CHAPTER 4: GETTING STARTED

"Numbers are the ruler of forms and ideas, and are the cause of gods and demons."

– Pythagorus

An electronic spreadsheet is a program that performs the most complex mathematical operations with lightning speed. Like its paper counterpart, a spreadsheet is divided into rows and columns creating a grid of cells. Numbers and text can be entered in these cells, and relationships among cells can be defined and manipulated.

HISTORY

VisiCalc, the first electronic spreadsheet, was created for the Apple®][by Dan Bricklin and Bob Frankston in 1979. It quickly became the most popular software of its time.

Four years later, Mitchell Kapor's Lotus 1-2-3® became the standard by which spreadsheets were measured. It propelled the IBM-PC® into the office and soon commanded over 90 percent of the spreadsheet market. By the late '80s, competitors, notably Borland Quattro Pro® and Microsoft® Excel, extended the 1-2-3 paradigm and captured significant market share by introducing enhanced features, especially in the areas of graphics, printing, and ease of use. Lotus responded with several updates, but, with the advent of Windows®, Lotus again lagged behind its competitors.

Most techniques and principles pioneered by 1-2-3 were adopted by its competitors, whom Lotus attacked in court, claiming they had stolen the "look and feel" of its spreadsheet. The courts ruled against Lotus, finding that copyright protection did not extend to the "look and feel" of software. It is not clear whether the court noted the similarity between 1-2-3 and VisiCalc. By 1999, Excel outsold 1-2-3 nine-to-one. Still, the shadow of 1-2-3's success affects several aspects of how we will learn and use Excel.

THE WORKSHEET

The largest section of the Excel window consists of the worksheet, seen in Figure 88.

The worksheet is divided into rows and columns. Each row is designated by a number, and each column, by a letter. The intersection of a row and a column is called a cell. Each cell can contain one of three things:

- a number;
- text (also known as a "string"); or,
- a formula.

Each cell has a name, corresponding to its location:

ColumnRow

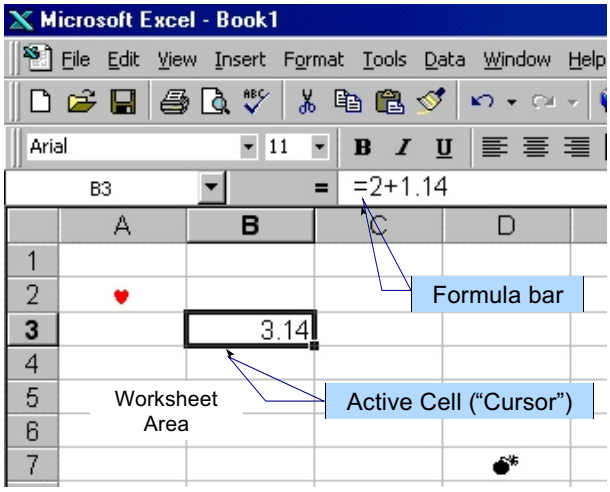


Figure 88

For example, in Figure 88, ♥ is in cell A2. Cell D7 contains 💣. Cell A1 is in the upper left-hand corner.

The active cell is cell B3. Notice that the column and row headers of the active cell are highlighted and its address appears in a box in the upper left. The thick line around the active cell is sometimes called the "cursor," a leftover from the old days of MS-DOS®.

The ***content*** of the cell—in this case, the formula:

```
=2+1.14
```

appears in the Formula bar. The ***value*** of the active cell, 3.14, appears in the worksheet. As you can see there is a difference between the contents of a cell and what appears in that cell. This is a simple, but important, idea.

EXPLORING THE WORKSHEET

Tapping the cursor arrows moves the cursor one cell at a time in the direction of the arrow. Holding these keys down moves the cursor very rapidly, but still just one cell at a time.

As you press ↓, you will see each row is numbered sequentially. As you press →, you will see that columns are labeled alphabetically, A through Z, followed by columns AA, AB, AC, . . . AY, AZ, followed by columns BA, BB, BC, . . . BY, BZ, and so on.

