FORMULAS AND FUNCTIONS

Chapter Objectives

By the time you finish this chapter, you should be able to identify the following terms:

- ❏ Range
- ❏ Range Address
- ❏ Format
- ❏ Merge and Center
- ❏ Formula
- ❏ Order of Operations
- ❏ Fill handle
- ❏ Function

- ❏ Replace
- ❏ SUM
- ❏ MAX
- ❏ MIN
- ❏ AVERAGE
- ❏ COUNTA
- ❏ TODAY
- ❏ NOW

By the time you finish this chapter, you should be able to perform the following tasks:

- ❏ Work with ranges
- ❏ Format text and numbers
- ❏ Use the Format Painter
- ❏ Enter simple formulas
- ❏ Use basic worksheet functions
- ❏ Use advanced worksheet functions
- ❏ Use the formula palette
- ❏ Use AutoCorrect
- ❏ Use Pick From List

- ❏ Use Find and Replace
- ❏ Use AutoFill
- ❏ Use AutoComplete
- ❏ Widen columns and heighten rows
- ❏ Insert and delete columns and rows
- ❏ Insert and remove cells
- ❏ Hide/unhide columns and rows
- ❏ Copy formulas

INTRODUCTION

In Chapter 1, you learned how to create, open, and save workbooks. You will build on that knowledge in this chapter. First, you will learn about ranges. A **range** is a group of cells that you select when you want an action to affect more than just one cell. Second, you will learn how to make the data in our worksheet more appealing to the eye by formatting it. Formatting your data means changing the way data is displayed such as bolding, italicizing, underlining, changing size and color of text, and applying commas, dollar signs, and decimal places to values. Finally, you will learn how to perform calculations using basic formulas and functions. Formulas and functions are the primary tools of the Excel user.

RANGES

In Chapter 1, you learned about working with individual cells. You will learn how to work with a group of cells in this chapter. Working with a group of cells is much more efficient than working with one cell at a time. Imagine you wanted to bold the text in 50 cells. It would take a rather long time if you did it one cell at a time.

A group of cells is called a **range.** Although one cell can be "technically" called a range, ranges are usually two or more selected cells. When an action such as bold or underline is applied to a selected range, only the selected range is affected.

There are many methods of selecting a range. The most common method is to click and drag the mouse pointer across the desired cells. When you release the mouse button, the selected area will be in gray. Other methods to select a range will be discussed later.
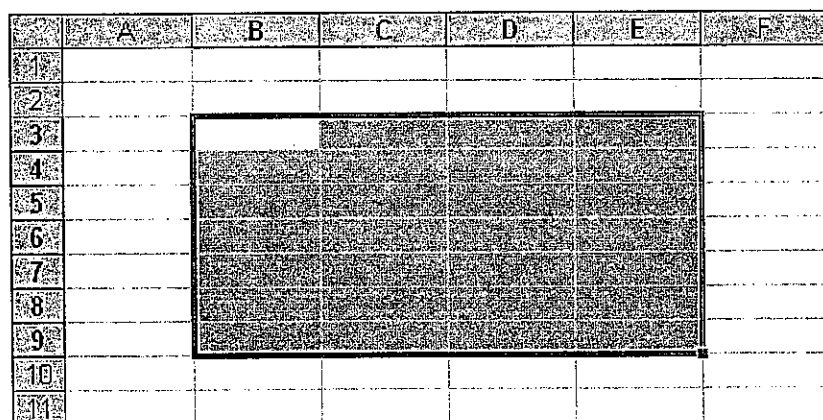
Figure 2.1: A Selected Range of Cells

When a range of cells is highlighted, the range has a range address just as an individual cell has a cell address. A **range address** is the first cell in the selection (the upper left of the selection) and the last cell address in the selection (the lower right corner of the selection) separated by a colon (:). For example, the range address **A1:A10** means all the cells from **A1** through **A10.** Any action applied to the **Range A1:A10,** such as formatting, will be applied to the selected range only. Figure 2.2 illustrates several highlighted ranges and their range addresses.

Figure 2.2: Several Selected Ranges and Their Range Addresses

A few more methods to select a range:

❑ Click and drag through the range with the mouse starting with the upper left cell.

❑ Click the first cell in the range. Press the **Shift** key, and click the last cell in the range.

❑ Hold the **Shift** key down while tapping the arrow keys on the keyboard.

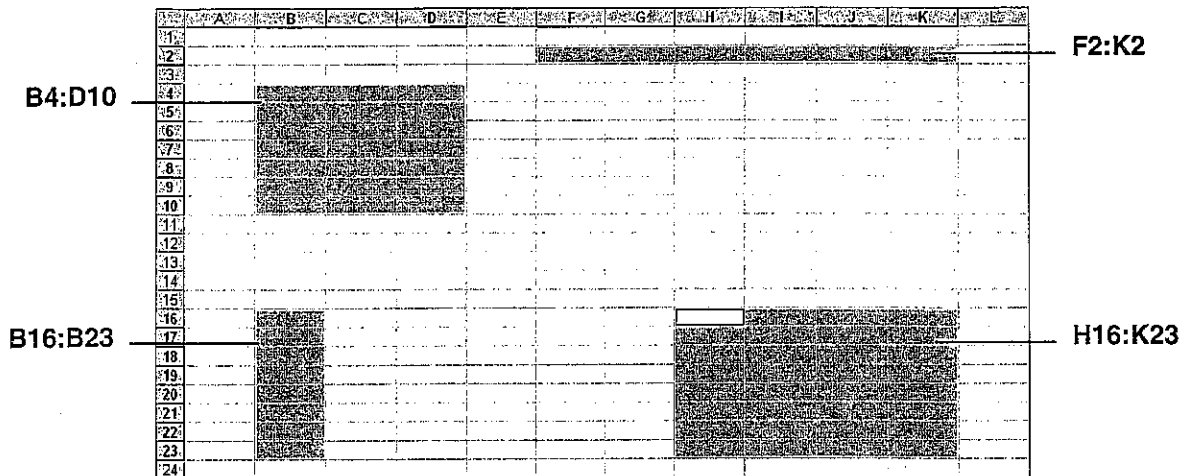❑ Type the range address into the **Name box** on the **Formula bar,** and press **Enter** key.

