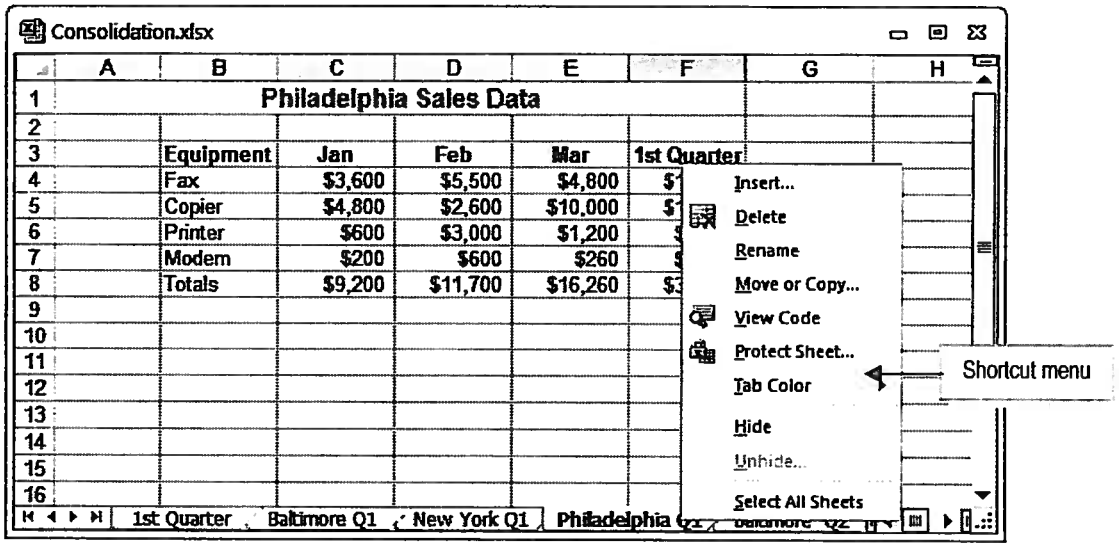
1. In the **Consolidation** workbook, view the Baltimore Q1, New York Q1, and Philadelphia Q1 worksheets to see that the worksheets have the same type of information and are similar in structure. Also notice that the width of column B is slightly narrower on the Baltimore Q1 worksheet.
2. View the Baltimore Q1 worksheet.
3. Hold down Shift and click the Philadelphia Q1 worksheet tab. Notice that [Group] appears in the title bar.
4. Select the cells A1 through F1; on the Home tab, click Merge and Center in the Alignment group.
5. Click the New York Q1 worksheet tab and note the changes on the worksheet.
6. With merged cell A1 still selected, click the down arrow of Font Color in the Font group and click one of the blue color boxes under Theme Fonts.
7. Click the Philadelphia Q1 worksheet tab, note the changes.
8. View the Baltimore Q1 worksheet. In cell B3, enter `Equipment` as the column label.
9. View all three worksheets in the group and notice that "Equipment" does not fit in the column.
10. To adjust column B, double-click the line between columns B and C in the workbook frame in any one of the selected worksheets.
11. Exit the group by clicking the 1st Quarter worksheet tab and view the changes in the three worksheets.
12. Regroup the same 3 worksheets.
13. To color-code the tabs of the grouped worksheets:
    - Right-click any one of the grouped worksheet tabs, point to *Tab Color* and choose a color.
14. Ungroup the worksheets.
15. Group and then color-code the Q2 worksheets in a different color.
16. Ungroup the Q2 worksheets and save the workbook.

Manipulating Worksheets

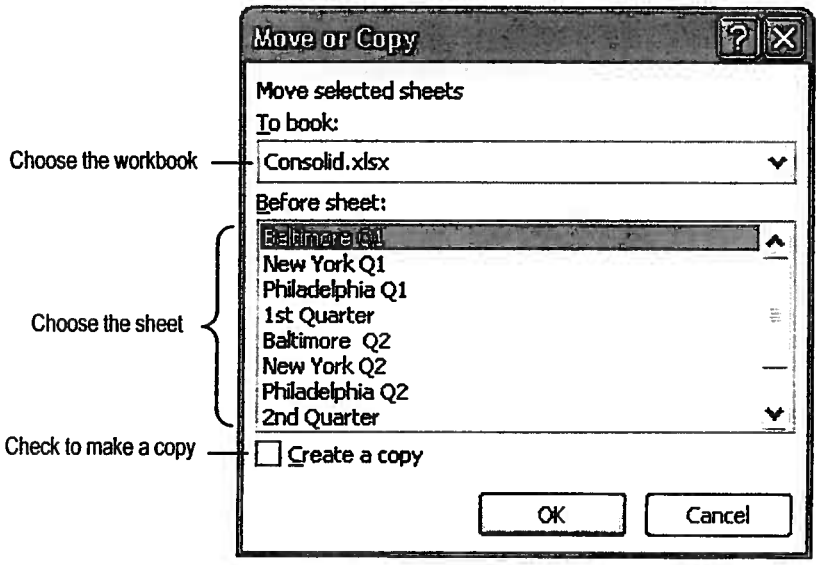
Excel gives you control of inserting, deleting, moving, copying, and hiding worksheets. By default, when you create a new workbook it contains three worksheets. If desired, you can delete the extra worksheets so that only one remains in the workbook. If you need additional worksheets later, you can insert them at any time. Although new worksheets are inserted before the active worksheet, you can reposition them as needed in the workbook.

To create a new worksheet that is similar to an existing one, you can duplicate the worksheet and then make the necessary alterations to the duplicate. Worksheets may be copied or moved within the same workbook or between open workbook files.

When you right-click a worksheet tab or a group of selected tabs, the shortcut menu illustrated below displays to help you manipulate worksheets:



The Move or Copy command on the worksheet shortcut menu above opens the dialog box illustrated below for you to duplicate or relocate worksheets within the same workbook or to another open workbook:



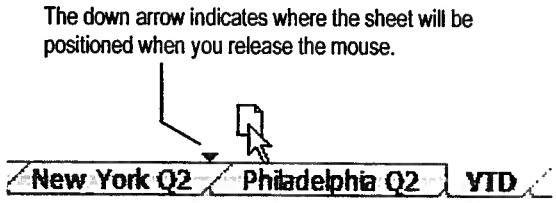
Manipulating Worksheets, continued:

Using Drag-and-Drop to Move and Copy Worksheets

To quickly move or copy single or multiple worksheets, you can use the drag-and-drop methods illustrated below:

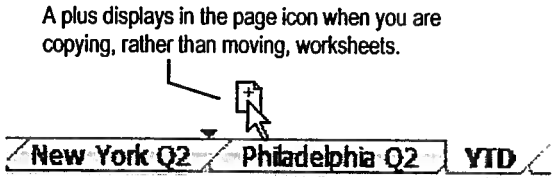
Move

To move a single worksheet, drag it to the desired location.



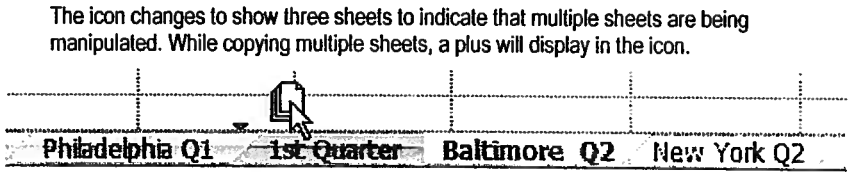
Copy

To copy a single worksheet, hold down Ctrl while you drag the sheet to the desired location.



Move or Copy Multiple Sheets

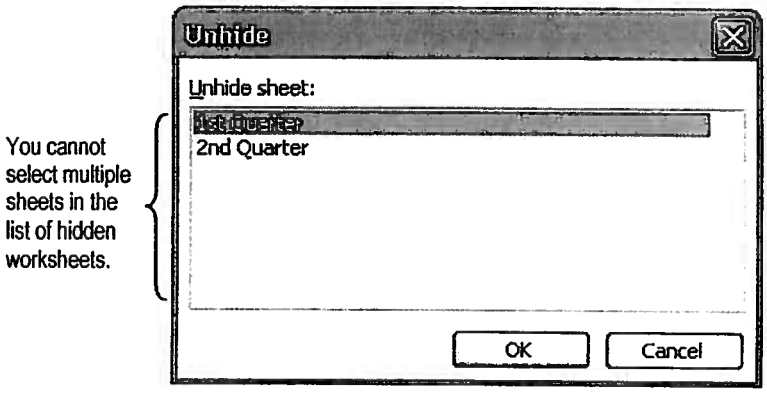
To move or copy multiple sheets, first select them. When moving the sheets, you can drag any one of the grouped sheet tabs. When copying the sheets, hold down Ctrl while dragging the sheet tab of the active worksheet to the desired location.



Hiding Worksheets

If need be, you can also hide worksheets so that they cannot be readily viewed. If you have hidden multiple worksheets, they can only be unhidden one at a time.

The dialog box for unhiding worksheets is shown below:



Manipulating Worksheets

STEPS

1. Select the worksheet or worksheets to be manipulated.
2. To move selected worksheets within a workbook or to another workbook:
   - Right-click a selected worksheet tab and select *Move or Copy*;
   - Select the target workbook from the *To book* drop-down list;
   - Optionally, choose the desired worksheet location from the *Before sheet* list box; then click OK.
3. To copy selected worksheets within a workbook or to another workbook:
   - Right-click a selected worksheet tab and select *Move or Copy*;
   - Click in the checkbox next to *Create a copy*;
   - Select the target workbook from the *To book* drop-down list;
   - Optionally, choose the desired worksheet location from the *Before sheet* list box; then click OK.
4. To delete selected worksheets from a workbook:
   - Right-click any sheet tab in the group and choose *Delete*.
   - If prompted to confirm the deletion, click Delete.
5. To hide selected worksheets, do one of the following:
   - On the Home tab, locate the Cells group and click Format; point to *Hide & Unhide* and then select *Hide Sheet*.
   - Right-click any sheet tab in the group and choose *Hide*.
6. To unhide a worksheet:
   - Right-click any visible worksheet tab and choose *Unhide*;
   - In the Unhide box, select the worksheet to unhide;
   - Click OK.
7. To insert worksheets in front of the active sheet:
   - Ensure that the number of worksheets selected is the same as the number of sheets to be inserted and do one of the following:
     - On the Home tab, locate the Cells group and click Insert; select *Insert Sheet*.
8. To insert one worksheet after the last sheet:
   - View the last worksheet tab and then click the Insert Worksheet tab.

Manipulating Worksheets, continued:

In the Move or Copy dialog box, select *(new book)* from the *To book* drop-down list to create a new workbook that contains only the moved or copied worksheets.

To move or copy a worksheet to another named workbook, the workbook must be open.

The default number of worksheets in a new workbook is three. To change that value, click the File tab and click Options. Make sure the General options are displayed and enter the new value in the *Include this many sheets* text box; then click OK. The maximum number of worksheets you can enter as the new default is 255; however, you can insert as many additional worksheets as desired, limited only by your computer's available memory.

Using the shortcut menu to insert a sheet gives you a choice as to the type of sheet to be inserted. To insert an additional worksheet, right-click the tab of the worksheet to follow the new sheet and select *Insert*. On the General tab of the Insert dialog box, *Worksheet* should already be selected for you; click OK to accept the choice.

If a worksheet contains data when you attempt to delete it, Excel displays the warning *"Data may exist in the sheet(s) selected for deletion. To permanently delete the data, press Delete."* You will receive the same warning for worksheets that you have used, even if you have deleted the data and they are blank when you attempt to delete them.

To use the drag-and-drop method to copy or move worksheets between open workbooks, arrange or tile the windows of the workbooks so you can see both worksheet areas simultaneously. To tile the open workbooks, click the View tab and locate the Window group, click Arrange All; choose *Tiled*, *Horizontal*, or *Vertical*.

Press Shift – F11 to quickly insert a worksheet in front of the active sheet.

No two worksheets in a workbook can have the same name.

You cannot use the Undo command to reverse the action of moving, copying, or deleting worksheets.

You cannot simultaneously insert noncontiguous worksheets.

Excel does not display a warning when you delete worksheets that have never been used.

Manipulating Worksheets

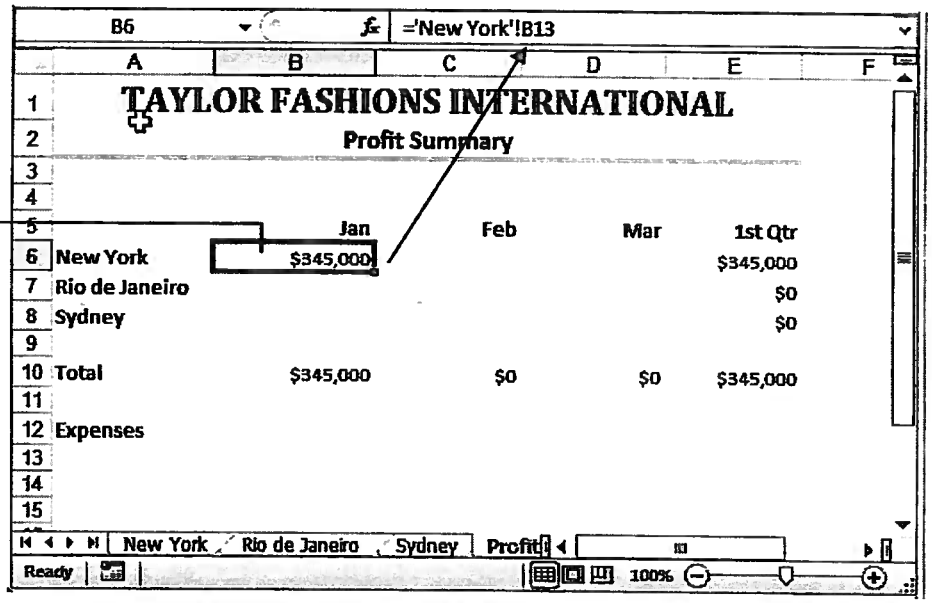
1. In the **Consolidation** workbook, right-click any worksheet tab and choose *Select All Sheets* from the shortcut menu.
2. To copy all of the sheets to a new workbook:
   - Right-click any worksheet tab and select *Move or Copy*;
   - Select the *Create a copy* check box (so you don't mistakenly move the sheets, instead of copying them);
   - Open the *To book* drop-down list and select *(new book)*;
   - Click OK; note by the name in the title bar that you are viewing a new workbook.
3. To use drag-and-drop to copy several worksheets in the new workbook:
   - If necessary, click ⏭ to display the last worksheet tab;
   - Select the three Q2 worksheets, Baltimore Q2 through Philadelphia Q2;
   - Position the mouse pointer over the active sheet of the three selected sheets;
   - Hold down Ctrl and drag the duplicates after the YTD sheet;
   - Release the mouse before releasing Ctrl. Note that each copied worksheet has a (2) after its name to distinguish it from the original sheet.
4. Edit the worksheet names to: Baltimore Q3, New York Q3, and Philadelphia Q3.
5. Group the three Q3 worksheets and do the following:
   - Change the color of the tabs;
   - Select the range C4:E7 and press Delete to remove the values from the worksheets, while retaining the formulas.
6. To insert a new worksheet in front of the YTD sheet:
   - Click the YTD worksheet tab;
   - Display the Home tab and locate the Cells group; click the down arrow next to Insert and select *Insert Sheet*.
7. Name the new sheet `Mid-YTD` and move the YTD sheet to the end of the tabs.
8. To hide the quarterly worksheets:
   - Select the 1st Quarter and 2nd Quarter worksheets;
   - In the Cells group, click Format and point to *Hide & Unhide*; select *Hide Sheet*.
9. Unhide the 1st Quarter worksheet and delete the Mid-YTD worksheet.
10. Save the workbook in the student data folder as **Third Quarter**.
11. Close all open files.

Creating Linked Formulas

You can create formulas that refer to cells in other worksheets or workbooks. This process is called "linking" because it allows automatic updating of data in the target or linked worksheet whenever data is changed in the source worksheet. Linking can be accomplished by creating simple formulas or by using the Paste Link option of the Paste Special command.

The illustration below shows a sample of a worksheet link:

Target formula in cell B6 references another worksheet as the source of the information.



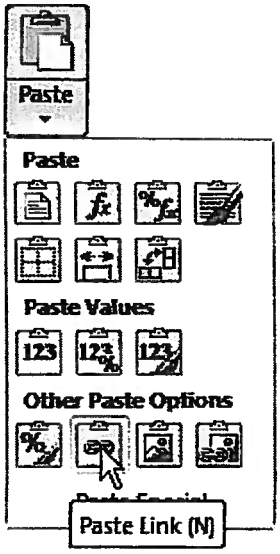
When you create a formula linked to another worksheet, the name of the sheet appears in the formula separated from the cell reference by an exclamation point. When you create a formula linked to another workbook, the name of the workbook appears in square brackets. If you create formulas by selecting cells, rather than by typing, the cell references will be relative when referring to another sheet and absolute when referring to another workbook.

The table below shows the basic differences in linked formulas:

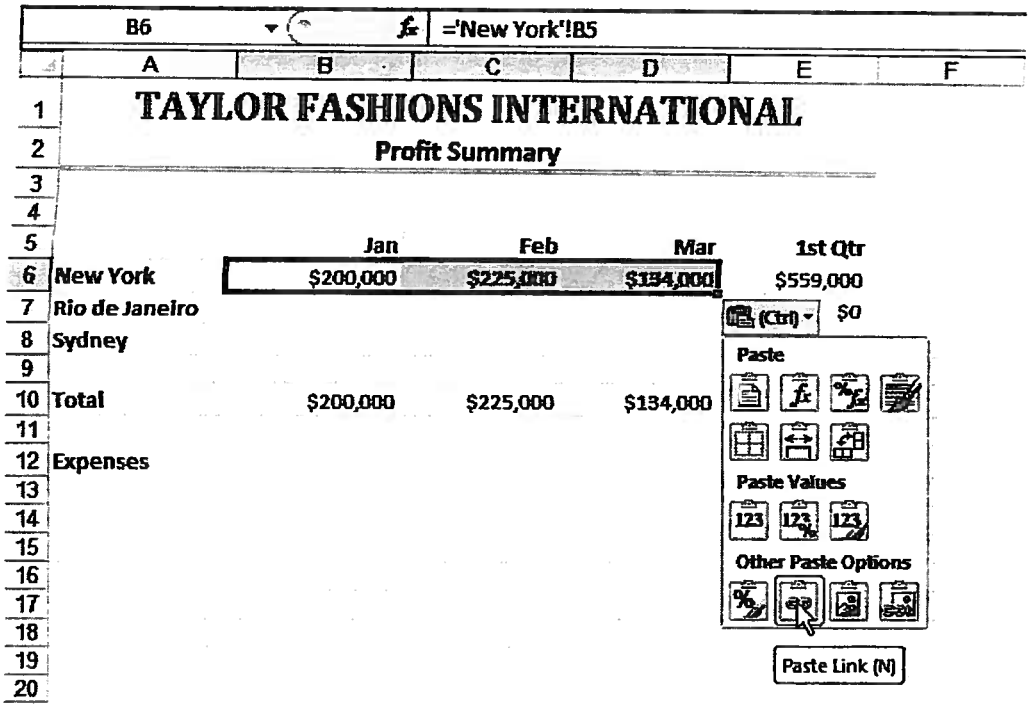
Linked to:	Resulting Formula:
A worksheet in the same workbook	=Sheet2!B1
Another workbook	=[Book2]Sheet2!$B$1

Creating Linked Formulas, continued:

After you copy a cell or range of cells from a source worksheet, you can establish a link using the drop-down list of the Paste button:



If you paste an item, the Paste Options button automatically appears as below the cell or range of cells. Click the button to choose an option for the pasted information; the Paste Link choice lets you link the pasted data to the copied cells.



Creating Linked Formulas

STEPS

1. Select the cell or range in the source worksheet that will be the reference.
2. Click Copy.
3. Select the desired worksheet in the target workbook.
4. Select the cell that represents the upper left corner of the Paste range for the target formula.
5. On the Home tab, locate the Clipboard group and click the Paste down arrow; choose *Paste Link*.

Some tools are segmented with the top portion of the tool being a button that you click and the lower portion of the tool a drop-down arrow that displays different options of the command. The Paste tool is an example of this type of tool; click the lower portion of the tool to display the menu containing the *Paste Link* option.

If a workbook contains links to another workbook, display the Data tab, locate the Connections group, and then click Edit Links to do any of the following: update links in the workbook, open or change the source workbook, or break the link.

To display options for updating links upon opening a workbook, display the Data tab; in the Connections group, click Edit Links. Click Startup Prompt and make a selection.

Depending on your security settings, when you open the target workbook, the message "*Automatic update of links has been disabled*" may appear in the Info Bar under the Ribbon. If necessary, click Options, choose *Enable this content* and then click OK. This will allow Excel to automatically update the links.

If either the source or target workbook has been moved to another location, the following prompt will appear when you open the companion workbook: "*This workbook contains one or more links that cannot be updated. To change the source of links, or attempt to update values again, click Edit Links. To leave the links as is, click Continue.*" To relocate a linked workbook, click Edit Links; in the Edit Links dialog box, select the link that contains the linked file name and click Change Source. Navigate to the location of the moved workbook, select the file, and click OK to update the linked data; then close the Edit Links dialog box.

The Paste Option button is on by default. If it does not appear when you paste an item into a worksheet, click the File tab and click Options. Display the Advanced options and select *Show Paste Options buttons when content is selected* from the options under Cut, copy and paste. It should then display the next time you paste into the worksheet.

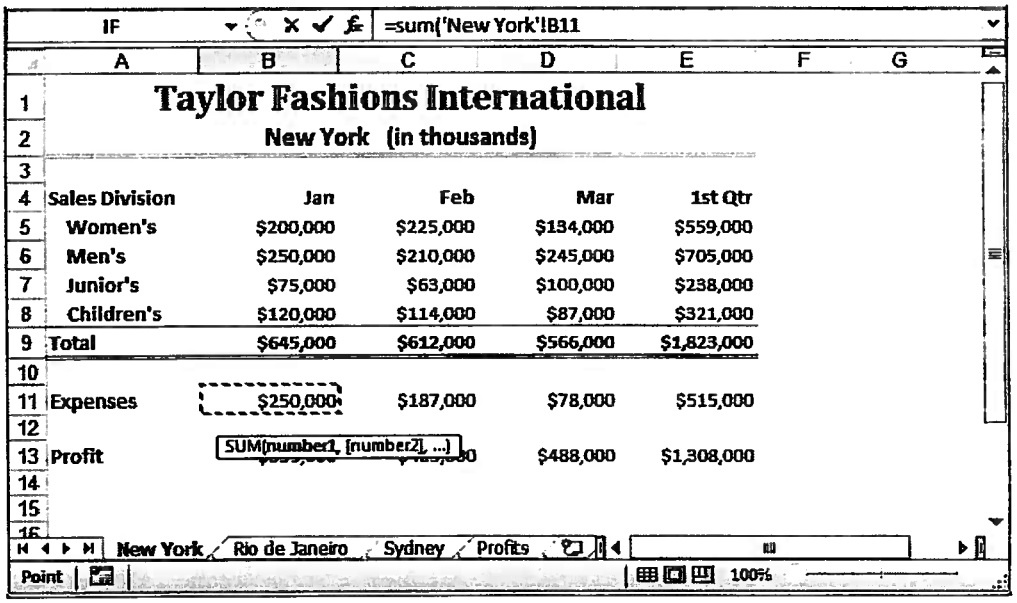
Creating Linked Formulas

1. Open **Links** and view the New York, Rio de Janeiro, Sydney, and Profits worksheets.
2. To create a formula that links the profit figures on the New York worksheet to the New York row in the Profit Summary worksheet:
   - Select the New York worksheet;
   - In the Profit row, select the range B13:D13;
   - On the Home tab, locate the Clipboard group and click Copy;
   - Move to the Profits worksheet;
   - Select cell B6;
   - To see what happens if you just paste the copied information into the cells, click Paste in the Clipboard group and view the results;
   - To correct the results, click the Paste Options button and choose *Paste Link* from the bottom row;
   - View each of the three linked formulas in the Formula bar.
3. To create a formula that links the profit figures on the Rio de Janeiro worksheet to the Rio de Janeiro row on the Profits worksheet:
   - On the Rio de Janeiro worksheet, copy the range B13:D13;
   - Move to the Profits worksheet and select cell B7;
   - In the Clipboard group, click the down arrow on the Paste command and select *Paste Link.*
4. Paste link the same range from the profit row of the Sydney worksheet into cell B8 in the Profits worksheet.
5. Note the value in cell B6 on the Profits worksheet.
6. On the New York worksheet, change the value in cell B5 to `250,000` and note the change in cell B13 below it.
7. Display the Profits worksheet and note the change in cell B6, the New York profit for January.
8. Save the workbook.

Using 3-D References

You may need to create formulas that use information from several worksheets. If the data on the worksheets is not arranged similarly, you will need to view each sheet separately to create its reference for a formula. However, if the worksheets are arranged in an identical fashion, you can use a three-dimensional reference that spans multiple adjacent worksheets for certain functions. A *3-D reference* refers to the same cell or range of cells on multiple sheets.

The illustration below shows a 3-D sum function being created on the Profits worksheet in cell B11 on three contiguous worksheets—New York, Rio de Janeiro, and Sydney:



Three-dimensional references can make lengthy formulas more readable. For instance, if you created a simple formula that adds the expenses for the same cell in the three worksheets above, it would look like this:

```
='New York'!B11+'Rio de Janeiro'!B11+Sydney!B11
```

By comparison, the 3-D formula is simplified and condensed to:

```
=sum('New York:Sydney'!B11)
```

Using 3-D References

STEPS

1. Select the cell that will contain a three-dimensional function.
2. Type = followed by the name of the function and an opening parenthesis; for example: `=sum(`
3. Select the tab of the worksheet that contains the first reference in the function.
4. Click the cell that represents the data for the first reference in the function.
5. If necessary, click a tab scrolling button to display the tab of the last worksheet to be referenced.
6. Hold down Shift and click the tab of the worksheet that contains the last reference in the function.
7. Press Enter.

A number of common functions can be used with three-dimensional references, including: SUM, AVERAGE, COUNT, MIN, MAX, and PRODUCT.

For a full list of functions that can use 3-D references, see the Excel Help topic titled "Refer to the same cell or range on multiple sheets."

The Auto Fill Options button appears after dragging over a range with the Auto Fill handle and offers options for filling the range. Click Auto Fill Options to display the list of options. Auto Fill options vary according to the type of data to be filled. The button will disappear with the next action you perform.

Using 3-D References

In this exercise, you'll first create a simple formula that sums information on three worksheets and then create a SUM function using a 3-D reference to accomplish the same thing. As you create the formulas, note how they are being built in the Formula bar.

1. In the **Links** workbook, create a simple linking formula for expenses using the following information:
   - On the Profits worksheet, select B12 and type an [=];
   - Click the New York worksheet tab;
   - Click B11 in New York and type a [+];
   - Click B11 in Rio de Janeiro and type a [+];
   - Click B11 in Sydney and press [Enter].
2. As an alternative, create a 3-D linking formula for the expenses using the steps below:
   - Select cell B13 on the Profits worksheet;
   - Type `=sum(` and click the New York worksheet tab;
   - Select cell B11;
   - Hold down [Shift] and click the Sydney worksheet tab;
   - Press [Enter].
3. Compare the formulas.
4. Select both formulas and use the Auto Fill handle to copy both formulas across the row to column E.
5. Save and close the workbook.

2

Working with Functions

Using absolute cell references

Creating and using named ranges

Creating a relative named range

Using custom zoom

Using functions

Working with Insert Function

Using financial functions

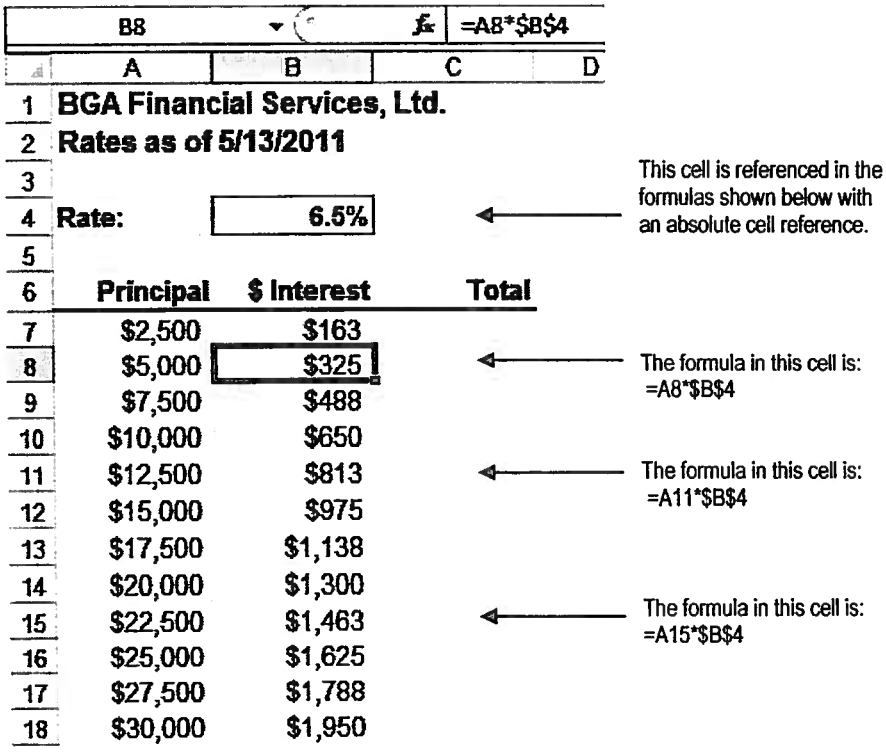
Using date functions

Using Absolute Cell References

Typically when a formula is copied, the cell references in the duplicate formula change to reflect the new location of the formula. This is because, by default, the cell references in formulas are relative references. However, sometimes it is necessary to have a cell reference that remains constant when it is copied so that it always refers to a specific cell. This requires the use of an absolute cell reference. An absolute cell reference in a formula will not change when it is copied to another location. The absolute reference is created by placing a dollar sign to the left of both the column letter and the row number in the cell reference, for example $B$4.

A common use for an absolute cell reference is to include a variable constant value in a formula, for example, an interest rate or sales quota.

The illustration below shows a typical use of an absolute cell reference:



F4

Using Absolute Cell References

STEPS

1. Select the cell that will contain the formula.
2. Press [=].
3. Build the formula as usual.
4. To make a cell an absolute reference:
   - While building the formula, press [F4] when the cell is selected.
5. Build the remainder of the formula, as necessary.
6. To complete the formula, perform one of the following:
   - Press [Enter↵].
   - Click [✓] Enter on the Formula Bar.

When you press [F4], the cell reference becomes absolute. Optionally, you can continue to press [F4] to make only the row reference absolute or only the column reference absolute. For example, H$7 is an absolute row reference while $H7 is an absolute column reference.

Using Absolute Cell References

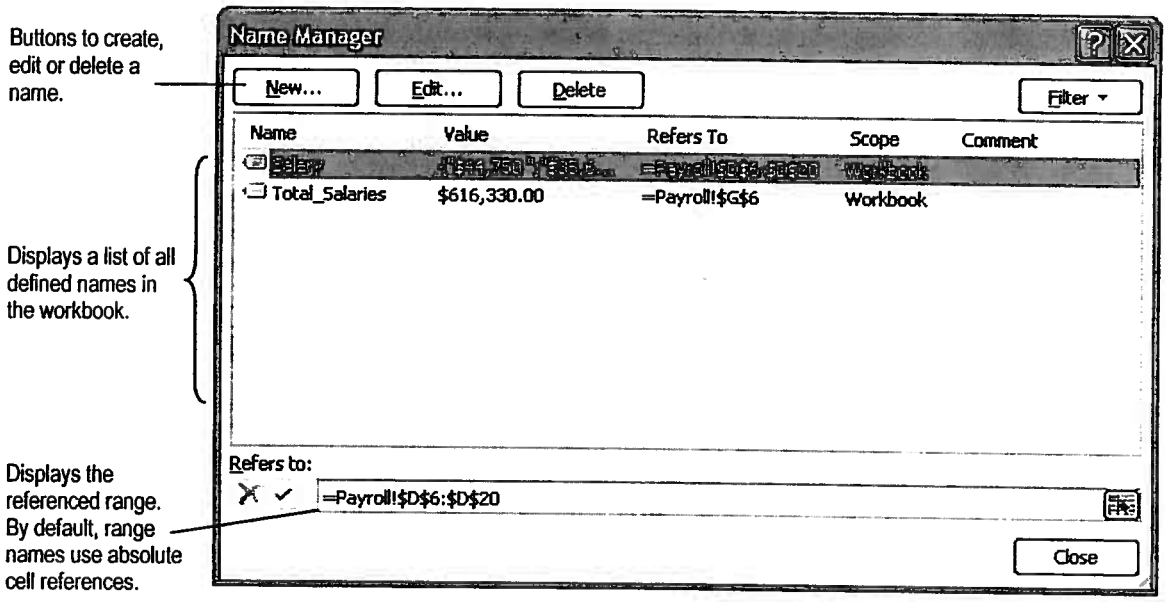
Try It

1. Open the **Function** workbook.
2. On the Absolute worksheet tab, select cell B7.
3. Create a formula that multiplies the principal in cell A7 by the interest in cell B4.
4. Fill the formula down the column and note the error messages.
5. Select cell B7 and click in the Formula bar after the reference to cell B4.
6. Press [F4] to make the reference to B4 an absolute reference; the reference should appear as $B$4. Press [Enter↵].
7. Copy the formula down the column again.
8. Complete the Total column, if desired.
9. On the Bonus worksheet, create a formula in C7 that will calculate the Principal multiplied by the Rate. Make sure the Principal column letter and the Rate row number are absolute.
10. Copy the formula from C7:F18 then save the workbook.

