

# CHAPTER 25



## ADVANCED WORKSHEET FORMATTING

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## HOW CELL FORMATTING WORKS

In an Excel worksheet, what you see in a cell is not necessarily what's stored in that cell. If you enter a formula, for example, Excel stores the formula but displays its result. When entering numbers, dates, and text, you can go as quickly as you want, without too much regard for how they'll look in your worksheet; afterwards, use cell formatting instructions to specify how you want the cells' contents to display, including such details as decimal places, currency symbols, and how many digits to use for the year. Other cell formatting options let you adjust fonts, colors, borders, and other attributes of a cell or range.

A handful of buttons on the Formatting toolbar let you bypass dialog boxes for some common tasks, such as choosing a font or changing a range of cells to bold. If you're building a financial worksheet, click the Currency button to ensure that every number in a given range lines up properly and includes the correct currency symbol. To see the full assortment of Excel formatting options, select a cell or range and choose Format, Cells, or right-click a cell or selection and choose Format Cells from the shortcut menu. All available cell formatting options are arranged on six tabs in the Format Cells dialog box.

### USING THE GENERAL NUMBER FORMAT

On a new worksheet, every cell starts out using the General format. When the cell contains a constant value, Excel usually displays the exact text or numbers you entered; in cells that contain a formula, the General format displays the results of the formula using up to 11 digits—the decimal point counts as a digit. (Date and time values follow a special set of rules, as you'll see shortly.) If the cell is not wide enough to show the entire number, Excel rounds the portion of the number to the right of the decimal point, for display purposes only; if the portion of the number to the left of the decimal point won't fit in the cell or contains more than 11 digits, the General format displays the number in scientific notation.

To remove all number formats you've applied manually and restore a cell to its default General format, right-click and choose Format Cells, and then click the Number tab and choose General from the Category list.

#### NOTE

Although it's not particularly intuitive, there's also a keyboard shortcut that applies the General format instantly to the active cell or current selection: Press **Ctrl+Shift+~** (tilde) to reset cells to General format.

### CONTROLLING AUTOMATIC NUMBER FORMATS

When you enter data in a format that resembles one of Excel's built-in formats, Excel automatically applies formatting to the cell. In some cases, the results might be unexpected or unwelcome:

- If you enter a number that contains a slash (/) or hyphen (-) and matches any of Windows's date and time formats, Excel converts the entry to a date serial value and formats the cell using the closest matching Date format. If the date you enter includes only the month and date, Excel adds the current year.

→ In some cases, Excel 2003 picks up formatting from your Windows version; for details of how this interaction works, see "Setting Date and Time Formats," p. 692.



*If you import data into a worksheet, Excel might convert values that look like dates or times. For suggestions on how to prevent this from occurring, see "Stopping Automatic Conversions" in the "Troubleshooting" section at the end of this chapter.*

- If you enter a number preceded by a dollar sign, Excel applies the Currency style, with two decimal places, regardless of how many decimal places you entered. (If you've used the Regional Settings option in Control Panel to specify a different currency symbol, Excel applies the Currency style when you enter data using that symbol.)

#### NOTE

As explained later in this chapter, the Currency style is actually a variation of the Accounting format.

- If you enter a number that begins or ends with a percent sign, Excel applies the Percent style with up to two decimal places.

#### TIP FROM

*EQ & Woody*

Excel supports fraction formats as well, but entering data in this format is tricky. If you enter 3/8, for example, Excel interprets your entry as a date—March 8 of the current year—and formats it accordingly. To enter a fraction that Excel can recognize automatically, start with 0 and a space: 0 3/8. Excel correctly enters that number as 0.375 and changes the cell format to Fraction. Although Excel stores the number as 0.375, it is displayed as 3/8.

#### TIP FROM

*EQ & Woody*

Excel also supports *compound fractions*—fractions that include a whole number and a fractional number, such as 12 1/8. Enter the whole number part (in this case, 12) followed by a space and then the fraction part. Excel displays the entry as 12 1/8 but stores it as 12.125. You'll find this technique invaluable if you ever have to perform calculations involving historical stock market prices; although most major markets have now moved to decimal pricing, some exchanges still use archaic fractional pricing—16ths, 32nds, even 64ths of a dollar!

- When you enter a number that contains a colon (:), Excel converts it to a time format if possible. If the number is followed by a space and the letter A or P, Excel adds AM or PM to the display format.
- If you enter a number that contains leading zeros (as in part numbers, for example, which might need to fill a precise number of characters), Excel drops the leading zero.

- When you enter a number that contains the letter E anywhere in the middle (3.14159E19, for example), Excel formats the cell using the Scientific option, using no more than two decimal places. In this case, Excel would display 3.14E+19.
- If you enter a number that includes a comma to set off thousands or millions, Excel applies the Number format using the default thousands separator as defined in Windows's Regional Settings. If the number you entered contains more than two decimal places, Excel stores the exact number you entered but rounds it for display purposes to no more than two decimal places.

To override any of these automatic number formats, you have four choices:

- After entering the data, choose Format, Cells and select a new format. (Press Ctrl+1 to quickly open this dialog box.) This is your best choice if the underlying data stored in the cell is correct and you just want to use a different display format.
- Enter an apostrophe before entering the number. When you do this, Excel formats the number as text and displays it exactly as entered. Note that this solution might have unintended consequences in formulas that use the value shown in that cell!
- Enter a space character before entering the number. This prefix also tells Excel to format the number as text and display it exactly as entered. Note that this technique will not prevent Excel from converting a number to scientific notation nor will it preserve leading zeros. It will, however, work with all other automatic formatting described in the previous list.
- Format the cell as text (choose Format, Cells, click the Number tab, and select Text) before entering the data. This option might also have unintended side effects, as explained a bit later in this chapter.

## AVOIDING ROUNDING ERRORS

It's tempting to assume that because numbers look so orderly in Excel's row-and-column grids, they're also unflinchingly accurate. That's not exactly so. To squeeze data so that it fits in a cell, Excel *rounds* numbers and *truncates* cell contents, usually without telling you. And there's an absolute limit on the precision of Excel calculations that affects every calculation you make.

### NOTE

What's the difference between rounding and truncating? When Excel rounds a number, it changes the value displayed in the cell without affecting the underlying number stored in the cell. If you enter 3.1415926 in a cell and format it to display two decimal points, Excel displays 3.14. If you later change the display format to show all seven decimal points, your number will appear exactly as you entered it. When Excel truncates data, on the other hand, it chops off digits permanently. If you enter a number with more than 15 decimal places, for example, Excel lops off the 16th and any subsequent numbers to the right of the decimal point. Likewise, if you copy a worksheet that contains cells with more than 255 characters, Excel discards all characters after the first 255.

When Excel alters the display of a number, the most common cause is that the number is too long to fit in the active cell. Excel deals with this sort of data in one of the following three ways:

- When you enter data that is wider than the current cell, Excel automatically resizes the column. It does not resize a column if you have already set the column width manually. If the cell is formatted using General format, this automatic resizing stops when the number reaches 11 digits, at which point Excel converts it to scientific notation. If the cell is formatted using Number format, automatic resizing continues until the number reaches 30 digits.
- In cells using the default General format, Excel uses scientific notation to display large numbers if possible. The General format rounds numbers expressed this way to no more than six *digits of precision* (8.39615E+13, for example).

**NOTE**

It's no accident that the total number of characters in the preceding example—including the decimal point, plus sign, and E—is 11. Regardless of column width, cells using the General format are always limited to 11 digits.

- In cells using any number format other than General, Excel displays a string of number signs (####) if the column is too narrow to display the number in scientific notation. You must change the cell's number format or make the column wider before Excel can display the number correctly.

The second most common cause of apparent errors in a worksheet occurs when the number of decimal cells you specify in a number format doesn't match the number of decimal places stored in that cell or range. Figure 25.1, for example, shows two identical columns of numbers. Because column A uses the General format, each number appears exactly as entered. Column B, on the other hand, is formatted with the Number format to show zero decimal places. When Excel performs the calculation on the numbers in column B, it uses the actual amount stored in the cell, not the rounded version you see here. It then displays the result without any decimal places, exactly as specified in the cell format. Although the sum of the rounded numbers in column B appears to be 16, Excel rounds the actual result to 15 for display purposes. Because of the mismatch between the numbers and their formatting, Excel (and, by extension, the author of this worksheet) appears incapable of basic arithmetic.

That's a simple and obvious example, but subtle rounding errors can wreak havoc in an environment where you require precise results. To prevent rounding from making it look like your worksheet contains errors, always match the number of decimal places displayed with the number of decimal places you've entered in the row or column in question.

**Figure 25.1**

The values in these two columns are identical, with different formatting. Because of cumulative rounding errors, the numbers in column B appear to add up to 16, despite what the SUM formula suggests.

E10		
	A	B
1	2.3	2
2	2.5	3
3	2.5	3
4	3.1	3
5	2.75	3
6	2.2	2
7	15.35	15

**TIP FROM**


If you must use rounded numbers in a worksheet, indicate that fact in a footnote on charts and reports you plan to present to others. Rounding can cause apparent mistakes, and anyone who sees your worksheet—or a chart or presentation slide based on those numbers—might make unflattering judgments about your accuracy if totals in a pie chart, for example, don't add up to 100%.