❑ Type the range address into the **Go To** dialog box.

❑ Select several noncontiguous ranges by holding down the **Ctrl** key while clicking and dragging the mouse.

❑ Select an entire column by clicking the column letter on the worksheet frame.

❑ Select an entire row by clicking the row number on the worksheet frame.

❑ Select every cell in the worksheet by clicking the **Select All** button (the unlabeled gray square at the convergence of the column and row labels in the upper left corner of the worksheet area).

Exercise 2-1	Select Ranges

I. Open a new workbook.

II. Select the **Range B5:B15.**
    a. Place the mouse pointer on **cell B5,** and click and drag straight down through **cell B15.**

III. Deselect the range.
    a. Click anywhere in the worksheet.

IV. Select the **Range B2:F15.**
    a. Place the mouse pointer on **cell B2,** and click and drag through **cell F15.**

V. Deselect the range.

VI. Select the **Range B5:G10.**
    a. Keyboard **B5:G10** in the **Name box,** and press **Enter** key.

VII. Deselect the range.

VIII. Select the **Range A1:G20.**
    a. Activate the **Go To** dialog box. Keyboard **A1:G20** in the **Reference** field, and click **OK.**

IX. Deselect the range.

    X. Select the **Range A3:D10.**
        a. Click **cell A3.** Press **Shift** key, and click **Cell D10.**
    XI. Select two noncontiguous ranges.
        a. Select the **Range A1:A10.** Hold down the **Ctrl** key, and select the **Range C1:C10.**
    XII. Deselect the range.
    XIII. Practice selecting more ranges with the mouse, the keyboard, the **Go To** dialog box, and the **Name box.**
    XIV. Practice selecting noncontiguous ranges with the **Ctrl** key and mouse.
    XV. Close the workbook without saving.

FORMAT DATA

Now that we know how to work with ranges, let's learn how to format data. Formatting makes your data easier to read. For example, **$4,500** looks much nicer than just plain old **4500.** Some formats that you can apply to your data include font, font size, font color, alignment, bold, italic, and underline. The two figures below demonstrate how formatting can make a worksheet more appealing to the eye.

	A	B	C	D	E
1	Acme Widget Company				
2	Quarterly Revenue				
3					
4	Revenue	January	February	March	Total
5	Sales	12500	10000	10800	33300
6	Services	10500	9500	10200	30200
7	Dividends	2500	2350	2400	7250
8					
9	Total	25500	21850	23400	70750

Figure 2.3: Unformatted Worksheet

	A	B	C	D	E
1	Acme Widget Company				
2	Quarterly Revenue				
3					
4	Revenue	January	February	March	Total
5	Sales	$ 12,500	$ 10,000	$ 10,800	$ 33,300
6	Services	10,500	9,500	10,200	30,200
7	Dividends	2,500	2,350	2,400	7,250
8					
9	Total	$ 25,500	$ 21,850	$ 23,400	$ 70,750

Figure 2.4: Formatted Worksheet

Fonts, Font Size, and Font Style

A **font,** also known as a typeface, is a set of characters that share a common shape or design. Fonts can vary in size and style. Font size is measured in points, and there are four types of Font styles: **Bold, Italic, Bold Italic,** and **Underline.** All font attributes can be adjusted in the **Font** dialog box, or by using the appropriate **Formatting toolbar** buttons.

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Methods of Formatting Data

There are two primary methods of formatting worksheet data: using the **Formatting toolbar,** and using the **Format Cells** dialog box. Either way works well, but the **Formatting toolbar** method is more popular because it is more readily available. To see what a formatting button does without activating it, place your mouse pointer over the button, and read the small **tool tip** box that appears. Even though all formatting tasks can be accomplished with the **Format Cells** dialog box, it is usually used for more specialized formatting tasks such as date, custom number formatting, and rotating data.
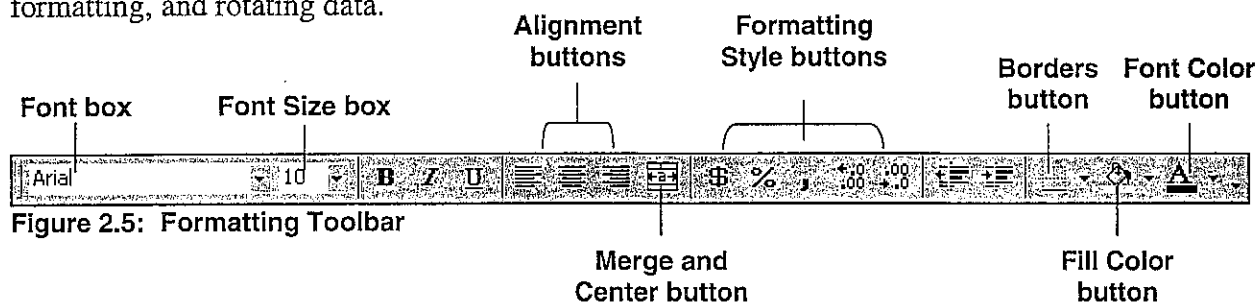

Figure 2.5: Formatting Toolbar

NUMBER FORMATS

General Format

The **General** format is Excel's default number format. You simply type your number into a cell, and no specialized formatting is applied.

Number Format

The **Number** format will display your numbers with no commas or dollar signs. **Number** format is ideal for displaying small numbers (lower than 1000) with a fixed number of decimal places. It is a great format to use for students' grades and averages, quantity amounts such as "# of gallons purchased," or any other numbers that do not require commas or dollar signs. You can also apply different attributes to your numbers such as displaying numbers in red for amounts less than zero.
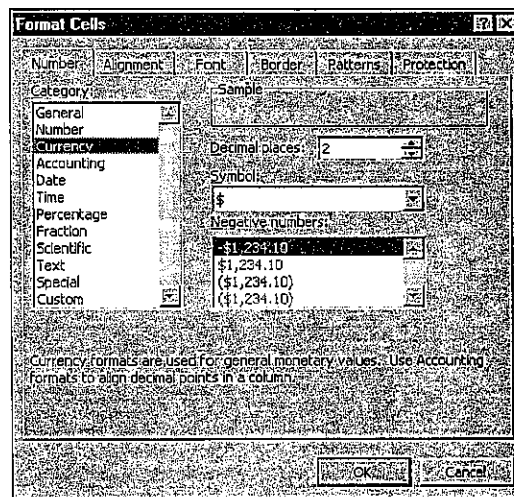
Figure 2.6: Format Cells Dialog Box

Currency Style

The **Currency** format (also known as **Currency Style**) automatically inserts a currency symbol, commas (if needed), and two decimal places into your number. Decimal places can be adjusted by using the **Increase and Decrease Decimal** buttons on the **Formatting toolbar** or by changing the **Decimal places** field in the **Format Cells** dialog box. The most common method of applying the format is to use the **Currency Style** button on the **Formatting toolbar.** Many different international currency symbols can be applied to your values by adjusting the **Symbols** field in the **Format Cells** dialog box.