Creating and Using Named Ranges

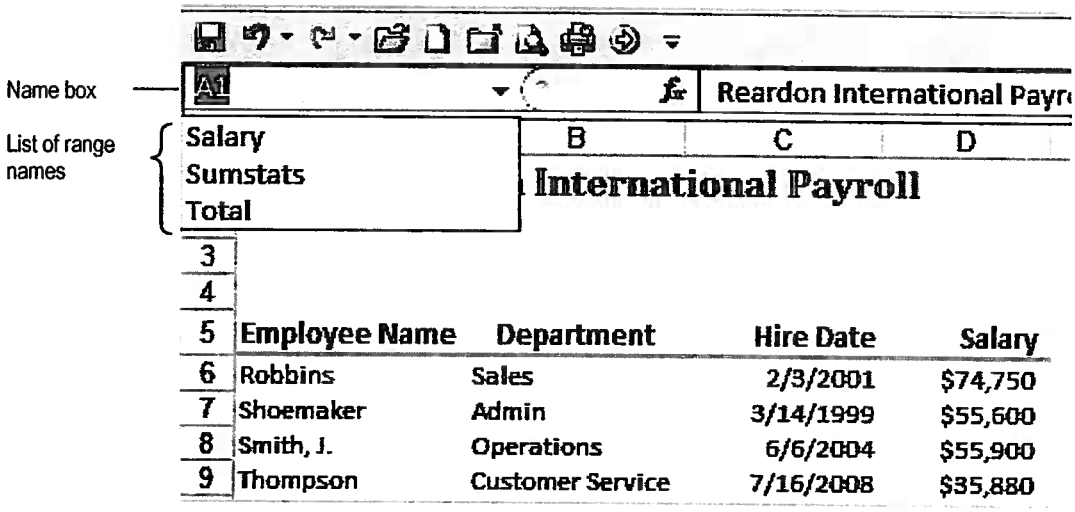
You can attach a name to a cell or group of cells. Once named, the cells can be referred to by name instead of by cell addresses. Creating defined names for worksheet areas can simplify using advanced commands and formulas. Range names can serve as a type of internal documentation that helps you to understand what is happening in a formula. In addition, if named cells are cut and pasted into another location, the name follows the data to the new location.

The Name Manager dialog box is illustrated below:



The Name box, on the left end of Excel's Formula bar, can also be used to quickly create an absolute named range. After you create named ranges in a workbook, you can also use the Name box to move the cell pointer quickly to a named range.

The Name box is illustrated below displaying its list of range names:



Creating and Using Named Ranges

STEPS

1. To create a named range using the Name Manager dialog box:
   - Select the cell or cells to be named;
   - On the Formulas tab, locate the Defined Names group and select *Name Manager*;
   - Select *New*;
   - Type the desired name in the *Name* text box and click OK. Click Close.
2. To create a named range using the Name box on the Formula bar:
   - Select the cell or cells to be named;
   - Click once in the Name box;
   - Type the desired name;
   - Press Enter.
3. To move to a defined name, use one of the following methods:
   - Open the Name box drop-down list and select the desired name.
   - Press F5, select the desired name from the list in the Go To dialog box, and click OK.

Defined range names must start with a letter, underscore (_), or a backslash (\) and are not case sensitive. You can use numbers, letters, periods and underscore characters but no spaces in your range name. Be careful not to use names that resemble cell references such as BC10 or QTR1. Defined range names can be up to 255 characters.

After defining the first named range, if you wish to create other named ranges, click New to leave the Define Name dialog box open. Type the next name, and use Collapse Dialog in the *Refers to* text box to select the appropriate range in the worksheet. When you have finished naming ranges, click Close.

When a defined range is selected, its name, rather than a cell address, appears in the Name box on the Formula bar.

Excel's Name box list is not available while you are editing a cell. To display a list of defined range names while editing, press F3. The Paste Name dialog box will be displayed so that you can select the desired range name.

You can use defined names in formulas and functions. For example, `=sum(wktotal)`.

To create names based on existing worksheet labels, select the ranges including the cells with labels. On the Formulas tab, locate the Defined Names group and select *Create from Selection*; indicate where the labels are situated: *Top row, Left column, Bottom row,* or *Right column*; and click OK.

The error value #NAME? will display in any cells containing a formula that refers to a range name that you have deleted.

Remember to press Enter if you create a range name using the Name box.

Range names use absolute cell references by default.

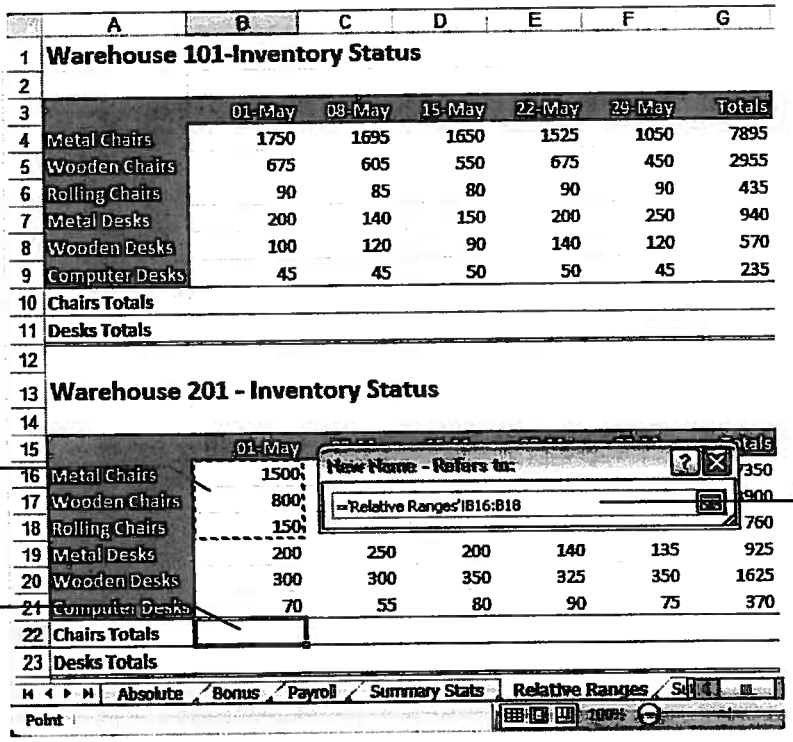
Creating and Using Named Ranges

1. On the Payroll worksheet in the **Function** workbook, select cells D6:D20.
2. On the Formulas tab, locate the Defined Names group and click Name Manager.
3. In the Name Manager box, click New.
4. In the New Name dialog box, note the suggested name Salary and the information in the *Refers to* text box and then click OK. Click Close.
5. To use the Salary range name in the statistical formulas:
   - In G3 type `=max(salary)` and press Enter;
   - In G4 type `=min(` and press F3;
   - Select the range name *Salary*, click OK, and press Enter;
   - Use the AVERAGE and SUM functions to complete the formulas in G5 and G6.
6. To name and then move the summary information to the Summary Stats worksheet:
   - Select the range F1:G6;
   - Click once in the Name box;
   - Type in the name `sumstat` and press Enter;
   - On the Home tab, click Cut.
   - Move to the Summary Stats sheet and click Paste in cell A1;
   - Return to the Payroll sheet and use the *Name* drop-down list to go to the *Sumstat* range in its new location.
7. Press F5 and use the Go To dialog box list to go to the *Salary* range.
8. Save the workbook.

Creating a Relative Named Range

By default, when you create a range name the cell references are absolute. If you use a range name in a formula and you want that named range reference to change when you copy the formula, the defined name should be relative. When you create a relative name, the cells that are named are relative to the active cell. Therefore, it is important that you select the correct cell prior to creating a relative name.

The illustration below shows the New Name dialog box with a relative name:



The cells being named display a marquee and are relative to the position of the cell pointer.

Cell addresses shown here are relative. Note the absence of the $ characters.

Creating a Relative Named Range

STEPS

1. Select the cell to which the named cells will be relative.
2. On the Formulas tab, locate the Defined Names group and select *Name Manager*; click New.
3. Type the desired name in the *Name* text box.
4. Press Tab three times or click Collapse Dialog in the *Refers to* text box.
5. Select the cell or cells to be named in the worksheet.
6. Press F4 three times to make the cell references relative.
7. Expand the dialog box, if necessary.
8. Click OK.

Creating a Relative Named Range, continued:

When you press F4, the cell reference changes from absolute to a mixed reference. Continue to press F4 to cycle through all the combinations; for example, H$7 is an absolute row reference while $H7 is an absolute column reference.

The Auto Fill Options button appears after dragging a range with the Auto Fill handle and offers options for filling the range. Click Auto Fill Options to display the list of options; the options shown will vary according to the type of data being fill. The Auto Fill Options button disappears with the next action you perform.

After an item is pasted, the Paste Options button automatically appears below the cell or range of cells. You can choose the characteristics of the pasted information after it has been pasted into the selection.

When you type the left parenthesis after the function name, a ToolTip appears displaying the recommended function arguments. Click the function name to link to the Help topic for that specific function.

When you enter a range name in a formula, the Range Finder feature places a colored border around the range used in the calculation.

When creating a relative name, do not select the cells to be named before opening the New dialog box. If you do, the cells will be relative to the active cell in the selected range. If you use this defined name in a formula, it will result in a circular reference.

Creating a Relative Named Range

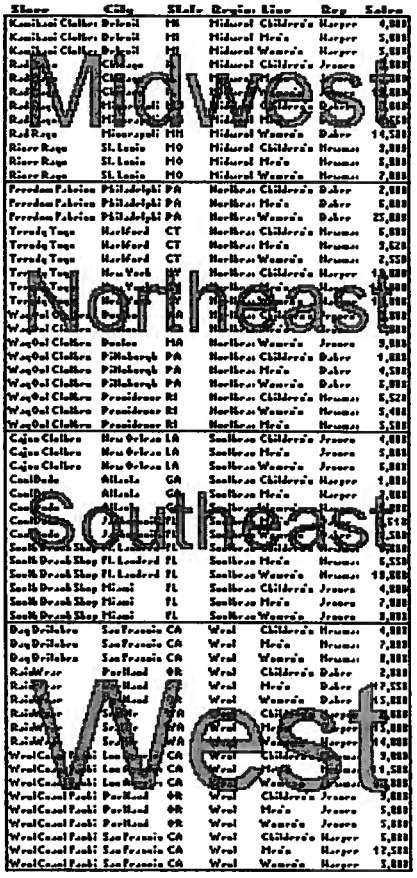
In this exercise, we'll first use an absolute range name in a formula so you can see the problem when copying the formula. Then we'll create a relative range name, use it in a formula, and copy the formula to see it done correctly.

1. Click the Relative Ranges worksheet tab in **Function**, and define the name `Chairs` for the range B4:B6.
2. Create the formula `=sum(Chairs)` in cell B10.
3. Use the fill handle to copy the formula, which uses an absolute range name, across the row and note the erroneous formula results.
4. To determine that the range "Chairs" is absolute, select cell E10 and use the Name box to select the range. Note that it refers to B4:B6.
5. Select cell B22.
6. On the Formula tab, locate the Defined Names group and select *Name Manager*.
7. Select "Chairs" in the Name Manager dialog box and click Edit.
8. Click Collapse Dialog in the *Refers to* text box.
9. Select the range B16:B18.
10. Press F4 three times to make the cell references relative.
11. Expand the dialog box, click OK, and then click Close. Notice the totals in row 10 have updated.
12. Type `=sum(chairs)` in cell B22.
13. Copy the formula across the row using the fill handle.
14. Double-click cell D10 and notice the formula is fixed. Press Esc to exit the formula.
15. Select cell B11 and create a relative named range for Desks using cells B7:B9.
16. In cell B11 create a formula to total the Desks named range.
17. Copy the formula from B11 to C11:G11 and B23:G23.
18. Save the workbook.

Using Custom Zoom

You can see the defined names associated with ranges of cells on the worksheet when you reduce the zoom magnification below 40%. This is most useful when working with fairly large ranges in a worksheet. When custom zoom is activated, you can see a border around each range and the name superimposed over the cells.

The worksheet in the illustration below is using Custom Zoom to show Defined Names:



Using Custom Zoom

STEPS

1. To display Custom Zoom:
   - On the View tab, locate the Zoom group and select *Zoom*;
   - Type `39` in the Custom % text box; click OK.
2. To return to Normal Zoom:
   - On the View tab, locate the Zoom group and click *100%*;

Any zoom percentage below 40% will display defined range names for absolute ranges. Relative range names are not displayed.

Return to Normal View from a custom view by pressing Ctrl – Z or clicking Undo if changing to the custom view was your last command.

The zoom tools on the status bar can be used to adjust the magnification.

Using Custom Zoom

1. Display the Payroll worksheet in the **Function** workbook.
2. On the View tab, in the Zoom group, select *Zoom*.
3. Enter `39` in the *Custom* text box.
4. Click OK.
5. Note the label for the range Salary.
6. Return the view magnification to *100%*.

Using Functions

A function is a predefined formula that performs calculations by inputting specific values in a particular order. The specific values used in a function are called the *arguments* and the order is referred to as the *syntax*.

A number of functions work as shorthand methods for performing calculations. For example, the SUM function can be used in place of a lengthy formula adding the values in a group of cells. In other instances, functions are substitutes for complex formulas. Knowing the interest rate and the amount you want to borrow, you can calculate the monthly payment on a loan using the PMT financial function.

While different functions require different input, all functions are comprised of three components: an equal sign, followed by the name of the function, and the arguments in parentheses.

The following describes the syntax of a function:

=function name(arguments)

```
=SUM(C14:C24)
```

=	indicates that a calculation is to be performed.
Function Name	is the name of the function.
Arguments	are the specific values to be used as input. Arguments are typically cell addresses or defined range names. They are listed inside parentheses and are separated by commas. In the example above, the SUM function has one argument, which is the range C14:C24.

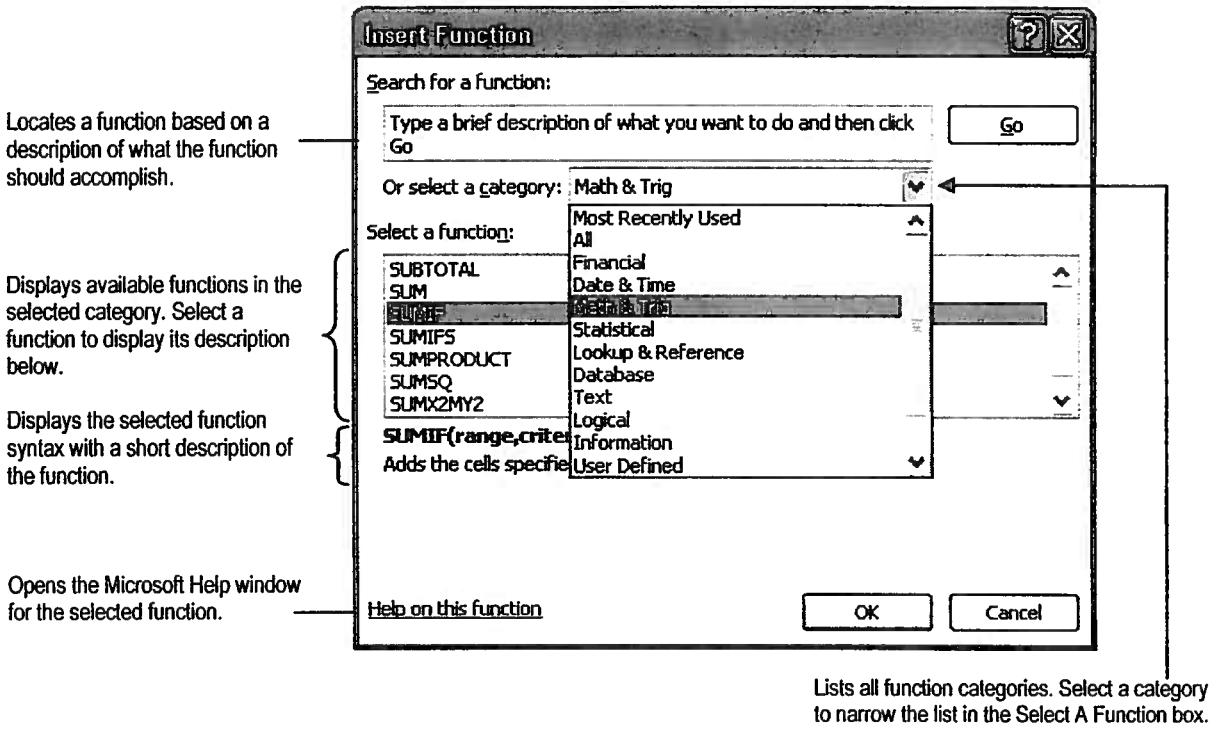
Using Functions, continued:

Excel has numerous functions that are divided into specific categories. The most commonly-used categories, along with examples and descriptions, are listed below:

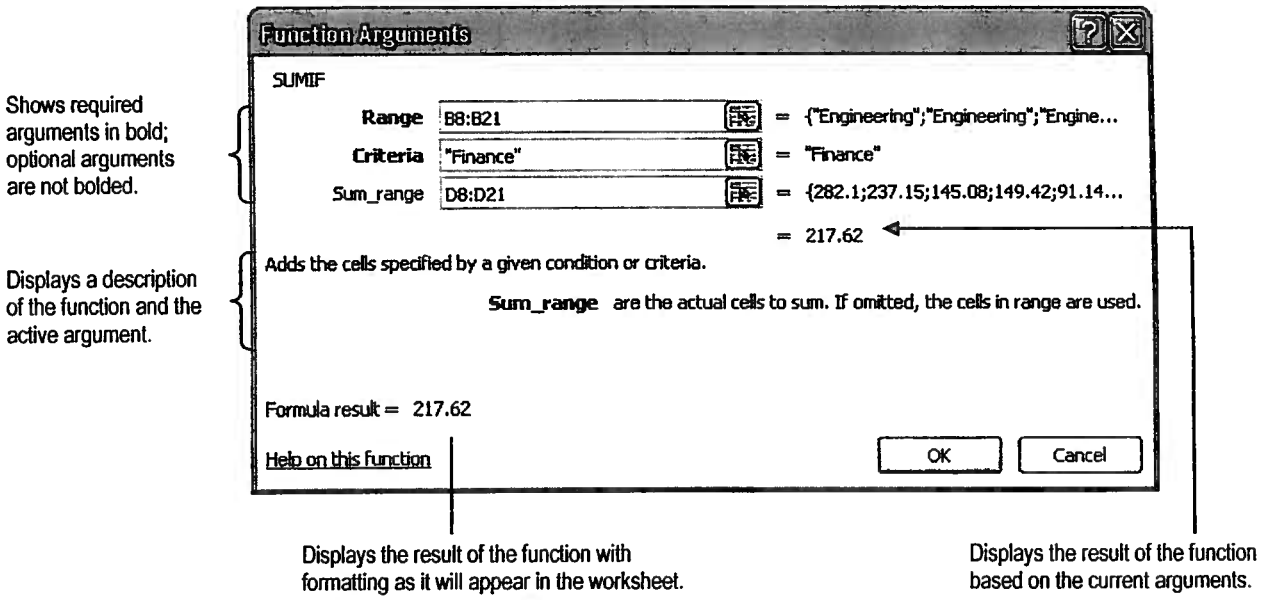
Category	Example	Description
Math and Trigonometry	=ROUND(number,number of digits)	performs calculations on numbers. The arguments vary based on the function.
Statistical	=AVERAGE(range)	performs statistical calculations on a group of numbers. The arguments are usually ranges of cell addresses.
Financial	=PMT(rate,number of periods, present value,future value,type)	calculates interest rates, payments, and other financial outcomes. The arguments are usually cell addresses.
Text	=VALUE(text)	changes the appearance of text. The argument is usually a single cell address.
Logical	=IF(logical_test,truevalue, falsevalue)	tests a condition and returns values based on the result. The arguments vary based on the function.
Date and Time	=MONTH(date)	manipulates dates entered into the worksheet. The arguments vary based on the function.

Working with Insert Function

The Insert Function dialog box, illustrated below, is used to select a function for a worksheet calculation; it provides a search feature as well as descriptions and help information on all of Excel's functions:



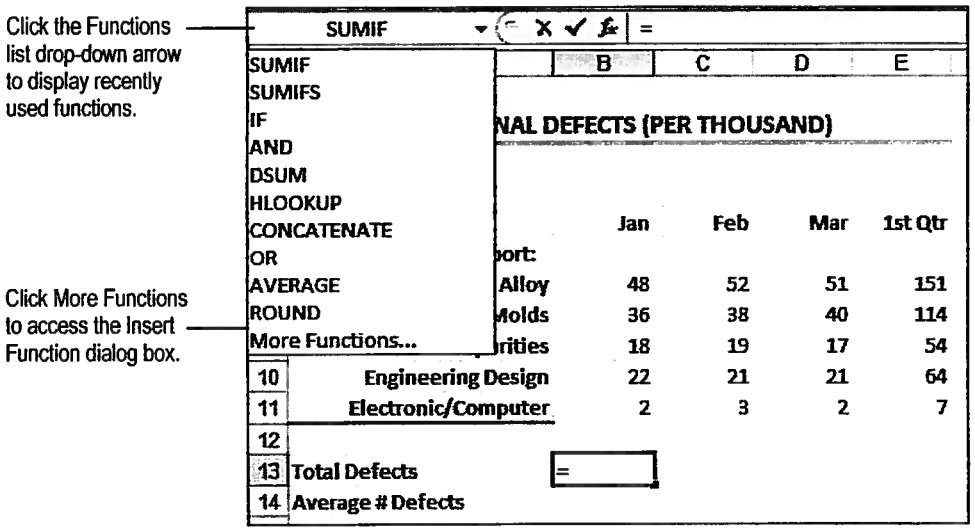
Once you select the desired function, the Function Arguments dialog box, which is illustrated below, displays to assist you in assembling the function arguments and inserting the function into the worksheet:



Working with Insert Function, continued:

The Name box on the Formula bar changes to the Functions list whenever you start with an equal sign (=) in a cell. The most recently used function name appears in the box; other recently used functions appear in the drop-down list attached to the Functions list.

The Functions list is illustrated below:



Working with Insert Function

STEPS

1. Select the cell that will contain the function.
2. Use the desired method to display the Insert Function dialog box:
   - Click the Formulas tab and click Insert Function in the Function Library group.
   - Click Insert Function on the Formula bar.
   - On the Home tab, click the AutoSum drop-down arrow and select *More Functions*.
   - Type = and click the Functions drop-down arrow on the Formula bar; select *More Functions*.
3. Do one of the following:
   - Enter search text in the *Search for a function* text box and click Go.
   - Select the desired Function category.
4. Select the desired Function name from the *Select a function* list box.
5. Click OK.
6. To enter arguments in the Function Arguments dialog box, use the desired method:
   - Click in the appropriate text box, if necessary, and type the cell address or range.
   - Click Collapse Dialog in the appropriate text box, select the desired cells in the worksheet, and press Enter.
7. Click OK.

The result of the function will be displayed in the Function Arguments dialog box. If the value does not look correct, edit the arguments before clicking OK.

To access a list of all available functions in the Insert Function dialog box, choose *All* in the *Or select a category* drop-down list. Click any function in the *Select a function* list box to display a short description of it below the list.

To display more in-depth information about a specific function, select it in the *Select a function* list box, and then click Help on this function at the bottom of the dialog box.

If you are unsure of a function name, you can search for it in the Insert Function dialog box. Type a short description of what the function should do in the *Search for a function* text box and click Go. In the *Select a function* list box, select each recommended function and note its description until you find the correct one.

Working with Insert Function, continued:

You do not need to include quotation marks to enter text as an argument in the Function Arguments dialog box.

Text entered as a function argument is not case sensitive.

When typing a function directly into a cell, the Function AutoComplete feature displays a scrollable list containing the functions that start with the letter or letters that you have typed. A ScreenTip appears with a description for the function that is selected in the list. You can use the ↑ and ↓ arrows to scroll through the list. To select a function, double-click it or press the Tab key when the desired function is selected.

If a cell has an error in the formula, a green triangle will display in the upper-left corner and the Trace Error button will appear when the cell is selected. Point to the Trace Error button to display a ScreenTip describing the error or click the button to display a list of commands to help resolve the error.

Once an error is resolved, the Trace Error button and green triangle disappear from a cell.

As an alternative to using the Collapse Dialog button, select the desired text box and then select cells directly in the worksheet. If necessary, move the dialog box so that you can view the desired cells.

Double-click a function in the *Select a function* list box of the Insert Function dialog box to quickly display the Function Arguments dialog box.

To edit an existing function using the Function Arguments dialog box, select the cell in the worksheet that contains the function and click Insert Function on the Formula bar.

While the Function Arguments dialog box is displayed, you cannot access range names from the Name box on the Formula bar to use them as arguments. You can, however, press F3 to open the Paste Name dialog box, which contains a list of range names for the current workbook. Select the desired range name from the list and click OK to paste the name into the active argument text box.

You do not have to use the Insert Function dialog box or the Function Arguments dialog box to enter a function into a cell. If you are familiar with a function's syntax, you may prefer to type the function directly into a cell.

Select a cell and press Shift – F3 to access the Insert Function dialog box. If the selected cell already contains a formula, the Function Arguments dialog box will be displayed.

To copy a function example to a worksheet for reference, select Help on this function in the Insert Function dialog box, click How do I copy an example under **Example** in the help topic for the function and follow the instructions.

Working with Insert Function

1. In the **Function** workbook, display the SumIf worksheet.
2. Select cell B26.
3. Click Insert Function on the Formula bar.
4. With the text in the *Search for a function* text box selected, type `count` and click Go.
5. Select a few of the functions that appear in the *Select a function* list box and note their descriptions; then select the COUNTIF function in the list.
6. Click Help on this function at the bottom of the Insert Function dialog box.
7. If you are not familiar with this function read the information and note the examples. Close the Help window when you are finished.
8. Click OK to accept the COUNTIF function.
9. In the Function Arguments dialog box, note the description for the active argument named Range and then click Collapse Dialog in the *Range* text box.
10. Select the range B8:B21 and press Enter to expand the dialog box.
11. Type `Engineering` in the *Criteria* argument text box.
12. Click in the *Range* text box and note the answer that appears in the Formula result area. Click OK.
13. To create a SUMIF function that will add the amounts in column D based on the department name, do the following:
    - Select cell C26 and click Insert Function on the Formula bar;
    - In the Insert Function dialog box, select *Math & Trig* from the *Or select a category* drop-down list;
    - In the *Select a function* list box, choose *SUMIF* and click OK;
    - In the Function Arguments box, enter the range B8:B21 as the Range argument;
    - Enter `Engineering` as the Criteria argument;
    - Enter the range D8:D21 as the Sum_range argument;
    - Check the formula result and then click OK.
14. Save the workbook.

Working with the Functions List

1. In the SumIf worksheet, type = in cell B27.
2. On the Formula bar, click the Functions list drop-down arrow and select *COUNTIF*.
3. Drag the Function Arguments dialog box to the right of the worksheet data, if necessary.
4. In the Function Arguments box, make sure the cursor is in the *Range* argument box.
5. In the worksheet, select the range B8:B21.
6. Press Tab to move the cursor to the *Criteria* argument box and then type `Finance` for the Criteria argument.
7. Click OK.
8. Enter a SUMIF function in C27 to sum the mileage amount for the Finance department. Use the Functions list to display the Function Arguments box for the function.
9. If time allows, create COUNTIF and SUMIF functions for the remaining departments.
10. Save the workbook.

Working with the Formulas Tab

1. In the Round worksheet, select cell D4.
2. On the Formulas tab, locate the Function Library group and click Math & Trig.
3. Select *Round*.
4. In the *Number* text box, type `B4`.
5. In the *Num_digits* text box, type `C4`.
6. Click OK.
7. Use the Auto Fill feature to copy the formula down the column.
8. Save the workbook.

Using Financial Functions

A financial function is a formula used to make a financial calculation. Most functions require arguments to calculate the result. In financial functions, a negative number represents any payment that is made; whereas amounts received are represented by a positive number.

The PMT Function

One commonly used financial function is PMT. The PMT function calculates the payment per period for a loan.

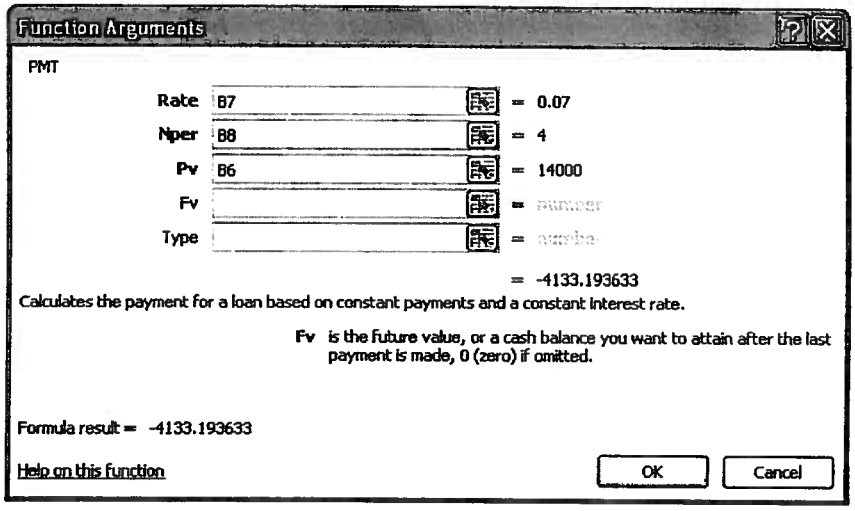
The syntax of the PMT function is as follows:

=PMT(Rate,Nper,Pv,Fv,Type)

```
=PMT(0.1,48,19000,,1)
```

Rate	is the interest rate per period.
Nper	is the number of payments for the loan.
Pv	is the present value or amount of the loan.
Fv	is the cash balance at the end of the loan. This argument is optional and defaults to 0 if omitted.
Type	indicates when the payments are due. Payments due at the beginning of the period = 1; payments due at the end of the period = 0. This argument is optional and defaults to 0 if omitted.

The illustration below shows the Function Arguments dialog box for the PMT function:



Using Financial Functions, continued:

The Rate Function

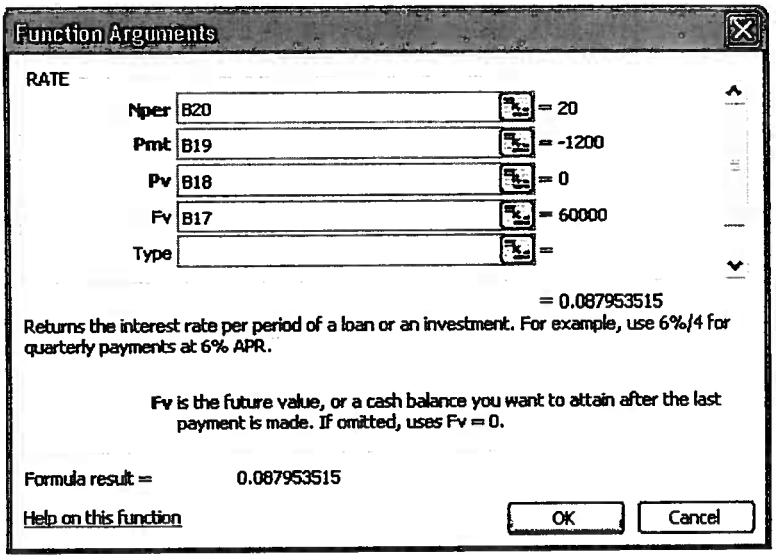
Another common financial function is the RATE function. RATE calculates the periodic interest rate necessary for the present value to grow to the future value. The syntax of the RATE function is as follows:

=RATE(Nper,Pmt,Pv,Fv,Type)

```
=RATE(48,-250,0,19000,1)
```

Nper	is the number of payment periods.
Pmt	is the payment per period. This number is traditionally a negative number and cannot change over life of the investment.
Pv	is the present value.
Fv	is the cash balance you wish to realize at the end of the period, the future value. This argument is optional and defaults to 0 if omitted.
Type	indicates when the payments are due. Payments due at the beginning of the period = 1; payments due at the end of the period = 0. This argument is optional and defaults to 0 if omitted.