**THE LIMITS OF PRECISION**

There's an overriding limit to the degree of precision you can achieve with Excel. If you enter a number that contains more than 15 significant digits, Excel permanently and irrevocably converts the 16th and subsequent digits to 0. (It doesn't matter which side of the decimal point the digits appear on—the total number of digits allowed includes those on both sides of the decimal point.) Although you can display numbers with up to 30 decimal places, your calculations will not be accurate if Excel has to store more than 15 digits.

Excel includes a useful, but extremely dangerous, option to permanently store numbers using the displayed precision. If you've increased the numbers in a budget worksheet by 8.25%, for example, you might end up with three decimal places for some entries, even though only two are displayed using the Currency format. If you choose Tools, Options, and click the Calculation tab, you can check the Precision As Displayed box to convert all stored numbers in the current workbook to the values actually displayed.

**CAUTION**

When you use the Precision As Displayed option, Excel displays a terse dialog box warning you that your data will permanently lose accuracy. Believe it. This option affects every cell on every sheet in the current workbook, and it remains in force until you explicitly remove the check mark from this box. If you forget you turned on this option, even simple formatting choices like changing the display of decimal places will permanently change stored data. Unless you're absolutely certain that using this option will have no unintended consequences, you should treat it like dynamite.

## TIP FROM



The Precision As Displayed option affects all cells in the current workbook, and there's no way to apply it just to a selected range. If you want to change the precision of a selection, use the Windows Clipboard to control this option precisely—in the process, you can also avoid any unintended ill effects. Open a new, blank workbook, copy the range you want to change from the original workbook, and paste it into the blank workbook. In the blank workbook, choose Tools, Options, click the Calculation tab, and check the Precision As Displayed box. Click OK when you see the warning dialog box. Now copy the changed data to the Clipboard and paste it over the original data. Close the blank workbook without saving it, and you're finished.

## WORKING WITH NUMBERS IN SCIENTIFIC NOTATION

*Scientific* (or exponential) *notation* displays large numbers in a shorthand form that shows the first few digits along with instructions on where to place the decimal point. To convert a number written in scientific notation to its decimal equivalent, move the decimal to the right by the number that appears after “E+”; if there's a minus sign after the *E*, move the decimal to the left. In either case, add extra zeros as needed. Thus, 8.23E+06 is actually 8,230,000, and 3.82E-07 is .000000382.

Numbers expressed in scientific notation are often rounded. When you see numbers in General format expressed in scientific notation, you'll see a maximum of six significant digits, even if the cell is wide enough to hold more. To display a number in scientific notation using more digits of precision, choose Format, Cells, and choose the Scientific option from the Category list. Use the spinner control to set a fixed number of decimal places, between 0 and 30.

## ENTERING NUMBERS AS TEXT

Hands down, the most confusing option on the Number tab of the Format Cells dialog box is Text. Use this format when you want to enter numbers in a cell, but you want Excel to treat them as though they were text. You might use this format, for example, when entering a list of part numbers that you will never use in calculations.

If you apply the Text format to a cell and then enter or paste a numeric value into that cell, Excel adds a small green triangle in the top-left corner of the cell, indicating a possible error. Selecting that cell reveals a Smart Tag that warns you the number is stored as text. Use the Convert to Number option to change the cell's contents to a number format, or click Ignore Error to keep the text and make the green triangle vanish.

- For more information about Smart Tags, see “Common Formatting Options,” p. 107.
- To learn how to check an Excel workbook for errors, see “Checking for Errors in a Worksheet,” p. 746.

When you format numbers as Text, Excel ignores them in formulas such as SUM() and AVERAGE(). It also aligns the cell's contents to the left rather than the right. Unfortunately, applying the Text format requires that you work around an admitted bug that still exists in

Excel 2003. If you format the cells first, then apply the Text format, and finally enter the numbers, Excel treats the data as text, just as you intended. However, if you try to apply the Text format to numbers that are already in your worksheet, Excel changes the alignment of the cell, but not the data stored there. After applying the Text format, you must click in each reformatted cell, press F2, and then press Enter to store the number as text. The new error-checking tools in Excel 2003 do not identify cells formatted this way, either.

If you format a cell as text and enter a formula in that cell, you see the formula itself rather than its result. To fix the display, change the cell format back to General, select the cell, press F2, and then press Enter.

## CHANGING FORMATTING FOR A CELL OR RANGE

In general, as noted previously, Excel stores exactly what you type in a cell. You have tremendous control over how that data appears, however. Number and date formats, for example, give you precise control over commas, decimal points, and whether months and days are spelled out or abbreviated. And if you can't find the precise format you're looking for, Excel lets you create your own custom format.

### SETTING NUMBER FORMATS

How should Excel display the contents of a cell? You have dozens of choices, all neatly organized by category on the Number tab of the Format Cells dialog box. To specify exactly how you want the contents of a cell or range to appear, follow these steps:

1. Click the cell you want to format, or select a range, and then choose Format, Cells. Use the keyboard shortcut Ctrl+1 to open this dialog box instantly.

#### TIP FROM



Few keyboard shortcuts in all of Office are as useful as Ctrl+1, which opens Excel's Format Cells dialog box. When you're formatting a large or complex worksheet, this key combination can save a startling number of mouse clicks. Even if you generally don't use keyboard shortcuts, this one is worth memorizing. Note that you must use the number 1 on the top row of the keyboard; the 1 on the numeric keypad won't work.

2. In the Format Cells dialog box, choose an entry from the Category list on the left.
3. If the category you selected includes predefined display options, select one from the Type list. Adjust other format options (currency symbol, decimal point, and so on), if necessary.

#### TIP FROM



To quickly adjust the number of decimal points in a cell or range, make a selection and click the Increase Decimal or Decrease Decimal buttons on the Formatting toolbar. Each click adds or subtracts one decimal point from the selection.

4. Inspect the Sample box in the upper-right corner of the dialog box to see how the active cell will appear with the format settings you've selected. Click OK to accept the settings and return to the editing window.

The following number format categories are available:

- General, the default format, displays numbers as entered, using as many decimal places as necessary, up to a maximum of 11 digits. It does not include separators between thousands. No additional options are available.
- Number formats let you specify the number of decimal places, from 0 to 30 (the default is 2), as well as an optional separator for thousands, based on the Windows Regional Settings. You can also choose one of four formats for negative numbers (see Figure 25.2).
- Choices in the Currency category display values using the default currency symbol, as specified in the Regional Settings options of Control Panel. You can adjust the number of decimal places from its default of 2 to any number between 0 and 30 and select a format for negative values (see Figure 25.3).
- Accounting formats are similar to those in the Currency category, except that currency symbols and decimal points align properly in columns and you can't choose a format for negative values. With Accounting formats, the currency symbol (\$) in U.S. English installations) sits at the left edge of the cell. This effect can be odd in wide columns that contain small numbers; in that case, choose a Currency format instead, if possible (see Figure 25.4).
- The Date category includes 15 formats that determine whether and how to display day, date, month, and year. All versions of Excel since Excel 2000 include a pair of Year-2000-compatible date formats that use four digits for the year (see Figure 25.5).
- The Time category includes eight formats that determine whether and how to display hours, minutes, seconds, and AM/PM designators (see Figure 25.6).

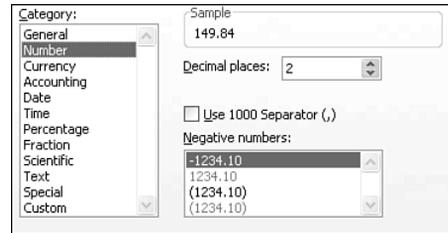


Figure 25.2

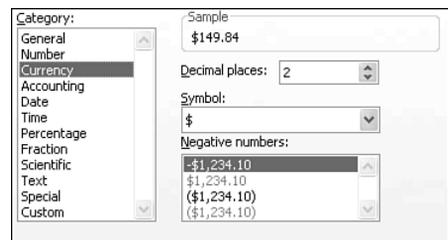


Figure 25.3

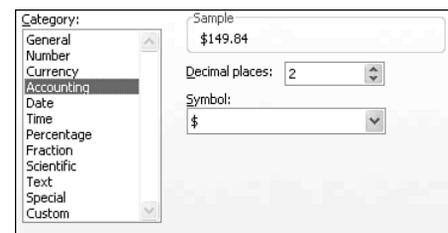


Figure 25.4

- Applying the Percentage format multiplies the cell value by 100 for display purposes and adds a percent symbol; the only option here lets you specify the number of decimal places, from 0 to 30 (the default is 2).
- Fraction formats store numbers in decimal format but display cell contents as fractions using any of 9 predefined settings; to display stock prices using 8ths, 16ths, and 32nds, click Up to Two Digits in the Type list (see Figure 25.7).
- Choose Scientific to display numbers in scientific notation; you select the number of decimal places, from 0 to 30.
- Applying the Text format displays cell contents exactly as entered, even if the cell contains numbers or a formula.
- The four choices in the Special category allow you to select formats for long and short U.S. ZIP Codes, phone numbers, and Social Security numbers. You enter the number without any punctuation, and Excel adds hyphens and parentheses as necessary for display purposes only (see Figure 25.8).
- Choose the Custom option to define your own display rules. Start with a built-in format and use symbols in the formatting instructions; see “Custom Number Formats” later in this chapter for more details on custom number formats.