Comma Style

The **Comma** format (also known as **Comma Style**) places commas and two decimal places in the number by default. The most common method of applying the format is to use the **Comma Style** button on the **Formatting toolbar**. This format is ideal for values over 1,000 that do not require currency symbols.

Percent Style

The **Percent** format (also known as **Percent Style**) places a percent sign to the right of the number. It is usually applied to decimal values such as **.34**. Percents are not treated as values in Excel, but as a representation of a decimal number. For example, the value **45%** is really **.45**, and the value **12.25%** is really **.1225**. When a **Percent** format is applied to a number, the number is multiplied by 100, and then the percent sign is added. For example, if **.45** is formatted to **Percent Style**, **45%** is displayed. If the whole number **5** is formatted in **Percent Style**, then **500%** is displayed because **5 * 100** is **500**. If **.1332** is formatted to a **Percent Style** with two decimal places, **13.32%** is displayed. The most common method of applying the format is to use the **Percent Style** button on the **Formatting toolbar**.

Fraction

Available through the **Format Cells** dialog box, the **Fraction** format is useful when you wish to display decimals as fractions. For example, **2.5** in **Fraction** format displays as **2 ½**, and **12.25** displays as **12 ¼**. Good for jobs that require fraction displays such as stock market quotes.

Decimal Places

When applying numeric formats to values, such as **Comma Style** or **Currency Style**, two decimal places are assigned by default. You may adjust the amount of decimal places in a value by using the **Increase** and **Decrease Decimal** buttons on the **Formatting toolbar.**

Date and Time

Using the **Date** and **Time** formats allows you to display them in a number of ways. When you enter a date into a cell such as **1/1/98**, it is stored as a date serial number. Date serial numbers start with **1**, the date **1/1/1900**, and keep counting until today. For example, **9/9/2000** translates into the date serial number of **36,797**. In other words, it has been **36,797** days since **1/1/1900**. Using dates as serial numbers works well when you want to perform calculations using dates such as finding out how many days an employee has worked. The **Format Cells** dialog box is used to format dates and times.

Rounding Values

Excel rounds off the display of any value to the last decimal place by default. For example, if the number **12.75** is entered into a cell, and then the cell is formatted to display one decimal place, the cell will display **12.8**. Keep in mind that the true value of the cell is still **12.75**. This means if any calculations are done using the cell, the value **12.75** is used and not **12.8.**

Automatic Formatting

You can also manually keyboard your data with commas, dollar signs, or percent signs. Excel automatically matches the cell format to an existing format.

Value	Format	Result
55	Currency Style (default)	$ 55.00
1250.75	Comma Style (default)	1,250.75
78.245	Number Style (default)	78.25
.55676	Percent Style w/ two decimal places	55.68%
5.678	Number Style w/ one decimal place	5.7
12/12/95	Date format (14-Mar-98)	12-Dec-95
3:00	Time format (1:30 PM)	3:00 PM
14:30	Time format (1:30:55 PM)	2:30:00 PM
4.375	Fraction format	4 3/8

Table 2.1: Number Formats

Data Alignment

In Chapter 1, you learned that when text is entered, it is left-aligned by default, and when numbers are entered, they are right-aligned by default. You can change the alignment by selecting the cell and using the alignment buttons on the **Formatting toolbar.**

Merge and Center

In addition to aligning data in individual cells, you can also center data across multiple columns using the **Merge and Center** button on the **Formatting toolbar.** For example, let's say you wish to center a worksheet title across **columns A** through **G.** With the data in the leftmost column—**column A** in this case—select the **Range A1:G1** and click the **Merge and Center** button on the **Formatting toolbar.**

Data Rotation

To add additional emphasis to your column headings, you may rotate them. To rotate text, select the range, and open **Format Cells** dialog box. Click the **Alignment** tab, and adjust the **Orientation** field. Click **OK** to apply the orientation.

Exercise 2-2   **Format Data Using the Formatting Toolbar**

	A	B	C	D	E	F	G
1	Pete's Computer Sales and Service						
2	Six-Month Expense and Revenue Report						
3							
4							
5	Revenue	January	February	March	April	May	June
6	Sales	$ 2,244	$ 1,730	$ 1,249	$ 1,252	$ 1,644	$ 1,365
7	Services	2,295	1,857	2,124	2,037	1,597	1,486
8	Dividends	1,365	1,233	1,542	1,396	2,367	2,235
9							
10							
11	Expenses	January	February	March	April	May	June
12	Utilities	$ 1,200	$ 1,206	$ 1,136	$ 1,184	$ 1,213	$ 1,171
13	Rent	1,200	1,200	1,200	1,200	1,200	1,200
14	Salaries	850	850	850	850	850	850
15	Promotion	1,161	1,155	1,218	1,137	1,132	1,135

I. Open the **Proj 1-2 Pete's Computer Store** workbook from your work disk.
II. Set the **Zoom** to **110%.**
III. Change font.
    a. Select **cell A1,** if necessary, and choose **Bookman Old Style** from the **Font** drop-down list on the **Formatting toolbar.**
       i. The font of **Pete's Computer Sales and Service** is changed to **Bookman Old Style.**

Merge and
Center
button

IV. Adjust font size.
    a. With **cell A1** still selected, choose **14** from the **Font Size** drop-down list.
       i. The font size is increased to **14** points.
V. Change the subtitle in **cell A2** to **12-point Bookman Old Style.**
VI. Merge and center text.
    a. Select **Range A1:G1.**
    b. Click the **Merge and Center** button on the **Formatting toolbar.**
       i. The title in **cell A1** is centered across the worksheet.