The illustration below shows the RATE function from the syntax box above as it would appear in the Function Arguments dialog box:



Using Financial Functions

STEPS

1. Select the desired cell.
2. On the Formula tab, locate the Function library group and click Financial.
3. Select the desired function from the list.
4. Enter the required arguments.
5. Click OK.

The rate and number of periods must be consistent units in the PMT function. For example, if you make annual payments on a five-year loan at an 8% annual interest rate, you would specify 8% as the rate and 5 as the nper. If you make monthly payments on the same loan, specify the rate as 8% / 12 and the nper as 5*12.

Using Financial Functions

1. In the **Function** workbook, click the Financial Fx worksheet tab and select cell B10.
2. On the Formula tab, locate the Function library group and click Financial.
3. Select *PMT*.
4. Make sure the cursor is in the *Rate* text box and then select cell B7 in the worksheet.
5. Press Tab to move to the *Nper* text box.
6. Set the Nper argument using the Term in B8.
7. Move to and then set the Pv argument using the Principal in B6.
8. Click OK.
9. Using the PMT function again, create a new formula in B11 that calculates the monthly payment due on the loan. If you need a hint, hover the mouse pointer over cell B11.
10. Change the Term to 5 in cell B8 and note the changes in the payments.
11. Select cell B22 and click Insert Function.
12. Select the *RATE* function and click OK.
13. Enter the appropriate values from the worksheet into the Function Arguments box.
    - **Nper** – Term
    - **Pmt** – Payment
    - **Pv** – Present Value
    - **Fv** – Future Value
14. Check the formula result and then click OK.
15. On the Home tab click Increase Decimal twice to display the result with 2 decimal places.
16. Change the Future Value to `$75,000` and note the change in the rate.
17. Save the workbook.

Using Date Functions

Since Excel stores dates and times as serial values, you can perform complex date and time arithmetic in your worksheets. The number 1 represents the beginning date of January 1, 1900. Successive dates are numbered in order to represent the number of days from the base date. For instance, the serial value for January 1, 2011 is 40,544 because it is that many days further on the timeline from the starting date.

Excel's date functions can help you manipulate dates. For example, you can use a date function to determine the year, month, or day on which a specific date falls.

Below are examples of several date function options:

=NOW( )	enters today's date along with the current time into a cell. You may need to change the format to see the time, which shows as a decimal place. The NOW function updates each time you open or recalculate the worksheet.
=TODAY( )	enters today's date into a cell. The TODAY function updates each time you open or recalculate.
=YEAR(x)	returns the year of the specified date (e.g., 1999, 2000).
=MONTH(x)	returns the month of the specified date (e.g., 2, 12).
=DAY(x)	returns the day of the specified date (e.g., 13, 30).
=WEEKDAY(x)	enters the day of the week of the specified date. By default, Sunday is equal to 1, Saturday is equal to 7.
=DAYS360(startdate, enddate)	calculates the numbers of days between two dates based on a 360 day year.

The illustration below shows a worksheet containing several common date functions:

	A	B	C	D	E	F	G
1							
2		=NOW()	5/13/2011 12:14				
3		=TODAY()	5/13/2011				
4							
5		Last day of the Year	12/31/2011				
6							
7		=YEAR(C3)	2011				
8		=MONTH(C3)	5				
9		=DAY(C3)	13				
10		=WEEKDAY(C3)	6	(1=Sunday. 2=Monday. 3=Tuesday. etc.)			
11							
12							
13		=DAYS360(C3,C5)	228				

Using Date Functions

STEPS

1. Select the desired cell.
2. Use the desired method to open the Insert Function dialog box.
3. Select *Date* from the *Or select a category* drop-down list.
4. Select the desired function from the *Select a function* list box.
5. Enter the required arguments.
6. Click OK.

You can type dates directly in cells using either forward slashes or hyphens as separators. For instance, to enter December 31, 2011, you can type either 12/31/11 or 12-31-11. Excel will automatically format the cell as a date.

Although you can type a two-digit year for a date, Excel will display the year with 4 digits. For instance, if you type 1/1/11, Excel will display 1/1/2011.

December 31, 2029 is the last date for which you can type a two-digit year and get the correct year. For example, if you type 1/1/30 into a cell, Excel will display 1/1/1930. To avoid confusion, you may want to enter the year with all four digits.

To display the serial value for the *=TODAY( )* or *=NOW( )* functions or a date or time that you have entered into a cell, you must change the format of the cell. To format the cell, display the Home tab and locate the Number group. Open the Number Format drop-down list and choose *General* or *Number*.

Time values are stored in Excel as decimals after the date value. The beginning of a day is 12:00 midnight; so, the value 0.5 represents 12:00 noon. For example, if you enter the *=NOW( )* function into a cell on January 1, 2011 at noon and format it to display the serial value, the number will show as 40544.5.

Using Date Functions

1. Display the Date Functions worksheet in **Function**.
2. Type `=today()` in cell B14 and press Enter.
3. In cell E4 use the DAYS360 function to calculate the approximate number days since the last order date.
4. Use the Order Date in C4 as the Start_date argument.
5. Use the current date in B14 for the End_date argument; make the reference to it an absolute reference.
6. Copy the function down the column.
7. Save and close the workbook.

3

Working with Formatting and Data Validation

Using conditional formatting

Using data validation

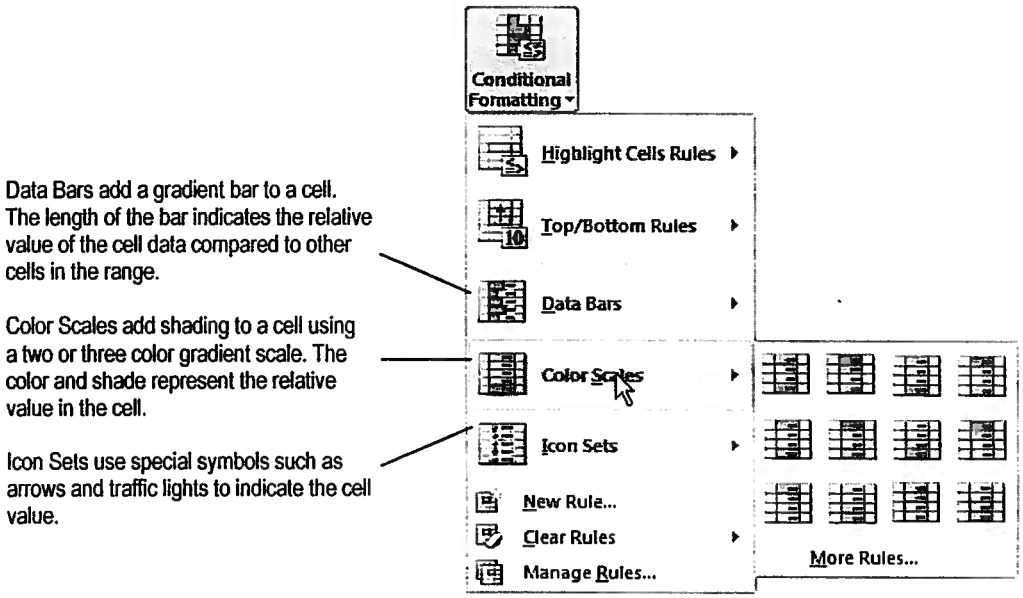
Creating and using custom formats

Working with auditing and error checking tools

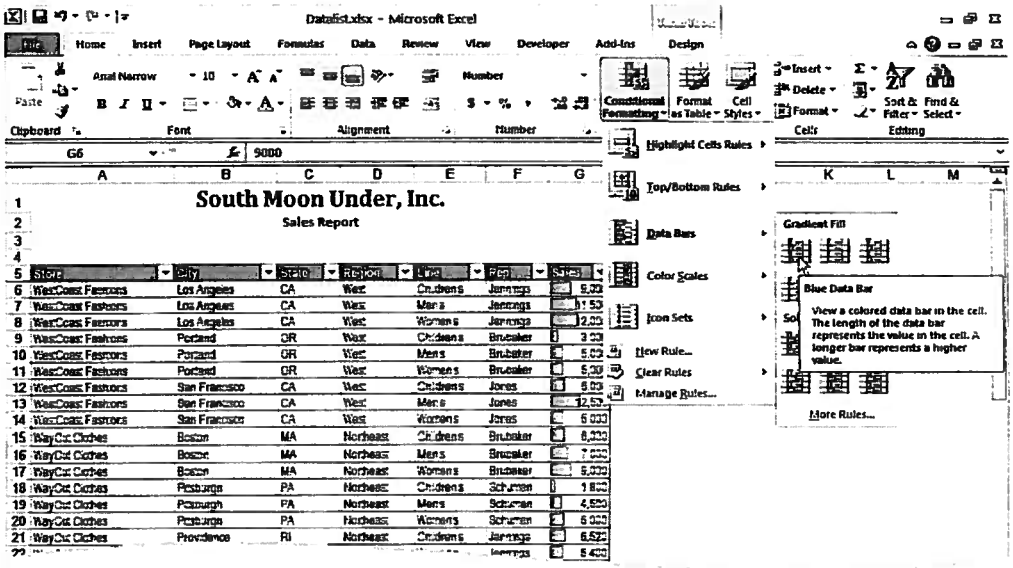
Applying Conditional Formatting

Conditional formatting facilitates data analysis by adding visual indicators to your data that allow you to spot trends and recognize patterns at a glance. The formatting applied to a cell is based on the cell's value as compared to some criteria. Excel provides several sets of built-in indicators that show values in relation to one another; alternatively, you can apply formatting based on criteria that you set.

The Conditional Formatting options are found in the Styles group on the Home tab:



In the picture below, the Data Bars formatting appears on a range of cells:



Applying Conditional Formatting

STEPS

1. Select the range of data for the conditional formatting.
2. On the Home tab, locate the Styles group and click Conditional Formatting.
3. To format cells based on their value using one of the built-in indicators:
   - Point to the *Data Bars*, *Color Scales*, or *Icon Sets* and then make a selection from the submenu.
4. To format cells containing a certain value based on a rule:
   - Point to *Highlight Cell Rules* and then select the type of rule from the submenu;
   - Define the criteria for the rule in the text box or boxes on the left;
   - Select the formatting to apply in the *with* text box and then click OK.
5. To format cells with top or bottom ranked values:
   - Point to *Top/Bottom Rules* and then select the type of rule from the submenu;
   - Set the number of items or percent;
   - Select the formatting to apply in the *with* text box and then click OK.
6. To format cells with above average or below average values:
   - Point to *Top/Bottom Rules* and then select the type of rule from the submenu;
   - Select the formatting to apply in the *with* text box and then click OK.
7. To create a rule for formatting cells in the New Formatting Rule dialog box:
   - Select *New Rule*;
   - Make a selection in the list under *Select a Rule Type*;
   - Enter the rule criteria and formatting using the options under *Edit the Rule Description*;
   - If necessary, click Format... to set the formatting for the rule in the Format Cells dialog box and click OK;
   - Click OK in the New Formatting Rule dialog box.
8. To remove a rule or rules, do one of the following:
   - Point to *Clear Rules* and make a selection.
   - Select *Manage Rules*, select a rule to remove and click Delete Rule; then click OK.

Applying Conditional Formatting

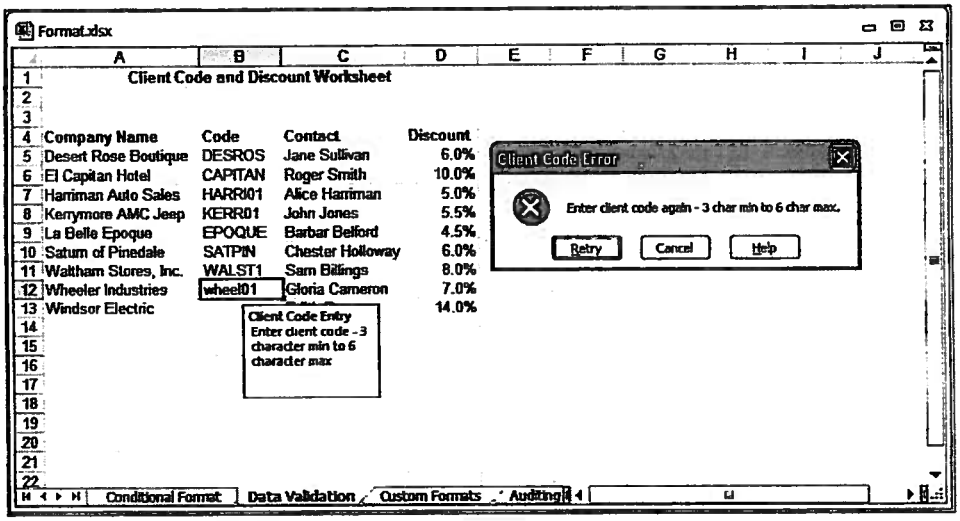
1. Open the **Format** workbook.
2. On the Conditional Format worksheet, note the formula used in column D.
3. Apply a conditional format to cells in column D that will display red if the value in the cell is greater than the maximum allowance in cell B3:
   - Select cells D7:D30;
   - On the Home tab, locate the Styles group and click Conditional Formatting;
   - Point to *Highlight Cell Rules* and choose *Greater Than*;
   - Click in the text box under Format cells that are GREATER THAN and then select B3 in the worksheet;
   - Note that Light Red Fill will Dark Red Text is selected in the with list and click OK.
4. Select cells C7:C30.
5. Click the Home tab, locate the Styles group and click Conditional Formatting.
6. Point to *Data Bars*. Point to the selections that appear on the Data Bars submenu and view the previews in the worksheet.
7. Preview the Color Scales and Icon Sets formatting choices also.
8. With the data still selected point to *Data Bars*; select the first choice *Blue Data Bar*. View the formatted data.
9. Select Conditional Formatting, then *Manage Rules*. Select *Data Bar*, click *Delete Rule* and then click OK.
10. To apply a conditional format to the top 10 highest values in column C to display green:
    - Select cells C7:C30;
    - On the Home tab, locate the Styles group and select Conditional Format;
    - Select *Top/Bottom Rules* and choose *Top 10 Items*;
    - Select *Green Fill with Dark Green Text* from the *with* drop down and click OK.
11. Select the Department names in cells B7 to B30.
12. Apply conditional formatting for the cells that contain the text Marketing with a color of your choice to the selection and then view the data.
13. Save the workbook.

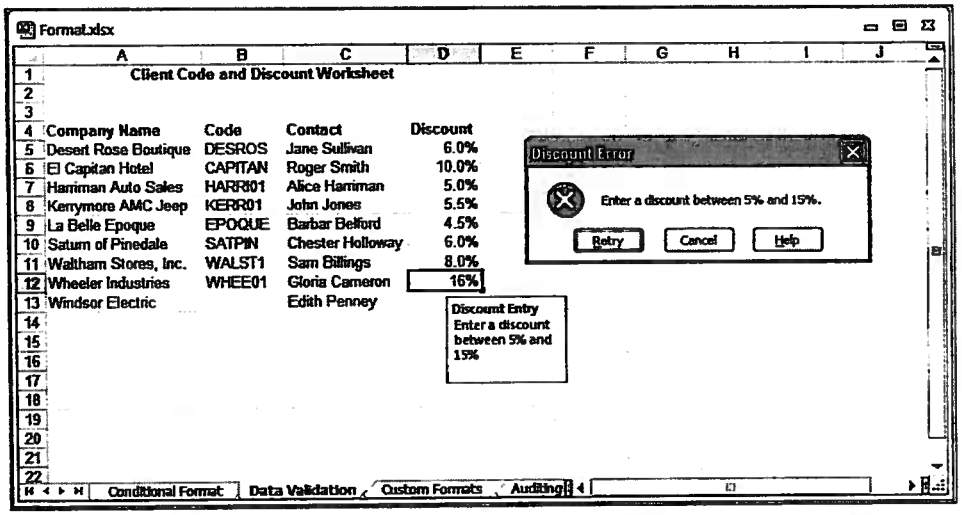
Using Data Validation

Excel's data validation feature can ensure that new data entered into a worksheet range meets certain criteria. Data validation is often incorporated into worksheets or forms, such as an expense report, to help other people enter information correctly. When you set up data validation, you specify the criteria, and you can also create on-screen prompts, such as directions and error messages, to assist a user.

Data validation settings do not affect data that is already in a cell. However, if you change the existing data, the replacement data will be validated as you enter it.

The illustrations below show a worksheet using two areas of data validation:



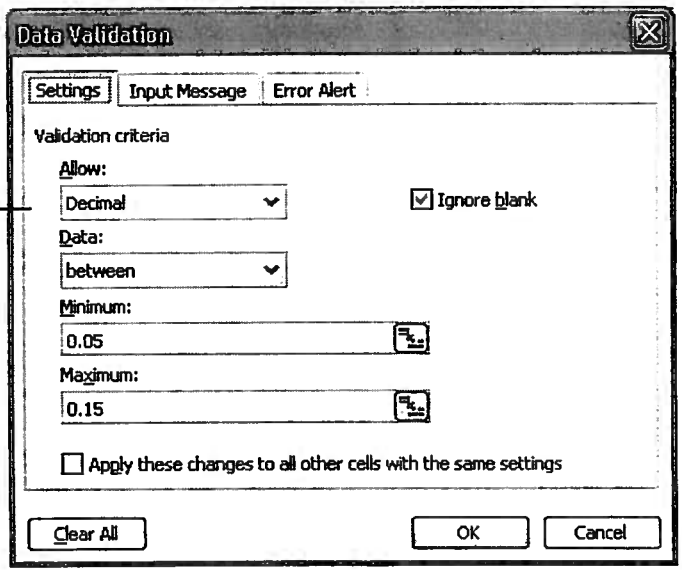


Using Data Validation, continued:

Specify the Criteria

The illustration below shows the Settings tab of the Data Validation dialog box, where you specify the criteria for validation:

Select an option from the drop-down list as defined in the table below.



The information box below summarizes the options in the Allow drop-down list:

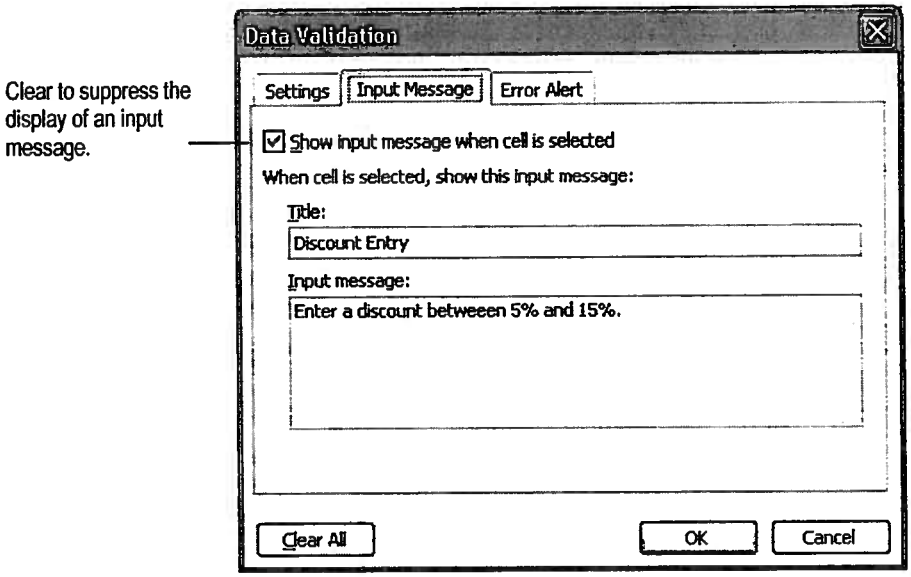
Whole Number, Decimal, Date, or Time	limits the data entered into cells to be of that exact type. You can specify a range of valid numbers, dates, or time using the Minimum and Maximum text boxes. Minimum and Maximum text boxes can contain a cell reference, a formula, or they can be left blank.
List	allows the user to specify a range of cells in the worksheet that contain the list of all valid entries.
Text Length	limits the number of characters that are valid as a cell entry. This option does not automatically format cells as text, and it does not limit the data type to text. The number of characters can also refer to a number of digits.
Custom	allows you to specify valid data based on the results of calculations done on multiple cells. Entries in the Formula text box should start with an equal sign and must result in a logical value of TRUE or FALSE. An example is: =A74>SUM(E73:F73)/10 where A74 is the cell that is being checked for validation.

Using Data Validation, continued:

Create a User Input Message

Use the Input Message tab of the Data Validation dialog box to create a prompt that appears on the screen when a user selects a cell in a range set up for data validation. The message can specify acceptable data types or limits on what can be entered into the cells.

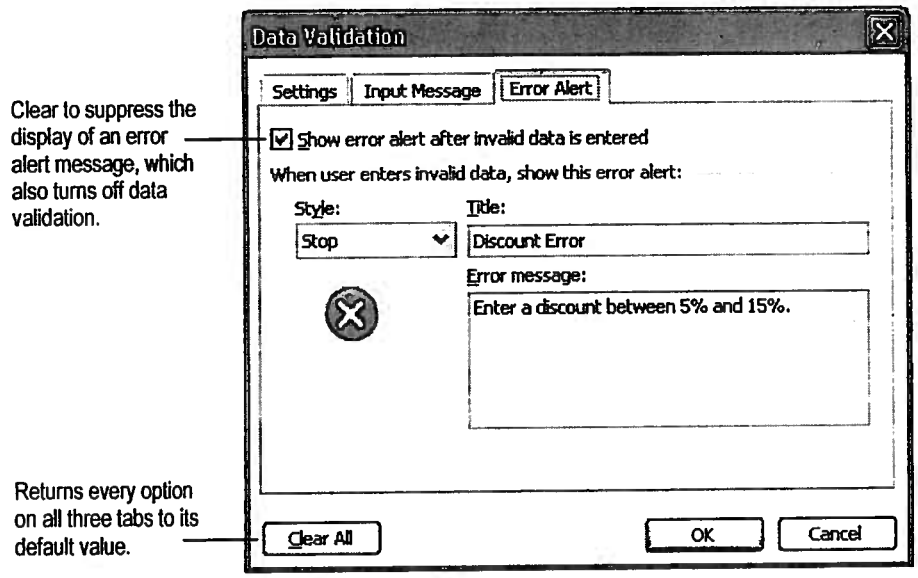
The illustration below shows a sample of a completed input message:



Create a User Error Message

Use the Error Alert tab of the Data Validation dialog box to enter an error message that appears on screen if invalid data is entered. Three different error alert styles are available; the choices offered for the user to reenter data will vary based on the style you select.

The illustration below shows a sample of a completed error alert:



Using Data Validation

STEPS

1. Select the cell or range of cells for data validation.
2. On the Data tab locate the Data Tools group and select Data Validation.
3. To specify data type and acceptable values:
   - Click the Settings tab;
   - Open the *Allow* drop-down list and select the desired option;
   - If necessary, open the *Data* drop-down list, select an operator, and provide *Minimum* and/or *Maximum* limits.
4. To create an input message:
   - Select the Input Message tab;
   - If desired, type a title in the *Title* text box;
   - Type the message contents in the *Input Message* text box.
5. To create an error prompt:
   - Select the Error Alert tab;
   - Open the *Style* drop-down list and select the desired option;
   - If desired, type a title in the *Title* text box;
   - Type the message contents in the *Error message* text box.
6. Click OK.

To create your own list of acceptable values for input, select the Settings tab, open the *Allow* drop-down list, choose *List*, and use Collapse Dialog in the *Source* text box to specify a range in the worksheet where you have entered allowable input. If you want to use a range on another worksheet, give it a range name to be able to access it. When the user selects a cell in the data validation range, a drop-down list of the entries becomes available.

If you do not create your own error message in a data validation range, Excel displays a standard error message whenever a user enters invalid data. The error message has options to retry input or cancel, which leaves the cell contents unchanged.

The maximum number of characters for the input message is 255. Error messages can be 225 characters.

To locate areas of a worksheet where data validation rules exist, on the Home tab locate the Editing group and choose *Find & Select*. Choose *Go To*, click Special, and choose *Data validation*. Leave *All* selected to have Excel highlight all cells on the worksheet that are formatted with a data validation rule; select *Same* to have Excel highlight only those cells that have the same data validation rule as the currently selected cell.

Clearing the *Show error alert after invalid data is entered* check box on the Error Alert tab will stop the display of an error alert prompt; however, it will also turn off data validation altogether. Clearing the *Show input message when cell is selected* checkbox on the Input Message tab will suppress the input message when a cell is selected.

To identify cells with invalid data, on the Data tab, locate the Data Tools group and click the Data Validation down arrow. Select *Circle Invalid Data* to place a red circle in cells where the data is not valid; click *Clear Validation Circles* to remove the red circles. Entering the correct data will also remove the circles.

By selecting different styles on the Error Alert tab, you can allow or limit invalid data. The *Stop* style will not allow a user to enter invalid data. However, the *Warning* and *Information* styles provide the user with an option to enter invalid data.

Using Data Validation

1. Select the Data Validation worksheet in the **Format** workbook.
2. To see if any areas of data validation have already been set up on the worksheet:
   - On the Home tab, locate the Editing Group and click Find & Select; select *Go To Special*;
   - Select *Data validation*; beneath the choice, leave *All* selected, and click OK.
3. Select cell B12 and note the data entry prompt.
4. Type the code `WHEEL01` and press Enter.
5. In the error dialog box, click Retry and enter the code correctly as `WHEE01`.
6. To see how the data validation is set up for this area, click the Data tab, locate the Data Tools group and select Data Validation. View the information on all three tabs of the dialog box and click Cancel when finished.
7. To begin setting up data validation for the Discount area, select the range D5:D13. On the Data tab, locate the Data Tools group and select Data Validation.
8. On the Settings tab, restrict the entries in this column as follows:
   - Open the *Allow* drop-down list and select *Decimal*;
   - In the *Data* drop-down list, *between* should automatically be selected;
   - Enter `.05` in the *Minimum* text box; and enter `.15` in the *Maximum* text box.

continued on next page

Using Data Validation, continued

9. Click the Input Message tab and do the following:
   - Type `Discount Entry` in the *Title* text box;
   - Type `Enter a discount between 5% and 15%` in the *Input message* text box;
   - Ensure that *Show input message when cell is selected* is enabled.
10. Click the Error Alert tab and create an error message as follows:
    - Ensure that *Show error alert after invalid data is entered* is selected;
    - View the choices in the *Style* drop-down list and select *Stop* as the error alert style;
    - Type `Discount Error` as the error message title;
    - Type `Enter a discount between 5% and 15%` as the error message.
11. Click OK.
12. Select cell D12 and enter `7%`.
13. Enter `16%` in cell D13.
14. Click Retry in the Discount Error dialog box, and then enter 12%.
15. To change the error alert style for the discount area, select D5:D13 and do the following:
    - Open the Data Validation dialog box;
    - On the Error Alert tab, change the Style from *Stop* to *Warning*;
    - Click OK.
16. In cell D13, enter `16%` and click Yes to continue.
17. On the Data tab, locate the Data Tools group and click the Data Validation down arrow; select *Circle Invalid Data.*
18. Enter `14%` in cell D13 to correct the error and note that the red circle disappears.
19. Click the Data Validation down arrow and select *Clear Validation Circles.*
20. Save the workbook.

Using Data Validation with a List of Values

In this exercise we will use lists of acceptable values to complete areas of data validation for the customers and sales reps.

1. In the **Format** workbook, select the Custom Formats worksheet. Note the customer and sales rep information in columns A and B.

2. Open the Name box drop-down list on the Formula bar and select the range name *Customers*. Note that the range is on the Lists worksheet.

3. Select the *SalesReps* range name from the Name box. Note that both lists are in alphabetical order and contain the same information as on the Custom Formats worksheet.

4. Return to the Custom Formats worksheet.

5. To create the validation area for customer names, do the following:
   - Select the range A4:A25;
   - On the Data tab, locate the Data Tools group and click Data Validation;
   - On the Settings tab, do the following:
     - Select *List* from the *Allow* drop-down list;
     - Press [F3] to display the Paste Name dialog box with a list of range names for the current workbook;
     - Select *Customers* and click OK;
     - Press [Enter] to expand the dialog box.
   - Click the Input Message tab and do the following:
     - Type `Customers` as the title;
     - Type `Please choose a customer from the list` as the message.
   - On the Error Alert tab, create a *Stop* style alert with the title and message of your choice and click OK.

6. Select cell A13 and test the drop-down list to enter any customer.

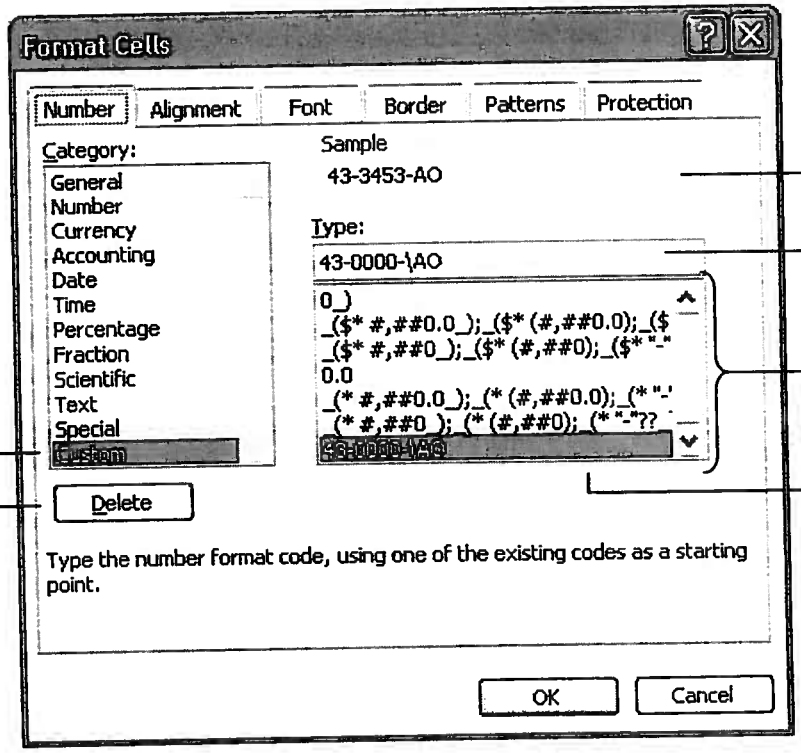
7. If desired, create another area of data validation in cells B4:B25 on the Custom Formats worksheet using the SalesRep named range.

8. Hide the Lists sheet and save the workbook.

Creating and Using Custom Formats

If none of the available built-in formats meet your needs, you can create your own format scheme. For example, if you want to add a three-letter prefix to purchase order numbers or add a state code to form numbers, you can devise a custom format to accomplish such tasks.

When you create a custom format, it is placed at the bottom of the Type list on the Number tab of the Format Cells dialog box as below:



Creating Custom Formats

STEPS

1. Select the desired cell or cells.
2. Use the desired method to display the Format Cells dialog box:
   - On the Home tab, locate the Cells group and select Format; select *Format Cells.*
   - Right-click the selection; select *Format Cells.*
3. On the Number tab, select *Custom* from the Category list and do one of the following:
   - To base the new format on an existing format, select the desired format from the list under the *Type* text box.
   - To start from scratch, select any format that appears in the *Type* text box to replace it when you type.
4. Type or modify the custom format code.
5. Click OK.

Use # as a number placeholder for significant digits. Use 0 as a placeholder for leading or trailing zeroes.

To copy a custom format to another workbook, copy a cell with the desired format. Open the destination workbook and select the desired cell. Click the Paste down arrow and select *Paste Special* and then *Formats*. Click OK.

For more information on the special characters that can be used in custom formats look up "number format codes" in Help.

The backslash character (\ ) appears in custom formats immediately to the left of any character that appear literally in a format and is inserted automatically in front of any character that isn't a placeholder character. To include a placeholder character in a format as a literal character, you must precede it with the backslash when you enter the format.

Custom formats are workbook dependent and are, therefore, only available in the workbook in which they are created. If custom formats are needed in various workbooks, create and save them as a template file.

If a built-in format is selected in the *Type* list, the Delete button will be unavailable because you cannot remove built-in formats. You can only delete custom formats.

Using Custom Formats

STEPS

1. Select the desired cells.
2. Use the desired method to display the Format Cells dialog box:
   - On the Home tab, locate the Cells group and select Format; choose *Format Cells.*
   - Right-click the selection; select *Format Cells.*
3. On the Number tab, select *Custom* from the Category list.
4. Select the custom format from the list under Type.
5. Click OK.