Pressing Ctrl Home returns the cursor to the upper left corner, of the worksheet.

Pressing moves the cursor one full screen up or down, respectively. Pressing Alt → moves the cursor one full screen to the right and Alt ← moves the cursor one full screen to the left.

Press Ctrl ←, Ctrl →, Ctrl ↑ or Ctrl ↓ to move the cursor to the *next intersection of a blank and a non-blank cell in that direction*. It may be easier to think of this as going "to the end of" the data, or "to the end of" the blank space.

WORKSHEET SIZE

We can use these navigation tools to determine the size of a worksheet. From cell A1 in a blank worksheet, press Ctrl ↓. This will take the cursor to the last cell in that column, cell A65536—65,536 rows!

Let's see how many columns there are: press Ctrl →, and you will go to the last cell in that row—column IV, the 256th column. This means that Excel 98 has 65,536 rows x 256 columns, or 16,777,216 cells, each of which is just large enough to hold a headache.

If you have unusually large headaches, Excel still has you covered. Along the bottom of the worksheet, shown in Figure 89, you will see tabs representing other worksheets, all of which are as big as the first.

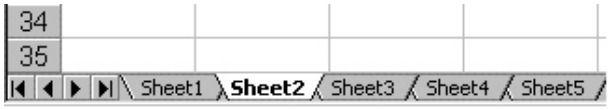


Figure 89

GO TO

You can use the "Go to" feature to move the cursor directly to any cell. For example:

Step 1: The Go To feature is so important that there are many ways to invoke it; either:

- press F5; or,
- press Ctrl G; or,
- from the pull-down menu, select Edit, Go to; or,
- click in the Name Box, shown in Figure 90.

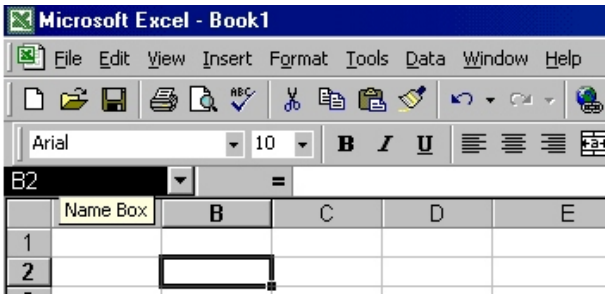


Figure 90

Step 2: Enter a cell address; for example, type:

B2

and press ↵Enter.

This moves the cursor to cell B2.

EXPLORING THE WORKSHEET	
←, →, ↑, or ↓	takes cursor to next cell in direction of the arrow
Ctrl ←, Ctrl →, Ctrl ↑, or Ctrl ↓	goes to the last non-empty cell in direction of arrow
F5	Xx moves cell cursor to cell Xx
Alt →	moves cursor one screen to the right
Alt ←	moves cursor one screen to the left
Page Down	moves cursor down one screen
Page Up	moves cursor up one screen
Ctrl Home	moves cursor to upper left corner of worksheet
Ctrl Home, Ctrl End	moves cursor to lower right corner of worksheet
Home	takes cursor to far left cell
Ctrl Page Up	moves up one sheet
Ctrl Page Down	moves down one sheet

ENTERING INFORMATION

As mentioned earlier, a cell may contain one of three types of data:

- a ***number***; or,
- ***text***, sometimes called a "string" or a "label," comprising any combination of alphanumeric characters, spaces, or punctuation; or,
- a ***formula***.

Entering text or numbers is as simple as typing. As text or numbers are typed, they appear in the left of the Formula bar. To lock the contents of the Formula bar into the active cell, you have several options:

- pressing Ctrl ↵Enter locks the entry in the active cell, but doesn't move the cursor; or,
- pressing ↵Enter or ↓ locks the entry in the cell, and moves the cursor ***down*** one row;
- pressing Shift ↵Enter or ↑ locks the entry in the cell, and moves the cursor ***up*** one row; or,
- pressing ←, →, ↑, or ↓ enters the value in the active cell, and then moves the cursor one cell in the direction of the arrow.