## SETTING DATE AND TIME FORMATS

Normally, Excel stores exactly what you type into a cell. That’s not the case when you type a recognizable date or time, however; when storing date and time information, Excel first converts the value you enter into *serial date format*. This numeric transformation explains how Excel can perform calculations using date and time information. Understanding the following facts is crucial to working effectively with serial date formats:

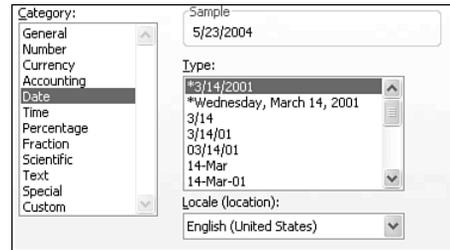


Figure 25.5

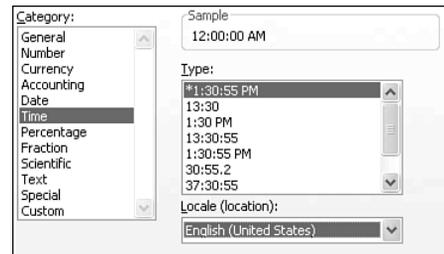


Figure 25.6

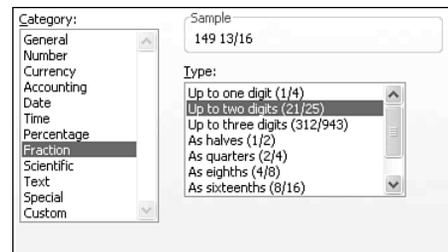


Figure 25.7

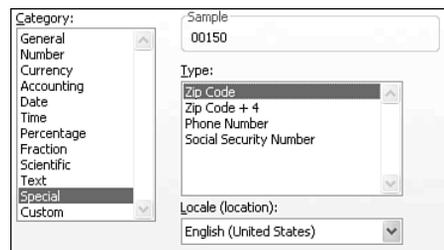


Figure 25.8

- Excel converts the date to a whole number that counts the number of days that have elapsed since January 1, 1900. Thus, the serial date value of December 31, 2003 is 37986.
- When you enter a time (hours, minutes, and seconds), Excel converts it to a fractional decimal value between 0 (midnight) and 0.999988 (11:59:59 p.m.). If you enter a time of 10:00 a.m., for example, Excel stores it as 0.416667.
- If you combine a date and time, Excel combines the serial date and time values. Thus, Excel saves December 31, 2003 10:00 a.m. as 37986.416667.

**NOTE**

When you enter only a date, Excel converts it to a serial value and uses 0 (or 12:00 a.m.) as the time value. If you enter only a time, Excel tacks on a date value of 1; if you later format this cell to show the date and time, Excel displays the nonsense date 1/0/1900.

The transformation to a serial value happens as soon as you enter a date or time value in a cell; at the same time, Excel automatically applies the default Date or Time format to your cell so that the data you enter displays correctly. You can choose a different Date or Time format to change the display format of date or time values. If you change the format of the cell to General or Number, however, you will see the serial values instead of the dates you expect.

Conversely, if you accidentally apply the Date format to a cell that contains a number, the result is likely to be nonsense, especially if the number is relatively low. Choose the General or Number format to display the cell's contents correctly.

**TIP FROM**

If the display of dates is important to you, be aware of the unusual interaction between Excel's date and time formats and those you define in Windows's Regional Options Control Panel (in some Windows versions, this appears as Regional Settings). These linked formats appear at the top of the Date and Time lists in the Format Cells dialog box, with an asterisk in front of the format. When you change the date format in Windows, the format in your worksheet changes too—if you've used one of these formats.

Excel transforms dates and times to serial values so that you can use them in calculations. Because date and time values are stored as numbers, you can easily enter formulas that calculate elapsed time. If you include an employee's hire date as part of a list, for instance, you can use a simple formula to compare that value to today's date and determine whether the employee has qualified for participation in a profit-sharing or stock-option program. If you enter start and end times for each participant in a road race, you can easily calculate the total elapsed time and determine the top finishers.

After you enter the employee's start date in C1 and your report date in C2, for example, you can calculate the difference between the two dates by using the formula `=C1-C2`.

#### TIP FROM



Unfortunately, Excel outsmarts itself when you use this type of formula. Because it sees dates in both cells used in the formula, it automatically applies a date format to the cell containing the formula. As a result, the cell contents display as a nonsense date. Reset the cell's format to General or Number to correctly display the difference between the dates.

To use a date directly in a formula, enclose it in quotation marks first: `=Today()-"1/1/2003"` counts the number of days that have elapsed since January 1, 2003, for instance.

#### NOTE

Excel's Options dialog box includes a setting for the 1904 date system. This obscure option is necessary only when exchanging files with users of old versions of Excel for the Macintosh, which started the calendar at the beginning of 1904 rather than 1900. Mac Excel versions since Excel 98 handle this conversion seamlessly. Under normal circumstances, you should never need to use this option.

## EXCEL AND YEAR 2000 ISSUES

The much-feared global Y2K crisis never happened. Planes continued to fly, power stations hummed along, and banks didn't run out of money. Yes, the world successfully entered the new millennium, but that doesn't let you off the hook when it comes to Year 2000 (Y2K) issues. Excel's default settings correctly handle most formulas that include dates from different centuries. But a few "gotchas" linger for the unwary:

- When you enter a date before January 1, 1900 in an Excel worksheet, the date appears as text. As far as Excel is concerned, dates before the 20th century simply don't exist—that's bad news for historians and scientists hoping to use Excel to plot dates that go back more than a century.
- On the other hand, dates after December 31, 1999 don't represent a problem. In fact, Excel worksheets will accept any date through December 31, 9999 (that's a serial date value of 2958465, if you want to try it for yourself).

#### TIP FROM



If you need to track timelines and perform calculations for dates before the beginning of 1900 (to chart long-term records of earthquake activities, for example), don't use Excel. Instead, fire up Access, which can correctly handle dates as early as January 1, 100 (Common Era). If you're a student of ancient history, you'll need to use another program—or perhaps you can make do with clay tablets.

Because Excel stores dates as serial values, it is unaffected by most garden-variety Y2K problems. In practice, however, you might encounter Y2K problems if you enter or import data that includes only two digits for the year. When Excel encounters dates in this format, it has to convert the year to four digits; in the process, it's possible to select the wrong century. When translating two-digit years, Excel uses the following rules:

- Excel automatically converts dates entered using the two-digit years 00 through 29 to the years 2000 through 2029. Thus, if you enter or import the value 5/23/04, Excel stores it as serial value 38130, or May 23, 2004.
- When you enter the two-digit years 30 through 99 as part of a date, Excel converts the dates using the years 1930 through 1999. Thus, when you enter or import the value 9/29/55, Excel stores it as serial value 20361, or September 29, 1955.

On a new worksheet, Excel automatically displays dates using a four-digit format. However, if you design a worksheet so that some dates display only two years (or if you use an older worksheet that was designed using those formats), you might not realize that Excel has stored the wrong data. In that case, any calculations you make might be off by a full century. To avoid inadvertently entering or importing incorrect data, get in the habit of entering all dates using four-digit formats for the year: 5/23/2004. Excel stores this date correctly regardless of the Date format you've chosen for display purposes.

When importing data that includes dates with two-digit years, check the format of the original data carefully. You might need to manually edit some dates after importing. Pay special attention to worksheets that were originally created using pre-2000 versions of Excel for Windows or the Macintosh, because the algorithms those programs use to convert two-digit years are different from those in Excel 2000 and later versions.

The automatic date conversion routine is a clever workaround, but don't rely on it. Entering or importing two-digit years is guaranteed to cause problems in the following circumstances:

- In the banking industry, in which dates beyond 2029 are common in 30-year mortgages that begin in the year 2000 or later. If you enter the start date as 2/1/03 and the end date as 2/1/33, your loan will start out 70 years overdue.
- In any group that includes milestone dates—birthdays, graduation dates, and so on—for an older population. If you enter a birthdate of 6/19/27, your worksheet might assume that the person in question isn't born yet.

#### TIP FROM

*EQ & Woody*

This can't be said strongly enough or repeated too often: Get in the habit of using four-digit years whenever you enter or display a date in a worksheet.

## CREATING CUSTOM CELL FORMATS

If the exact number format you need isn't in Excel's collection of built-in formats, create a custom format. Custom formats let you specify the display of positive and negative numbers as well as zero values; you can also add text to the contents of any cell.

### TIP FROM

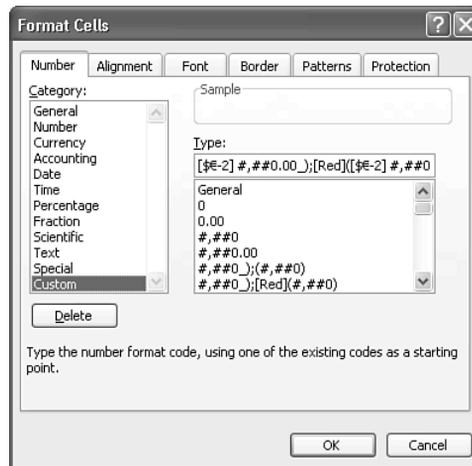
*EQ & Woody*

Excel saves custom number formats in the workbook in which you create them. To reuse formats, add them to the template on which you base new workbooks. To copy cell formats from one workbook to another, copy the cell that contains the custom format, click in the workbook where you want to add the format, and choose Edit, Paste Special, Formats.