Try It

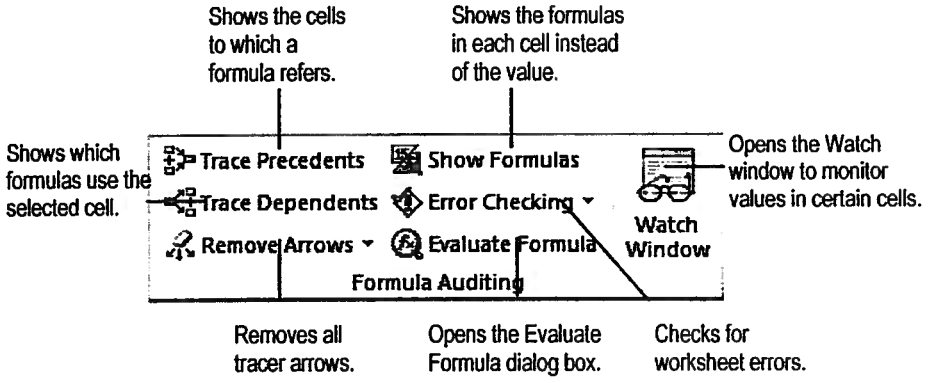
Creating and Using Custom Formats

1. In the **Format** workbook on the Custom Formats sheet, select the range C4:C13.
2. Right-click the selected range and select *Format Cells.*
3. On the Number tab, select *Custom* from the Category list.
4. Note that the Sample area shows the first number in the list. Double-click the information in the *Type* text box.
5. Type `43-#-AO` as the format, note the information under *Sample*, and click OK. Note the change in the order numbers in column C.
6. In cell C12, enter `9845` as the order number.
7. In cell C13, enter `0503` as the order number.
8. To modify the custom format:
   - Select the range C4:C13;
   - Open the Format Cells dialog box;
   - Select the *Custom* category and scroll to the bottom of the Type list;
   - Select your custom format and note that Excel automatically placed a \ in front of the text portion of the format;
   - In the *Type* text box, change the format to `43-0000-\AO`.
9. Save the workbook.

Working with Auditing and Error Checking Tools

Excel has many features to assist you in determining how information in one part of the worksheet relates to information in another part. Several tools are also available to find worksheet errors and to analyze formulas.

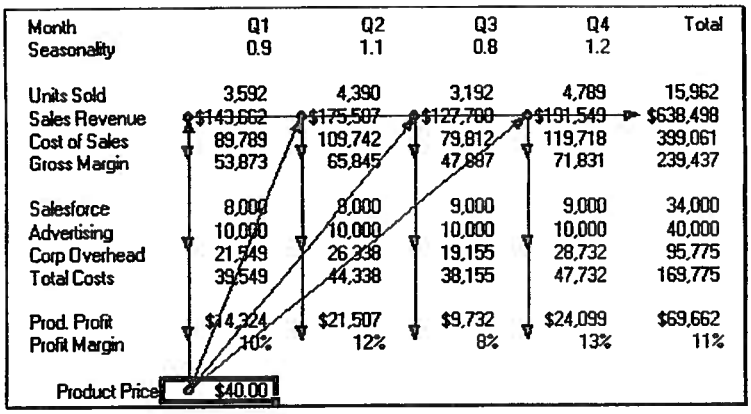
The Formula Auditing group on the Formulas tab has many useful tools as shown below:



Two important terms are defined below:

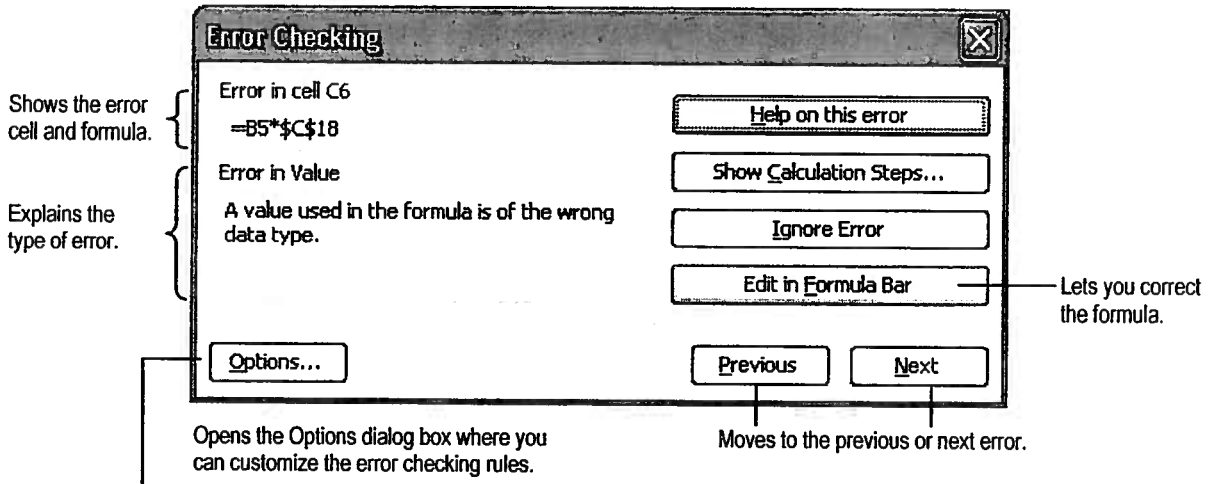
Precedents	are cells referenced in a formula. For instance, if the formula in cell C10 is =A10-B10, then A10 and B10 are precedents of cell C10. Precedent cells can contain either values or formulas and are indicated by dots in the illustration below.
Dependents	are cells that use the value of the selected cell and, thus, are dependent upon it. In the example above, C10 is a dependent of both A10 and B10. Dependent cells always contain a formula and are indicated by arrows in the illustration below.

The arrows in the illustration below indicate the direction of the data flow.
In the illustration below, the Trace Dependents button was clicked twice to show the cells where the Product Price is used.

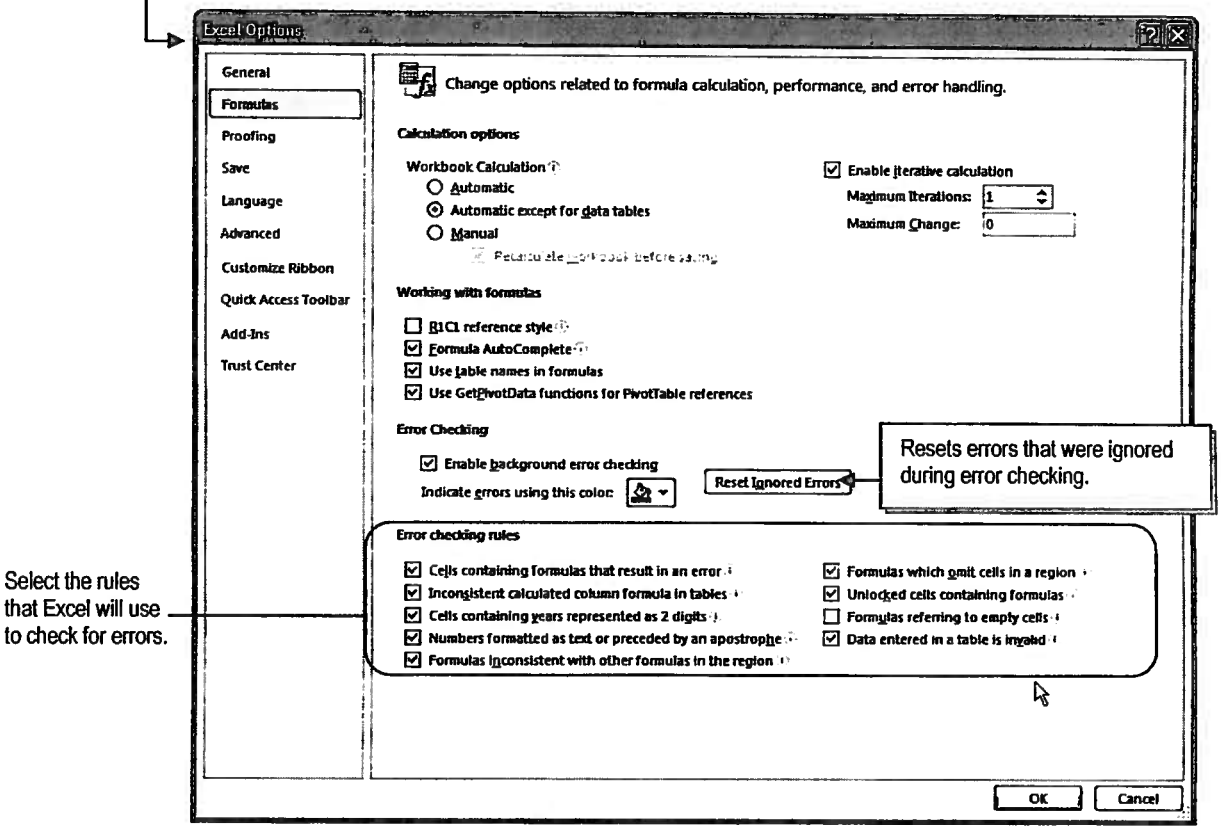


Working with Auditing and Error Checking Tools, continued:

When you have an error in a worksheet cell you can use the Error Checking dialog box for assistance as shown below:



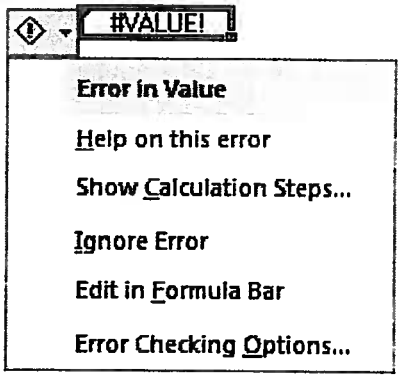
The rules that Excel uses to check errors can be customized in the Options dialog box shown below:



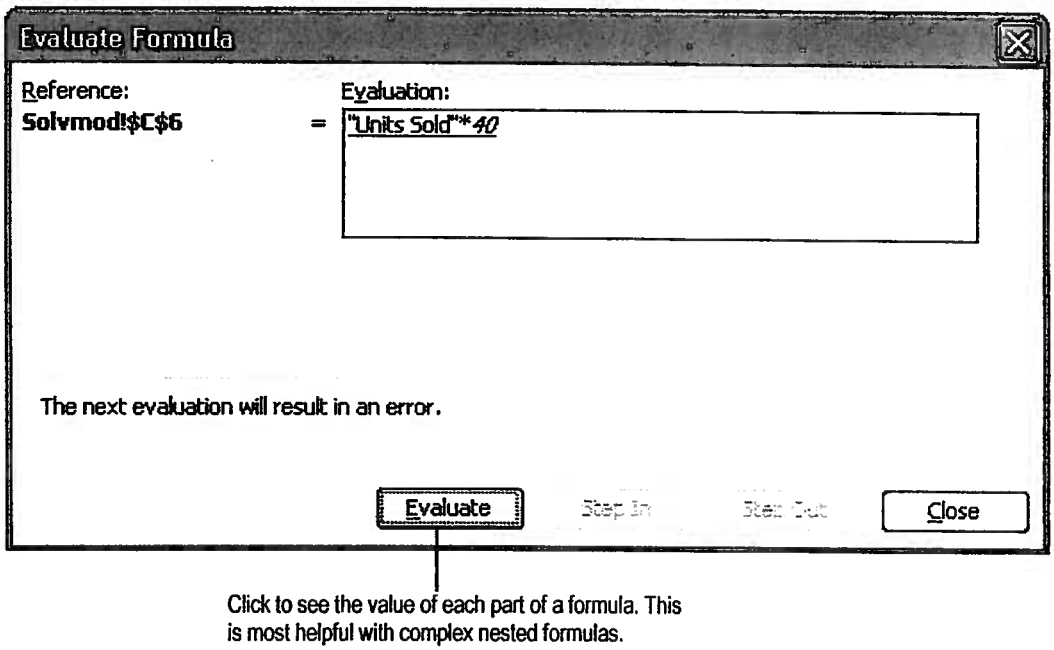
Working with Auditing and Error Checking Tools, continued:

Whenever you have an error in a worksheet formula, a green triangle will display in the upper-left corner of the cell and the Trace Error button will appear when the cell is selected. Point to the Trace Error button to display a ScreenTip describing the error or click the button to display a list of commands.

The Trace Error button, illustrated below, has many of the same choices as the Error Checking dialog box:



When you select *Show Calculation Steps* in the menu above, the Evaluate Formula dialog box, which is illustrated below, opens:



Working with Auditing Tools

STEPS

1. To identify all the cells referenced in a formula (the precedents):
   - Select the cell containing the formula;
   - On the Formulas tab, locate the Formula Auditing group;
   - Click Trace Precedents.
2. To display all the formulas that use a specific cell (the dependents):
   - Select the cell;
   - On the Formulas tab, locate the Formula Auditing group;
   - Click Trace Dependents.
3. To remove the tracing arrows:
   - On the Formulas tab, locate the Formula Auditing group;
     - Click Remove Arrows Remove Arrows to remove all arrows.
     - Click the Remove Arrows down arrow and select *Remove Precedent Arrows*.
     - Click the Remove Arrows down arrow and select *Remove Dependent Arrows*.

The tracer arrows can be used to navigate through the worksheet. Double-click a tracer arrow to move the cell pointer to the cell referenced at the end of the arrow.

Tracing arrows cannot be removed by the Undo command.

Working with Error Checking Tools

STEPS

1. To open the Error Checking dialog box:
   - Select the cell containing an error;
   - On the Formulas tab, locate the Formula Auditing group;
   - Click Error Checking.
2. To trace the flow of data to an error value:
   - Select the cell containing an error value;
   - On the Formulas tab, locate the Formula Auditing group;
   - Click the Error Checking down arrow;
   - Select *Trace Error*.
3. To open the Evaluate Formula dialog box, choose one of the following:
   - On the Formulas tab, locate the Formula Auditing group; click Evaluate Formula.
   - Click Show Calculation Steps in the Error Checking dialog box.
4. To customize the error checking rules, do one of the following:
   - Click Options in the Error Checking dialog box.
   - Click the File tab and click Options; click Formulas.

To add a note to a cell, right-click the cell and select *Insert Comment.* Type the desired text and click any cell in the worksheet.

Cells that contain comments appear with a small red triangle in their upper-right corner.

To view a comment, position the mouse pointer over the cell. In order to see the comment, the mouse pointer must be shaped as a .

To remove a comment from a cell, right-click the cell and select *Delete Comment.*

To change a comment, right-click the cell and select *Edit Comment.*

To see worksheet formulas instead of the results, on the Formulas tab, locate the Formula Auditing group and click Show Formulas. Click Show Formulas again to return to the results instead of the formulas.

To get to formula auditing mode for an individual formula, double-click the formula.

When you need to monitor a formula as you make changes to other areas of your workbook, turn on the Watch Window and add the formula that will be monitored. To open the Watch Window, display the Formulas tab, locate the Formula Auditing group and click Watch Window.

Working with Auditing and Error Checking Tools

1. Move to the Auditing worksheet in **Format**.
2. On the Formulas tab locate the Formula Auditing group.
3. To work with precedents and dependents:
   - Select cell G13 and click Trace Precedents;
   - Click Trace Precedents a second time;
   - Click the Remove Arrows down arrow and select *Remove Precedent Arrows*; do this again to remove the second set of arrows;
   - Select cell C18 and click Trace Dependents;
   - Click Trace Dependents a second time;
   - Click Remove Arrows.
4. Change the formula in C6 to `=B5*$C$18` to create worksheet errors.
5. With C6 as the active cell, click the Error Checking down arrow and select *Trace Error*.
6. Click Remove Arrows on the Ribbon.
7. Click Error Checking.
8. Click Next to move to the next error; then click Previous to return to cell C6.
9. Click Show Calculation Steps to view the Evaluate Formula dialog box and then click Close.
10. Click Edit in Formula Bar to correct the formula from B5 back to C5; then click Resume and click OK.
11. Save and close the workbook.

Review - Worksheets, Functions, and Conditional Formatting

1. Open the **Orders** workbook.
2. Move the Annual Summary and Profit and Loss worksheets to the end of the workbook.
3. Group the Quarter 1 through Quarter 4 worksheets.
4. On the Quarter 1 worksheet, select cell B32 and create an AVERAGE function for the range B7:B30.
5. Copy the function across the row to column I.
6. Select the Quarter 2 worksheet tab.
7. Format the values in rows 7 and 32 as *Accounting* with 2 decimal places and the dollar symbol.
8. Format the remaining rows to align rows 7 and 32, but without a dollar sign.
9. Ungroup the worksheets.
10. Select the Profit and Loss worksheet. Apply conditional formatting that will display negative cell entries in light red fill with dark red text to the range B7:F14.
11. Create totals in row 16 of the Profit and Loss worksheet.
12. In column G use the ROUND function to round the numbers in column F to the nearest thousand.
13. On the Annual Summary worksheet, create a 3-D sum in B7 to add the values in B7 on each of the quarterly worksheets.
14. Copy the formula in B7 down and across the sheet to create the summary information for each product and company name.
15. Save and close the workbook.

4

Working with Charts

Creating Charts

Changing the chart location and size

Changing the chart type

Modifying chart elements

Formatting chart elements

Adding and removing data series

Printing charts

Creating and using a chart template

Creating a Sparkline

Creating Charts

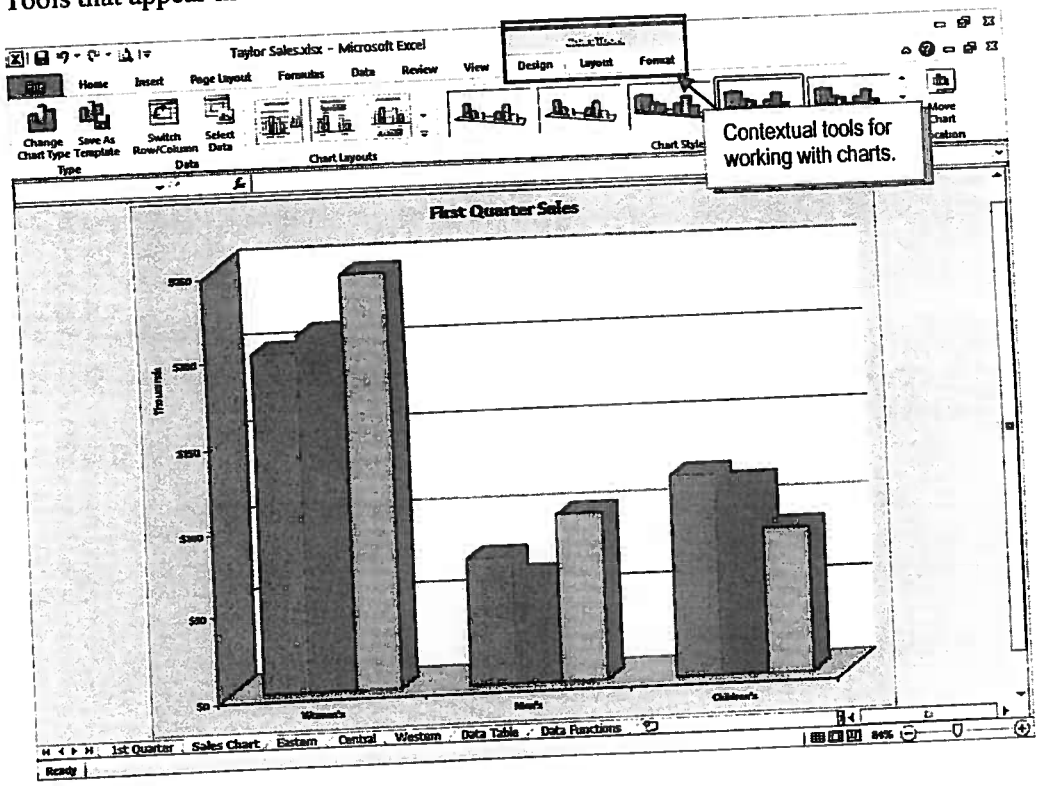
A chart is a visual representation of data from a worksheet that shows comparisons, trends, or patterns. The enhancements to the charting feature in Excel 2010 help you create professional-looking charts. Three contextual tabs, Design, Layout, and Format, expose the galleries, options, and other tools for working with charts. The Chart Styles gallery provides over forty choices for formatting charts. Additionally, if you develop a custom design for your charts, you can easily save it as a template so that it can be used over and over again.

The illustration below shows a worksheet with data selected to create a chart:

This range is selected to create the chart below.

	A	B	C	D	E
1		Glad Rags International			
2		Quarterly Report			
3					
4					YTD
5	Region	Jan	Feb	Mar	$804,000
6	North	$280,000	$297,000	$227,000	$529,000
7	South	$145,000	$187,000	$197,000	$585,000
8	East	$190,000	$187,000	$208,000	$296,000
9	West	$80,000	$92,000	$124,000	$2,214,000
10	Total Sales	$695,000	$763,000	$756,000	
11					
12	Expenses	$223,000	$214,000	$245,000	$682,000
13					
14	Profit	$472,000	$549,000	$511,000	$1,532,000

The following illustration shows an Excel column chart and the contextual Chart Tools that appear in the Ribbon when the chart is active:



Creating Charts

STEPS

1. Select the data for the chart.
2. Click the Insert tab, locate the Charts group and do one of the following:
   - Open the gallery for the type of chart to insert and select a chart subtype.
   - Click the dialog launcher to open the Insert Chart dialog box to see all chart types; select a subtype and click OK.

The Excel 2010 charting feature is shared with Word and PowerPoint. If you create a chart in one of those applications, you will have all of the same tools and options that are available in Excel.

Select data and then press F11 to quickly create a chart with the default settings on a new chart sheet.

To change the default chart type, select a chart type or chart template in the Insert Chart dialog box and click Set as Default Chart.

The Live Preview feature does not work with the Chart Styles gallery.

Try It

Creating Charts

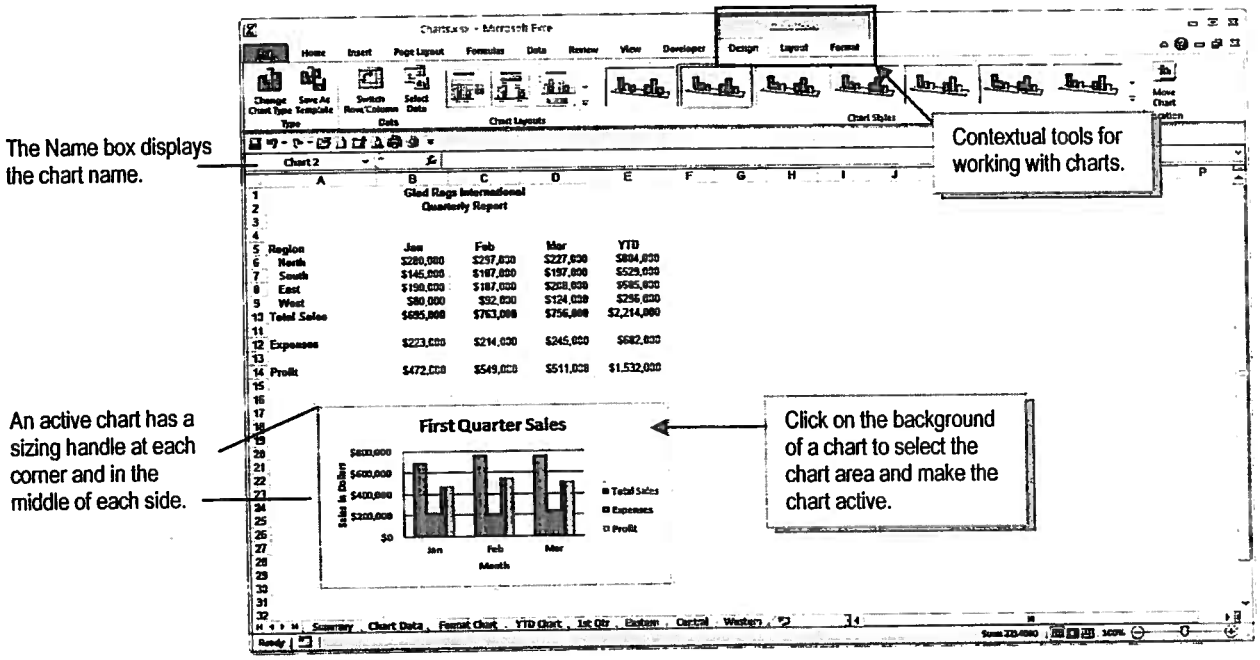
1. Open the **Charts** workbook, switch to the Chart Data worksheet, if necessary.
2. Select the range A5 to D9.
3. Click the Insert tab and locate the Charts group.
4. Click Column and view the different column charts. Point to a chart type and note the description in the ScreenTip.
5. In the choices under 3-D Column, select *Stacked Column in 3-D*.
6. Save the workbook.

Changing the Chart Location and Size

When you create a chart, Excel sizes and places the chart on the worksheet. If you don't like the chart's position, you can move it to a different location on the worksheet by dragging any portion of the chart outside its plot area. To resize a chart, you need to select its chart area so that sizing handles appear around the periphery of the chart; you can drag the handles to resize the chart.

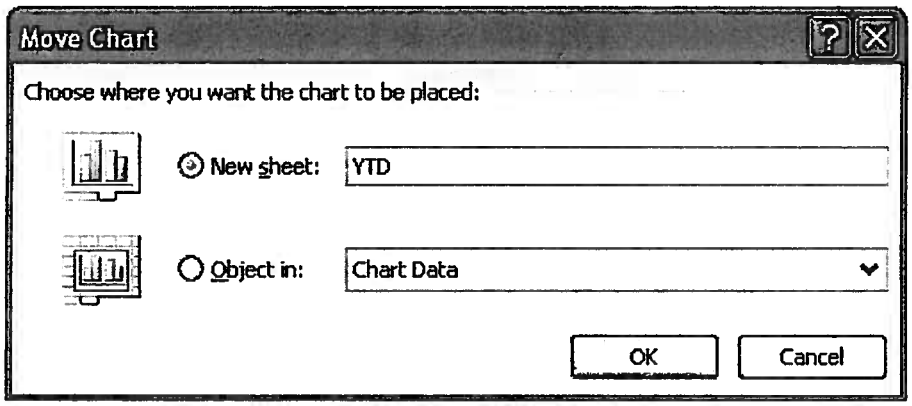
You can also relocate a chart to a separate chart sheet or vice versa. When you switch a chart's location in this manner, Excel will automatically resize the chart and its elements, including text, and you may have to manually adjust areas of the chart to your liking. Charts on chart sheets are created in a standard size and the chart area cannot be resized, although you can resize chart objects, such as the plot and text, to make the chart appear larger or smaller.

When an embedded chart's Chart Area is selected, sizing handles appear around the chart as in the illustration below:

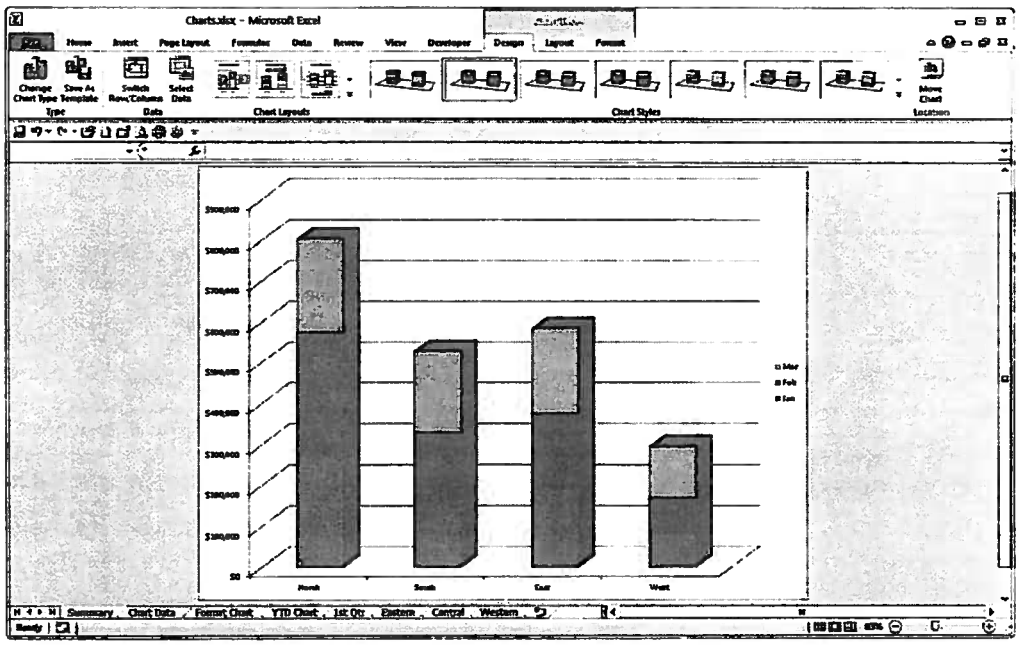


Changing the Chart Location and Size, continued:

The Move Chart dialog box that is displayed when you move a chart is illustrated below:



A chart sheet with a column chart is illustrated below:



Changing a Chart's Location and Size

STEPS

1. To move an embedded chart to a different location on the current worksheet:
   - Click in the chart to make it active;
   - Position the mouse pointer on the chart's frame but not on the sizing handles so that the ScreenTip says "Chart Area";
   - Drag the chart to the desired location.
2. To resize an embedded chart;
   - Click in the chart to make it active;
   - Position the mouse pointer on the chart's frame in a corner of the chart so that the ScreenTip says "Chart Area";
   - Click to select the chart;
   - Position the mouse pointer over the desired sizing handle so that it appears as ↕, ↔, ↘, or ↙;
   - Drag away from the center of the chart to make it larger; drag toward the center of the chart to make it smaller.
3. To relocate a chart to another sheet:
   - Select the chart;
   - On the Ribbon select the Design tab of the Chart Tools;
   - In the Location group, select Move Chart;
   - To move an embedded chart to a chart sheet:
     - Select *New sheet* and, optionally, type a name for the new sheet.
   - To move a chart from its own sheet to embed it on a worksheet:
     - Select *Object in* and use the drop-down list to select the desired worksheet.
   - Click OK.

By default, charts are created as an embedded object on the source data worksheet. Once created, they can be moved, resized or placed on a separate worksheet.

To delete an embedded chart, select the frame and press Delete.

To delete a chart sheet, right-click the chart sheet tab, choose *Delete*, and click Delete.

To maintain an embedded chart's proportions while resizing it, hold down Shift while dragging a corner handle.

To maintain the location of the center of an embedded chart while resizing it, hold down Ctrl while dragging any sizing handle.

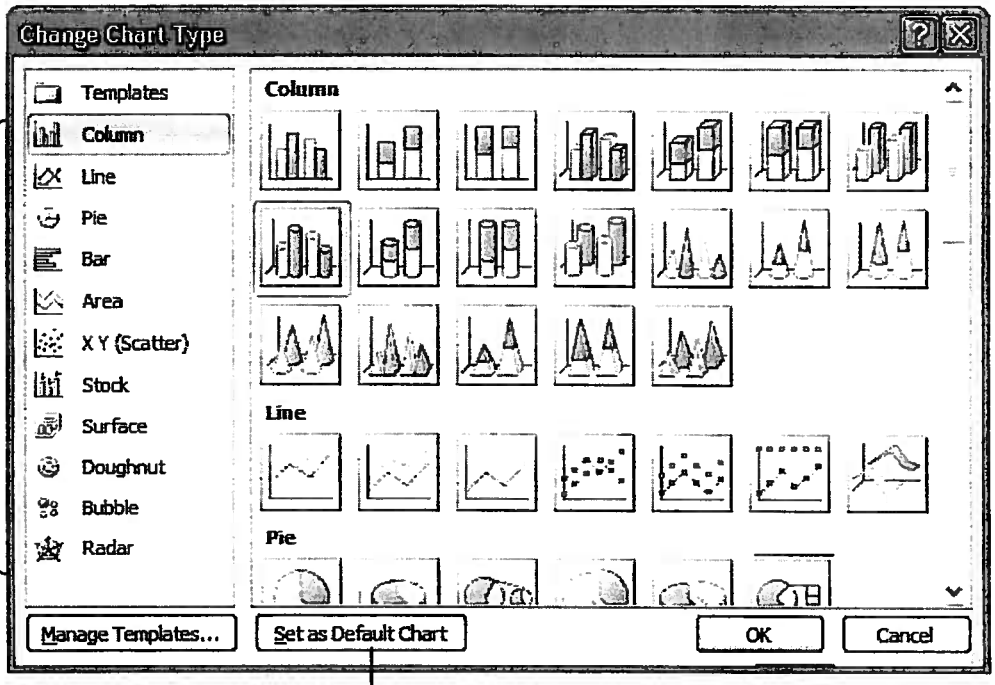
Changing a Chart's Location and Size

1. On the Chart Data worksheet make sure the newly-created chart is selected.
2. To move the new embedded chart to a separate worksheet:
   - Click the Design tab of the Chart Tools;
   - In the Location group, click Move Chart;
   - Select *New sheet*;
   - Type `Summary` as the sheet name;
   - Click OK.
3. Return to the Chart Data worksheet and select the existing cylinder chart.
4. Resize the chart by dragging the upper right hand corner of the chart frame so it stretches out to right edge of column F.
5. Reposition the chart so it is centered under the worksheet data with the upper left corner in A16.
6. Save the workbook.

Changing the Chart Type

Once a chart has been created, the chart type may be changed at any time. Some of the main types of charts available are column, line, pie, bar, area, and scatter. The other types of charts available are stock, surface, doughnut, bubble and radar. In addition, 3-D types are available for area, bar, column, line, pie, surface, cylinder, cone, and pyramid charts. Each of these main chart types has a gallery of several sub-type choices. Additionally, a number of custom chart types are available.

Below is an illustration of the Change Chart Type dialog box:



Changing the Chart Type

STEPS

1. Make the chart active.
2. Display the Design tab of the Chart Tools.
3. Locate the Type group and click Change Chart Type.
4. Select the desired chart type and, if necessary, choose a sub-type.
5. Click OK.