Pressing → is especially helpful if you are entering a row of items.

ERASING MISTAKES

As you type a cell entry, you are in Edit mode. If you make a mistake *while entering data,* you may press Backspace. Each tap will erase one character to the left of the insertion point.

If the mistake has already been locked in the cell, move back to the errant cell, type the correct number, label, or formula, and press ↵Enter. This replaces the old contents of the cell with new data. You need not press Delete first.

The preferred method is to enter Edit mode, by pressing F2. In Edit mode, you can move the cursor around the contents of the active cell in the control box, making any number of changes. To erase a mistake in Edit mode, move the cursor to the left of the offending character and tap Delete. Similarly, in Edit mode, each tap of Backspace erases one character to the cursor's left. While in Edit mode, the ←, →, End and Home keys can be used to maneuver within the cell.

When you are finished, pressing ↵Enter locks in your changes and exits Edit mode.

WORKING WITHIN A CELL IN EDIT MODE	
End	takes cursor to last character of active cell
Home	takes cursor to first character of active cell
←, →	moves the cursor one character left, or right
Delete	deletes character to the right of the cursor
Backspace	deletes character to the left of the cursor

UNDO

Previous versions of Excel allowed you to undo one—but only one—operation. Excel now allows you to undo as many as 99 operations:

- click the Undo icon, ; or,
- press Ctrl Z.

There is one significant limitation to the use of Undo in Excel. It only works until you save the workbook. Saving the workbook deletes everything from the Undo list.

CUT, COPY, & PASTE: KEYBOARD

Using the keyboard to cut, copy, and paste in Excel is virtually identical to the approach used in all Windows® programs:

- To cut a cell's contents, select the cell, and then press Ctrl X.
- To copy a cell's contents, select the cell, and then press Ctrl C.
- To paste the contents of Clipboard, move to the new location and press Ctrl V (or ←Enter).

When you are copying one cell to adjacent cells down or to the right, there are two other handy shortcuts.

COPY TO THE RIGHT

To copy a cell's contents to adjacent cells on its right:

Step 1: Select the cell to be copied.

Step 2: Press Shift → to select the target cells in that row.

Step 3: Press Ctrl R to copy to the right.

COPY DOWN

To copy a cell's contents to adjacent cells below it:

Step 1: Select the cell to be copied.

Step 2: Press Shift ↓ to select the target cells in that column.

Step 3: Press Ctrl D to copy down.

CUT, COPY, & PASTE: MOUSE

To ***cut and paste*** a cell's contents with the mouse, move the pointer to the border of the cell. When the pointer turns into an arrow, as shown in Figure 92, click and drag the cell to its new location.

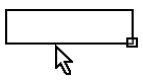


Figure 92

To ***copy and paste*** with the mouse, move the pointer to the border of the cell, and depress Ctrl as you click and drag it. As you drag, a " ⊞ " will appear by the arrow, as shown in Figure 93.

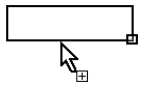


Figure 93

You can also drag an object to another worksheet if you know this trick. Normally, if you drag something to the bottom of your worksheet, the worksheet itself will scroll beneath you. Pressing Alt as you drag prevents this, enabling you to drag an object down, onto another worksheet's tab. When you drag an object to a tab, its worksheet appears, and you can then drag it to a location on that sheet.

To copy an object to another worksheet, press Ctrl Alt as you drag it to another worksheet's tab, and then to its new location on that sheet.

THE RIGHT-HAND OPTION

You know that if you click and drag the border of a selection, you will move the selection. If you click and drag the border of a selection *as you hold down* Ctrl, you will copy the selection.

Here's an interesting option: if you ***right****-click and drag* a selection, when you release the mouse, you will get the pop-up menu in Figure 94. As you can see, you move it, copy it, copy the values without the formatting, copy the formatting without the values, and create links in a snap.