The list of 35 custom formats in the Type box includes some that are already available within other categories, as well as a few you won't find elsewhere. It's almost always easier to design a custom format if you start with one that already exists. To create a custom number format, open the Format Cells dialog box and choose the format you want to start with. Then click Custom at the bottom of the Category list. Excel displays the codes for the format you just selected in the Type box, ready for you to modify. The example shown in Figure 25.9, for example, shows the results when we chose a Currency format and changed the symbol from the U.S. dollar sign to the Euro. Although the switches for these codes are undocumented, this technique adds them to the Type box, making it easy to define a new format that uses this symbol correctly.

**Figure 25.9**

Enter custom format codes here. Note the Sample area, which shows how the contents of the active cell will appear.



Custom formats use format codes to tell Excel how to display digits, decimal places, dates and times, and other details. Each custom format can include up to four sections, separated by semicolons, as shown in the example in Figure 25.10. Using all four sections defines display formats for positive numbers, negative numbers, zero values, and text, respectively. If

you enter only two sections, Excel uses the first set of instructions for positive numbers and zero values and the second for negative numbers. If you enter only one section, that format will apply to all numbers you enter. You don't need to enter a format for each section, but if you plan to skip a format option (specifying formats only for positive numbers and zero values, for example), insert a semicolon for each section you skip.

**Figure 25.10**  
Custom number formats can contain up to four sections.

```
_$* #,##0_);_($* (#,##0);_($* "-"_);_(@_)
```

#### TIP FROM

*EQ & Woody*

When creating an extremely complex custom format, working with the narrow text box in the Format Cells dialog box can be difficult. To make life easier, select the contents of this box, and then copy them to a friendlier editor, such as Notepad or Word. Edit the format codes, and then use the Clipboard to paste the results back into the dialog box.

Creative use of custom number formats can help you deal with tricky data-entry challenges. For example, how do you make it easy to enter a serial number with leading zeros? Say your company uses invoice or part numbers that must be exactly seven digits, with no exceptions. If the number you enter includes fewer than seven digits, you want Excel to pad the beginning of the entry with as many zeros as it takes to reach that magic number. Entering a number like 0001234 won't work, because Excel considers the leading zeros insignificant digits and strips them before storing the value in the cell.

The solution is to create a custom format that includes a zero for each digit you want to include in the displayed result—in this case, 0000000.

#### TIP FROM

*EQ & Woody*

To guarantee that only correct data appears in the cell, combine this custom format with a data-validation rule. If your company policy says the number must be larger than 1000, create a validation rule that restricts data entry to whole numbers (to prevent stray decimal points or text from messing up the list) between 1001 and 9999999. The all-zeros display format guarantees that any data within this range will display as exactly seven digits, with leading zeros if necessary.

### CUSTOM NUMBER FORMATS

Custom number formats let you round or truncate numbers, control the number of decimal places or significant digits, and make sure amounts line up properly in columns. Use the codes shown in Table 25.1 to define the display format.

TABLE 25.1 CUSTOM NUMBER FORMAT CODES

Code	What It Does	How You Use It
#	Display significant digit	Using the format <code>##</code> displays all significant (nonzero) digits to the left of the decimal point and rounds to one digit on the right of the decimal point; if you enter <code>0.567</code> , this format displays <code>.6</code> .
0	Display zero if the number has fewer digits than the number to format	The format <code>0.000</code> always displays exactly three decimal points; for numbers below 1, it includes a 0 to the left of the decimal point.
?	Align decimal points or fractions	Click any of Excel's built-in Fraction formats, and then choose Custom to see an example of how to use this placeholder.
.	Decimal point	To round the cell's contents to a whole number, leave off the decimal point.
,	Display thousands separator or scale number by multiple of 1,000	Inserting two commas after a number scales it by a million; to display a large number (163,200,000) in an easier-to-read style (163.2 MM), enter this format: <code>#0.0,, " MM"</code> .
%	Display the number as a percentage of 100	If you enter <code>8</code> , Excel displays it as <code>800%</code> . To enter <code>8%</code> , start with a decimal point and a zero: <code>.08</code> .
[color]	Show the cell contents in specified color	Choose one of eight colors—Black, Blue, Cyan, Green, Magenta, Red, White, Yellow—for any section; you must use brackets and enter the color as the first item in each section, like this: <code>[Blue]#,##0;[Red]#,##0;[Black]0</code> .

### CUSTOM DATE AND TIME FORMATS

Excel's selection of ready-made date and time formats is extensive, but there are several situations in which you might want to create your own. For example, if your company uses a special date format to identify dates on an invoice, you can enter a format such as `yyyymmdd` to display a date as `19990321`.

Custom date and time formats are also useful on billing worksheets for professionals who charge by the minute or hour, or if you've captured data from time sheets filled out by hourly workers. Table 25.2 includes examples of date and time codes you can add to custom formats.

**TABLE 25.2** CUSTOM DATE/TIME FORMAT CODES

Code	What It Does	How You Use It
d, dd m, mm	Day or month in numeric format, with or without leading zero	Use the leading zero when you want columns of dates to line up properly; to add a zero to the date only, use this format: m/dd/yyyy.
ddd, mmm dddd, mmmm	Day or month in text format, abbreviated or full	Use ddd or mmm to show abbreviations such as Wed or Jan; use dddd and mmmm for the fully spelled out month or day: January and Wednesday.
mmmmm	Month as first letter only	Potentially confusing, because it's impossible to distinguish between January, June, and July, or between March and May.
yy, yyyy	Year, in two- or four-digit format	If you're concerned about possible confusion caused by the Year 2000, specify four-digit years.
h, hh m, mm s, ss	Hours, minutes, or seconds, with or without leading zero	Use a leading zero with minutes and seconds; to store precise times, add a decimal point and extra digits after the format: h:mm:ss.00.
A/P, AM/PM	Show AM/PM indicator	Insert after time code to use 12-hour clock and display AM or PM (6:12 p.m.); otherwise, Excel displays the time in 24-hour format (18:12).
[h], [m], [s]	Show elapsed time in hours, minutes, or seconds	Add brackets to display elapsed time rather than a time of day. Add decimals for seconds; for instance, for a worksheet containing race times, use this format: [m]:ss.00.

### ADDING TEXT TO A CELL

To display text in a cell that contains numbers, Excel includes a selection of special format codes. Use this type of format to add a word like “shortage” or “deficit” after a negative number, for example. Because the format doesn't change the contents of the cell, the number you entered will still work in formulas that reference that cell.

You can add the space character, left and right single quotation mark, and any of the following special characters without enclosing them in double quotation marks:

\$ - + / ( ) : ! [ct] & ~ { } = < >

To add other text to a cell, use the codes in Table 25.3.

TABLE 25.3 CUSTOM TEXT FORMAT CODES

Code	What It Does	How You Use It
*	Repeat characters to fill cell to column width	Enter an asterisk followed by the character you want to repeat. Use *- in the third position of a custom format to replace zero values with a line of hyphens, for example.
_ (underscore character)	Add a space the width of a specified character	Enter an underscore followed by the character whose width you want to use. Several built-in formats use _) with positive number formats, for example, to make sure they line up properly with negative numbers that use parentheses.
\	Display the character that follows the backslash	To add a space and the letter P or L after a positive or negative value, use this format: #,##0_) \P; [Red] (#,##0) \L.
"text"	Display the text you enter inside the double quotation marks	Remember to add a space inside the quotes when necessary. For example, to display a negative amount as \$514.32 Loss in red, enter this format: <b>\$0.00 " Profit"; [Red] \$0.00 " Loss"</b> .
@	Display the text entered in the cell	Use this code only in the fourth (text) section in a custom format to combine the entered text with other text. If you include a text section without the @ character, Excel hides any text in the cell.

## TIP FROM



When creating a custom number format, first click in a cell that contains data you want to see in the new format. As you edit the custom format, the Preview region of the Custom Format dialog box shows you how the active cell's contents will appear in the new format.

## ADDING CONDITIONS TO A DISPLAY FORMAT

You can also use *conditions* as part of custom number formats. Conditions use comparison operators and are contained in brackets as part of a format definition. Look at the built-in Phone Number format (in the Special category) to see how this option works:

```
[<=9999999]### -####; (###) ### -####
```

If you enter a number of seven or fewer digits in a cell that uses this format, Excel treats it as a local phone number and adds a hyphen where the prefix appears. If you enter a number greater than seven digits, Excel uses the second part of the format, displaying the last seven digits as a phone number and any number of digits prior to that number as an area code in parentheses.

The results of this format can be absurd if you enter a number that's smaller than 7 digits or larger than 10 digits. Here's how to use conditions to customize this format. The example shown here assumes you work in the 212 area code and want to add that code to the beginning of any 7-digit (local) number; if the number uses more than 10 digits, the default condition at the end kicks in, adding the international dialing prefix (+011) and splitting the digits before the number into country and city codes.

```
[<=9999999](212) ###-####;[<=9999999999](###) ###-####;" +011 "(#-##) ###-####
```

#### TIP FROM



Don't confuse these custom formats with conditional formatting, which is described later in this chapter. If you want to change the font or color of text based on values displayed in the cell, use the Conditional Formatting option on the Format menu (described later in this chapter). The conditional display formats shown here are most useful when you want to subdivide a number with punctuation marks or change the number of digits displayed. You can effectively combine this type of format with conditional formatting—for example, if the user enters a phone number with six or fewer digits, you might display it in red to help it stand out as a possibly invalid number.