After the chart type is selected, the data can be switched from the row to column. To make this change, on the Design tab of the Chart Tools, locate the Data group and click Switch Row/Column. Click it again to switch it back.

Try It

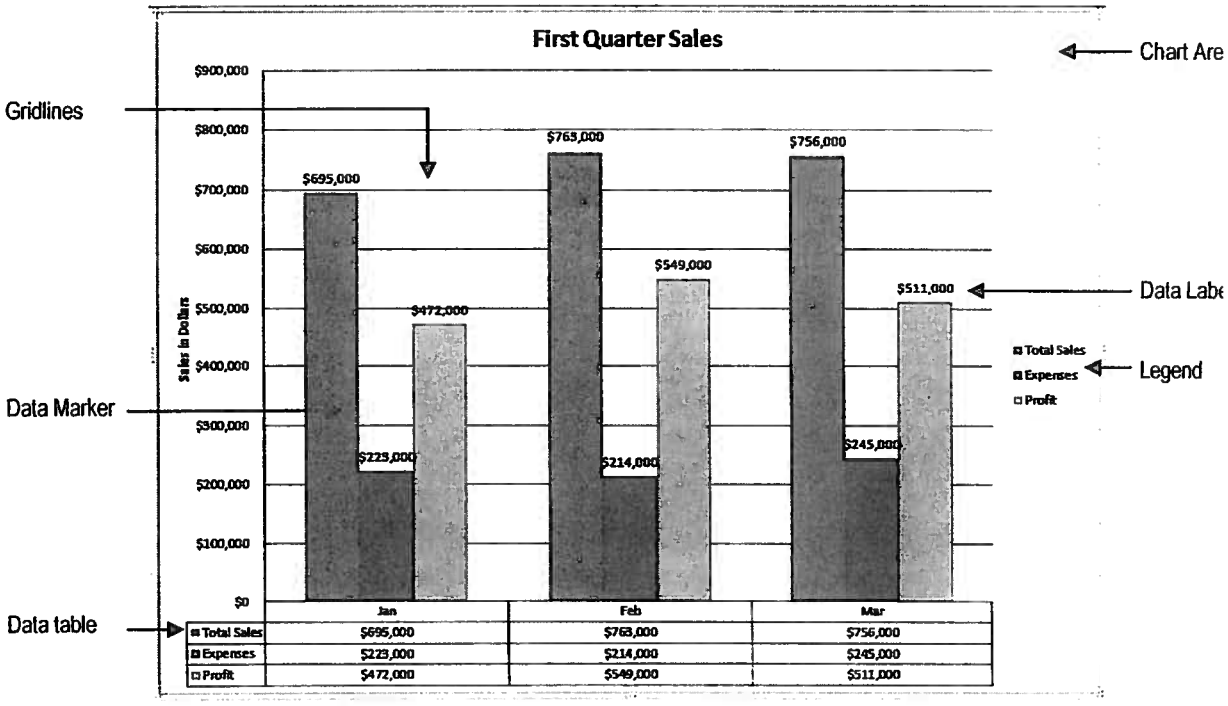
Changing the Chart Type

1. Move to the Format Chart sheet in the **Charts** workbook and click in the chart.
2. On the Design tab of the Chart Tools, locate the Type group and click Change Chart Type.
3. Choose *Bar* from the list of chart types.
4. Explore different chart sub-types.
5. Select *Clustered Bar in 3-D* and click OK.
6. Change the chart type to the Clustered Horizontal Cylinder style.
7. On the YTD Chart sheet, change the chart to a *Pie in 3-D* chart.
8. Save the workbook.

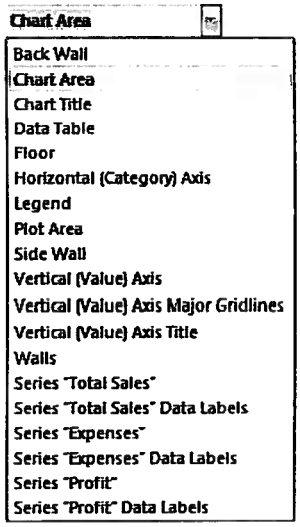
Modifying Chart Elements

In order to modify a chart, you need to click in it to make it active. Depending upon where you click, an object within the chart will be selected, thereby activating the whole chart. As you move the mouse pointer over an active chart, ScreenTips display the name of the chart element beneath the pointer so you can select the object by clicking the mouse.

The illustration below identifies typical chart elements:

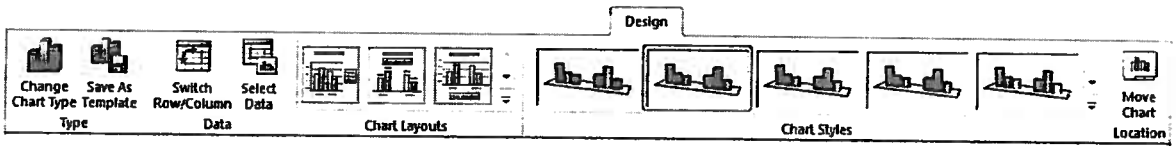


You can also select chart elements from the Chart Elements drop-down list on the Layout tab of the Chart Tools as illustrated below:

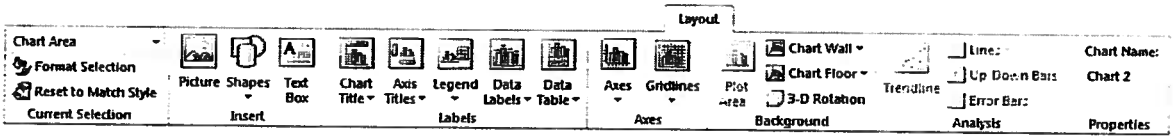


Modifying Chart Elements, continued:

The Design tab of the Chart Tools provides options to change the chart type, modify the data source, change the chart layout, select a chart styles or change the location. The Design tab is displayed below:



The Layout tab of the Chart Tools provides options to add, remove or customize chart elements such as the titles, labels and legend shown in the illustration below:



Modifying Chart Elements

STEPS

1. Click in the chart to make it active;
2. To modify a chart using the shortcut menus:
   - Right-click the object to be modified;
   - Select the appropriate choice;
   - Make the desired changes in the dialog box;
   - Click OK.
3. To modify a chart using the Ribbon:
   - If necessary, click the desired area of the chart to select it;
   - In the Chart Tools, click the desired button Design or Layout tab.

When a chart is active, the Chart Tools contextual tabs are displayed.

On the Layout tab of the Chart Tools, the chart elements list changes to reflect whatever object is selected in a chart.

As you move the mouse pointer over a chart, ScreenTips appear to help you identify which chart object will be made active if you click either the left or right mouse button.

Modifying Chart Elements

1. On the YTD Chart sheet in **Charts**, make sure the pie chart is active.
2. On the Design tab of the Chart Tools, locate the Chart Styles group and click on one of the visible styles.
3. In the Chart Styles group, click the drop-down arrow for more options and select a style of your choice.
4. On the Design tab of the Chart Tools, locate the Chart Layouts group and click the first choice (Layout 1). Notice additional elements are added to the pie chart.
5. Select the Summary sheet; activate the chart, if necessary.
6. On the Layout tab of the Chart Tools, locate the Labels group. Click Chart Title and then *Above Chart.*
7. With the Chart Title already selected, type `First Quarter Sales` and press Enter.
8. On the Layout tab of the Chart Tools, locate the Labels group and click Axis Titles. Point to *Primary Vertical Axis Title* and then click *Vertical Title.*
9. Type `Sales in Dollars` and press Enter.
10. Add a horizontal axis title and type `Region` as the text.
11. Save the workbook.

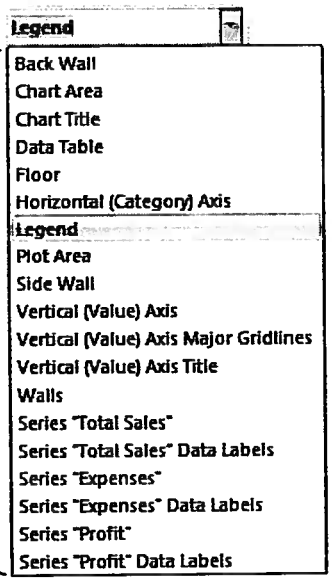
Formatting Chart Elements

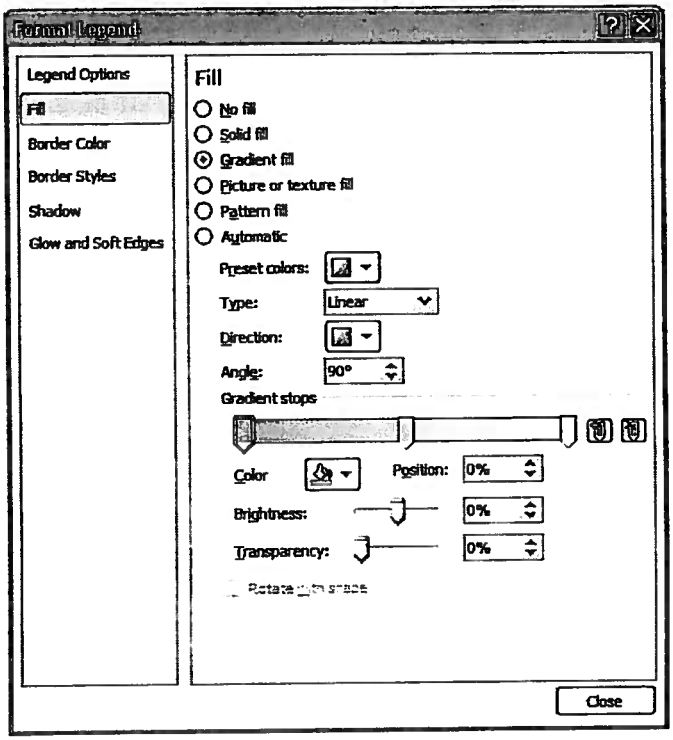
Charts are comprised of individual elements that you can modify using the formatting options that correspond with the element. Formatting chart elements changes or enhances their appearance.

All of Excel's chart elements have corresponding Format dialog boxes that contain options to alter that specific chart element; you can also transform chart elements using tools on the Format tab of the Chart Tools. For instance, you can format text elements in a chart by choosing a different style, alignment, orientation, and font size to improve the readability. Enclosed elements, such as a slice in a pie chart or the area surrounding a text object, can be filled with different colors or fill effects like textures and patterns. Additionally, you can alter the borderlines of various elements, such as the data series, axis, legend, title text, or text boxes.

The Chart Elements drop-down list pictured below shows the Legend as the selected chart element. Clicking the Format Selection tool with Legend as the selected element displays the corresponding Format Legend dialog box with the choices for formatting the legend:

Select a chart element in the drop-down list.





Formatting Chart Elements

STEPS

1. Make the chart active.
2. On the Layout or Format tab of the Chart Tools, locate the Current Selection group.
3. Open the Chart Elements list and select the element to format.
4. Do one of the following:
   - Click Format Selection in the Current Selection group, make the desired selections in the Format dialog box and click Close.
   - Use any applicable tools on the Format tab of the Chart Tools or the Home tab.

As you move your mouse pointer over a chart, ScreenTips show the name of the chart elements.

To quickly display the respective format dialog box for a chart element, right-click the element and choose *Format <Object Name>*.

When a chart element is selected, its name is displayed in the Chart Elements drop-down list in the Current Selection group.

To delete a chart element in an active chart, select it and press Delete.

To select one data label or one entry in a legend, click to first select the whole legend or all data labels; then click the desired label or entry within the selected object and format as desired.

To create a gradient, texture, pattern, or picture fill for a selected element, click Fill in the Format dialog box. Make the desired choices and click Close.

To select one data marker in a series, click any marker in the series, then click the desired marker.

To move chart legends, titles, or data labels, click the desired chart object to select it. With the mouse pointer as a , drag the object to the desired position.

Data labels are used to identify chart data series with values, percents, labels, or various combinations.

You can format chart text using WordArt Styles. Select the text and display the Format tab of the Chart Tools; open the WordArt Styles gallery and make a selection.

The Format tab of the Chart Tools contains the Shape Styles group. Use the tools in this group to apply formatting to selected chart elements.

Formatting Chart Elements, continued:

If your value-axis units are large numbers, you can change the display using the Display units drop-down list in the Axis Options category of the Format Axis dialog box. The choices range from hundreds to trillions. For instance, $200,000 will display as $200 if you choose *Thousands* from the *Display Units* drop-down list. Excel will add a thousands label above the value-axis.

To explode a pie chart, activate the chart and click the pie to select the entire chart. Drag any slice away from the center of the pie.

To explode just one piece of an active pie chart, click once on the whole pie, and then click again on the desired slice. Drag the selected slice away from the center of the pie.

To rotate the position of slices in a pie chart, select the slice you want to change. Right-click and select *Format Data Point*. In the Series Option category, and enter a value between 0 and 360 degrees in the Angle of First Slice text box. Optionally, you can use the slider to change the rotation.

If you need to format a new chart like an existing one, you can copy the formats from one chart to another. Activate the existing chart and on the Home tab locate the Clipboard group, click Copy. Activate the new chart; on the Home tab locate the Clipboard group, click the Paste down arrow. Select *Paste Special*, select *Formats* and click OK. If you changed the scaling on the existing chart, you may need to adjust it on the new chart.

You cannot rotate or angle Legend text.

To add unattached text to a chart, locate the Layout tab in the Chart Tools. Click Text Box in the Insert group. Draw a text box; enter the text; and then click outside the text box. Text boxes that you've added to a chart do not appear in the Chart Elements drop-down list.

Using the mouse, you can drag a chart's legend to any location; however, the chart will not automatically adjust in size to accommodate the legend as it does when you change the legend position using choices in the Legend Options of the Format Legend dialog box.

Formatting Chart Elements

1. In **Charts**, move to the YTD Chart worksheet.
2. Click the chart title and change it to `Year to Date Sales`.
3. To add a shape style to the chart title:
   - Make sure the chart title is active;
   - On the Format tab of the Chart Tools, locate the Shape Styles group;
   - Click the drop-down arrow to display the Shape Styles gallery;
   - Select *Moderate Effect – Red, Accent 2* in the fifth row.
4. Click one of the data labels on a slice of the pie. This will select all four labels.
5. On the Home tab locate the Font group. Change the font size to 16 and apply bold formatting.
6. Avoiding the text label, click the South slice; then click it again to activate only that slice.
7. Click and drag the South slice outward to explode that piece of the pie.
8. Move to the Format Chart sheet.
9. Right-click the legend and select *Format Legend.*
10. Select *Bottom* as the legend position.
11. With the Format Legend dialog box still open, click on the background of the chart to select the wall. This activates the wall element and displays the Format Walls dialog box.
12. Select a darker solid fill color for the wall and then click Close.
13. Add a `First Quarter Sales` chart title above the chart and format the title as desired.
14. Select the Summary sheet and format any chart elements as desired.
15. Save the workbook.

Adding and Removing Data Series

Once a chart is created in Excel, it is linked to the data in the worksheet and will update if the worksheet data changes. If you add data to a worksheet after a chart is created, or if you wish to include data that was not originally incorporated in the chart, several methods are available to include the new data in the chart. Additionally, you can change or remove a data series once it is included in a chart.

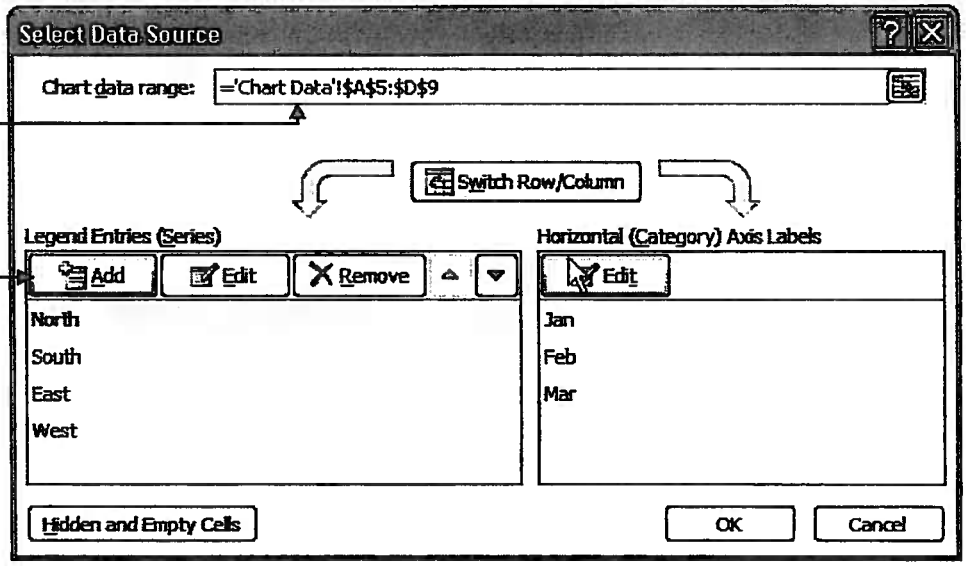
How you modify a chart depends on whether the data series for the chart is derived from contiguous or non-contiguous cells.

Generally, the easiest method for adding data to a chart is to copy the desired range from the worksheet and paste it directly into the chart. You can also readily remove data from charts by selecting the desired data series in the chart and pressing the Delete key.

In instances where you need to view the ranges that created a chart or place non-linked data in a chart, you may want to use the Select Data Source dialog box, which is illustrated below:

Use this option to add a data series to chart when the source data is derived from contiguous cells.

Use this option to add a data series to a chart when the source data is derived from non-contiguous cells.



Adding and Removing Data Series

STEPS

1. Make the chart active.
2. On the Design tab of the Chart Tools, locate the Data group and click Select Data.
3. To add a data series that is contiguous:
   - In the *Chart data range* text box, click Collapse Dialog;
   - Select the new contiguous range for the chart and press Enter;
   - Click OK.
4. To add a data series that is non-contiguous:
   - From the Legend Entries (Series) options, click Add;
   - In the *Series name* text box, type a name or click Collapse Dialog, move to the worksheet and select a cell that contains the name for the data series;
   - In the *Series value* text box, type in the new data values separated by commas or click Collapse Dialog, move to the worksheet and select the data for the new data series;
   - Click OK in the Edit Series box.
5. To edit a data series:
   - In the *Legend Entries (Series)* list box, select the data series to be edited;
   - Click Edit;
   - In the Edit Series box, modify the *Series name* or *Series values* and click OK.
6. To remove a data series:
   - In the *Legend Entries (Series)* list box, select the data series to be removed;
   - Click Remove.
7. To edit the horizontal axis labels:
   - In the Horizontal (Category) Axis Labels option, click Edit;
   - Modify the Axis label range;
   - Click OK.
8. Click OK to close the Select Data Source dialog box.

When adding a data series to a chart created from a series of contiguous cells, make sure to select the existing data series and the new data series.

In the Select Data Source dialog box, you can add data and labels by typing in the appropriate text boxes. This information is not entered into the worksheet and, therefore, is not linked to it.

To add multiple labels, separate the words with commas. For instance, if your x-axis labels in the worksheet are abbreviations for month names and you want to have full month names in the chart, you can enter the new labels in the Select Data Source dialog box.

When you select a data series in an embedded chart, the Range Finder displays color-coded borders for all the data included in the chart. Legend labels display a green border, x-axis labels have a purple border, and the data values are outlined in blue.

You can copy data ranges from a worksheet and paste them into a chart.

Select a data series in a chart and press Delete to remove it.

Adding and Removing Data Series

1. On the Chart Data worksheet in **Charts**, insert a new row above row 10.
2. Type the following information in the new row, pressing Tab after each entry:

```
Central     150000      203000      128000
```

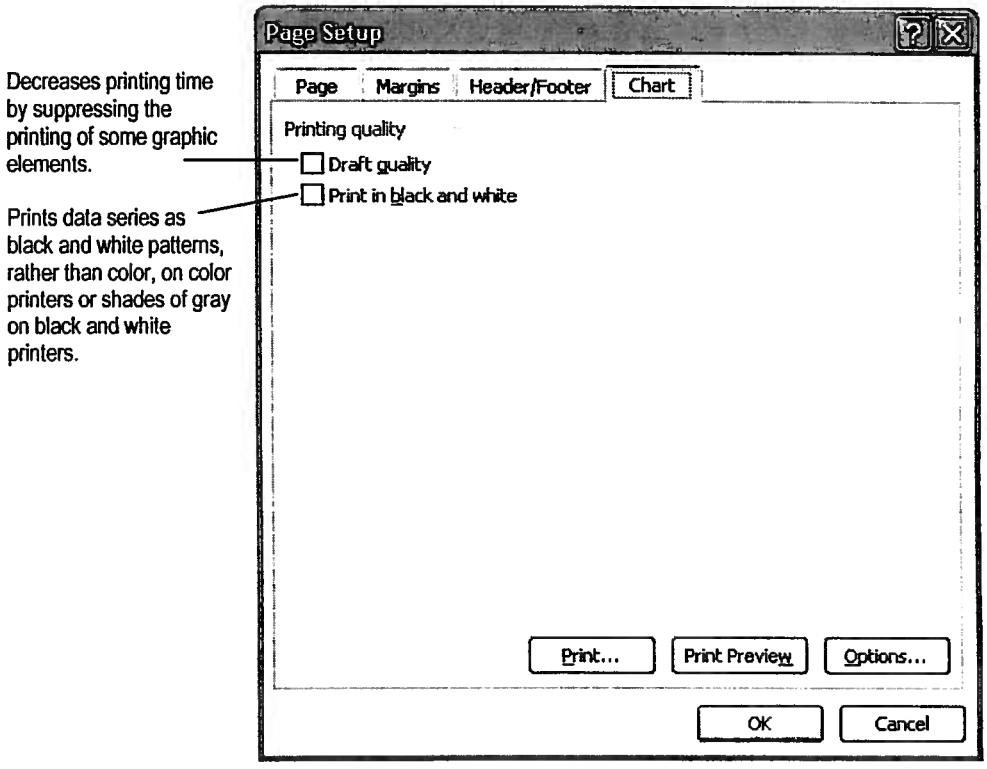
3. Check the formulas for Total Sales and YTD to make sure the new cells have been added.
4. Move to the YTD Chart sheet and note that the "Central" data is not included.
5. To add a Central region to the YTD chart:
   - Make the chart active;
   - On the Design tab of the Chart Tools, locate the Data group and click Select Data;
   - In the *Chart data range* text box, click Collapse Dialog;
   - On the Chart Data worksheet, select the range A6 through A10, hold down Ctrl and select the range E6 to E10; press Enter;
   - Click OK and note that the Central region is now part of the pie chart.
6. Move to the Chart Data worksheet. Select cells A15:D15 and copy the data.
7. Move to the 1st Qtr worksheet.
8. Right-click near the edge of the chart and select *Paste*. Note the copied data series has been pasted in the chart.
9. Save the workbook.

Printing Charts

Typically, you should preview a chart before printing it, in case you want to make adjustments such as changing the page orientation, altering the margins, or adding a header or footer. You can also use the preview feature to help determine if you want to print an embedded chart with or without its surrounding data.

To print an embedded chart without data, select the chart before using the Print command. To print an embedded chart along with the worksheet data, select a cell in the data, rather than the chart. When you print the worksheet, it will print as it appears on the screen. Therefore, if the chart is larger than the page margins or covers any worksheet data, the printed page will look the same way. A chart created on a chart sheet will automatically print without the data used to create it.

When a chart is active, Excel's Page Setup dialog box includes a Chart tab, illustrated below, for adjusting a chart's print quality:



Printing Charts

STEPS

1. Make the chart active.
2. Click the click the File tab and click Print.
3. Set the desired options and click Print.

When printing a chart on a separate chart sheet, the default page orientation is landscape.

When an embedded chart is selected, *Print selected chart* is automatically chosen in the Settings on the Print tab in Backstage View.

To print an embedded chart along with its worksheet data, select a cell in the worksheet rather than the chart and then print the worksheet.

To access the Page Setup dialog box for a chart without previewing it, activate the chart. On the Ribbon, click the Page Layout tab, locate the Page Setup group and then click the [dialog launcher] dialog launcher to open the Page Setup dialog box.

Press Ctrl – P to access the Print dialog box.

Press Esc to return to the worksheet after previewing.

Click the File tab and click Print to view a chart or a chart along with its data before printing.

Try It

Printing Charts

1. Select the Chart Data worksheet in **Charts**, and make the embedded chart active.
2. Click the File tab and click Print to preview the chart. Press Esc to return to the worksheet.
3. Click in cell A1.
4. Click the File tab and click Print to preview the worksheet and the embedded chart.
5. Click the Page Setup link below Settings.
6. On the Margins tab and select *Horizontally* and click OK.
7. Return to the worksheet.
8. Save the workbook.

Creating and Using a Chart Template

Once a chart is created in Excel, the chart layout can be saved as a template. The next time you need a new chart to look that same way as the template chart, just apply the template to the selected data.

Creating and Using a Chart Template

STEPS

1. To create a chart template:
   - Create a chart and apply the desired formatting;
   - Click the Design tab of the Chart Tools;
   - Locate the Type group and click Save as Template;
   - In the Save Chart Template dialog box, enter a name for the template;
   - Click Save.
2. To create a chart from a template:
   - Select the worksheet data for the chart;
   - On the Insert tab, locate the Charts group and then click the dialog launcher to open the Insert Chart dialog box.
   - Select the Templates category;
   - Select the desired template and then click OK.

Click Manage Templates in the Insert Chart dialog box to launch the Windows Explorer and view templates in the default template location which is C:\Documents and Settings*Username*\Application Data\Microsoft\Templates\Charts. The templates can also be renamed or deleted from the Windows Explorer by right-clicking the .crtx file and selecting the desired option from the shortcut menu.

Creating and Using a Chart Template

1. Switch to the Eastern worksheet in **Charts**.
2. To save the chart as a template, do the following:
   - Make sure the chart is active;
   - Click the Design tab of the Chart Tools;
   - In the Type group, click Save As Template;
   - Enter `Quarter Sales` as the name for the template and click Save.
3. Switch to the Central worksheet and select the data in A3 to D6.
4. To create a chart using the Quarter Sales template:
   - Click the Insert tab and then click the dialog launcher in the Charts group;
   - Display the Templates category;
   - Select the Quarter Sales template and then click OK.
5. Move the chart under the data.
6. Select the title, type `First Quarter Sales - Central` and press Enter.
7. Apply the template to the Western worksheet for cells A3 to D6.
8. Change the title to `First Quarter Sales - Western.`
9. Save the workbook.

Creating a Sparkline

A sparkline is a mini chart that appears in the background of a cell. Use a sparkline to show the trend or pattern in a series of data. Choose from three different types of sparklines to represent your data: Line, Column, and Win/Loss.

The picture below shows a column sparkline for each series of monthly data in rows 4 through 6:

	A	B	C	D	E	F	G
1		Taylor Fashions - Eastern Region					
2							
3	Product Line	Jan	Feb	Mar	1st Qtr		Jan to Mar
4	Women's	$200,000.00	$210,000.00	$245,000.00	$655,000.00		
5	Men's	$135,000.00	$63,000.00	$100,000.00	$298,000.00		
6	Children's	$120,000.00	$114,000.00	$87,000.00	$321,000.00		
7	Total	$455,000.00	$387,000.00	$432,000.00	$1,274,000.00		
8							
9	Expenses	$250,000.00	$187,000.00	$78,000.00	$515,000.00		Sparklines
10							
11	Profit	$205,000.00	$200,000.00	$354,000.00	$759,000.00		
12							

Creating a Sparkline

1. Select the empty cell in which to create a sparkline.
2. On the Ribbon, display the Insert tab.
3. Locate the Sparklines group and do one of the following:
   - Click Line to create a Line chart.
   - Click Column to create a Column chart.
   - Click Win/Loss to create a Win/Loss chart.
4. In the Create Sparklines dialog box, make sure the cursor is in the *Data Range* box.
5. Select the data for the sparkline in the worksheet.
6. Click OK.

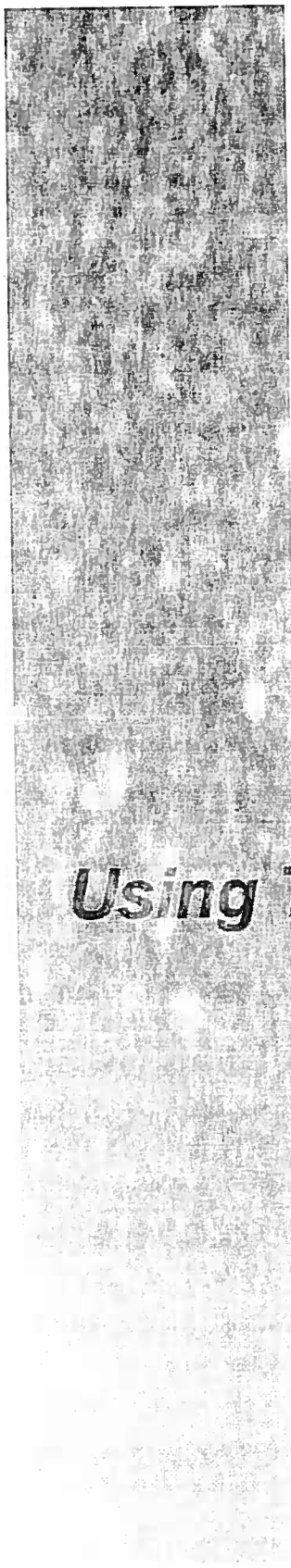
Click the Design tab of the Sparkline Tools to access options for formatting sparklines, changing the sparkline type, and working with data markers.

To remove a sparkline, select the cell containing the sparkline. On the Design tab of the Sparkline Tools, locate the Group group and click Clear.

To create a group of sparklines, use the fill handle to copy a sparkline to adjacent cells. When you apply formatting to a sparkline in a group, the other sparklines in the group are formatted as well.

Creating a Sparkline

1. In **Charts**, switch to the Eastern worksheet.
2. Select cell G4.
3. On the Ribbon, click the Insert tab.
4. Locate the Sparklines group and click Column.
5. Make sure the cursor is in the *Data Range* text box and select the data in the range B4 to D4.
6. Click OK.
7. Use the fill handle to copy the sparkline to cells G5 and G6.
8. Select cell G4. Note the border around the group of sparklines.
9. Click the Design tab of the Sparkline tools.
10. In the Style group, click Marker Color and point to *High Point*; then select a color in the palette. Note the changes to the group.
11. Save and close the workbook.



Using Table Features

Creating a table

Using AutoComplete

Sorting a table

Filtering a table

Working with the Total Row

Creating a Calculated Column

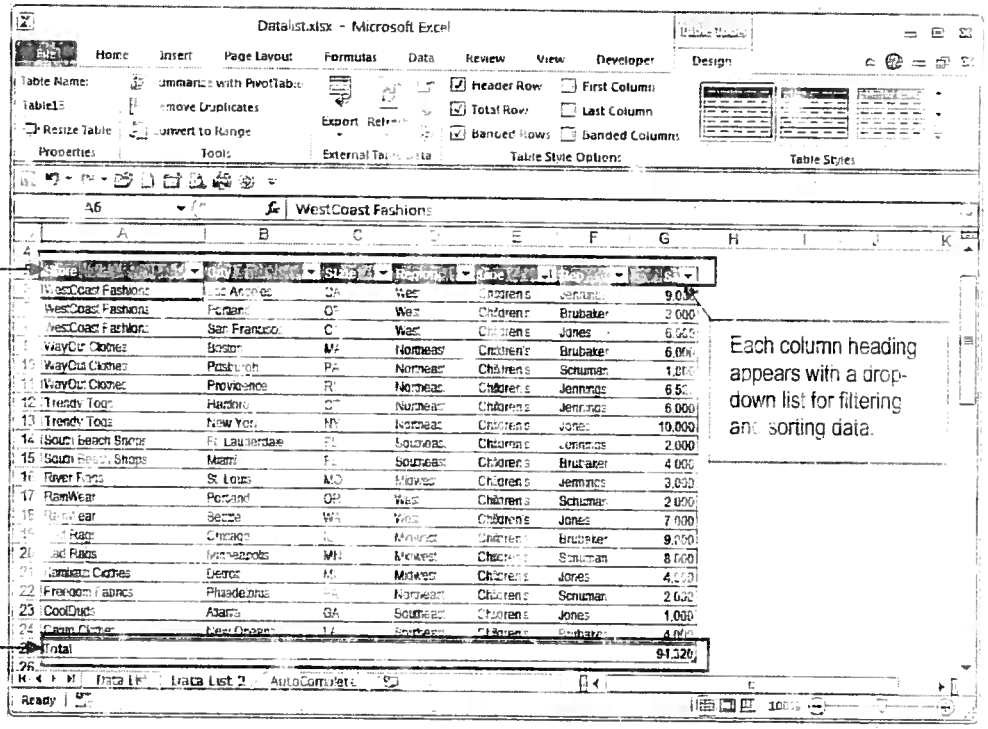
Formatting a Table

Creating a Table

Excel has special features for working with data that is organized like a database with columns as fields and rows as records of related information such as a list of invoices or client names and addresses. You can designate data that has been organized in this manner as a *table* to take advantage of the sorting, filtering, formatting, and analysis tools for working with tabular data in Excel. In versions earlier than Excel 2007, tables were referred to as lists.