Bold
button

VII. Repeat the above step to center the subtitle in **cell A2** across the worksheet.
VIII. Bold and center data.
    a. Select **Range B5:G5.** Press and hold the **Ctrl** key while selecting the **Range B11:G11.**
       i. The two noncontiguous ranges are selected.

Center
button

    b. Click the **Bold** and **Center** buttons on the **Formatting toolbar.**
       i. The monthly column headings are centered and bold.
    c. Simultaneously select **cells A5** and **A11.**
    d. Click the **Bold** button.
       i. The labels **Revenue** and **Expenses** are bolded.

Font Color
button

IX. Adjust font color.
    a. Simultaneously select **Ranges A5:G5** and **A11:G11.**
       i. The **Revenue** and **Expense** column headings are selected.
    b. Click the **Font Color** drop-down list on the **Formatting toolbar,** and select **Blue.**
    c. Deselect the range.
       i. The column headings for both sections are blue.

Currency
Style
button

X. Apply Currency style.
    a. Simultaneously select **Ranges B6:G6** and **B12:G12.**
       i. The **Sales** and **Utilities** amounts for the six months are selected.
    b. Click the **Currency Style** button on the **Formatting toolbar.**
    c. Click the **Decrease Decimal** button on the **Formatting toolbar** two times.
       i. The amounts are formatted to Currency Style with no decimal places.

Decrease
Decimal
button

XI. Apply Comma style.
    a. Simultaneously select **Ranges B7:G8** and **B13:G15.**
       i. The remaining amounts for **Revenue** and **Expenses** are selected.
    b. Click the **Comma Style** button on the **Formatting toolbar,** and then click the **Decrease Decimal** button on the **Formatting toolbar** twice.

Comma
Style
button

       i. The remaining **Revenue** and **Expense** amounts are formatted to **Comma Style with no decimal places.**
XII. Save as **Ex 2-2 Pete's Computer Store,** and close the workbook.

Exercise 2-3 — Format Data Using the Format Cells Dialog Box

	A	B	C	D	E	F	G	H
1	KLM Company							
2	Employee List							
3								
4								
5								
6	Last Name	First Name	Address	City	State	ZIP	Salary	Date Hired
7	Smith	Brian	334 Oak St.	Lakeland	FL	33801	$25,000	8-Dec-96
8	Johnson	Brittany	915 Highland St	Bartow	FL	33830	$75,000	23-Aug-98
9	Mickeley	Annie	503 Buff Dr.	Auburndale	FL	33823	$25,500	4-Nov-97
10	Houser	Gregory	31 Imperial Dr.	Mulberry	FL	33860	$32,500	18-Feb-99
11	Jackson	Jarred	136 High St.	Winter Haven	FL	33810	$39,200	29-May-00
12	Potter	Sarah	2020 Main St.	Lakeland	FL	33801	$26,500	3-Jan-97
13	Scott	Zachary	2690 1st St.	Lakeland	FL	33801	$72,300	15-Dec-97
14	Butler	Angela	685 Park St.	Lakeland	FL	33801	$70,000	24-Jan-99
15	Jones	Annie	2055 Georgia St.	Lakeland	FL	33801	$49,320	27-Nov-96
16	Henderson	Odie	3815 Davis St.	Mulberry	FL	33860	$49,500	26-Apr-00
17	Hawkins	Barbara	956 Hankins St.	Bartow	FL	33830	$50,000	24-Nov-97
18	White	Darlene	990 Dudley St.	Bartow	FL	33830	$55,000	12-Aug-00
19	Douglas	Tracey	202 Griffin St.	Lakeland	FL	33801	$26,500	3-Dec-97
20	Evans	Michelle	510 Whitman St.	Mulberry	FL	33860	$70,000	30-Mar-00
21	Bliss	Kyle	265 Hooker St.	Mulberry	FL	33860	$69,500	15-Oct-96

I. Open the **Employee List** workbook from the data disk, and save it using the name **Ex 2-3 Employee List** to your work disk.

II. Adjust font, font size, font color, and underline.
   a. With **cell A1** selected, click **Format, Cells** on the **Menu bar.**
      i. The **Format Cells** dialog box is activated.
   b. Click the **Font** tab.
   c. Select **Arial** from the **Font** list, **Bold Italic** from the **Font Style** list, **16** from the **Font Size** list, **Single** from the **Underline** drop-down list, and **Aqua** from the **Color** drop-down list. Click **OK** to apply.
      i. The worksheet title is formatted to **Aqua 16-point Arial Bold Italic** with a single underline.

III. Repeat the step above for the subtitle in **cell A2** except make the font size **14,** and do not include underline.
   a. The subtitle title is formatted to **Aqua 14-point Arial Bold Italic.**

IV. Merge and center title and subtitle across the worksheet.
   a. Select **Range A1:H1**, and click the **Merge and Center** button on the **Formatting toolbar.**
   b. Select **Range A2:H2** and click the **Merge and Center** button on the **Formatting toolbar.**
      i. The two titles are centered across the worksheet.

V. Adjust font, font size, font color, and orientation.
   a. Select **Range A6:H6.**
      i. The employee list column headings are selected.

Merge and Center button

    b. Click **Format, Cells** on the **Menu bar,** and choose the **Font** tab if necessary.

    c. Select **Arial** from the **Font** list, **11** from the **Font Size** list, and **Red** from the **Color** drop-down list.

    d. Click the **Alignment** tab.

    e. Keyboard **35** in the **Degrees** field of the **Orientation** section, and click **OK.**

        i. The data is formatted to **Red 11-point Arial** and tilted **35 degrees.**

VI. Apply Currency style.

    a. Select **Range G7:G21.**

    b. Click **Format, Cells** from the **Menu bar** to call up the **Format Cells** dialog box, and click the **Number** tab.

    c. Click **Currency** in the **Category** list, type **0** in the **Decimal Places** field. Click **OK.**

        i. The salaries are formatted to **Currency Style with no decimal places.**

VII. Apply a date format.

    a. Select **Range H7:H21,** and then activate the **Format Cells** dialog box.

    b. With the **Number** tab selected, click **Date** in the **Category** list.

    c. Click **14-Mar-98** in the **Type** list, and click **OK.**

        i. The dates for **Date Hired** are formatted to the **14-Mar-98** date format.