## DESIGNING AND FORMATTING A WORKSHEET FOR MAXIMUM READABILITY

If you simply enter data into a new worksheet without adjusting any formatting first, every cell will look exactly the same, and anyone reading the worksheet will be forced to work to pick out the important details. Want to make it easier on your audience? Set off different regions of a worksheet by using custom cell formatting—larger, bolder fonts for headings, for example, plus borders around the data area with a double line to mark where the data range ends and the totals begin. Carefully resetting row heights and column widths, wrapping and slanting text, and adding background shading can make the entire sheet easier to follow.

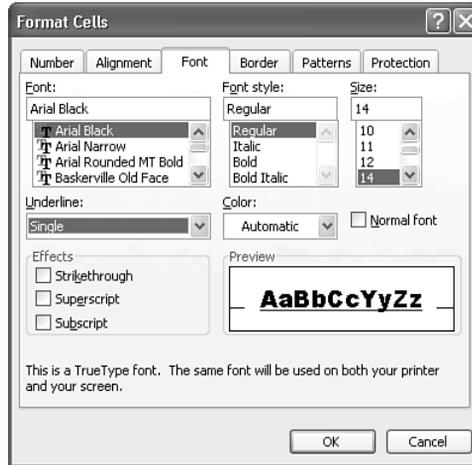
### CHANGING FONTS AND CHARACTER ATTRIBUTES

The default worksheet font (10-point Arial) is fine for basic data entry, but for any worksheet more complex than a simple list you'll probably want to adjust fonts to squeeze more data onto printed pages while beefing up titles, totals, and category headings with larger, bolder fonts.

- ➔ If you're entering data in a list, some cells format themselves automatically; for details, see "Speeding Up Repetitive Data Entry with AutoComplete," p. 786.

If you select a cell or range, you can apply font formatting to the entire contents of the selection. You can also apply different fonts, font sizes, colors, and font attributes to different words or characters in the same cell. In either case, you can use the Font and Font Size lists on the Formatting toolbar. Open the Format Cells dialog box and click the Font tab (see Figure 25.11) for access to all font formats, including some options you won't find on the toolbar, such as strikethrough and double underline attributes.

**Figure 25.11**  
Options on the Font tab let you format an entire cell or selected words or characters within a cell.



Most of the options on the Font tab of this dialog box are fairly straightforward. One check box deserves some explanation, however. When you add custom font formatting, you automatically clear the Normal Font check box. Check this box again to remove all font formatting from the current cell or selection and restore Excel's default style.

25



*If you're having trouble restoring default font formatting to a cell, see "Click Twice for Normal" in the "Troubleshooting" section at the end of this chapter.*

You'll find countless uses for rich formatting within cells. The range shown in Figure 25.12, for example, uses different font formatting for the product number and name in a list of products. This feature is also a useful way to insert trademark and copyright symbols and other special characters within a cell.

**Figure 25.12**  
Mix and match font formatting within a cell to emphasize one type of data over another.

	A
1	CA114959881 <b>Zodiac® FleaTrol Fogger</b>
2	CA673738343 <b>Zoom Groom</b>
3	CA349674589 <b>Adams™ Flea &amp; Tick Shampoo</b>
4	CA723628148 <b>Zodiac® Flea &amp; Tick Shampoo</b>

## NOTE

To enter a manual line break within a cell, position the insertion point at the spot where you want the break to appear and press Alt+Enter. Unfortunately, there's no easy way to copy rich formatting from one cell to another. If you use the Format Painter or the Clipboard to copy formats, only the first font is copied.

An obscure check box on the Alignment tab of the Format Cells dialog box actually has a major effect on formatting. Check the Shrink to Fit box when you want Excel to automatically adjust the font size when the contents of a cell are too wide to fit. This option doesn't change the formatting applied to the cell; it changes the scaling instead, going up or down in 1-point increments. If you enter more text or adjust the width of the column, Excel changes the size of the font automatically so that you can continue to see its contents. Use this option with care—if you format an entire column as Shrink to Fit and then fill it with data that varies in length, the results can look like a ransom note.

## ALIGNING, WRAPPING, AND ROTATING TEXT AND NUMBERS

When you use the default General format, cells containing text align to the left, and those with numbers align to the right. You can change the alignment of any cell or range by using the Align Left, Center, and Align Right buttons on the Formatting toolbar.

Use the Wrap Text option on the Alignment tab to handle long strings of text that don't fit in a cell. Wrapped text is useful for column headings that are much longer than the data in the column. You can also use wrapped text to create tables, where each cell in a row holds an entire paragraph. Excel wraps text to additional lines automatically, maintaining the column width you specified. To control the location of each break, press Alt+Enter. To use text wrapping, follow these steps:

1. Select the cell or range that contains the text you want to wrap. Right-click and choose Format Cells.
2. Click the Alignment tab on the Format Cells dialog box and check the Wrap Text box.
3. Adjust the vertical alignment if needed. For column headings with long and short entries, for example, choose Center from the Vertical drop-down list. Headings formatted this way seem to “float” instead of sit on the bottom of the cell. For text in a table, choose the Top format so that each paragraph begins at the same point.
4. Click OK to apply the new format. Now, instead of disappearing from view when they reach the right edge of the cell, the text you enter begins filling additional lines in the same cell.

Two other alignment options can help make worksheets easier to read. You can change the orientation of a column heading to any angle, including straight up or down. Slanting column headings can save space and give tables a professional look when you have narrow columns with lengthy titles. To help set off groups of items in a column, indent the cells in second and subsequent levels. (See the before and after worksheets at the end of this chapter for examples of all these alignment options.) This option is especially useful when you want to distinguish subheadings from headings at the beginning of a row.

To indent a cell or range of cells, follow these steps:

1. Select the cell or range you want to format, right-click, and choose Format Cells.
2. Click the Alignment tab. In the Text Alignment section, click the Horizontal drop-down list and choose Indent (Left).

- Use the Indent spinner to select the indent level for the selection. For each number, Excel adds approximately as much space as a capital M. For the outline levels in column A of Figure 25.13, we used settings of 1 and 2, respectively.
- Click OK to accept the changes and return to the worksheet.

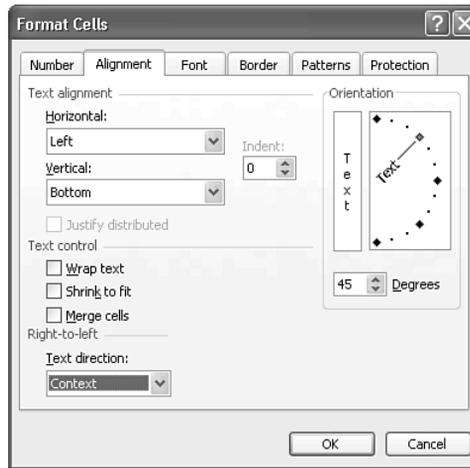
Use the Format Cells dialog box to change the orientation of column headings so that they slant up or down:

- After entering the text for the headings, select one or more cells, right-click, and choose Format Cells.
- Click the Alignment tab, and then point to the control in the Orientation section of the dialog box and drag it up or down to the desired angle, as shown in Figure 25.14, or use the spinner to specify a precise angle by degrees.

	A
1	<b>Expenses</b>
2	<b>Payroll &amp; Benefits</b>
3	<i>Salaries</i>
4	<i>Payroll Taxes</i>
5	<i>Benefits</i>
6	<i>Insurance</i>
7	<b>Travel &amp; Entertainment</b>
8	<i>Travel</i>
9	<i>Entertainment</i>
10	<b>Capital Budget</b>
11	<i>Equipment</i>
12	<i>Computer Equipment</i>
13	<b>Office Expenses</b>
14	<i>Office Supplies</i>
15	<i>Printing and Copying</i>
16	<i>Telephone and Fax</i>
17	<i>Postage and Delivery</i>
18	<b>Real Estate Costs</b>
19	<i>Rent</i>
20	<i>Utilities</i>
21	<i>Maintenance</i>
22	<b>Consultants and Professional Fees</b>

Figure 25.13

**Figure 25.14**  
Click the line between the word Text and the red square; then drag it up or down to arrange text at a space-saving angle.



- Click OK to accept the changes and return to the worksheet.

#### TIP FROM

*EQ & Woody*

Word and PowerPoint don't allow you to position headings using any orientation except horizontal or vertical. If you want to add a table with slanted headings to a Word document or PowerPoint presentation, create the table in Excel, and then use Paste Special and choose Microsoft Excel Worksheet Object to embed the worksheet range, complete with slanted headings.

Vertical headings use little column width, but they can be difficult to read. You have two choices when changing a heading to vertical orientation. Click the skinny box just under the word Orientation to stack letters one over another. This option is most effective with short words in all capitals. You can also change the orientation to 90° to turn the cell on its side, so the contents read from bottom to top.