When you specify a range of cells containing data as a table, filter drop-down lists are added to the column headings and formatting is applied to the table. When the cell pointer is within the table, a contextual tab appears in the Ribbon containing the tools for working with table features. In addition to sorting and filtering, you can summarize data in a Total row, add columns or rows automatically, and create calculated columns.

The illustration below shows a sample table with the Design tab of the Tables Tools highlighted on the Ribbon:



Creating a Table, continued:

The following guidelines are useful when organizing data for a table in Excel.

Location

- Leave at least one blank row or column between the table and other data on the worksheet.
- Try not to store important information in the cells to the left or right of a table. If you do, the information might be hidden when you filter the table.

Column Labels

- Position the column heading labels in the first row of the table.
- Format the column labels differently than the data in the table.
- Do not use a blank row to separate the column labels from the data.

Contents

- Create each row of the table so that the columns consist of similar items.
- Remove any extra spaces at the beginning and end of a cell. The spaces will affect sorting and searching.
- Use the same format for every data cell in a column.

The illustration below shows a sample of table data:

	A	B	C	D	E	F	G
5	Store	City	State	Region	Line	Rep	Sales
6	WestCoast Fashions	Los Angeles	CA	West	Children's	Jennings	9,000
7	WestCoast Fashions	Portland	OR	West	Children's	Brubaker	3,000
8	WestCoast Fashions	San Francisco	CA	West	Children's	Jones	6,000
9	WayOut Clothes	Boston	MA	Northeast	Children's	Brubaker	6,005
10	WayOut Clothes	Pittsburgh	PA	Northeast	Children's	Schuman	1,800
11	WayOut Clothes	Providence	RI	Northeast	Children's	Jennings	6,520
12	Trendy Togs	Hartford	CT	Northeast	Children's	Jennings	6,000
13	Trendy Togs	New York	NY	Northeast	Children's	Jones	10,000
14	South Beach Shops	Ft. Lauderdale	FL	Southeast	Children's	Jennings	2,000
15	South Beach Shops	Miami	FL	Southeast	Children's	Brubaker	4,000
16	River Rags	St. Louis	MO	Midwest	Children's	Jennings	3,000
17	RainWear	Portland	OR	West	Children's	Schuman	2,000
18	RainWear	Seattle	WA	West	Children's	Jones	7,000
19	Rad Rags	Chicago	IL	Midwest	Children's	Brubaker	9,000
20	Rad Rags	Minneapolis	MN	Midwest	Children's	Schuman	8,000
21	Kamikazi Clothes	Detroit	MI	Midwest	Children's	Jones	4,000
22	Freedom Fabrics	Philadelphia	PA	Northeast	Children's	Schuman	2,000
23	CoolDuds	Atlanta	GA	Southeast	Children's	Jones	1,000
24	Cajun Clothes	New Orleans	LA	Southeast	Children's	Brubaker	4,000
25	Bay Britches	San Francisco	CA	West	Children's	Jennings	4,000
26	WestCoast Fashions	Los Angeles	CA	West	Men's	Jennings	11,500
27	WestCoast Fashions	Portland	OR	West	Men's	Brubaker	5,000
28	WestCoast Fashions	San Francisco	CA	West	Men's	Jones	12,500
29	WayOut Clothes	Boston	MA	Northeast	Men's	Brubaker	7,000
30	WayOut Clothes	Pittsburgh	PA	Northeast	Men's	Schuman	4,500
31	WayOut Clothes	Providence	RI	Northeast	Men's	Jennings	5,500
32	Trendy Togs	Hartford	CT	Northeast	Men's	Jennings	3,620
33	Trendy Togs	New York	NY	Northeast	Men's	Jones	11,000
34	South Beach Shops	Ft. Lauderdale	FL	Southeast	Men's	Jennings	6,550
35	South Beach Shops	Miami	FL	Southeast	Men's	Brubaker	7,000

Creating a Table

STEPS

1. Enter the table data into adjacent columns and rows.
2. Position the cell pointer within the table.
3. On the Ribbon, click the Insert tab and locate the Tables group.
4. Click Table.
5. Verify the range that appears in the Create Table dialog box.
6. Select or clear the *My table has headers* option, if necessary.
7. Click OK.

You can create multiple tables on one worksheet.

If your table does not have column headings, Excel will create generic column headings for you, i.e., Column1, Column2, etc.

To remove a table, on the Design tab of the Tables Tools, locate the Tools group and click Convert to Range; then click Yes. The filter drop-down lists will be removed; however, the formatting of the table will remain.

It is not necessary to create a table to sort or filter data. The Sort & Filter tools on the Data tab of the Ribbon can be used on any data that is organized as a table. Place the cell pointer within the data before using the commands.

When you create a table, it is given a generic name, such as Table1, Table 2, etc. To rename the table, display the Design tab of the Table Tools and locate the Properties group. Click in the *Table Name* text box, type the name and press Enter.

You can easily remove duplicate rows in a table. Select any cell in the table and display the Design tab of the Table Tools; locate the Tools group and click Remove Duplicates. In the Remove Duplicates dialog box, select the column or columns that contain duplicate information and click OK. Leave all columns selected if you want to search for entire rows that are identical and remove them.

On the Home tab of the Ribbon, use the Format as Table tool in the Styles group to quickly create a table and apply a table style of your choice.

To quickly turn a range of data into a table, select the range and press Ctrl – L.

Creating a Table

1. Open the **Datalist** workbook.
2. On the Data List worksheet, select cell A6.
3. On the Ribbon, click the Insert tab.
4. Locate the Tables group and click Table.
5. Verify that $A$5:$G$67 appears as the range for the table and that the *My table has headers* option is checked.
6. Click OK.
7. Note that the entire table is selected and that a table format has been applied.
8. Select cell A6 and save the file.

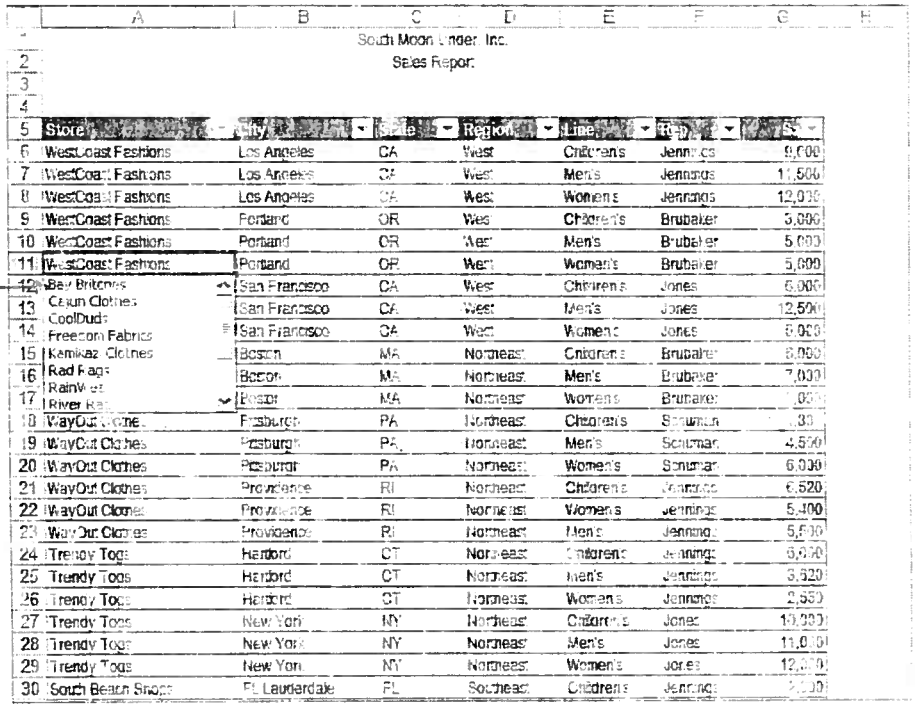
Using AutoComplete

The AutoComplete feature facilitates data entry by filling in repetitive entries in a column. If the first few characters typed in a cell match an entry in that column, Excel can help complete the entry for you. This feature is used with text entries only.

Additionally, as entries are typed into a column, they are built into a drop-down list. Rather than typing an entry in a cell, you can select the desired entry from the list of entries that already appear in that column.

The illustration below shows a worksheet with the drop-down list of entries visible:

Drop-down list of available entries



South Moon Under, Inc.
Sales Report

Store	City	State	Region	Line	Rep	$
WestCoast Fashions	Los Angeles	CA	West	Children's	Jennings	9,000
WestCoast Fashions	Los Angeles	CA	West	Men's	Jennings	11,500
WestCoast Fashions	Los Angeles	CA	West	Women's	Jennings	12,030
WestCoast Fashions	Portland	OR	West	Children's	Brubaker	5,000
WestCoast Fashions	Portland	OR	West	Men's	Brubaker	5,000
WestCoast Fashions	Portland	OR	West	Women's	Brubaker	5,000
Bay Britches	San Francisco	CA	West	Children's	Jones	6,000
Cajun Clothes	San Francisco	CA	West	Men's	Jones	12,500
CoolDuds	San Francisco	CA	West	Women's	Jones	8,000
Freedom Fabrics	Boston	MA	Northeast	Children's	Brubaker	6,000
Kamikaz Clothes	Boston	MA	Northeast	Men's	Brubaker	7,000
Rad Rags	Boston	MA	Northeast	Women's	Brubaker	8,000
RainWear	Pittsburgh	PA	Northeast	Children's	Schulman	4,000
River Rags	Pittsburgh	PA	Northeast	Men's	Schulman	4,500
WayOut Clothes	Pittsburgh	PA	Northeast	Women's	Schulman	6,000
WayOut Clothes	Providence	RI	Northeast	Children's	Jennings	6,520
WayOut Clothes	Providence	RI	Northeast	Women's	Jennings	5,400
WayOut Clothes	Providence	RI	Northeast	Men's	Jennings	5,500
Trendy Togs	Hartford	CT	Northeast	Children's	Jennings	6,000
Trendy Togs	Hartford	CT	Northeast	Men's	Jennings	3,520
Trendy Togs	Hartford	CT	Northeast	Women's	Jennings	2,550
Trendy Togs	New York	NY	Northeast	Children's	Jones	10,000
Trendy Togs	New York	NY	Northeast	Men's	Jones	11,000
Trendy Togs	New York	NY	Northeast	Women's	Jones	12,000
South Beach Shops	Ft. Lauderdale	FL	Southeast	Children's	Jennings	7,000

Using AutoComplete

STEPS

1. To enable or disable AutoComplete:
   - Click the File tab and click Options;
   - Display the Advanced category;
   - Under Editing Options, select or clear the *Enable AutoComplete for cell values* check box;
   - Click OK.
2. To use AutoComplete:
   - Be sure that the cell pointer is in a column that has existing text entries;
   - Start typing the first few characters of text;
   - When the appropriate entry is displayed, press Enter or Tab.
3. To choose an entry from a drop-down list:
   - Right-click the desired cell to display the shortcut menu;
   - Select *Pick From Drop-down List*;
   - Click the appropriate entry in the drop-down list.

Excel uses the text in the column as a reference. When multiple entries have the same beginning characters, you will have to type until you reach a unique character for Excel to determine how to complete the entry.

If AutoComplete is disabled, you can still use *Pick From Drop-down List*.

Entering data in the next row at the bottom of a table automatically extends the range of the table and the table formatting. Similarly, entering data into an adjacent column to the right of the table extends the table range.

The AutoComplete feature can be used with a table or with a range of tabular data.

Select the desired cell and press Alt – ↓ to display the drop-down list of entries.

Different columns contain different text entries. AutoComplete entries available in one column will not be available in another.

Only entries that contain text or a combination of text and numbers can be completed. Entries that contain numbers, dates, or times are not.

Using AutoComplete

1. In the **Datalist** workbook, select the AutoComplete worksheet.
2. To check if the AutoComplete and List AutoFill features are enabled on your computer:
   - Click the File tab and click Options.
   - Click the Advanced category.
   - Ensure that *Enable AutoComplete for cell values* is selected in the Editing options.
   - Click OK.
3. Use AutoComplete to fill in the information below for row 19. Beginning in A19, type the first few characters of each entry and press Tab when the appropriate entry appears.

```
WayOut Clothes   Pittsburgh   PA   Northeast   Men's   Schuman
```

4. Type `4500` for the sales figure in G19 and press Enter.
5. Right-click A20 and select *Pick From Drop-down List*.
6. Choose *WayOut Clothes*.
7. Use the drop-down list or type and use AutoComplete to complete the row with the following information:

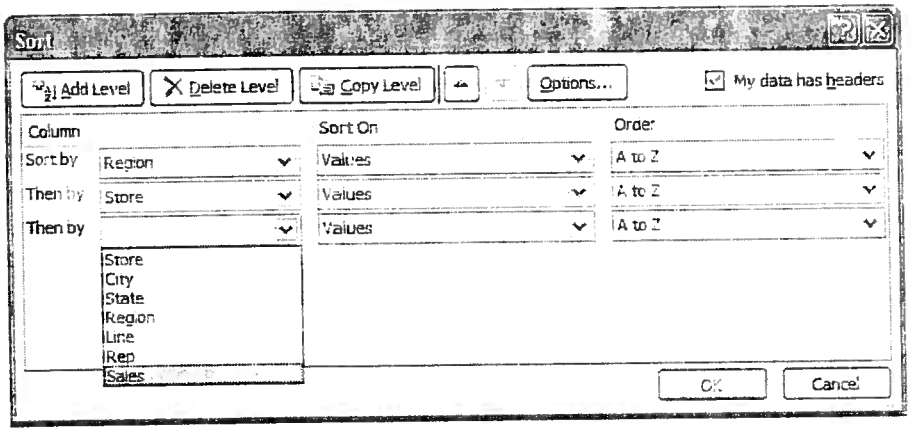
```
Pittsburgh      PA      Northeast      Women's      Schuman
```

8. Enter `6000` in G20.
9. Save the workbook.

Sorting a Table

The order of the rows in a table can be rearranged by sorting. You can arrange the table alphabetically, numerically, or chronologically according to the contents of up to sixty-four columns. Once a multi-level sort is created, you can add, delete, or reorder the sort levels.

Below is an illustration of the Sort dialog box:



Sorting a Table

STEPS

1. To sort by a single column, do one of the following:
   - In the table, open the drop-down list for the column to sort by and select *Sort A to Z* or *Sort Z to A*.
   - Select a cell in the column to sort by and display the Data tab on the Ribbon; locate the Sort & Filter group and then click Sort A to Z or Sort Z to A.
2. To sort by multiple columns:
   - Select any cell in the table;
   - On the Ribbon, click the Data tab and locate the Sort & Filter group;
   - Click Sort;
   - Open the drop-down list under Column and select the primary sort field;
   - Open the drop-down list under Sort On and make a selection;
   - Open the drop-down list under Order and make a selection;
   - Click Add Level and set the criteria for the second sort level in the second row of drop-down lists;
   - Create additional sort levels as desired and then click OK.
3. To remove a sort level:
   - Click the sort level row to be removed and then click Delete Level.

To undo a sort, click Undo on the Quick Access toolbar.

In the Sort dialog box, click Options and select *Case sensitive* to create a sort that differentiates between upper and lower case letters.

To move a sort level row up or down in a multi-level sort, click the row and then click or .

You can sort data according to the font or fill color in the cells to be sorted.

If you are sorting a column containing both text and numbers and you want the numbers sorted together, such as 1, 1a, 2, 2a, you will need to format the numbers as text. If the numbers have already been entered, edit each one to place an apostrophe (') before the number. If the numbers have not been entered, format the cells as text before typing in the numbers.

Try It

Sorting a Table

1. Move to the Data List worksheet in **Datalist**.
2. Scroll down to see the extent of the table and note the current sort order.
3. In cell A5, open the drop-down list for the STORE column and select *Sort A to Z*.
4. View the data and click Undo on the Quick Access toolbar.
5. Select any entry in the REGION column.
6. On the Ribbon, display the Data tab. In the Sort & Filter group, click Sort A to Z.
7. Click Undo.
8. On the Data tab, click Sort in the Sort & Filter group.
9. In the Sort dialog box, open the *Sort by* drop-down list and select *Region*.
10. Click Add Level.
11. Open the *Then by* drop-down list and select *Store*.
12. Add the *Line* field as the third row.
13. Make sure that *Values* is selected under Sort On and *A to Z* is selected under Order in all rows.
14. Click OK.
15. View the data and click Undo.

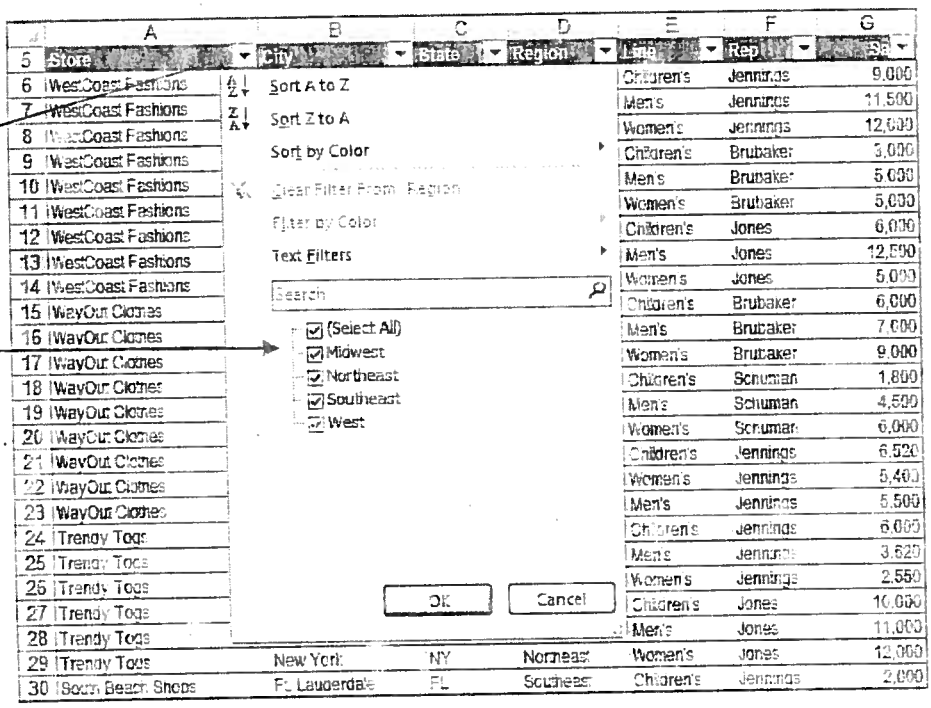
Filtering a Table

When you create a table, a drop-down menu used to set conditions for filtering data becomes available for each column in the table. When you define a filter, only rows containing data matching the criteria you specify will be displayed; the remainder of the table will be hidden.

The illustration below shows a table with the drop-down list for the Region column displayed:

Drop-down arrows appear to the right of the column headings when you create a table.

Choices for filtering the Region column are displayed.



Filtering a Table

STEPS

1. To filter a table:
   - Open the drop-down list for the column to filter;
   - Click to remove the check next to *(Select All)*;
   - Click a check next to the value or values to be used as the filter criteria.
   - Click OK.
2. To create a custom filter:
   - Open the drop-down list for the column to filter;
   - Point to *Text Filters*, *Number Filters*, or *Date Filters* and then select *Custom Filter*;
   - In the first row, select a comparison operator in the drop-down list on the left; then select a value to be used as the filter criterion from the drop-down list on the right;
   - To add another filter:
     - Select *And* or *Or*; and make the desired selections in the second row;
   - Click OK.
3. To remove the filter from a column:
   - Open the drop-down list for the column and select *Clear Filter From <Column Name>*.
4. To turn on the AutoFilter feature to filter data that has not been designated as a table:
   - Select any cell in the data range;
   - On the Ribbon, display the Data tab;
   - Locate the Sort & Filter group and click Filter.
5. To turn off the AutoFilter feature:
   - Select any cell in the data range;
   - On the Ribbon, display the Data tab;
   - Locate the Sort & Filter group and click Filter.

When a filter has been applied, the down arrow for the filtered column appears as .

You can apply a filter to a table that has already been filtered to create multiple conditions.

You can use the wildcard characters * and ? when entering a comparison value in the Custom AutoFilter dialog box.

When creating a custom filter, conditions can be combined using the And and Or operators. *And* requires that both conditions are met for a row to be included in the result. *Or* allows for either condition to be met for a row to appear in the filtered results.

You can copy and paste filtered data to create a new table. Select the rows and use the desired method to copy the data. When you paste, only the filtered data that was visible in the original table will be pasted to the new location.

If a worksheet contains multiple tables, data in one table may be hidden when you filter data in another table as filtering affects the entire row.

Remember to deselect previous criteria before creating new filter criteria. Criteria selections remain in effect until they are removed.

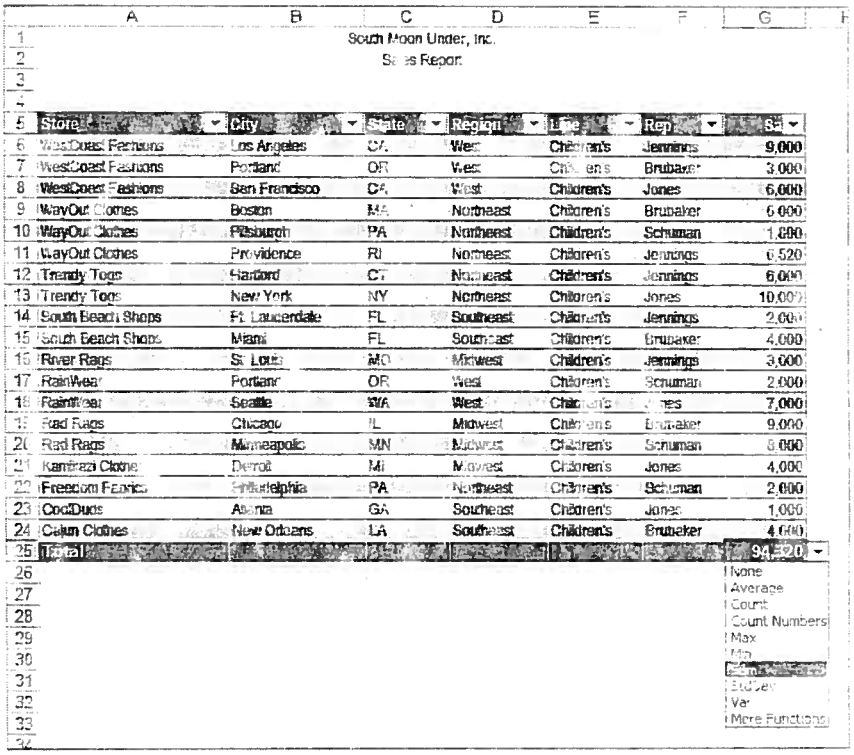
Filtering a Table

1. In the Data List worksheet, select any cell in the table.
2. Open the drop-down list in the Region column and click to remove the check next to *(Select All)*.
3. Select *West* and then click OK. View the changes in the table.
4. Remove the West filter by choosing *Clear Filter From "Region"* from the Region drop-down list.
5. Filter the Rep column to show information for Jennings.
6. Open the Rep column drop-down list and point to *Text Filters*; then select *Begins with*.
7. In the Custom AutoFilter dialog box, enter J as the filter criterion in the first row.
8. Click OK to view the data.
9. Remove the filter from the Rep column.
10. Add filters to find the records in the West region for Brubaker and Jones.
11. Add a Custom filter to find the records where the sales amount is greater than 5,000 for the subset above.
12. Remove all existing criteria.
13. Use the *Top 10 AutoFilter* to show the top 5 items in the Sales column.
14. Change the *Top 10 AutoFilter* to show the top 15 percent of sales items.
15. Save the workbook.

Working with the Total Row

You can choose to display a total row at the bottom of your table to summarize data. When you initially turn the total row on, the word "Total" appears in the leftmost cell of the row and the cell in the last column shows the result of a summary function. If the data in the last column is numeric, the data is summed; if the data in the last column is text, a count of the values in the column is shown. However, you can change the text and the function in the total row to whatever you like. The cell containing the summary function has a drop-down list for selecting an alternate function; you can also enter a formula of your own.

The table in the picture below has the total row displayed:



Working with the Total Row

STEPS

1. To display or hide the total row:
   - On the Ribbon, display the Design tab of the Table Tools:
   - In the Table Style Options group, select or clear the *Total Row* option.
2. To change the text:
   - Select the cell containing the existing text:
   - Type the new text.
3. To replace the summary function with a different function:
   - Select the cell containing the function:
   - Open the drop-down list for the cell and make a selection.
4. To add a function to another cell:
   - Select a cell in the total row;
   - Open the drop-down list and make a selection.
5. To add a formula to the total row:
   - Enter the formula in a cell in the total row.

If you enter a formula or function in any of the cells in the row immediately below a table, the total row will display automatically.

The results of formulas and functions in the total row will change to reflect filtered data.

Working with the Total Row

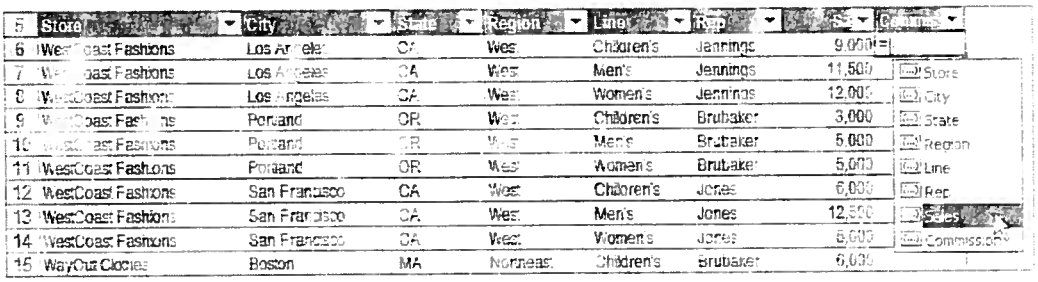
Try It

1. In the Data List worksheet, select any cell in the table.
2. Display the Design tab of the Table Tools and locate the Table Style Options group.
3. Click to select *Total Row* and view the row at the bottom of the table.
4. Open the drop-down list of the cell containing the summary function and select *Average*.
5. Clear all filters and notice the change in the average sales.
6. Select the cell containing the text "Total" and type `Average Sales`.
7. Save the file.

Creating a Calculated Column

In a table, you can easily create a new column of data using a formula that references existing data in the table. Upon entering a formula in a column of a table, the formula automatically extends to all cells in the column, eliminating the need to copy it.

Moreover, rather than cell references, the data in an Excel table can be referred to by its column name. When you refer to data using a column name rather than a cell address, it is called *structured referencing*. A structured reference is entered in a formula inside square brackets. When you type the opening bracket, a list of the structured references for the table appears in the AutoComplete list, as shown in the picture below:



Creating a Calculated Column

1. Create a new column in a table.
2. Enter the formula in a cell in the new column and press Enter.
3. To use a structured reference in the formula:
   - At the point in the formula to use the reference, type an opening square bracket ([ ):
   - Select the reference from the AutoComplete list and press Tab:
   - Type a closing square bracket ( ]) and continue the formula.

The boundary of an Excel table will automatically expand when you enter data in the column immediately to the right of the table.

Double-click the name of a structured reference in the AutoComplete list to enter it into the formula.

To prevent a formula you enter into a table from automatically extending to the entire column, click the File tab and click Options. Select the Proofing category and click the AutoCorrect Options button; in the AutoCorrect dialog box, click the AutoFormat As You Type tab. Clear the *Fill formulas in tables to create calculated columns* check box and click OK. When this option has been disabled and you enter a formula in a table, the AutoCorrect Options button displays with an option to extend the formula to all cells in the column.

Creating a Calculated Column

1. In the Data List worksheet, select cell H5.
2. Type `Commission` as a label for a new column. Notice that the formatting of the table is extended to column H.
3. Select cell H6 and type the following: `=[`
4. In the AutoComplete list, double-click *Sales* to add the reference to the formula.
5. Type a closing square bracket ( ]) to finish the reference.
6. Complete the formula to matches the formula below:

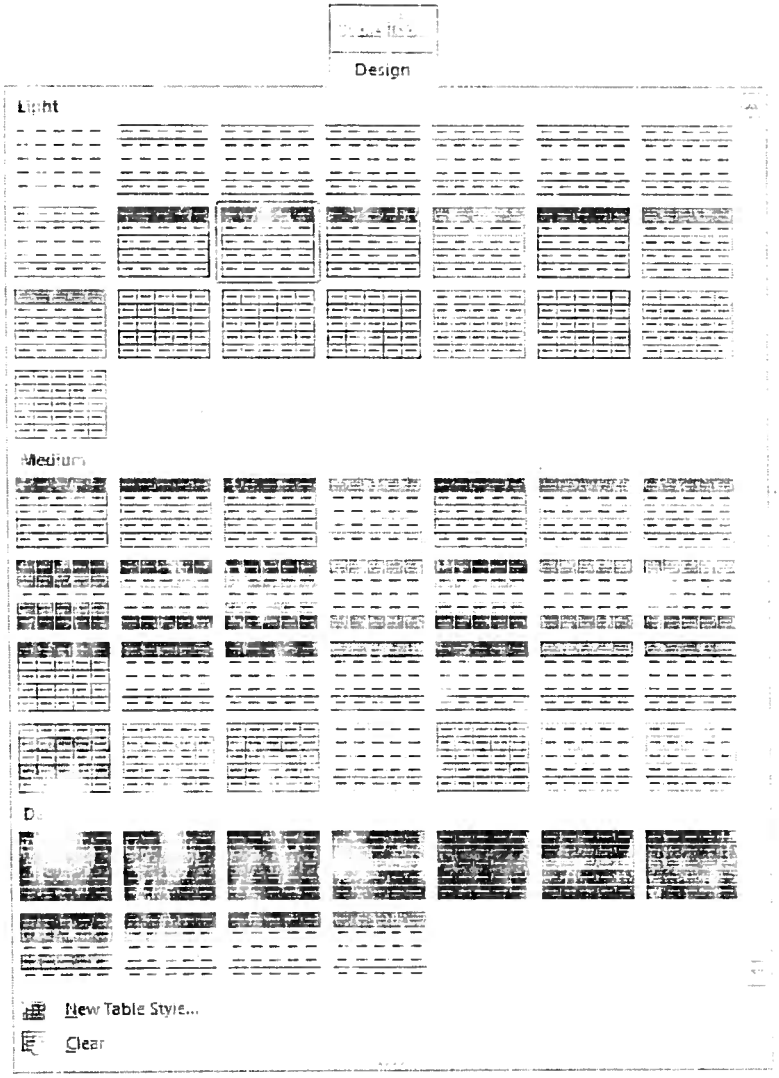
```
=[Sales]*.12
```

7. Press Enter.
8. Notice that the formula is automatically extended to the entire column.
9. Save the workbook.

Formatting a Table

The Table Styles gallery contains several predesigned tables formats that you can apply to your table. As with most galleries in Office 2010, the Table Styles gallery works with the Live Preview feature to display a preview of a style as it will appear in the worksheet. When you mouse over the thumbnail in the gallery, the preview appears. Once you apply a style, you can enable or disable certain elements of it. For example, you can choose to turn off the Banded Rows option on a style that features different shading for every other row.

The Table Styles gallery is shown in the picture below:



Formatting a Table

STEPS

1. To apply a table style:
   - Place the cell pointer within the table;
   - Display the Design tab of the Table Tools;
   - Locate the Table Styles group and click More to open the gallery;
   - Move the mouse over the selections to view the preview and then make a selection.
2. To modify a style:
   - On the Design tab of the Table Tools, locate the Table Style Options group and then do one of the following:
     - To apply different formatting to the first or last column, select *First Column* or *Last Column*.
     - To display every other row or every other column differently, select *Banded Rows* or *Banded Columns*.
3. To clear table formatting:
   - Open the Table Styles gallery and select *Clear*.

Use the controls on the right side of the Table Styles gallery to display a several choices at once or view one row at a time in the Ribbon.

The Table Styles gallery can be sized. Position the mouse over at the bottom the gallery and drag this handle to size the gallery.

You can modify the table formatting using options in the Table Style Options group on the Design tab of the Table Tools.

The palette of colors that appears in the Table Styles gallery is controlled by the theme that is currently active in the workbook. The tools for changing the theme can be found on the Page Layout tab of the Ribbon.

Open the Table Styles gallery and select *New Table Style* to create a custom style in the New Table Quick Style dialog box. Custom table styles are only available in the workbook in which you create them.

To delete a custom table style, right-click the style thumbnail in the Table Styles gallery and select *Delete*.

Right-click a format in the gallery and select *Set As Default* to have that format applied to newly created tables in the current file.

When you insert or delete rows or columns in a table that has banded rows or banded columns, the shading will adjust to maintain the style. This functionality is lost when you convert a table to a range.

The settings of options in the Table Style Options group affect the way thumbnails appear in the Table Styles gallery. For example, if the Banded Rows option is disabled, styles in the gallery will not reflect banded rows.