VIII. Deselect the range.

IX. Save and close the workbook.

Format Painter

An easy method of formatting data is to copy existing cell formats and apply them to other cells on the worksheet using **Format Painter.** This ensures consistency and efficiency when it comes to formatting your data. The format painter is accessed from the **Standard toolbar.** Select a cell whose format you wish to mimic, and click the **Format Painter** button on the **Standard toolbar.** The mouse pointer will change into a little paintbrush. Click and drag the format painter over the range you wish to format.

Exercise 2-4	Use the Format Painter

I. Open the **Cloud-9 Airplane Company** workbook from your data disk, and then save it as **Ex 2-4 Cloud-9 Airplane Company** to your work disk.

II. Format the title in **cell A1** to **Blue 18-point Arial.**

III. Format the subtitle in **cell A2** to **Blue 14-point Arial.**

IV. Format **Range A6:E6** to **Red 11-point Arial Bold,** and center it.

**Format
Painter
button**

V. Use the format painter.

    a. With the range still selected, click the **Format Painter** button on the **Standard toolbar.**

        i. The mouse turns into a mouse pointer with a paintbrush attached and a scrolling marquee surrounds the range.

    b. Click **cell A15,** and then deselect the range.

        i. The **Expense** headings are formatted identical to the **Revenue** headings.

VI. Format **Range B7:D9** to **Comma Style with no decimal places,** and then deselect the range.

	A	B	C	D	E
1	Cloud-9 Airplane Company				
2	Quartlerly Revenue and Expense Statement				
3					
4					
5					
6	Revenue	January	February	March	Total
7	Consult Fees	2,244	1,730	1,249	$ 5,223
8	Sales	2,295	1,675	2,124	6,094
9	Services	1,365	1,233	1,542	4,140
10	Total	$ 5,904	$ 4,638	$ 4,915	$ 15,457
11					
12					
13					
14					
15	Expenses	January	February	March	Total
16	Utilities	1200	1206	1136	$ 3,542
17	Rent	1174	1164	1160	3,498
18	Salaries	1191	1203	1125	3,519
19	Advertising	1161	1155	1218	3,534
20	Phone	500	400	350	1,250
21	Total	$ 5,226	$ 5,128	$ 4,989	$ 15,343

VII. Use the format painter.
   a. Select **cell B7,** and then click the **Format Painter** button on the **Standard toolbar.**
   b. Click and drag through the **Range B16:D20.**
      i. The **Expense** amounts are formatted identical to the **Revenue** amounts.
VIII. Clear formatting.
   a. With the range still selected, click **Edit, Clear, Formats** from the **Menu bar.**
      i. The cells revert to default format.
IX. Select **cell A1.**
X. Save and close the workbook.

WORKSHEET FORMATTING

Now that we know how to format our data, let's learn to format the worksheet itself. Worksheet formatting includes columns widths and row heights, inserting and deleting columns and rows, hiding and unhiding columns and rows, inserting and deleting cells, changing cell background colors, applying cell borders, and displaying and hiding worksheet gridlines.

Column Width

By default, the width of every column is **8.43** characters. This is often not wide enough to hold your data. When data is entered into a cell that is longer than the cell is wide, it appears to wrap over into the next cell. Whether or not the data wraps into the next cell is dependent on what type of material is entered. If a long text entry is entered, it will wrap into the next cell as long as

the neighboring cell is empty. If the neighboring cell is not empty, the text entry will appear cut in half even though it is not. If a value is entered into a cell and the cell is not wide enough, either you will see ##### in the cell or the number will be formatted to Scientific Notation. Excel will never display half of a number in a cell.

There are three ways you can change the width of your columns—widen just one column, widen numerous contiguous columns, or widen every column in the worksheet. If you want to change the width of one column, place the cell cursor in the column, and click **Format, Column, Width** on the **Menu bar.**

The simplest way to widen one column is to click and drag the column border (located in between the column labels at the top of the worksheet area) to the desired width. For example, if you wish to widen **column B** to **12** characters, click and hold on the column border between the **column B** and **C** labels and drag to the right until the small box accompanying the widening action says **12.00,** and then release the mouse button.

Another easy method to widen one column would be to move the mouse pointer over the column border. When the mouse pointer changes, double-click to automatically expand the column to the width of its largest entry.

If you wish to widen several columns, select any cell in each of the columns, and click **Format, Column, Width** on the **Menu bar.** Keyboard in the number of characters you want in the **Column Width** field, and click **OK.**

If you wish to widen every column in the worksheet, no columns need to be selected. Simply click **Format, Column, Standard Width** from the **Menu bar,** and type in the number of characters wide you would like every column to be, and click **OK.**

Row Height

A less common operation in Excel is to adjust the row height. Adjusting row height is usually less necessary because row height is automatically adjusted when you increase or decrease the font size of your data so that your data is always visible. However, if you wish, row height can be adjusted manually to make the worksheet easier to read.

The methods used to adjust row height are similar to those of columns. You can change the row height of one row, of numerous contiguous rows, or of every row in the worksheet at one time.

To heighten just one row, click and drag the row heading border on the worksheet frame to the desired height. Row heights are measured in point sizes: **1 point = 1/72 of an inch.** To change the row height of numerous rows like **rows 1** through **5,** select any five cells in the rows like **A1:A5,** click **Format, Row, Height** from the **Menu bar,** and type in the number of points. Click **OK** to set.