## USING BORDERS, BOXES, AND COLORS

You can create a distinctive identity for sections of a worksheet by using borders, boxes, and background colors. Dark backgrounds and white type help worksheet titles stand out. Soft, light background colors make columns of numbers easier to read. Use alternating colors or shading to make it easy for the eye to tell which entries belong in each row, even on a wide worksheet that contains many columns of data.

### TIP FROM

The logo for 'EQ & Woody' is written in a stylized, cursive script. The letters are black and have a slightly irregular, hand-drawn appearance. The 'E' and 'Q' are connected, and the 'W' and 'o' are also connected. The 'o' has a long, thin tail that loops back up towards the 'y'.

When preparing a worksheet that you intend to print on a black-and-white printer, test different color combinations. Use the printout to decide which colors are best for you. Sometimes, for example, it's easier to read black type on a light yellow background (which appears gray) than on a background on which you specify a shade of gray.

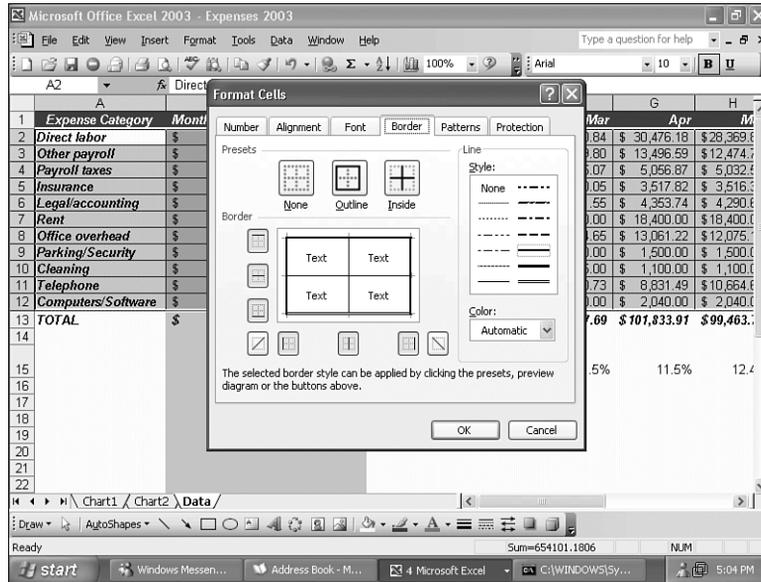
The Borders, Fill Color, and Font Color buttons on the Formatting toolbar work much as you would expect. After selecting a cell or range, click the arrow to the right of each button to choose a specific option from the drop-down list.

These toolbars don't give you access to every formatting option, however. For maximum control over borders and colors, first select the cells or range you want to format; then right-click and choose Format Cells. Click the Border tab (see Figure 25.15) to add and remove lines around the selection.

To create custom borders, follow these steps:

1. Before you add any lines, choose a line style—thick, thin, doubled, dotted, or dashed—from the Style box at the right.
2. Choose a different border color, if you like, from the Color drop-down list. Colors are most effective with thick lines.
3. Click the Outline button to add lines in the thickness and color you specified on all four sides of the active cell. If you selected a range, click Outline to draw a box around the range, and click Inside to draw borders around every cell in the selection.

**Figure 25.15**  
Use borders to distinguish sections of your worksheet. Note that this range includes three different line styles.



4. Click any of the buttons in the Border section to add one line at a time, on the left, right, top, or bottom of the cell, or diagonally. Click again to remove the line. The preview area shows which edges currently have borders.

#### NOTE

You can also click directly on lines in the preview area to add or remove borders.

5. You can mix and match line styles and colors, even on different borders of the same cell. Click the line style or change the color, and then click the button in the Border area to change the style.
6. Click OK to close the Format Cells dialog box and return to the worksheet.

Getting borders just right on a complex worksheet often takes multiple iterations. The trick is figuring out which regions need separate formatting and which have common borders. For example, you might need to select the entire data area first to add a thick border around the outside. Then select the heading rows to adjust their borders, which might be thinner and lighter. Select the data area next, to add, remove, and format interior rules between rows and columns that contain data. Finally, if your data area contains a totals row at the bottom, select that row (or the last row of data) to add a double line between the end of the data range and the totals.

## MERGING CELLS

On a highly structured worksheet, merging cells can help you show the relationship between headings and subheadings. In a list where two or three rows have the same value in the first column, for example, you could merge those cells to make the common nature of those rows truly stand out. You can combine adjacent cells in a row, a column, or any contiguous range.

To quickly merge two or more cells, select the cells and click the Merge and Center button on the Formatting toolbar. Excel displays a dialog box warning you that when you merge cells, you will lose all data except the contents of the top-left cell in the selection. Click OK to continue or Cancel if you want to back out and move the data before you lose it.

- Merged cells can cause problems when you create scenarios on a worksheet; for details, see “Storing Multiple Scenarios in a Single Workbook,” p. 829.

To edit text in a merged cell, click in the cell and begin typing. You can also change the alignment of the merged cells to left or right, without changing the merge.

You might encounter problems when you try to cut and paste merged cells, or when you attempt to sort a list that contains a merged cell. To restore the merged cells to their normal position on the grid, click to make the merged cell active, and then click the Merge and Center icon on the Formatting toolbar. You can also use Excel’s menus: Right-click and choose Format Cells. Click the Alignment tab and clear the check mark from the Merge Cells box.

## CHANGING ROW HEIGHT AND COLUMN WIDTH

On a new worksheet, every row is exactly 12.75 points high, and every column is 8.43 characters wide. (If the default font for Normal style is a proportional one such as Arial, Excel uses a lowercase x as the character to measure.) As you design a worksheet and fill it with data, however, you’ll need to change the size of rows and columns. A column that contains only two-digit numbers doesn’t need to be as wide as one that’s filled with category headings, for example.

Some of these adjustments happen automatically. If you change the font size of text in a cell, the row automatically changes height to accommodate it. Likewise, when you enter data that’s too wide to fit in the default column width, Excel expands the column.

- For an explanation of how columns expand to accommodate data you enter, see “Avoiding Rounding Errors,” p. 686.

You can also adjust row heights and column widths manually in any of three ways:

- Use Excel’s AutoFit feature to set column widths and row heights automatically. Double-click the right border of a column heading to adjust column width to fit the widest entry in the column. Double-click the bottom border of a row heading to resize a row to accommodate the tallest character in that row. If you select multiple rows or columns, you can adjust them all at once.

- Click and drag any column or row to a new size. Point to the thin line at the right of the column heading or the bottom of a row heading until the pointer changes to a two-headed arrow. Click and drag the column or row to the desired width or height, and release the mouse button.

#### TIP FROM

*EQ & Woody*

When you use the mouse to adjust column widths and row heights, ScreenTips show the exact height and width, in characters (for columns) or points (for rows). Curiously, both ScreenTips also show the measurements in *pixels*—use this scale if you’re optimizing a worksheet for viewing in a browser at a specific resolution, say, 800×600 pixels.

- To set a precise height or width, use a dialog box. Choose Format, Row, Height and enter any number between 0 and 409 (points). Or choose Format, Column, Width and enter any number between 0 and 255 (characters).

To adjust more than one row or column, select the group of rows or columns first. Then point to the border of any row or column heading in the selection and drag to the desired size. When you release the mouse button, Excel adjusts all selected rows or columns to the height or width of the column you selected. This technique is especially useful when you’re putting together a budget worksheet with 12 columns, one for each month. After entering data, select all 12 columns and drag them to the correct width.

Here are some expert tips to help you when working with row heights and column widths:

- To hide any row or column, set its height or width to 0 (click the right side of a column heading and drag to the left, or click the bottom of a row heading and drag to the top). To make a hidden column or row visible, select the columns or rows on either side of the hidden one; then choose Format, Row or Column, and click Unhide.
- To resize a column according to the contents of one or more specific cells in that column, make a selection and then choose Format, Column, AutoFit Selection.
- To automatically change the size of a group of columns or rows without dragging, use AutoFit from the menus. Select the rows or columns, and then click Format, Row or Column, and choose AutoFit Selection.
- If you’ve customized column widths and/or row heights and you want to copy this information along with data, copy and paste the entire row or column, not just the individual cells. Use the Column Widths option on the Paste Special dialog box to duplicate the arrangement of columns from one worksheet to another.
- To change the standard width for all columns in the current worksheet, choose Format, Column, Standard Width, and then enter the new column width (in characters) in the dialog box. The new width will not apply to columns whose width you have already reset.

## USING CONDITIONAL FORMATTING TO IDENTIFY KEY VALUES

*Conditional formatting* lets you set font attributes, colors, and other formatting options that cause data to appear differently based on the value displayed in a cell. Most often, you'll use this feature to set an alarm that highlights data that is outside of an expected range. For example, you might attach conditional formatting to a row of totals on a daily sales report, displaying each cell's contents in bold red letters if it falls below a target level and in bright green if the number is significantly above average. In an employee roster, you might use bold formatting to identify the names of employees who are overdue for a formal evaluation.