Try It

Formatting a Table

1. On the Data List worksheet in the **Datalist** workbook, select any cell in the table.
2. On the Ribbon, display the Design tab of the Table Tools.
3. Locate the Table Styles group and click More to open the Table Styles gallery.
4. Mouse over several of the formatting thumbnails and then select one of the styles that has different shading for alternate rows.
5. Locate the Table Style Options group and clear the check next to *Banded Rows*.
6. In the Table Style Options group, select *Banded Columns* and view the results in the table.
7. Open the Table Styles gallery and notice that some thumbnails reflect the Banded Column option and that none appear with banded rows.
8. Press Esc to close the gallery without making a selection.
9. In the Table Style Options group, select *First Column* and clear *Banded Columns*. Note the results.
10. Remove the *First Column* formatting and reapply the *Banded Rows* formatting.
11. Open the Table Styles gallery and note that the thumbnails appear with banded rows.
12. At the bottom of the gallery, choose *Clear* to remove the table formatting.
13. Save and close the workbook.

Using Styles and Templates

Creating and using styles

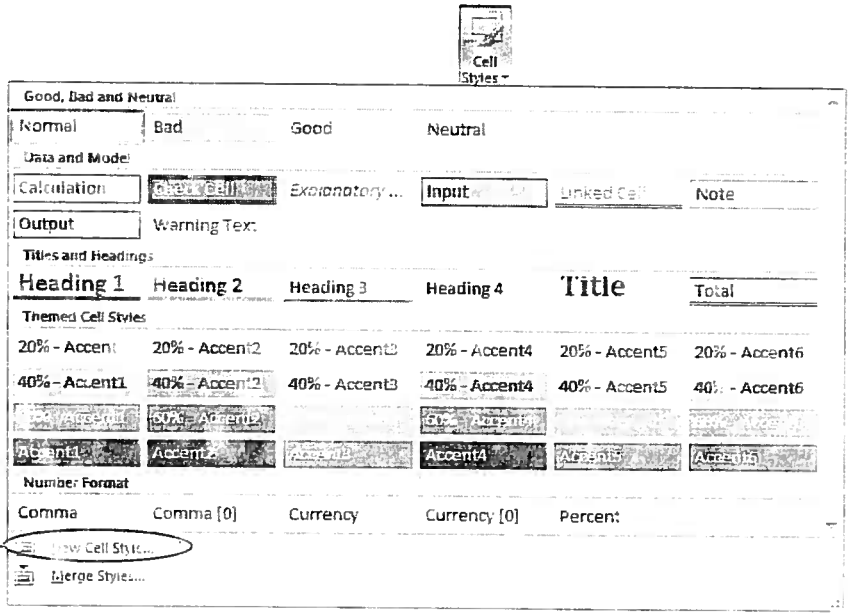
Merging styles

Using templates

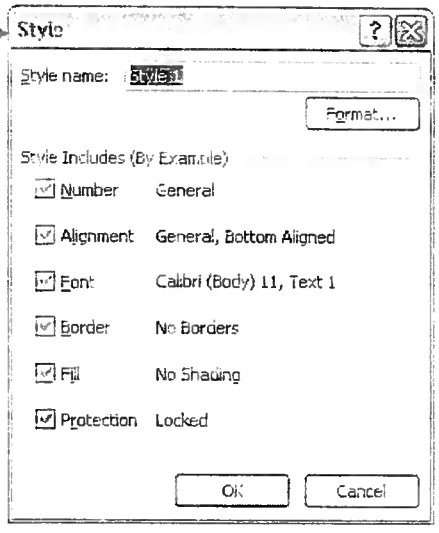
Creating templates

Working with Cell Styles

A cell style is a collection of formats that can be applied to a cell or range of cells. Styles define characteristics such as font size, font color, borders, number formatting, and cell shading. While a handful of built-in number format styles were available in previous versions of Excel, the feature is more accessible and useful in Excel 2010. In addition to the Comma, Currency, and Percent number format styles that you may be familiar with, Excel 2010 provides several other styles for changing the appearance of your worksheet data. These built-in styles appear in the Cell Styles gallery, shown here:



Click *New Cell Style* to open the Style dialog box where you can create and name a custom style.



Working with Cell Styles

STEPS

1. To apply a cell style to a cell or range of cells:
   - Select the cell or cells;
   - On the Home tab, locate the Styles group;
   - Click Cell Styles to open the Cell Styles gallery;
   - Apply the desired style from the gallery.
2. To create a custom style:
   - Display the Cell Styles gallery and select *New Cell Style*;
   - Enter a name in the *Style name* text box;
   - Click Format;
   - In the Format Cells dialog box, make the desired changes and click OK;
   - Click OK in the Style dialog box.
3. To customize an existing style:
   - Display the Cell Styles gallery and right-click the style to be customized;
   - Select *Modify* from the shortcut menu;
   - In the Style dialog box, click Format;
   - In the Format Cells dialog box, make the desired changes and click OK.
   - Click OK in the Style dialog box.
4. To delete a cell style:
   - Display the Cell Styles gallery and right-click the style to delete;
   - Select *Delete* from the shortcut menu.
5. To remove a style from a selected cell or cells:
   - Display the Cell Styles gallery and select Normal under Good, Bad and Neutral.

You can remove a cell style from selected cells using the Clear command. On the Home tab, locate the Editing group; click Clear and then select *Clear Formats*.

If you create your own styles, they will appear at the top of the Cell Styles gallery under Custom.

Custom styles are stored in the workbook in which you create them. You can share custom styles between workbooks using the Merge Styles command which appears at the bottom of the Cell Styles gallery.

The cell styles are based on the theme that is applied to the whole workbook. If you change to a different theme, the styles will be changed to match the new theme in the whole workbook.

To create a new style based on a formatted cell in your worksheet, select the cell, display the Cell Styles gallery and select *New Cell Style*; enter a name for the style and then click OK.

If you delete a style, the formatting will be cleared from all cells that have the style applied.

Merge and Center is not supported in cell styles. If you want merged and centered text to have a cell style, merge and center the text first then apply the style.

Try It

Working with Cell Styles

1. Open the **Taylor Saies** workbook.
2. Display the Eastern worksheet and select cells A1 through E1.
3. On the Home tab, locate the Alignment group and then click Merge & Center.
4. With the merged cell still selected, locate the Styles group and open the Cell Styles gallery.
5. Point to various selections and view the changes in the worksheet. When you are finished, select the Title style.
6. Select the column headings in cells B3 through E3 and use the Cell Styles gallery to apply the Heading 3 style.
7. Continue to use the Cell Styles gallery and do the following:
   - Select the row labels in A4 through A6. Apply the Heading 4 style.
   - Apply the Total style to the label and figures in row 7.
   - Select cells A9:E9 and A11:E11 and apply one of the styles that appears under Themed Cell Styles.
   - Select cells B4:E11 and apply the *Currency [0]* number format.
8. Select the title in cell A1 and apply formats as follows:
   - On the Home tab, locate the Font group and click Decrease Font Size.
   - In the Font group, click the down arrow next to Fill Color and select a color from the palette under Theme Colors.
9. To create a new style based on the formatting applied to the title in cell A1:
   - Make sure cell A1 is selected and open the Cell Styles gallery.
   - Select *New Cell Style*.
   - Type `MyStyle` in the Style name box and the click OK.

continued on next page

Working with Cell Styles, continued

10. Switch to the Central worksheet.
11. Merge and center cells A1:E1.
12. Open the Cell Styles gallery and select *MyStyle* at the top of the gallery.
13. To apply the Eastern cell style formatting to the Western worksheet:
    - On the Eastern worksheet, select cells A1:E11 and copy the data.
    - Display the Western worksheet and select A1:E11.
    - On the Home tab in the Clipboard group, open the Paste drop-down arrow and select *Formatting* from the last row under Other Paste Options.
14. On the Page Layout tab in the Themes group, select Themes.
15. Click Apex and note the changes to the worksheet.
16. Return to the Eastern worksheet and note the changes.
17. Save the workbook.

Merging Styles

Styles created or modified in a workbook are only available in that workbook. To use a style in the current workbook that was created in a different workbook, you need to copy the style from the source workbook to the active workbook. This process is called *merging* styles.

Merging Styles

STEPS

1. Open the source workbook that contains the styles to be copied and the destination workbook that will receive the styles.
2. Make the destination workbook the active window.
3. On the Home tab, locate the Styles group and select Cell Styles.
4. Click Merge Styles.
5. Select the workbook that contains the styles to be copied.
6. Click OK.

If the destination workbook has styles that have the same names as styles that are being merged from the source workbook, Excel will display the "*Merge styles that have the same names?*" prompt. Click Yes to replace styles in the active workbook with styles from the source workbook; click No to retain the styles in the active workbook.

Copy the contents of a cell to which a style has been applied and paste it in another workbook to make the style available in the other workbook.

Merging Styles

Try It

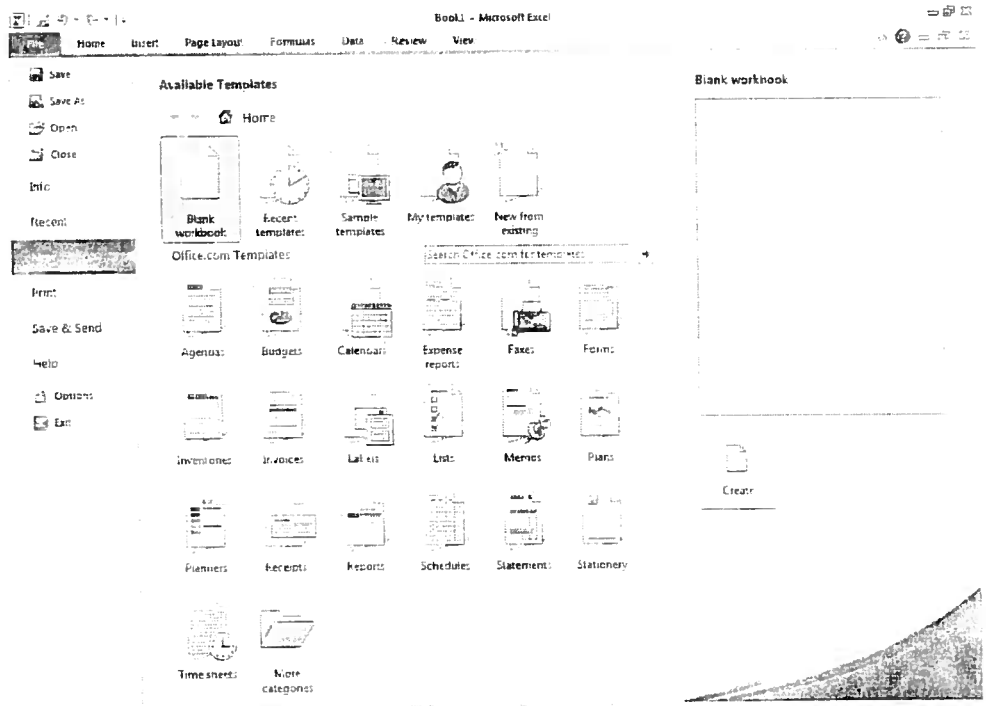
1. Open the **Northern** workbook.
2. On the Home tab, locate the Styles group and select Cell Styles. Click Merge Styles.
3. In the *Merge styles from* list, select ***Taylor Sales.xlsx*** and click OK.
4. Merge and center cells A1:E1.
5. On the Home tab locate the Styles group and select Cell Styles.
6. Apply the *MyStyle* style.
7. Apply styles to the remaining cells in column A and the column headings.
8. Close both workbooks saving changes when prompted.

Using Templates

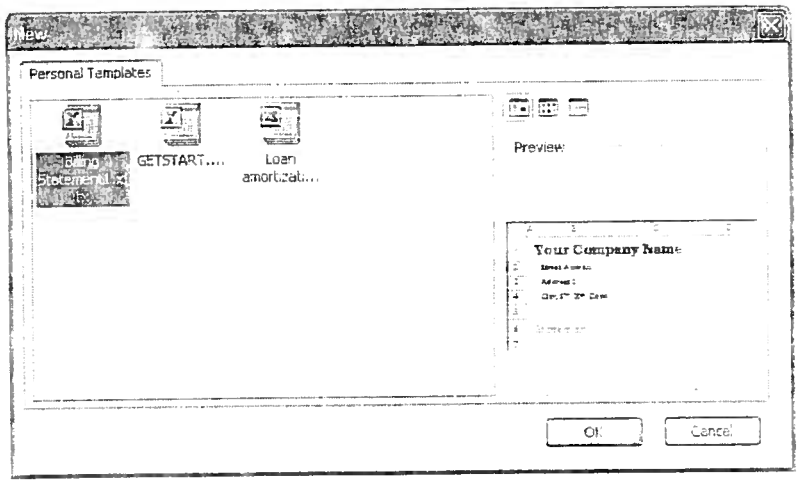
A template file contains a pattern or framework on which new worksheets can be based. Templates usually include data and formatting such as column and row labels, page headers and footers, and standard formulas. They may also include styles, custom toolbars, and VBA macros, which are programming commands. Excel has several templates that you can use as a foundation for worksheets. Some templates are installed automatically, while others can be created by the user.

When you create a new file based on a template, you are using a working copy of the template. When you save the file, Excel will automatically save it as a workbook rather than a template, and you will be prompted to enter a filename. This keeps the template file from being altered or overwritten.

The illustration below shows the New tab of Backstage View:



The illustration below shows the Personal Templates tab of the New dialog box:



Using Templates

STEPS

1. Click the File tab and select *New*.
2. Select the desired option under Available Templates.
3. Select the desired template.
4. Click Create.

When you create a new file based on a template, the template name appears in the window title bar along with a number. For instance, when you create a new file based on the Loan Amortization template, "Loan Amortization1" appears in the title bar.

Click Save to save a new workbook that you've created from a template. The Save As dialog will be displayed and *Excel Workbook (*.xlsx)* will be automatically selected in the Save As Type drop-down list. Type a name for the workbook, navigate to the desired location, and click Save.

The template categories under Office.com Templates are only available if you are connected to the Internet.

If you download one of the templates from Microsoft Office Online, you can save it as a template stored on your computer. To save it as a template, click the File tab and select *Save As*. In the *Save as type* drop-down list, select *Excel Template (*.xltx)*. This will save the template in the Templates folder on your computer. The next time you need it, click the File tab and select New and choose My templates. Select the template from the New dialog box and click OK.

Using Templates

1. Click the File tab and select *New*.
2. In the New Workbook dialog box, click Schedules in the Office.com Templates category.
3. Click Business schedules, select **Loan amortization schedule** and click Download.
4. Enter the following information, pressing Enter ↵ or Tab ⇥ after each entry:

Loan Amount:	100000
Annual Interest Rate:	7%
Loan Period in Years:	30
Number of Payments Per Year:	12
Start Date of Loan:	Press Ctrl – ; to enter today's date
Optional Extra Payments:	0
Lender Name:	Online Bank, Inc.

5. Review the payment information and the Loan Summary.
6. Save the workbook in the student data folder as **Mortgage**.
7. Close the workbook.

Creating Templates

Template files are typically used to produce worksheets for forms and reports that you need to repeatedly create, such as expense forms or weekly or monthly reports. As such, they contain information such as column and row labels, formulas, formatting, styles, and any other items that are part of that specific form or report. Besides template files that come with Excel or that you can download from Microsoft Office Online's web site, you can also create your own templates to save time, achieve consistency, and develop custom applications.

For example, you could create a travel expense template for your company that includes formulas to calculate various totals. You could protect the cells that contain formulas so that other users could not modify them. All employees could then use the template to not only save time but also to eliminate mistakes in calculations.

When you save a template, by default Excel points to a location in the Microsoft Office Templates folder where its built-in templates are stored. Accept this location to have your template appear on the Personal Templates tab of the New dialog box.

Creating Templates

STEPS

1. Create a workbook with the desired headings, formulas, and formats. Do not include information that will change.
2. To save the workbook as a template, click the File tab and select *Save As*.
3. Enter the name of the file.
4. Open the *Save As type* drop-down list.
5. Select *Excel Template (*.xltx)*.
6. Click Save.

Templates have an .xltx extension.

If a template contains macros, the file needs to be saved as an Excel Macro-Enabled Template (*.xltm) file type.

The default location for templates you create is:
C:\Documents and Settings\<Username>\Application Data\Microsoft\Templates

You can use any Excel workbook as a template, even if it has not been saved as a template, by moving or copying the file to the default location for templates shown in the note above. The workbook will appear on the Personal Templates tab of the New dialog box. When you open the workbook, a working copy, rather than an original copy, of the file is opened and its name is displayed along with a number in the title bar.

If the templates that you create are not saved in the default folder, they will not appear on the Personal Templates tab of the New dialog box.

To save a template you have created back to a workbook, open the template then use the *Save As* command from the File tab. Remember to change the Save as Type to *Excel Workbook (*.xlsx)* before saving the file.

Creating a Template

1. Open the **Expenses** workbook.
2. In cell I8, create a formula that sums the mileage reimbursement and the miscellaneous expenses.
3. Copy the formula down through cell H22.
4. Select the ranges C3:C5 and A7:I7; apply the *Heading4* cell style to the ranges.
5. Select cell A1 and apply the *Title* cell style.
6. Format F8:G22 and I8:I22 as the *Currency* cell style.
7. Apply the *Total* cell style to cell I23.
8. Move the cell pointer to D3.
9. Click the File tab and select *Save As*.
10. Select *Excel Template (*.xltx)* from the *Save as type* drop-down list.
11. Click Save.
12. Close the template file.

Using a Template

1. Click the File tab and select *New*.
2. Click My templates.
3. In the New dialog box double-click the **Expenses** template. Note the file name in the title bar.
4. Add the following data in row 8, pressing Tab↹ after each entry:

Date	Today's Date
Location	Philadelphia, PA
Beginning Odometer	17003
Ending Odometer	17080
Miscellaneous Expense	15.00
Miscellaneous Expense Description	parking

5. To save the expense report in your folder:
   - Click Save on the Quick Access toolbar;
   - Type January Expenses as the file name;
   - Be sure to navigate to the student data folder;
   - Click Save.
6. Close the workbook.
7. To delete the template:
   - Click the File tab;
   - Select *New*;
   - Click My templates;
   - Right-click **Expenses**;
   - Select *Delete*;
   - In the Confirm File Delete dialog box, click Yes.
8. Close the New dialog box.
9. Click the Home tab to display the worksheet.
10. Close any open workbooks, saving as desired.

Review – Working with Charts, Lists, and Styles

1. Open the **Invent** workbook.
2. On the PC Products worksheet, select the range A6:E10.
3. Create a 2-D clustered column chart with a legend, and the title "Inventory Control Associates" on a new sheet named Inventory.
4. Add axis titles as desired.
5. Change the chart type to a 3-D clustered column chart.
6. To add the hard drives information to the chart, on the PC Products worksheet copy the range F6:F10 and paste it into the chart.
7. Format the Titles as desired.
8. Select the Employee List worksheet.
9. Move the cell pointer within the data and create a table. The range is A5 to H52.
10. Sort the table by Employee ID in ascending order.
11. Filter the list to find employees with a BA degree who are earning more than $43,000.
12. Move to the Annual Review worksheet.
13. Create a style named `My Heading 1` that formats text to 14 points, bold, and red. Apply the style to cells A1 and A3.
14. Create another style named `My Heading 2` that formats text to 12 points and bold. Apply the style to cells A5, A7, A9, A11, and A13.
15. AutoFit column A.
16. Just note how you would save the workbook as a template. (If you do, in fact, save the file as a template in the default folder, be sure to delete the template file from the Personal Templates tab of the New dialog box.)
17. Save and close all open workbooks.

Using Protection and Shared Workbook Features

Protecting workbooks and worksheets

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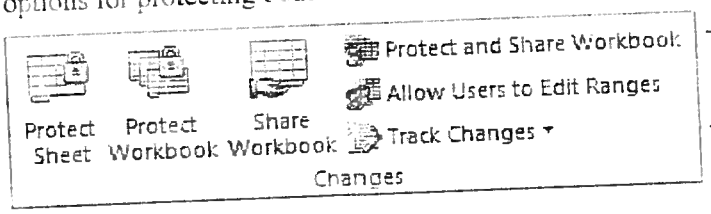
Protecting Workbooks and Worksheets

Excel has various levels of protection to prevent someone from changing the contents of a worksheet or altering a workbook. Protection at the worksheet level includes preventing data, objects, or scenarios from being changed. Protection at the workbook level can prevent worksheets from being added, deleted, hidden, or renamed as well as maintaining the size and placement of the workbook window.

When you use protection in Excel, you have the option of assigning a case-sensitive password in the different dialog boxes. This prevents others from unprotecting the worksheet or workbook and making unauthorized changes.

The illustration below shows the Changes group on the Review tab that contains options for protecting both worksheets and workbooks.

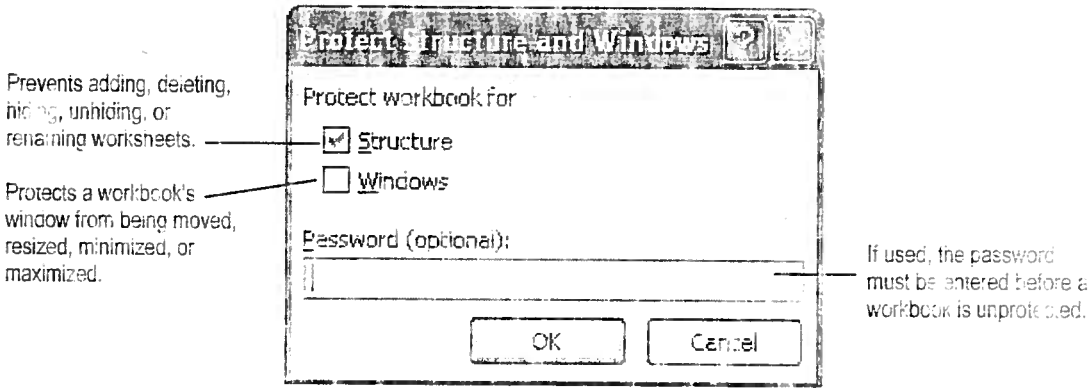


Components of protecting workbooks and worksheets are listed below:

Protecting a Workbook	You can protect the structure and/or the workbook window. Protecting the *structure* will prevent viewing hidden worksheets, inserting new sheets, deleting sheets, modifying the names of worksheets, and moving or copying worksheets to another workbook. However, you can insert an embedded chart in a protected workbook. Protecting the *window* will prevent changing the size or position of the window. You can set a password to further protect a workbook.
Protecting a Worksheet	By default all cells are locked when protecting a worksheet. To allow changes to specific cells you must unlock them before protecting the worksheet. Optionally, you can grant permission for specific users to change locked cells. This, too, must be set before protecting the worksheet. You can set a password to further protect several of the worksheet protection options.

Protecting a Workbook

When sharing a workbook with others, you may want to protect the workbook from certain changes, such as a worksheet being deleted. The choices available in the Protect Structure and Windows dialog box, which is opened from the Protect Workbook command, are illustrated below:



Protecting a Workbook

STEPS

1. Set up the workbook as it should be when protected, including hiding worksheets and designating the size and placement of the window.
2. To enable protection for the workbook:
   - On the Review tab, locate the Changes group and click Protect Workbook;
   - Select the desired options;
   - Optionally, type a password and click OK. In the Confirm Password dialog box, enter the same password again and click OK.
3. To remove the workbook protection:
   - On the Review tab, locate the Changes group and click Protect Workbook;
   - If necessary, enter the password and click OK.

You can set a password protect to prevent users from opening a file: click the click the File tab and select *Save As*. In the Save As dialog box, open the Tools drop-down list and select *General Options*. Type a password in the Password to open text box. When prompted, reenter the password and click OK. Click Save and then click Yes.

Passwords that you assign in Excel are case-sensitive. A password can be up to 255 characters long and may consist of numbers, letters, spaces, and symbols.

Excel has no method for you to readily recover forgotten passwords.

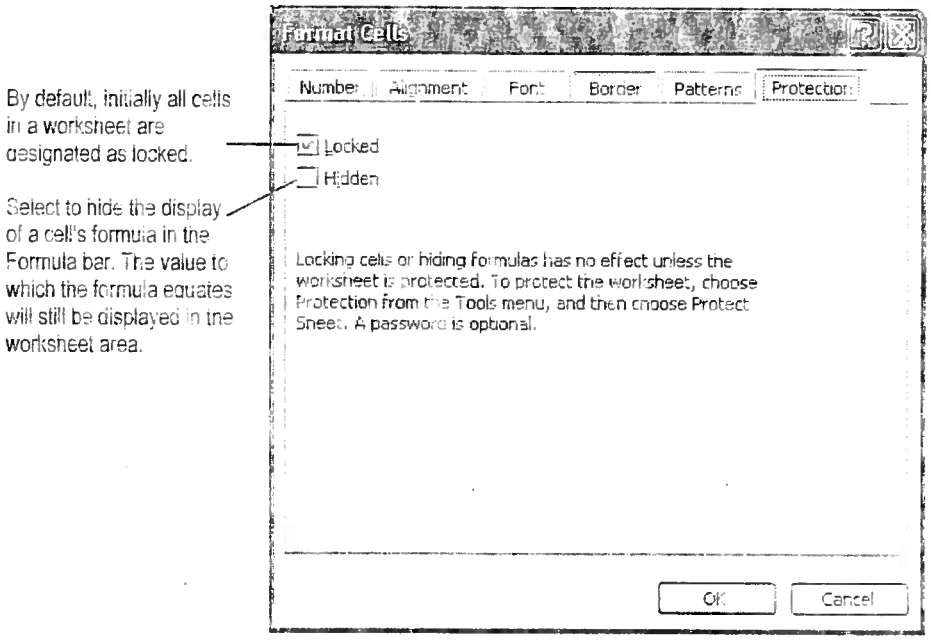
Protecting a Workbook

1. Open the **Quarter4** workbook.
2. On the Home tab, locate the Cells group and select Format.
3. Select *Hide & Unhide* and click *Unhide Sheet*.
4. Note that the 4th Quarter worksheet is hidden and click Cancel.
5. If the workbook window is maximized, click Restore.
6. Resize the workbook window to show only through columns G.
7. On the Review tab, locate the Changes group and click Protect Workbook.
8. In the Protect Structure and Windows dialog box:
   - Make sure that both the *Structure* and *Windows* check boxes are selected;
   - Do not enter a password;
   - Click OK.
9. Try to maximize, move, or resize the **Quarter4** workbook window.
10. Click several worksheet tabs to note that you can still access the different sheets.
11. On the Home tab, locate the Cells group and click Format. Note that you cannot hide, unhide, rename, move or copy sheets, or color-code worksheets.
12. On the Review tab, locate the Changes group and click Protect Workbook to turn off the workbook protection.
13. Maximize the workbook.
14. Save and close the file.

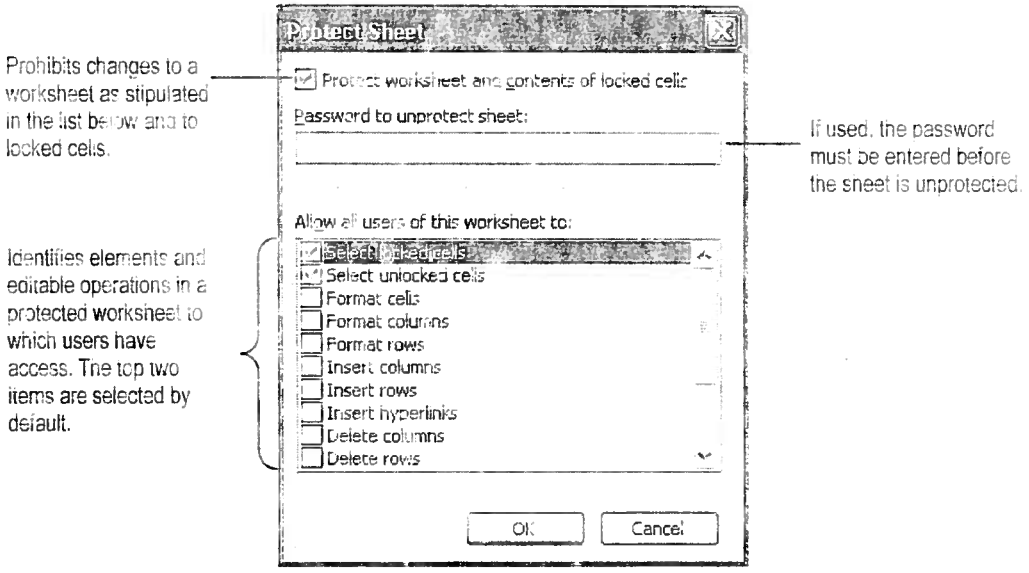
Protecting a Worksheet

Use worksheet level protection to prevent data, objects, or scenarios from being changed. Protecting a worksheet requires two steps: unlocking cells or ranges where changes will be allowed, and enabling the protection.

The illustration below shows the Protection tab of the Format Cells dialog box that is used to designate selected cells as locked or unlocked:



The Protect Sheet command opens the Protect Sheet dialog box, where you can specify the protection status of the current worksheet as illustrated below:



Protecting a Worksheet

STEPS

1. To unlock the cells in which to allow changes once the protection is enabled:
   - Select the desired cells or ranges.
   - On the Home tab, locate the Cells group and click Format.
   - Select *Lock Cell*.
2. To enable worksheet protection:
   - On the Review tab, locate the Changes group and click Protect Sheet.
   - Ensure that *Protect worksheet and contents of locked cells* is selected.
   - Optionally, type a password.
   - Select the items to be enabled for all users of the worksheet under *Allow all users of this worksheet to*.
   - Click OK; if necessary, enter the same password again in the Confirm Password dialog box and click OK.
3. To remove the worksheet protection:
   - On the Review tab, locate the Changes group and select Unprotect Sheet.
   - If necessary, enter the password and click OK.

By default, all cells in a worksheet are locked. If you want the majority of the worksheet to be editable, you can first unlock all cells in the worksheet and then lock only the cells and ranges you want to protect.

Using a password in the Protect Sheet dialog box prevents others from unprotecting the worksheet. When granting access of protected ranges to individual users, you can enter a password to prevent others from editing the designated ranges.

When a cell containing a formula is unlocked, a green triangle appears in the upper-left corner of the cell to indicate an unprotected formula. If you select the cell, Trace Error displays to the left of the cell. Point to the error indicator to view the following ScreenTip: *This cell contains a formula and is not locked to protect it from being changed inadvertently.*

If you click Trace Error, a list of options appears under the heading "Unprotected Formula".

The Protection tab in the Format Cells dialog box is not available if the worksheet is protected.

The elements selected in the Protect Sheet dialog box affect the entire worksheet and apply to all users.

To select the entire worksheet, click the Select All button in the upper left corner of the worksheet where the column and row headings meet.

To unlock cells, right-click the selected cells and select *Format Cells*. Click the Protection tab, remove the check next to *Locked* and click OK.

You cannot lock or unlock individual cells after protecting a worksheet. You must first remove the protection.

Many menu choices will be unavailable when protection is turned on.

If you copy a protected worksheet to another workbook, it will still be protected. If you copy cells from a protected worksheet to another workbook, they will not be protected.

If worksheet protection is enabled, you cannot grant specific users access to edit ranges.