Inserting and Deleting Columns and Rows

If, after completing a worksheet, you wish to add information, then you can insert columns and/or rows. Inserting rows and columns is a simple process. If you want to insert a row, place

the cell cursor on the row below where you want to insert the new row, and click **Insert, Rows** on the **Menu bar.** If you want to insert a column, then place the cell cursor in the column to the right of where the column is to be inserted, and click **Insert, Columns** from the **Menu bar.** To delete columns or rows, select cells anywhere in the column or row to be deleted and click **Edit, Delete** on the **Menu bar.** Select either **Entire Row** or **Entire Column** in the **Delete** dialog box, and click **OK.**

Hiding Columns and Rows

Sometimes you may wish to print a worksheet but you do not want certain columns to show like an **Hourly Rate** column or **Telephone #** column. In this case, you can temporarily hide and then redisplay the column(s) after printing. To hide a column, place the cell cursor in the column you want to hide, and click **Format, Column, Hide** on the **Menu bar.** To bring the column back, select two cells across the hidden column, and click **Format, Column, Unhide** from the **Menu bar.**

Hiding a row is essentially the same process as hiding a column. Select any cell or cells in the rows you wish to hide, and click **Format, Row, Hide** from the **Menu bar.** Redisplaying rows is the same as redisplaying columns except you use **Format, Row, Unhide** from the **Menu bar.**

A shortcut to hide columns and rows is to right-click the column or row heading, and select **Hide** from the **Shortcut menu.**

| Exercise 2-5 | Format Columns and Rows |

	A	B	C	D	E
1	*American Construction Company*				
2	*Jenkins Public Library Expansion Project*				
3	Cost Estimates				
4					
5					
6					
7		Estimated	10% Cost	15% Cost	20% Cost
8	Expenditures	Cost	Increase	Increase	Increase
9	Lumber	$150,000	$165,000	$172,500	$180,000
10	Concrete	78,000	85,800	89,700	93,600
11	Drywall	69,000	75,900	79,350	82,800
12	Paint	12,000	13,200	13,800	14,400
13	Miscellaneous	20,000	22,000	23,000	24,000
14					
15	Total Expenditures	$329,000	$361,900	$378,350	$394,800

I. Open the **American Construction Company** workbook from your data disk, and save it as **Ex 2-5 American Construction Company** on your work disk.

II. Format the title in cell **A1** to **Red 20-point Arial Bold Italic.**

III. Format the subtitle in **cell A2** to **Red 14-point Arial Bold Italic.**
IV. Format **cell A3** to **Red 12-point Arial Bold Italic.**
V. Widen columns.
   a. Move the mouse pointer over the border between the **Column A** and **Column B** letters (labels) on the worksheet frame.
      i. The mouse pointer turns into a left and right arrow.
   b. Click and drag to the right until the **Column width box** accompanying the mouse pointer displays **16**, and then release the mouse button.
      i. **Column A** is **16 characters** wide.
   c. Select **Range B4:E4.**
   d. Click **Format, Column, Width** from the **Menu bar.**
      i. The **Column Width** dialog box is activated.
   e. Type **12** in the box, click **OK,** and deselect the range.
      i. **Columns B** through **E** have a **12-character** width.
VI. Heighten rows.
   a. Select **Range A9:A15.**
   b. Click **Format, Row, Height** from the **Menu bar.**
      i. The **Row Height** dialog box is activated.
VII. Type **18** in the box, click **OK,** and deselect the range.
   a. **Rows 9** through **15** are heightened to **18 points.**

Save button

VIII. Save the workbook using the **Save** button on the **Standard toolbar.**
IX. Hide columns and rows.
   a. Select **Range D4:E4.**
   b. Click **Format, Column, Hide** from the **Menu bar.**
      i. **Columns D** and **E** are hidden.
   c. Place the cell cursor anywhere in **row 9.**
   d. Click **Format, Row, Hide** from the **Menu bar.**
      i. **Row 9** is hidden.
X. Print a copy of the worksheet.
XI. Unhide columns and rows.
   a. Select **Range C4:F4.**
   b. Click **Format, Column, Unhide** from the **Menu bar.**
      i. **Columns D** and **E** are redisplayed.
   c. Select **Range A8:A10.**
   d. Click **Format, Row, Unhide** from the **Menu bar.**
      i. **Row 9** is redisplayed.
XII. Format data.
   a. Format **Ranges B9:E9** and **B15:E15** to **Currency Style with no decimals.**
   b. Format **Range B10:E13** to **Comma Style with no decimals.**
XIII. Make **cell A1** active. Save, and close the workbook.

Exercise 2-6	Insert and Delete Columns, Rows, and Cells

	A	B	C	D	E	F	G
1	ABC Company						
2	Expense Report						
3							
4							
5							
6	Expense	January	February	March	April	May	June
7	Salaries	$5,500	$5,500	$5,500	$5,500	$5,500	$5,500
8	Rent	2,500	2,500	2,500	2,500	2,500	2,500
9	Electric	454	550	353	471	512	436
10	Telephone	650	700	675	580	500	625
11	Truck	850	775	700	650	285	500
12	Promotion	2,500	2,250	3,200	2,300	2,450	2,200
13	Misc.	1,200	1,500	1,750	1,450	1,250	1,100

I. Open the **Ex 1-2 ABC Company Expense Report** workbook from your work disk, and save it as **Ex 2-6 ABC Company Expense Report** in the same place.

II. Widen **column A** to **16 characters** and **columns B through G** to **11 characters.**

III. Increase the indent.
   a. Select **Range A5:A10,** and click the **Increase Indent** button on the **Formatting toolbar** four times.
      i. The expense labels are indented four character spaces to the right.

Increase Indent button

IV. Format the title in **cell A1** to **Teal 18-point Arial Bold.**

V. Format the subtitle in **cell A2** to **Teal 14-point Arial Bold.**

VI. Center and bold the column headings in **row 4.**

VII. Format the **Salary** values in **row 5** to **Currency Style with no decimal places.**

VIII. Format the remaining numbers to **Comma Style with no decimal places.**

IX. Insert row.
   a. With **cell A7** active, click **Insert, Rows** from the **Menu bar.**
      i. A row is inserted between the **Rent** and **Telephone** rows.
   b. In **cell A7,** keyboard **Electric,** and then enter **454, 550, 353, 471, 512,** and **436** for the **Electric** bill amounts for **January–June.**

X. Delete a row.
   a. Click anywhere in **row 10,** and then select **Edit, Delete** from the **Menu bar.**
      i. Activates the **Delete** dialog box.
   b. Choose the **Entire Row** option, and click **OK.**
      i. The **Promotion** expense row is deleted.
   c. Right-click the heading (label) for **row 8** on the worksheet frame.
      i. The row is selected, and the **Shortcut menu** displays.
   d. Click **Delete** from the **Shortcut menu.**
      i. The **Telephone** expense row is deleted.