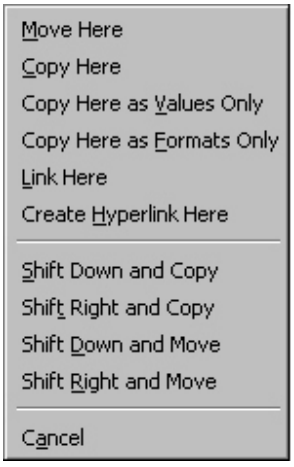
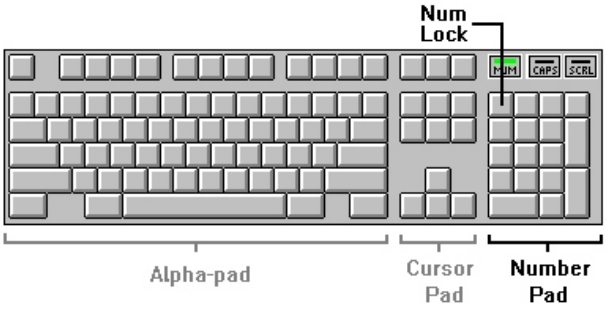


Figure 94

NUMLOCK

Note the NumLock key. When Num Lock is on, pressing keys on the number pad enters numbers; when off, these keys control cursor movement.



Pressing Num Lock toggles between the two functions. As a rule, when working in Excel, we always want Num Lock on.

PRODUCTIVITY

When entering numbers, it makes no difference to Excel whether you use the number pad (***remember:*** Num Lock must be on!) or the number keys across the top of the keyboard. It may make a difference to your employer, though, because using the number pad is much faster!

PERSPECTIVE

That last point is important. This book—indeed, this entire series of books—is based on one simple truth:

> ***You do not get paid more money because you know an application. You get paid more because that application makes you more productive.***

There is nothing magical about an answer because you used Excel to get it. Excel is a tool, a means to an end. That end, surprisingly, is ***not*** the right answer! The end we seek is productivity—getting ***the right answer***, and getting it ***as quickly as possible***.

If you are very, very fast, but get the wrong answer, you have failed. Everyone knows that. But here's something that people are hazy about: If you get the right answer, but you are very, very slow, you have also failed. In the real world, it's not what you know, it's what you know in time, that counts! In desktop applications, such as Excel, productivity is all!

There are many elements to becoming productive with Excel, and this chapter has introduced one of them. As in most Windows® applications, Excel provides many ways to do almost everything. Disregard all, but two:

- focus on the ***best*** way to do the task with your hands on the keyboard, and,
- focus on the ***best*** way to do it with your hand on the mouse.

Many things are better done by mouse. Many, though, are better done by keyboard. Learning just one does not make you as productive as you could be, and productivity is the only thing that matters.

NOTES

CHAPTER 5: CELL FORMATTING

"I have been asked (by members of Parliament), 'Pray, Mr. Babbage, if you put into the machine wrong figures, will the right answers come out?' I am not able to rightly apprehend the kind of confusion of ideas that could provoke such a question."

– Charles Babbage

"Purgamentum init, exit purgamentum."

Babbage, the father of Computer Science, knew if you put bad data into a computer program, that's what it will return—garbage in, garbage out. In Excel, GIGO has a new meaning: "Garbage in, *Gospel* out." Why? Because when something comes out of a computer, people assume that the results are accurate—and the better it looks, the more they believe it.

MAKING TEXT FIT

Each column is, by default, 8.43 characters (= 64 pixels) wide. Later you will see how this is easily changed for individual columns or for the entire worksheet, but for now, let's examine how to make text fit. These techniques are demonstrated here:

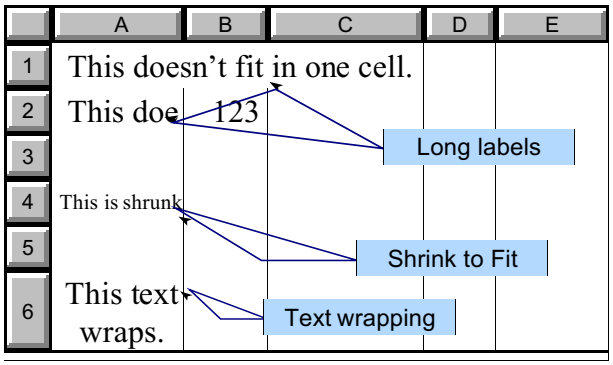


Figure 96

LONG LABEL CONVENTION

When we type text longer than the width of the column, Excel displays and prints it, just as if its cell were very wide *as long as nothing is entered in the cell to its right.* This is particularly helpful for placing titles above tables.