### TIP FROM

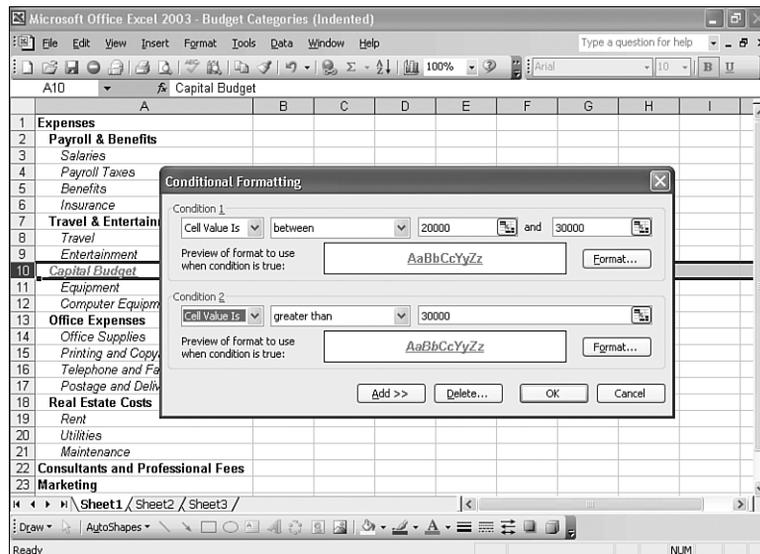
*EQ & Woody*

Conditional formats are most effective when used sparingly. If every cell in a worksheet has "special" formatting, nothing stands out. The best use of this option is to highlight truly unusual conditions that require action—when you open a worksheet and see one or two items in bright red, they get your full attention.

Some predefined number formats automatically display negative numbers in red, but conditional formatting gives you somewhat greater control. For cells whose contents match one or more conditions you define, you can specify a new font style (bold italic, for example), use the underline or strikethrough attributes, or change the borders and color of the selection. You cannot use conditional formatting to change fonts or font sizes.

To use conditional formatting, select a cell or range, and then choose Format, Conditional Formatting; fill in the dialog box shown in Figure 25.16.

**Figure 25.16**  
Use conditional formatting to change the appearance of certain cells based on comparisons you define.



Use drop-down lists in the Condition section to compare the cell values with the contents of another cell, a value, or a formula. For example, you could define a condition Cell Value Is Greater Than or Equal to 20000, and Excel would apply the special formatting if the value is 30,000 but leave the standard format in place if the value is only 15,000. If you enter a formula in this box, it must use a logical function that evaluates to True or False. For most garden-variety conditions, you should choose Cell Value Is.

Formulas in conditional formats can apply to any data on the worksheet, not just the data in the current cell, or even to external data. For example, in a list where Column A contains dates and Columns B, C, and D contain sales figures, you might want to automatically apply shading to each row that contains data for a Monday; this trick helps you pick out each new week at a glance. If the data begins in row 2, create a conditional format using the formula `=WEEKDAY($A2)=2`, using the shading you want to see. Copy that format to all cells in the data range, using the Paste Special dialog box or the Format Painter (described in the following section), to automatically shade every Monday row in the entire list.

To create a conditional format, follow these steps:

1. In the box labeled Condition 1, use the drop-down lists to define the comparison you want to make.
2. Click the Format button to open a stripped-down version of the Format Cells dialog box, and then define the special format you want to use when the cell's contents match that condition. If you want the highlighted cells to be noticeable on a printed page, use bold italic, underline, or other text formatting rather than color.
3. To create a second or third conditional format, click the Add button and repeat the previous steps for Condition 2 and Condition 3.



*Is conditional formatting producing unexpected results? For possible solutions, see "Working with Multiple Conditions" in the "Troubleshooting" section at the end of this chapter.*

4. Click OK to apply the new formatting options to the selected cell or range.

➔ To prevent out-of-the-ordinary data from appearing in a worksheet in the first place, use data-validation rules; see "Restricting and Validating Data Entry for a Cell or Range," p. 662.

## COPYING FORMATS WITH THE FORMAT PAINTER

Use the Format Painter button to quickly copy all formats—fonts, colors, borders, alignment...the works—from one cell to another. Select a cell that has the formatting you want to copy, and then click the Format Painter button and click the cell to which you want to copy the formatting. (If you select a range of cells to copy from, Excel repeats the formatting in your selection.)

If you want to copy formatting to multiple cells, select the cell whose formats you want to copy, and then double-click the Format Painter button to lock it in position. Click each destination cell to copy formatting. When you're finished, click the button again or press Esc to turn off the Format Painter.

## TIP FROM

EQ &amp; Woody

If you select an entire column or row, you can use the Format Painter to copy column widths and row heights. After the pointer turns to the paintbrush shape, click the heading of the row or column you want to change. Note that this technique will also copy other formats (fonts, colors, and so on) from the selected row or column.

## SAVING FORMATS AS NAMED STYLES

Although Excel's *named styles* are considerably less versatile than their equivalents in Word, you can still use this feature to reuse favorite formats. By default, every new workbook includes a set of predefined formats in the following named styles: Normal, Percent, Currency, Comma, Currency [0], and Comma [0]. (The two styles followed by [0] show whole numbers only rather than two decimal places.)

## TIP FROM

EQ &amp; Woody

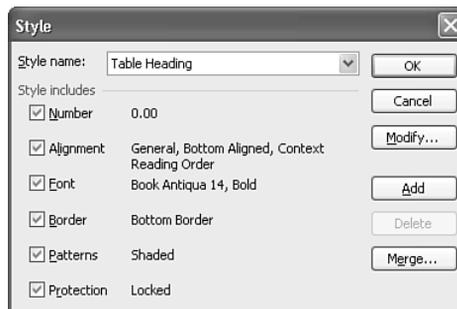
The Currency, Percent, and Comma buttons on Excel's Formatting toolbar actually apply the corresponding named styles. If you want to redefine any of these buttons, just redefine that style. The Currency button, for example, applies the Accounting format with two decimal places to the selected cell or range. To change the way the Currency button works, redefine the Currency named style so that it uses a Currency format, if you want. Likewise, you can change the named Percent style to include one or two decimal places, if you prefer. See Chapter 24, "Excel Essentials," for instructions on how to save these changes as part of the default workbook format so that they are available for every new workbook you create.

You can create named styles using any format you want. This technique is a great time-saver if you continually find yourself applying the same formatting options to new worksheets:

1. Click to select the cell or range you want to format.
2. Choose Format, Style to display the Style dialog box shown in Figure 25.17.

**Figure 25.17**

To reuse a complicated cell format, save it as a named style and then apply it when you need it.



3. Type a descriptive name in the Style Name box. Use any combination of letters, numbers, and spaces; to make sure you can read the full name, keep its total length to 30 characters or fewer.
4. By default, all cell formatting options are included with the style. Clear the check mark from any of the boxes below the style name to remove that option from the style.
5. Regardless of the formatting applied to the current selection, the Style dialog box shows default settings. Click the Modify button to open the Format Cells dialog box and adjust any formatting options, if necessary.
6. Click the Add button to save the style in the current workbook.

To use a named style instead of direct formatting options, choose Format, Style. Choose a style name from the drop-down list and click OK.

Styles are available only to worksheets in the workbook in which you save them. To save named styles so that they're available for all new worksheets, save them in a template. To copy styles between two open workbooks, switch to the workbook you want to copy the styles to, and choose Format, Style. In the Style dialog box, click the Merge button. In the Merge Styles dialog box, pick the name of the workbook that contains the styles you want to reuse, and then click OK.

#### TIP FROM

*EQ & Woody*

If you regularly use named styles in worksheets, you can dramatically increase your productivity by adding the Style list to the Formatting toolbar. You'll find step-by-step instructions for this task in Chapter 2, "Customizing the Office Interface." Make sure you do this with the default workbook template, as defined in Chapter 24, so the new toolbar is available to all workbooks you create.

- For more details on how to create and customize toolbars, see "Customizing Toolbars," p. 35.
- For step-by-step instructions on how to customize the default Excel workbook template, see "Changing Default Formatting for New Workbooks and Worksheets," p. 678.

## USING AUTOFORMAT

Like the Word feature of the same name, Excel's AutoFormat promises to turn your worksheet into a work of art, instantly and effortlessly. When you apply AutoFormatting to simple worksheet ranges with easily identifiable headings, totals, and other elements, the feature works pretty much as advertised. In fact, the AutoFormat options available with PivotTables are exceptionally useful because the format of a PivotTable is always the same. For more complex worksheets, however, it's likely that you'll need to clean up after AutoFormat. In general, we recommend trying the AutoFormat options; you can always undo the results if you don't like them, and in many cases the formatting gives you a good start.

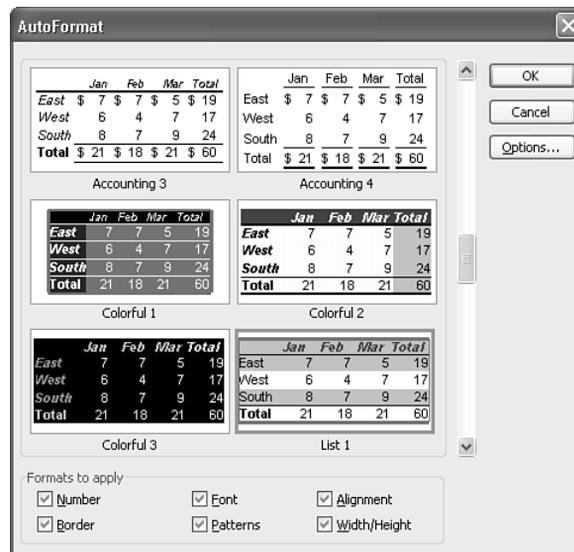
When you use AutoFormat and other table-based options (such as sorting a list), Excel tries to apply your instructions to the current selection. If you don't make a selection, Excel uses the current region, which is the block of filled-in cells that extends in all directions from the insertion point to the next empty row or column or the edge of the worksheet. For that reason, when you design a worksheet, you should always include at least one blank row and column to mark the border of every separate data entry block.