XI. Undo two actions.
   a. The two expense rows are restored.

XII. Insert rows.
   a. Select **Range A4:A5,** and click **Insert, Rows** on the **Menu bar.**

          i.   Two rows are inserted and all data is pushed down.

XIII. Delete a column.
     a.   Select a cell anywhere in the **May** column, and click **Edit, Delete** on the **Menu bar.**
        i.   The **Delete** dialog box is activated.
     b.   Select the **Entire Column** option, and click **OK.**
        i.   The **May** column is deleted.

XIV. Undo one action.
     a.   The **May** column is restored.

XV. Delete a column.
     a.   Right-click the heading (label) for **column C** on the worksheet frame, and select **Delete** from the **Shortcut menu.**
        i.   The **February** column is deleted.

XVI. Undo one action.
     a.   The **February** column is restored.

XVII. Insert cells.
     a.   Select **Range F7:F13.**
     b.   Click **Insert, Cells** on the **Menu bar.**
        i.   The **Insert Cells** dialog box is activated.
     c.   Select the **Shift Cells Down** option, and click **OK.**
        i.   The **May** expenses are pushed down six cells.

XVIII. Delete cells.
     a.   With **Range F7:F13** still selected, click **Edit, Delete** on the **Menu bar.**
        i.   The **Delete** dialog box is activated.
     b.   Choose the **Shift Cells Up** option, and click **OK.**
        i.   The **May** expenses are brought back up into the correct range.

XIX. Make **cell A1** active. Save and close the workbook.

Change Cell Background Color and Cell Borders

You can change the color of your cells as well as add borders to your cells to add further emphasis to your worksheet. Select the range you wish to format. Use either the **Patterns** and **Borders** tab in the **Format Cells** dialog box, or the **Fill Color** and **Border** buttons on the **Formatting toolbar.**

Exercise 2-7	**Background Color and Borders - Part 1**

    I. Open the **Ex 2-5 American Construction Company** workbook from your work disk, and save it as **Ex 2-7 American Construction Company** in the same location.

   II. Adjust background color.
     a.   Select **Range A7:E8,** and click **Format, Cells** on the **Menu bar.**
     b.   Click the **Patterns** tab.
        i.   The **Patterns** panel of the **Format Cells** dialog box is activated.
     c.   Select the **Yellow** color in the color palette, and click **OK.** Deselect the range.
        i.   The background for **Range A8:E8** is yellow.

  III. Adjust background color.

	A	B	C	D	E
1	**American Construction Company**				
2	*Jenkins Public Library Expansion Project*				
3	Cost Estimates				
4					
5					
6					
7		Estimated	10% Cost	15% Cost	20% Cost
8	Expenditures	Cost	Increase	Increase	Increase
9	Lumber	$150,000	$165,000	$172,500	$180,000
10	Concrete	78,000	85,800	89,700	93,600
11	Drywall	69,000	75,900	79,350	82,800
12	Paint	12,000	13,200	13,800	14,400
13	Miscellaneous	20,000	22,000	23,000	24,000
14					
15	Total Expenditures	$329,000	$361,900	$378,350	$394,800

   a. Select **Range A9:E13.**

   b. Activate the **Format Cells** dialog box, and then click the **Patterns** tab if necessary.

   c. Select the **Lavender** in the color palette, and click **OK.** Deselect the range.

      i. The background in **Range A9:E9** is lavender.

IV. Adjust the background color using **Formatting toolbar.**

   a. Apply the **Aqua** fill color to **Range A15:E15** by clicking the down arrow on the **Fill Color** button on the **Formatting toolbar,** and selecting **Aqua.**

Fill Color button

V. Adjust cell borders.

   a. Select **Range A7:E13.**

   b. Click **Format, Cells** on the **Menu bar,** and choose the **Border** tab.

      i. Activates the **Border** panel of the **Format Cells** dialog box.

   c. Choose the **thin single line** in the **Line Style** section (last line in the first column), and click the **Inside** button.

   d. Choose the **double line** in the **Line Style** section, and click the **Outline** button.

   e. Click **OK,** and deselect the range.

      i. The table has a double line outside border and a single line inside border.

VI. Adjust cell borders.

   a. Select **Range A15:E15.**

   b. Click the drop-down arrow on the **Borders** button on the **Formatting toolbar,** and select the **All Borders** icon from the drop-down list.

Borders button

      i. The **Range A15:E15** has all borders in the range.

VII. Make **cell A1** active. Save and close the workbook.

Exercise 2-8	Background Color and Borders - Part 2

	A	B	C	D	E	F	G	H
1			*KLM Company*					
2			*Employee List*					
3								
4								
5								
6	Last Name	First Name	Address	City	State	ZIP	Salary	Date Hired
7	Smith	Brian	334 Oak St.	Lakeland	FL.	33801	$25,000	8-Dec-96
8	Johnson	Brittany	915 Highland St	Bartow	FL.	33830	$75,000	23-Aug-98
9	Mickeley	Annie	503 Buff Dr.	Auburndale	FL.	33823	$25,500	4-Nov-97
10	Houser	Gregory	31 Imperial Dr.	Mulberry	FL.	33860	$32,500	18-Feb-99
11	Jackson	Jarred	136 High St.	Winter Haven	FL.	33810	$39,200	29-May-00
12	Potter	Sarah	2020 Main St.	Lakeland	FL.	33801	$26,500	3-Jan-97
13	Scott	Zachary	2690 1st Street	Lakeland	FL.	33801	$72,300	15-Dec-97
14	Butler	Angela	685 Park St.	Lakeland	FL.	33801	$70,000	24-Jan-99
15	Jones	Annie	2055 Georgia St.	Lakeland	FL.	33801	$49,320	27-Nov-96
16	Henderson	Odie	3815 Davis St.	Mulberry	FL.	33860	$49,500	26-Apr-00
17	Hawkins	Barbara	956 Hankins St.	Bartow	FL.	33830	$50,000	24-Nov-97
18	White	Darlene	990 Dudley St.	Bartow	FL.	33830	$55,000	12-Aug-00
19	Douglas	Tracey	202 Griffin St.	Lakeland	FL.	33801	$26,500	3-Dec-97
20	Evans	Michelle	510 Whitman St.	Mulberry	FL.	33860	$70,000	30-Mar-00
21	Bliss	Kyle	265 Hooker St.	Mulberry	FL.	33860	$69,500	15-Oct-96

I. Open the **Ex 2-3 Employee List** workbook from your work disk, and save it as **Ex 2-8 Employee List** to the same location.
II. Apply border.
   a. Select **Range A6:H6**.
   b. Choose **Format, Cells** from the **Menu bar,** and click the **Borders** tab.
   c. Click **Blue** on the **Line Color** drop-down list.
      i. A blue border is applied.
   d. Click the thickest single line in the **Line Style** section.
      i. A thick single-line border is applied.
   e. Click the bottom area in the **Text** box to assign a thick and blue single-line border to the bottom of the range. Click **OK,** and deselect the range.
III. Save, and close the workbook.