For example, in Figure 96, both cells A1 and A2 contain the same text. Because there is nothing in the cells to its right, the contents of cell A1 appear to spill out into those empty cells. The cell to the right of cell A2, though, contains something, so the display of cell A2's text is truncated. Only the first *n* characters appear, where *n* is the column width. Nonetheless—and this is the important part—the ***contents*** of the cell have ***not*** changed, only its appearance. Cell A2 still contains the same text as cell A2—you just can't see all of it.

Note that as the cursor moves from cell to cell, the contents of that cell appears in the Formula bar—*not necessarily in the cell itself.* This is an important concept that is useful in many contexts. If you were to go to cell B1 and press Delete, nothing would happen, because nothing is there.

SHRINK CELL CONTENTS

If text doesn't fit within a cell, the long-label rule allows it to spill out into the next cell to the right—but only if there is nothing in that cell. If there is, the text will be truncated. One way to make it fit is to make the text smaller as shown in cell A4 of Figure 96.

You can change the font size of that cell manually, or take advantage of Excel's Shrink to Fit feature:

Step 1: To change the cell's format, either:

- press Ctrl 1, or,
- from the pull-down menu, select Format, Cells.

Step 2: On the Alignment tab, select the Shrink to fit check box.

Step 3: Click OK to accept the changes and close the dialog.

Excel will automatically reduce the font size of the text to the largest size that fits within the cell on one line.

WRAPPING TEXT

You can make text wrap within a cell, as shown in cell A6 in Figure 96.

- press Alt ←Enter where you want the text to wrap, or,
- from the pull-down menu, select Format, Cells. On the alignment tab, select the Wrap text check box, as shown in Figure 97, and click OK.

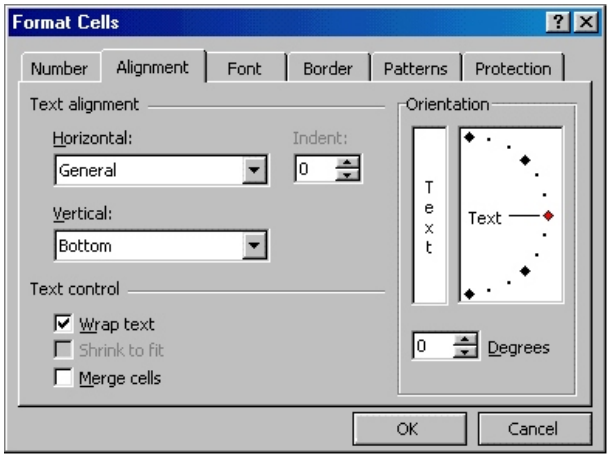


Figure 97

RESIZE A COLUMN

To resize a column, place the pointer over the right border of its column header. The pointer will change to a two-headed arrow (↔), as shown in Figure 98. Click-and-drag the pointer to widen or narrow the column.

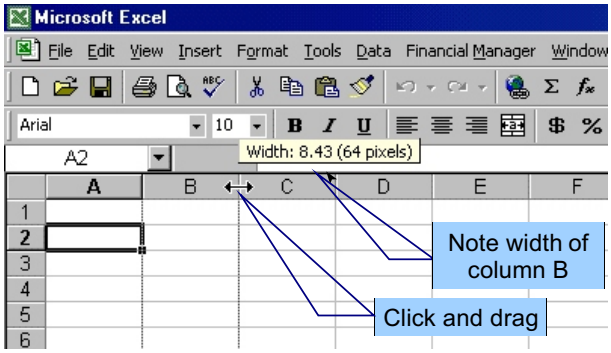


Figure 98

A little pop-up will appear, displaying the width of the column as you drag, in characters and in pixels. This technique is similar to changing the column width of an Explorer view, which we examined on page 26.