To use AutoFormat, follow these steps:

1. Select a range. If you skip this step, Excel selects the current region.
2. Choose Format, AutoFormat. The dialog box shown in Figure 25.18 appears.

**Figure 25.18**

AutoFormat is most effective when you use it on small, well-defined ranges. Choose the options at the bottom of the dialog box to determine what types of changes to apply automatically.



3. Pick one of the built-in formats. Each entry in the list includes a sample that gives you a general idea of the formats you can expect. The Simple and Accounting formats are the most conservative and are best for lists that you plan to include as tables in financial reports. The 3D choices at the end of the list are good for Web pages.
4. To enable or disable specific types of automatic formatting, such as borders or fonts, click the Options button and add or remove check marks.
5. Click OK to apply the formats.

→ For an overview of other Office-wide formatting options, see “Common Formatting Options,” p. 107.

## TROUBLESHOOTING

### STOPPING AUTOMATIC CONVERSIONS

*After importing data into a worksheet from text files and databases, I noticed that Excel converts some data to date serial values and other data to scientific notation. I want the information to appear in my worksheet exactly as it did in the database. Is there any way to change it back?*

No, unfortunately. When Excel sees a value that looks like a date or time or scientific notation, either when you type a value into a cell or when you import a database, it converts the value automatically as you type or import. There is no way to reverse this conversion. If you have serial numbers that use the format ##X####, where each # is a number and the X is a letter, Excel converts any serial number that contains the letter E in that position to scientific notation. Your best option is to edit the text or database file, adding an apostrophe to the beginning of each field that contains values Excel will try to convert. In that case, Excel imports the data in text format exactly as it appears.

### CLICKING TWICE FOR NORMAL

*I formatted text in a cell using more than one font, and I want to restore Excel's default font format. I opened the Format Cells dialog box, clicked the Font tab, and checked the Normal Font box once, but my formatting stays exactly as it was. What's the secret?*

When you have multiple font formats applied to different words or characters in a cell, the Normal Font check box is checked, but it's grayed out. To restore the default formatting, click once to clear the box (exactly the opposite of what you normally do), and then click OK to close the dialog box. Now reopen the dialog box and check the Normal Font box again. This time your change will stick.

### WORKING WITH MULTIPLE CONDITIONS

*I applied conditional formatting to a cell, but the formatting doesn't appear on some cells, even though the data in those cells meets the conditions I specified.*

If you specify multiple conditions and more than one is true for a given cell, Excel applies the formats of the first true condition it encounters and ignores the second and third conditions. If you've defined conditions that have the potential to overlap, arrange them in order so that the most important one (or the one least likely to be true) is first in the list.

## SECRETS OF THE OFFICE MASTERS: REDESIGNING A WORKSHEET CLARIFIES THE INFORMATION

When you first create a worksheet, every cell uses the same fonts, every row is the same height, and there's no distinction between headings and the data they describe. With Excel's extensive selection of formatting tools, you can redesign a worksheet to make its organization crystal clear.

When we imported data from a database into a worksheet, the results looked like a data disaster, as the “Before” example in Figure 25.19 illustrates.

Figure 25.19

Budget Category	Jan	Feb	Mar	Apr	May	Jun	Jul	Aug	Sep
Salaries	281340	243876	259289	251553	246743	280259	284904	250273	2684
Payroll Tax	38262	33167	36036	34211	33557	38115	38747	34037	366
Benefits	20093.3	17417.6	18518.4	17965.9	17622.3	20016.1	20347.8	17874.5	1917
Contract L	11475	18435	13153	11031	20710	34130	6188	13685	155
Insurance	9199.82	7974.75	8478.74	8225.77	8068.48	9164.46	9316.35	8183.91	8779
Travel	10203	14919	43235	38373	25836	39566	45058	3412	316
Entertainm	1924	6792	11422	12179	9457	18652	15796	2401	139
Equipment	812	3910	4717	6289	9032	584	6664	9922	106
Computer	10674	14849	4407	10974	14129	2306	4495	2143	35
Office Sup	723	723	1249	811	1011	965	899	755	6
Printing an	1635	997	1837	1872	1266	1778	1240	2075	14
Telephone	13839	15250	10614	15586	14346	12280	9587	15036	141
Postage a	14176	13644	12988	16289	11079	17086	12366	10937	213
Rent	19500	19500	19500	19500	19500	19500	19500	19500	195
Utilities	4153	4090	3616	3857	3544	3479	3386	3578	36
Maintenan	9600	9600	9600	9600	9600	9600	9600	9600	96
Marketing	60020	39833	28157	19417	35332	10899	38396	26213	806
Other	1145.1	123.2	741	303.6	1312.3	959.2	1131.9	1342	12

After some careful formatting, however, the results are much easier to read and follow. Here are the basic principles we followed when formatting the “After” worksheet shown in Figure 25.20:

- Adjust the formatting for every cell, especially those that contain numbers, dates, and dollar amounts. Pay particular attention to fonts, font size, and the number of decimal places displayed.
- Enter totals, averages, and other formulas as needed for analytical purposes.
- Make sure that all columns align properly and that rows and columns are the proper width.
- Make headings and titles bigger and bolder so that they clearly define what type of data is in each row and column. Bold white type on a dark background is especially effective in column headings. Excel also uses this formatting to identify headings for sorting purposes.
- Turn on text wrapping and merge cells as needed, especially in headings.
- To unclutter the worksheet, choose File, Page Setup, click the Sheet tab, and clear the check mark from the Gridlines box.
- Use the Borders button to add grid elements as necessary. Notice the double underline above a row of totals and the thin single borders along the bottom of each row of data that help the reader follow along from left to right in each row.

- Use the Fill Color drop-down menu to add light shading throughout the data section. In this worksheet, a soft green shading was added to alternate rows to make long rows easier to follow.
- Freeze worksheet panes to make it easier to scroll through columns and rows without losing track of data.
- Add graphics as needed to give the worksheet the proper corporate identity.

Figure 25.20

Budget Category	Annual Total	Monthly Average	As % of Total	Jan	Feb	Mar	Apr	May
Salaries	\$ 3,156,087	\$ 263,007	53.5%	\$ 281,340	\$ 243,876	\$ 259,289	\$ 251,553	\$ 246,743
Payroll Taxes	\$ 430,001	\$ 35,833	7.3%	\$ 38,262	\$ 33,167	\$ 36,036	\$ 34,211	\$ 33,557
Benefits	\$ 225,408	\$ 18,784	3.8%	\$ 20,093	\$ 17,418	\$ 18,518	\$ 17,966	\$ 17,622
Contract Labor	\$ 188,960	\$ 15,747	3.2%	\$ 11,475	\$ 18,435	\$ 13,153	\$ 11,031	\$ 20,710
Insurance	\$ 103,204	\$ 8,600	1.8%	\$ 9,200	\$ 7,975	\$ 8,479	\$ 8,226	\$ 8,068
Travel	\$ 284,695	\$ 23,725	4.8%	\$ 10,203	\$ 14,919	\$ 43,235	\$ 38,373	\$ 25,836
Entertainment	\$ 102,090	\$ 8,508	1.7%	\$ 1,924	\$ 6,792	\$ 11,422	\$ 12,179	\$ 9,457
Equipment	\$ 71,554	\$ 5,963	1.2%	\$ 812	\$ 3,910	\$ 4,717	\$ 6,289	\$ 9,032
Computer Equipment	\$ 92,006	\$ 7,667	1.6%	\$ 10,674	\$ 14,849	\$ 4,407	\$ 10,974	\$ 14,129
Office Supplies	\$ 11,451	\$ 954	0.2%	\$ 723	\$ 723	\$ 1,249	\$ 811	\$ 1,011
Printing and Copying	\$ 17,862	\$ 1,489	0.3%	\$ 1,635	\$ 997	\$ 1,837	\$ 1,872	\$ 1,266
Telephone and Fax	\$ 147,205	\$ 12,267	2.5%	\$ 13,839	\$ 15,250	\$ 10,614	\$ 15,596	\$ 14,346
Postage and Delivery	\$ 181,236	\$ 15,103	3.1%	\$ 14,176	\$ 13,644	\$ 12,968	\$ 16,289	\$ 11,079
Rent	\$ 234,000	\$ 19,500	4.0%	\$ 19,500	\$ 19,500	\$ 19,500	\$ 19,500	\$ 19,500
Utilities	\$ 45,616	\$ 3,801	0.8%	\$ 4,153	\$ 4,090	\$ 3,616	\$ 3,857	\$ 3,544
Maintenance	\$ 115,200	\$ 9,600	2.0%	\$ 9,600	\$ 9,600	\$ 9,600	\$ 9,600	\$ 9,600