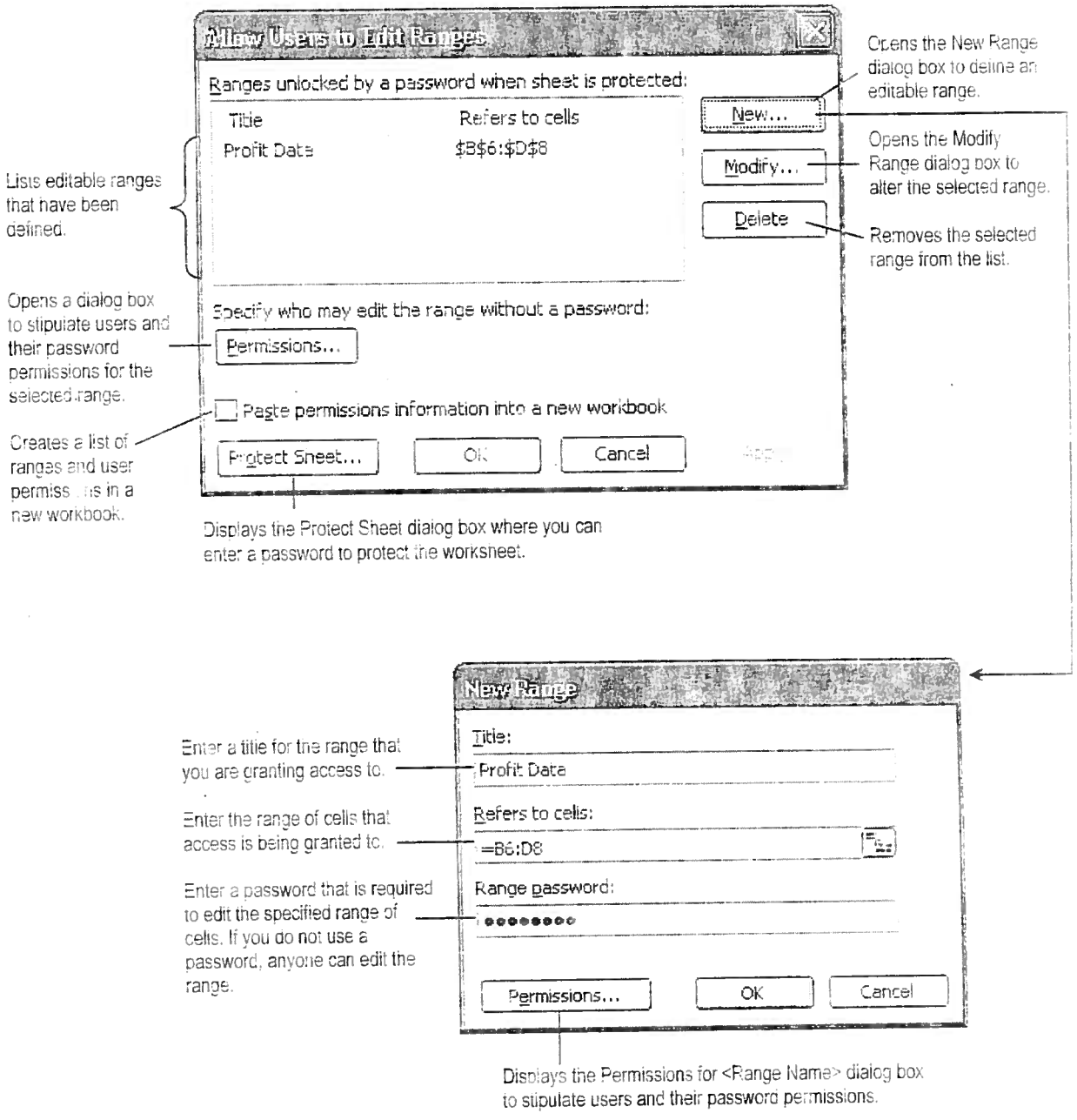
Protecting a Worksheet

1. Open the **Williams** workbook and display the New York worksheet.
2. To make sure that an Error Checking rule is enabled before doing the exercise:
   - Click the File tab and click Options;
   - Click Formulas;
   - Under Error Checking Rules, ensure that *Unlocked cells containing formulas* is selected and click OK.
3. To unlock cells to be used for data entry:
   - Select cells B5:E8;
   - On the Home tab, locate the Cells group and click Format; select *Lock Cell*.
4. Note the green triangles and the error message for the cells containing formulas in E5 through E8. Select E5:E8 and click Trace Error; select *Lock Cell* to lock them. Note the green triangles are gone.
5. To enable worksheet protection for the worksheet:
   - On the Review tab, locate the Changes group and click Protect Sheet;
   - Leave the three default check boxes selected;
   - Leave the password blank and click OK.
6. Select cell B13 and try to type over the formula; click OK to close the warning dialog box. Verify that only cells B5:D8 can be edited.
7. Save the file.

Allowing Users to Edit Ranges

When you protect a worksheet, all users are prohibited from making changes to locked cells. Before protecting a worksheet, you can provide exclusive access to individuals, groups, or computers to allow them to edit specified ranges in the worksheet. With this access, a user can make changes to cells even if they are locked.

The Allow Users to Edit Ranges dialog box, available from the command with the same name and shown below, is where you assign special access to protected ranges:



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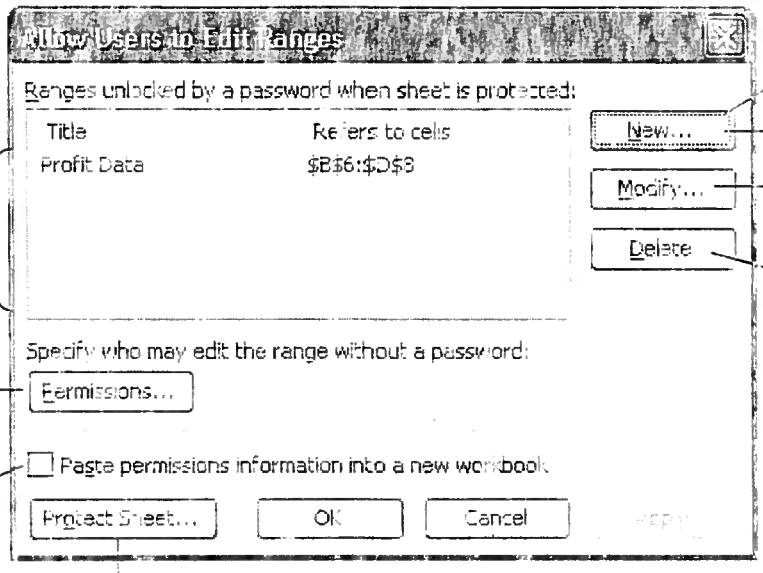
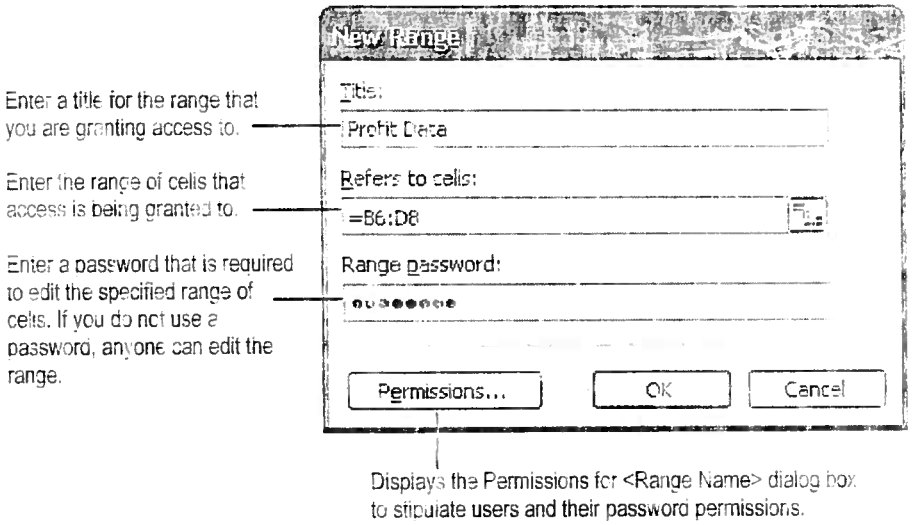




Allowing Users to Edit Ranges

STEPS

1. On the Review tab, locate the Changes group and select *Allow Users to Edit Ranges*.
2. In the Allow Users to Edit Ranges dialog box, click New.
3. To create a range and its access permissions for specific users, do the following in the New Range dialog box:
   - In the *Title* text box: type a title for the range:
   - In the *Refers to cells* text box: specify the desired worksheet range;
   - In the *Range password* text box, type a password to access the range;
   - Click Permissions;
   - In the Permissions for <Range Name> dialog box, do the following:
     - To access users on the system, click Add:
     - In the Select Users, Computers, or Groups dialog box, enter the desired users in the text box and click OK:
     - To require a user to supply the password to edit the range, select the user's name in the list at the top of the Permissions dialog box and then select the *Deny* option at the bottom of the dialog box:
     - Click OK. If a security warning appears, click Yes to continue.
   - Click OK to close the New Range dialog box:
   - If necessary, in the Confirm Password dialog box, reenter the password and click OK.
4. To grant access to other ranges, click New in the Allow Users to Edit Ranges dialog box and repeat the steps above starting with Step 3.
5. To enable the protection after all ranges have been set up, click Protect Sheet in the Allow Users to Edit Ranges dialog box and do the following:
   - In the Protect Sheet dialog box, ensure that *Protect worksheet and contents of locked cells* is selected;
   - Optionally, type a password in the *Password to unprotect sheet* text box:
   - Select the items to be enabled for all users of the worksheet under *Allow all users of this worksheet to* and click OK;
   - If necessary, in the Confirm Password dialog box, enter the same password again and click OK.

To specify a worksheet range to grant access to users in the Refers To Cells text box of the New Range dialog box, you can either type the range or click Collapse Dialog and select the range; then click Expand Dialog or press Enter.

To change permissions for a range, select it in the Allow Users to Edit Ranges dialog box and click Permissions.

To modify a range name, the cells to which it refers, or its password, select it in the Allow Users to Edit Ranges dialog box and click Modify.

Allowing Users to Edit Ranges

1. In the **Williams** workbook, move to the Rio de Janeiro worksheet.
2. Select the range B5:D8.
3. On the Review tab, in the Changes group, click Allow Users to Edit Ranges.
4. In the Allow Users to Edit Ranges dialog box, click New.
5. Enter `password` in the *Range password* text box and click OK.
6. Reenter the password in the Confirm Password box and click OK.
7. Click Protect Sheet and then click OK.
8. Attempt to enter 55,000 in cell C5.
9. Enter the password in the Unlock Range box.
10. Change the contents of C5 to 55,000.
11. Move to the Profits worksheet and protect the sheet.
12. Note the Rio de Janeiro January profit value in cell B7.
13. Move to the Rio de Janeiro worksheet and change cell B5 to 250,000.
14. Return to the Profit worksheet and note that the Rio de Janeiro profit has been updated even though the worksheet is protected.
15. Optionally, to hide the display of formulas in the Formula Bar in the Profits worksheet:
    - Unprotect the sheet;
    - Select cells B6:E12. Right-click any cell in the range and choose *Format Cells*;
    - Click the Protection tab, select *Hidden*; and then click OK;
    - Protect the sheet;
    - Note the suppression of the formulas in the formula bar.
16. Save and close all open workbooks.

Working with Shared Workbooks

Workbook sharing allows multiple users on a network to simultaneously view or modify a workbook. Since some Excel features can't be changed when a workbook is designated as shared, you should set up the data and format it as necessary before making it available to other users. Once multiple users can edit the workbook, as they save their changes, other users can see the modifications. When you save a shared workbook, it is updated with all the changes that other users have saved to it.

All features of Excel are not available when a workbook is shared. If you want to include any of the following features, you should add them before you save the workbook as a shared workbook: merged cells, conditional formats, data validation, charts, pictures, objects including drawing objects, hyperlinks, scenarios, outlines, subtotals, data tables, PivotTable reports, workbook and worksheet protection, and macros. You cannot make changes to these features after you share the workbook.

Conflicts arise only when multiple users save changes that affect the same cell. When this happens, Excel will display the Resolve Conflicts dialog box so that the last person to save the changes will get to decide which alterations to keep.

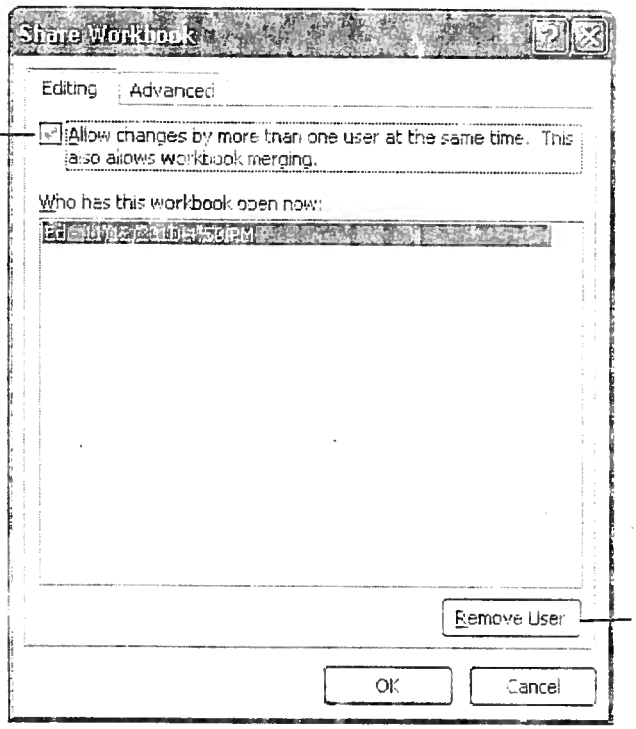
The steps in this process are as follows:

- A workbook is saved as a shared workbook in a shared network location.
- Individual users edit and then save the workbook.
- One person reviews the workbook and accepts and/or rejects changes.

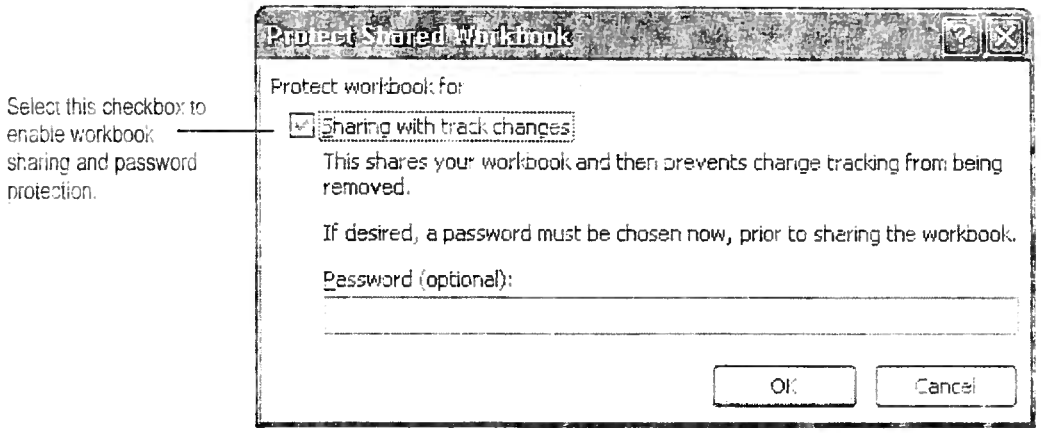
Configuring a Workbook for Shared Use

Before a workbook can be shared, it must be configured correctly. The originator must enable workbook sharing so that multiple users can access it. You can share a workbook or you can protect a workbook with a password and share it at the same time. Once the workbook is shared, many users can edit the data as needed.

The following is an illustration of the Share Workbook dialog box for sharing a workbook:



The illustration below shows the Protect Shared Workbook dialog box where you can add a password and share a workbook at the same time:



STEPS

1. Open the workbook that is to be configured.
2. To share a workbook:
   - On the Review tab, locate the Changes group and click Share Workbook;
   - On the Editing tab of the Share Workbook dialog box, select *Allow changes by more than one user at the same time. This also allows workbook merging*;
   - Click OK;
   - At the "*This action will now save the workbook. Do you want to continue?*" prompt, click OK to save the workbook.
3. To remove a workbook from shared use:
   - On the Review tab, locate the Changes group and click Share Workbook;
   - On the Editing tab of the Share Workbook dialog box, clear *Allow changes by more than one user at the same time. This also allows workbook merging*;
   - Click OK;
   - Click Yes.

If you want to limit access to a shared workbook using a password, use Protect and Share Workbook in the Changes group on the Review tab. The Protect Shared Workbook dialog box has options for enabling tracked changes and for adding an optional password.

To remove an individual user, display the Review tab, locate the Changes group, and click Share Workbook. On the Editing tab select the user you want to remove, and then click Remove User.

The maximum number of users of a shared workbook is 256.

Sharing a workbook turns on the change history. By default, the change history is retained for 30 days. If a different period is needed, click Share Workbook and then click the Advanced tab, and enter the number of days in the *Keep change history for* text box.

Any user can remove a workbook from shared use and change any of the options unless *Sharing with track changes* is enabled and a password has been entered.

Passwords are case sensitive. If forgotten, they cannot be recovered.

When a workbook is removed from shared use, the change history is automatically deleted. Make sure the changes have been accepted or rejected first.

Configuring a Workbook for Shared Use

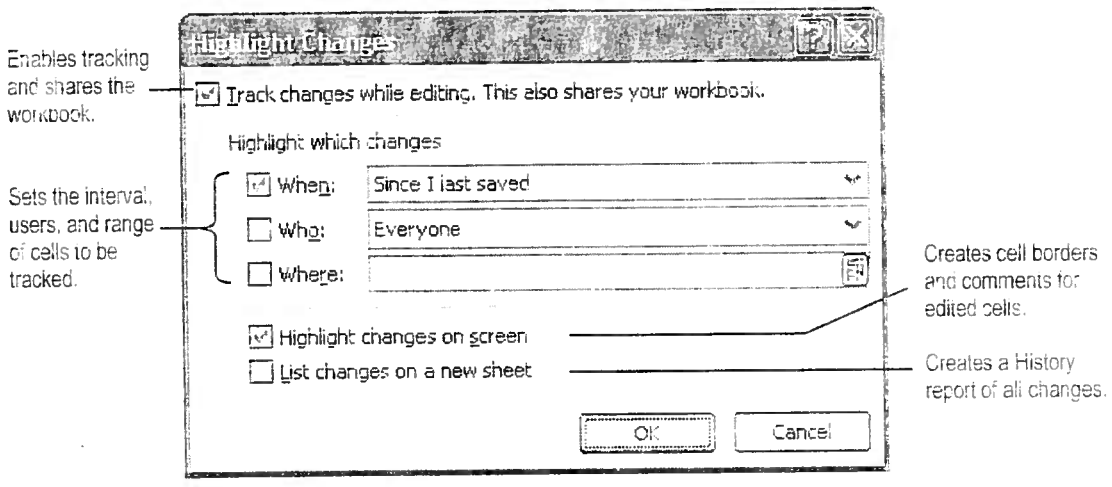
The workbooks that we will use for the exercises in this chapter have been designed to simulate working in a shared environment without needing to be in a shared area.

1. Open the **Shared** workbook.
2. Display the Review tab.
3. Locate the Changes group.
4. Click Share Workbook.
5. On the Editing tab of the Share Workbook dialog box, select the *Allow changes by more than one user at the same time* check box and click OK.
6. Click OK to answer the prompt: "This action will now save the workbook. Do you want to continue?"
7. Note the addition of [Shared] in the title bar.

Highlighting Tracked Changes

The ability to track the changes made to a shared workbook, when the changes were made, and by whom, is important. This feature is so closely linked with workbook sharing that if you enable the Highlight Changes option, the workbook is automatically shared.

Below is an illustration of the Highlight Changes dialog box followed by a description of the Highlight Which Changes options:



When	specifies the interval of time to retain or display changes.
Who	specifies which user changes to track.
Where	provides the ability to specify ranges of cells for tracking.

Highlighting Tracked Changes

STEPS

1. Display the Review tab.
2. Locate the Changes group and click Track Changes.
3. Select *Highlight Changes*.
4. Select *Track changes while editing. This also shares your workbook.*
5. Make the desired selections from the *Highlight which changes* options.
6. To enable borders and cell notes for edited cells:
   - Select *Highlight changes on screen.*
7. Click OK.

To make sure that your user name is correct so that your changes are properly identified in the shared workbook, click the File tab and click Options. Verify the name in the *User name* text box under Personalize your copy of Microsoft Office.

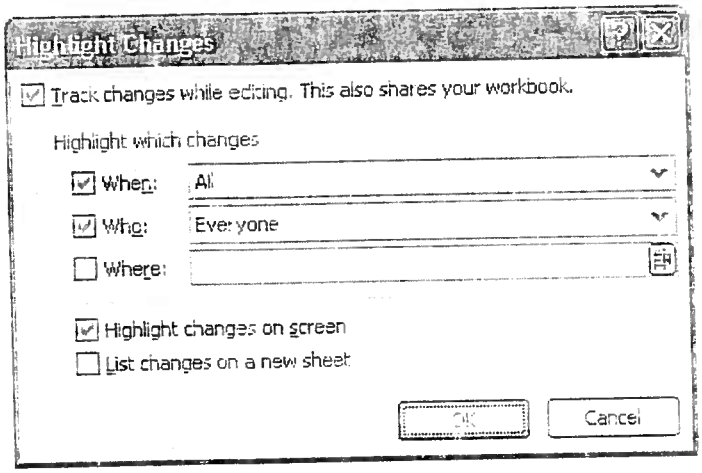
The borders around edited cells will display in different colors for each user who edits the file.

The comment indicator displays in the upper left corner to indicate tracked changes rather than in the upper right corner as it does for a regular comment.

To add, edit, delete or view comments use the Comments group on the Review tab.

Highlighting Tracked Changes

1. In the **Shared** workbook, display the Review tab.
2. Locate the Changes group and select Track Changes.
3. Select *Highlight Changes*.
4. Match the choices in the Highlight Changes dialog box with the illustration below:



5. Click OK twice.
6. Change the contents of cell B7 to `567`. Note the border around the cell and the note indicator in the upper left corner of the cell.
7. Point to cell B7 and read the note that is displayed.
8. Change the contents of cell B11 to `=sum(B7:B10)`.
9. Change C10 to `350`.
10. Select cell B10 and click New Comment in the Comments group on the Review tab.
11. Type `Why are sales so low?` and click outside the comment box.
12. Add the following comment to cell F10:

```
What happened this month?
```

13. Add any other changes as desired.
14. Save and close the workbook.

Creating the History Report

The History report listing all the saved changes made to the worksheet automatically appears on a separate sheet once it is configured. Although the report is not saved with the worksheet, it can be regenerated at any time.

Creating the History Report

STEPS

1. Open the shared workbook.
2. Make the desired changes to the worksheet.
3. Save the workbook.
4. Display the Review tab.
5. Locate the Changes group and click Track Changes.
6. Select *Highlight Changes*.
7. Clear the checks next to *When*, *Who*, and *Where* in the *Highlight which changes* options.
8. Select *Highlight changes on screen*, if necessary.
9. Select *List changes on a new sheet*.
10. Click OK.

The History worksheet is created with the AutoFilter feature turned on and can be used to filter this worksheet to view different categories of changes.

Once the workbook is saved, the History worksheet will be deleted automatically. To retain a copy of the change history, print the History worksheet or copy the desired cells from the sheet to another workbook. The worksheet cannot be copied as you cannot copy a worksheet from a shared workbook.

Sharing a workbook turns on the change history. By default, the change history is retained for 30 days. If a different period is needed, display the Review tab and locate the Changes group. Click Share Workbook, click the Advanced tab, and enter the number of days in the *Keep change history for* text box.

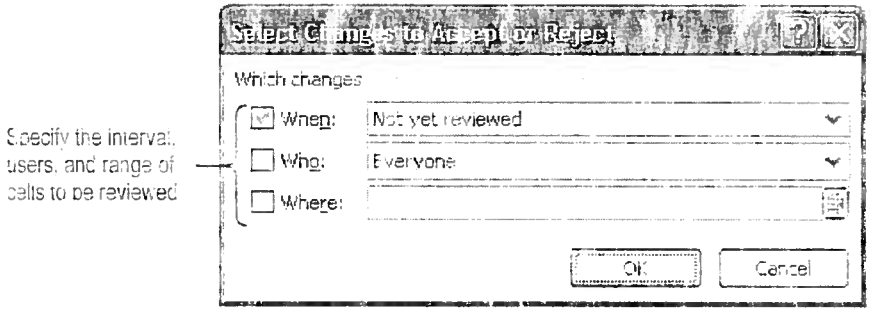
Creating the History Report

1. Open the **Shared2** workbook.
2. Make the following changes to the worksheet:
   - Change cell A10 to `North Hills Mall`.
   - Change cell D7 to `375`.
   - Change cell E9 to `700`.
3. Save the workbook.
4. Display the Review tab and locate the Changes group.
5. Click Track Changes.
6. Select *Highlight Changes*.
7. Clear the *When*, *Who*, and *Where* options under *Highlight which changes*.
8. Select *List changes on a new sheet* and click OK.
9. Display the History worksheet.
10. Save and close the workbook.
11. Open the **Shared2** workbook again.
12. Change cell G7 to `841`.
13. Save the workbook.
14. Regenerate the History report.
15. Save the workbook.

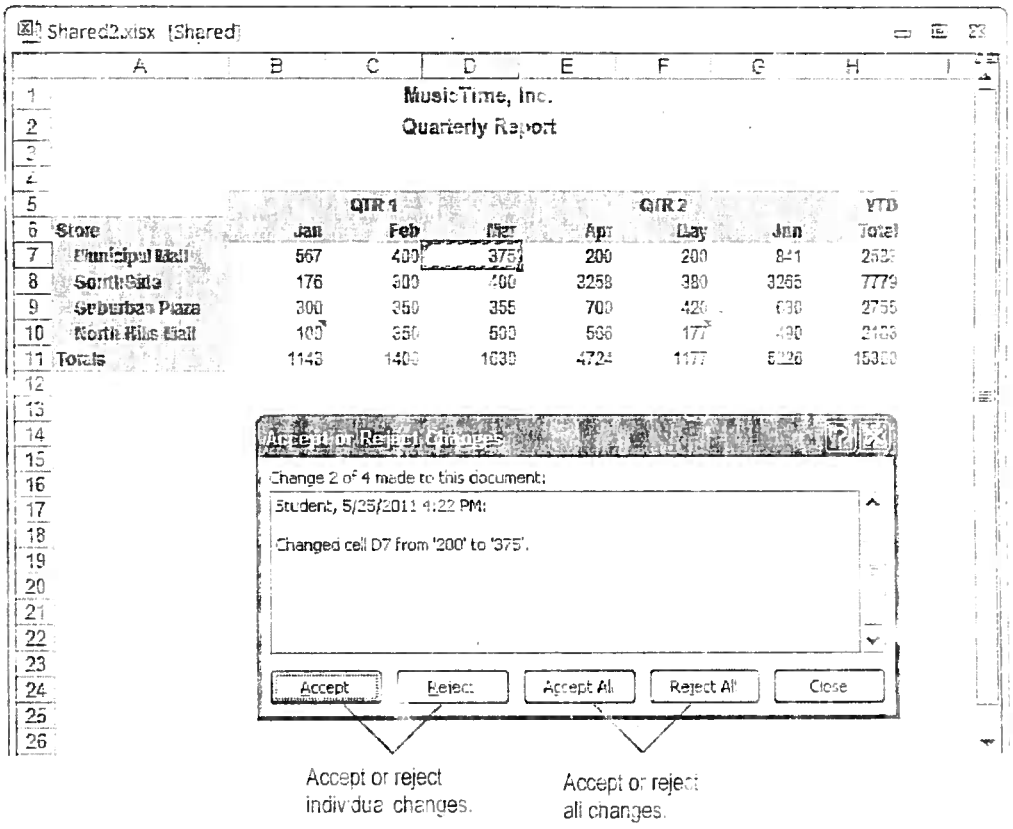
Reviewing Shared Workbook Changes

Once revisions have been made to a shared workbook, they are reviewed by one individual and are either accepted or rejected. This can only be done after all users have saved their copies of the shared workbook.

Below is an illustration of the Select Changes to Accept or Reject dialog box:



The illustration below shows a workbook with the Accept or Reject Changes dialog box open and cell B11 highlighted:



Reviewing Shared Workbook Changes

STEPS

1. Make sure that all users have saved the shared workbook.
2. Display the Review tab and locate the Changes group.
3. Click Track Changes.
4. Select *Accept/Reject Changes*.
5. In the Select Changes to Accept or Reject dialog box, make the desired choices.
6. Click OK.
7. Select the desired revision, if necessary.
8. To accept the change:
   - Click Accept.
9. To reject the change:
   - Click Reject.
10. To accept all revisions and close the dialog box:
    - Click Accept All.
11. To reject all revisions and close the dialog box:
    - Click Reject All and click Yes.
12. Save the workbook.

You do not have to own the workbook to accept or reject changes. However, it is a good idea to decide who will do this when the workbook is set up.

If more than one user has made changes to the same cell, a dialog box will appear containing the original value and each of the user's changes. Any of the changes can be accepted, including the original value.

Once a change is accepted or rejected and the workbook is saved, the change is not available to be reviewed by another user.

If the workbook has unsaved changes, you will be prompted to save them before accepting or rejecting revisions.

Try It

Reviewing Shared Workbook Changes

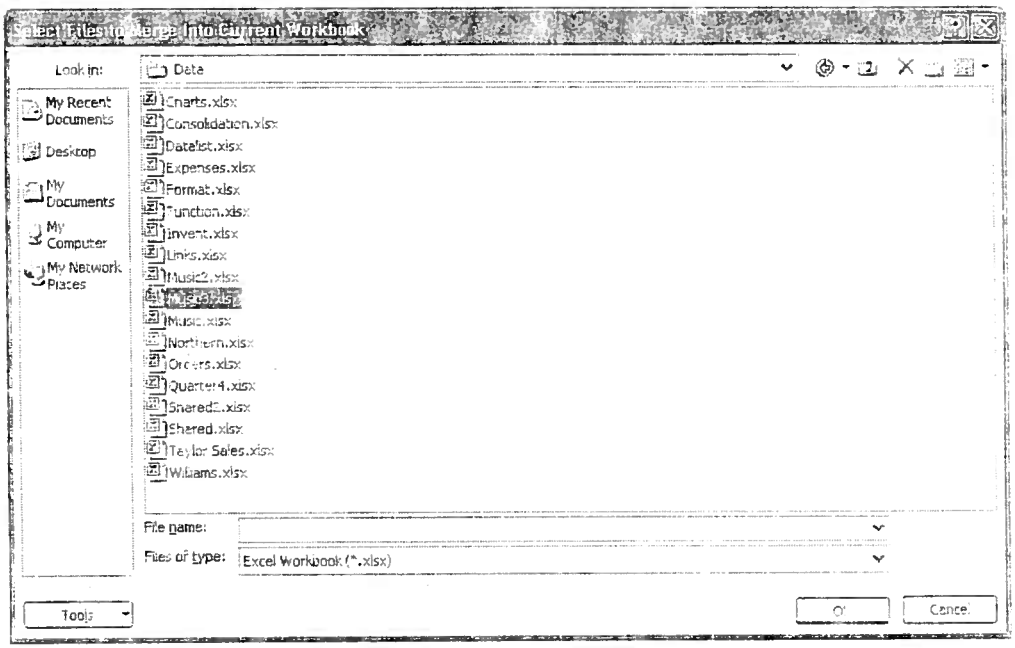
1. In the **Shared2** workbook, display the Review tab and locate the Changes group.
2. Click Track Changes.
3. Select *Accept/Reject Change* and click OK.
4. Click Accept for the first proposed change.
5. Click Accept for the second change.
6. Click Reject for the third change.
7. Accept or reject the remaining changes as desired.
8. Save and close the workbook.

Merging Workbooks

If multiple users need to edit a workbook but do not have access to the network, you can still share the workbook by making separate copies for the individuals without network access. Once the users have made their individual changes, Excel can merge the separate copies of the workbook together into one file. The original file is considered the master and all additional copies of the workbook will be replicated into the master.

The Compare and Merge Workbooks command is not available on the Ribbon. To use this feature you must add it to the Quick Access toolbar.

Below is an illustration of the Select Files to Merge into Current Workbook dialog box:



Merging Workbooks

STEPS

1. Open the master workbook.
2. Configure the master workbook for shared use, if necessary.
3. To set or verify the duration of the change history:
   - Display the Review tab and locate the Changes group;
   - Click Share Workbook;
   - In the Share Workbook dialog box, click the Advanced tab;
   - In the *Keep change history for* option make sure the time period is long enough to complete the review. Click OK and save the file.
4. Copy the master workbook and distribute the copies to reviewers.
5. To add the Compare and Merge Workbooks tool to the Quick Access toolbar:
   - Click the down arrow next to the Quick Access toolbar and select *More Commands*;
   - Select *Commands Not in the Ribbon* from the *Choose commands from* drop-down list;
   - Select *Compare and Merge Workbooks*;
   - Click Add, and then click OK.
6. To merge the workbooks once the reviews are complete:
   - Open the master workbook;
   - On the Quick Access toolbar, click Compare and Merge Workbooks;
   - Select the files to be merged and click OK;
   - Accept or reject the changes, as desired.

All changes made to the merged workbooks will be made to the master workbook one-by-one in the order that they appear in the dialog box.

Each copy of the master workbook must have a unique name.

The default history duration is 30 days.

Use Ctrl – click to select multiple nonadjacent files. Use ⇧ Shift – click to select multiple adjacent files.

The workbooks that you want to merge into the master cannot be open at the time of the merge.

Sharing must be enabled in the master workbook and the history duration set before the copies are made.

If the history time period has been exceeded the workbooks cannot be merged.

Merging Workbooks

1. Open the **Music2** workbook.
3. Change B7 to 500 and add the comment `Jane gave me this new figure.`
2. Save and close the workbook.
3. Open the **Music** workbook.
4. Add Compare and Merge Workbooks to the Quick Access toolbar, if necessary:
   - Click the down arrow next to the Quick Access toolbar;
   - Select *More Commands*;
   - Select *Commands Not in the Ribbon* from the *Choose commands from* drop-down list;
   - Select *Compare and Merge Workbooks*;
   - Click Add, and then click OK.
5. On the Quick Access toolbar, click Compare and Merge Workbooks.
6. Select **Music2** and click OK.
7. Note the comment in the worksheet.
8. Merge **Music3** into the current workbook. This will merge a comment into cell F10.
9. Display the Review tab and locate the Changes group.
10. Click Track Changes and then select *Accept/Reject Changes*.
11. Click OK to accept the default choices in the Select Changes to Accept or Reject dialog box.
12. Accept all the changes.
13. Delete the comments.
14. Save the workbook.
15. Save and close any open files.

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