AUTOSIZE A COLUMN

You can autosize the column to accommodate the width of the widest item in that column:

Step 1: Pass the mouse to the right border of the column header.

Step 2: When the pointer turns into a two-headed arrow, double-click the mouse.

This automatically adjusts the column's width to the widest item in that column.

ENTERING NUMBERS

When you enter more than a cell can accommodate, the long label convention says that it will spill out into the cell to its right, unless, of course, there is something in that cell. In that case, it truncates the text.

Not so with numbers. When a number has too many characters, truncating it could be misleading. Instead, whenever this happens, the cell will fill with #, like this:

As a result, you may get something that looks like this:

	A	B	C	D
1		2002	2003	2004
2	Food	500.00	550.00	
3	Housing	1,000.00	1,000.00	
4	Insurance	########	########	
5	Gas	########	########	

The solution is simple. Simply resize the columns to make them wide enough for the number.

SCIENTIFIC NOTATION

If you make the column too narrow for a number, but at least 7 characters wide, you may get an unusual result. To demonstrate this, consider cell B4:

	A	B	C	D
1		2002		
2	Food	500.00		
3	Housing	1,000.00		
4	Insurance	1234567890		
5	Gas			

Now, resize column B so that it is 7 characters wide; here is the result:

	A	B	C	D
1		2002		
2	Food	500.00		
3	Housing	1,000.00		
4	Insurance	1.2E+09		
5	Gas			

It looks strange, but you may recognize this as scientific notation, which you studied in 7th or 8th grade. It's just another way of expressing 1.2×10^9.

Simply widen the column, and it returns to its usual Arabic notation (or, if it is not wide enough, a series of #'s. Thus, you never have to use scientific notation—as long as you recognize what it is.

FUNDAMENTAL RULE OF FORMATTING

In Excel, as in all Windows® applications, the fundamental rule of formatting is "Select, then apply." Keep this in mind as we explore cell formatting, using the Format toolbar as a guide.

FONT

As with most Windows® applications, you can change fonts and font sizes from combo boxes on the Format toolbar. Click the ▼ to the right of the font. As seen in Figure 99, this expands the list of available fonts.

One common mistake is to take the pointer off the scroll bar too early. Move the pointer left only when you are ready to select the font. Use the same approach to change font size.

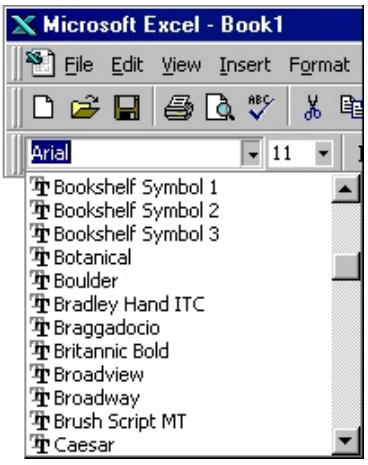


Figure 99

FONT ATTRIBUTES

To change the font attributes of the active cells, click the Bold, Italics, or Underscore icons, **B** *I* U. When you click the Bold icon, **B**, it appears depressed and the contents of the active cell become bold. Click it again, and the button appears to pop back up, and the contents of the active cell return to normal. Similarly, clicking *I* toggles the italics and clicking U toggles the underline.

Alternatively, press Ctrl B to make the active cell bold, Ctrl I to italicize, and Ctrl U to underscore. Each of these shortcuts toggle the attribute, just like clicking their corresponding icons.

UNDERLINING

Excel gives you several underlining alternatives:

Step 1: Either:

- press Ctrl 1, or,
- from the pull-down menu, select Format, Cells.

Step 2: On the Font tab, select a style from the Underline list.

- There are four underline options: Single, Double, Single Accounting, and Double Accounting.