FORMULAS AND FUNCTIONS

The core reason office workers use Excel is because of its powerful number-crunching capabilities. Many complex calculations can be achieved in seconds using Excel. In this section, you will learn many formulas and functions to help you perform daily office duties in an efficient manner.

In Chapter 1, you learned that you can place two types of entries into a cell–text and values. Values can be placed into three categories: figures, formulas, and functions. **Figures** are simply numbers that are entered into the cell. **Formulas** are sets of instructions that tell Excel to

perform a calculation using your numbers. Formulas use arithmetic operators to multiply (*), add (+), subtract (-), and divide (/) numbers. **Functions** are built-in formulas for more complex calculations. Functions are used to find averages, highs, lows, and loan payment information, and to create amortization schedules among other things.

Formulas

We will begin with some simple formulas and then work our way up to more complex formulas. It is much easier to create formulas in Excel if you can first state your objective in plain English. Once you are able to express your formula in English, then you begin to put your formula into Excel terms. When constructing basic formulas you should say to yourself "What do I want this formula to do?" Example: "I want to add the Revenue amounts", or "I want to divide that value by this value."

	A	B	C	D
1	Joe's Auto Parts			
2	Inventory Worksheet			
3	Joe Miller - Owner			
4				
5	Item	Price	On-Hand	Total
6	Clamps	$19.95	75	$1,496.25
7	Hoses	12.95	78	1,010.10
8	Clips	11.95	89	1,063.55
9			Total	$3,569.90

Figure 2.7: Spreadsheet with Values

	A	B	C	D
1	Joe's Auto Parts			
2	Inventory Worksheet			
3	Joe Miller - Owner			
4				
5	Item	Price	On-Hand	Total
6	Clamps	$19.95	75	=B6*C6
7	Hoses	12.95	78	=B7*C7
8	Clips	11.95	89	=B8*C8
9			Total	=D6+D7+D8

Figure 2.8: Spreadsheet with Formulas

All formulas in Excel begin with the equals sign (=). The equals sign tells Excel that you wish to perform a calculation. After the equals sign, you may enter numbers, cell addresses that contain numbers, range names, and arithmetic operators to perform your basic arithmetic. Look at the two sample worksheets for **Joe's Auto Parts**, Figures 2.7 and 2.8. One figure displays the worksheet with the totals and the other shows the same sheet but with the formulas exposed so we can see how the totals were calculated. The formula for the **Total** column is **=Price * On-Hand** (the asterisk is the multiplication operator). The total in **Cell D9** is a **grand total** and represents the sum of all the individual item totals in the columns above. Notice, in the formulas, that cell addresses are used and not actual numbers. This way, if we change any numbers in the **On-Hand** or **Price** columns, the totals will adjust automatically. This feature is called **automatic recalculation.**

Order of Operations

Excel follows a consistent set of rules when applying operators in a formula. It is called the **order of operations.** This means that in lengthy formulas with many operators the calculations such as addition, multiplication, and division are performed in a certain order. Generally working from the first calculation to the last (left to right), Excel evaluates operators in the order shown in Table 2.2. Parentheses are the one exception to the left-to-right rule. If an operation is placed in parentheses, it will be calculated before an operation outside the parentheses may be applied to it.

Order	Operation	Operator
First	Negation	-
Second	Percent	%
Third	Exponentiation	^
Fourth	Multiplication/Division	*, /
Fifth	Addition/Subtraction	+, -
Sixth	Text Joining	&
Seventh	Comparison	=, <, >, <=, >=, <>

Table 2.2: Order of Operations

Examine the examples below to see how the order of operations is used to solve complex formulas.

(5+5)*2/10	Beginning formula
10 * 2/10	Parentheses evaluated first
20/10	Multiplication evaluated second
2	Division evaluated last and displays final answer

(5+5*2)/3+2-1	Beginning formula
(5+10)/3+2-1	Multiplication inside parentheses is evaluated first
15/3+2-1	Addition inside parentheses is evaluated second
5+2-1	Division is evaluated third
7-1	Addition is evaluated fourth
6	Subtraction is evaluated fifth and displays final answer

Complex Formulas

In order to build complex formulas, the order of operations must be understood. Figure 2.9 shows the worksheet with the desired results, and Figure 2.10 shows the actual formulas that were typed to achieve the desired results. The **Years with Company** column illustrates the importance of the order of operations.

The **Years with Company** column contains a formula that subtracts the **Date Hired** from **Today's Date** in cell **B1,** and then divides the result by **365.** Since we want the subtraction to take place first, the subtraction portion of the formula must be enclosed in parentheses.

	A	B	C	D	E	F	G	H	I
1	Today's Date:	10/10/00							
2									
3									Years with
4	Sales Rep.	Sales	Commission	Base Pay	Total Pay	Taxes	Net Pay Due	Date Hired	Company
5	Sanchez	$52,000	$2,600	$175	$2,775	$416.25	$2,358.75	12/12/95	4.8
6	Smith	47,000	2,350	175	2,525	378.75	2,146.25	1/18/98	2.7
7	Jones	45,000	2,250	175	2,425	363.75	2,061.25	4/17/96	4.5
8	Taylor	49,000	2,450	175	2,625	393.75	2,231.25	3/19/97	3.6
9	Meyers	50,000	2,500	175	2,675	401.25	2,273.75	10/30/98	1.9

Figure 2.9: Worksheet with Values