UNDERLINE STYLE	APPEARANCE
Single	$1,234.56
Double	$1,234.56
Single Accounting	$1,234.56
Double Accounting	$1,234.56

As you can see, the two Accounting styles do not underline the currency symbol.

Whenever you press Ctrl U, or click the underline icon, U, you apply the Single style to the selection.

DOUBLE-UNDERLINE SHORTCUT

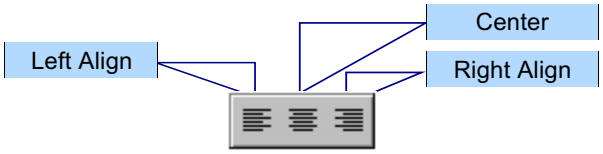
Here's an interesting short-cut. To apply the Double underline style to the contents of a cell, press Shift as you click U on the Format toolbar.

ALIGNMENT

Note that when a number is entered, it appears "right-aligned"—that is, positioned on the right side of the cell. Text appears, by default, "left-aligned."

	A
1	This is left-aligned.
2	This is centered.
3	This is right-aligned.

To change the alignment of the active cell, click an alignment icon.



This works much like alignment in Microsoft® Word, with two exceptions. First, Word has a fourth alignment icon for full justification that Excel lacks. Second, in Word, you *must* select an alignment; you can't just turn them off. In Excel you can select one or deselect it—in which case the alignment of the cell reverts to its default: text on the left, and numbers on the right.

FORMAT NUMBERS

USING COMMAS

Early spreadsheets didn't allow you to type commas as you entered numbers. To enter 1,234,567,890, type:

```
1234567890
```

and then format it in the comma style, making it appear:

```
1,234,567,890.00
```

That's not a problem with small numbers, but with large numbers, it's easy to get confused. Excel allows you to type commas as you go, but just because you can doesn't mean you should. For one thing, it adds keystrokes. Also, if you were to make a mistake, such as typing:

```
1,234,56,7890
```

Excel will automatically assume that you have entered text instead of a number. Performing an arithmetic operation on text is meaningless; technically, this is called a "type mismatch error." Just as 2 + Blue is meaningless, so is 2 + 1,234,56,7890.

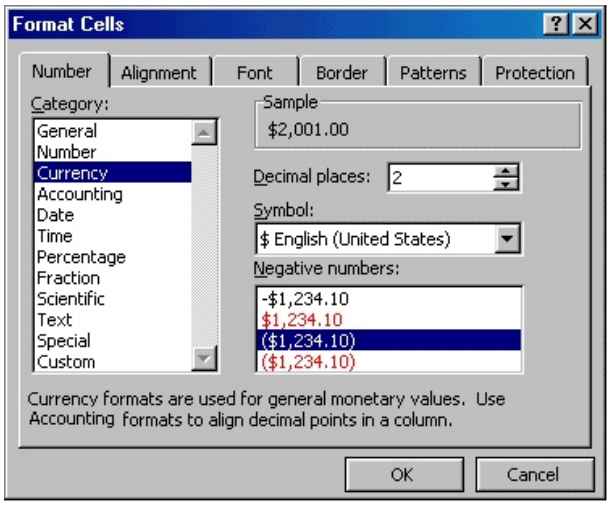


Figure 107

NUMBER FORMATS

The keyboard shortcuts for number formats are relatively obscure:

FORMAT	SHORTCUT	APPEARANCE
Currency	Ctrl Shift $	$1,234.00
General	Ctrl Shift ~	1234
Comma	Ctrl Shift !	1,234.00
Percent	Ctrl Shift %	1234%
Scientific	Ctrl Shift ^	1+E4
Date	Ctrl Shift #	28-Sep- 2
Time	Ctrl Shift @	06:26:46

CHANGE DECIMAL PLACES

To change the number of decimal places that appear in the selection click:

- click  to increase the number of decimal places of the selection, or,
- click  to decrease the number of decimal places of the selection.

As with all formatting, this doesn't change the value of the cell, but merely how that value is displayed.

INDENT TEXT

The Indent tools,  , work like Tab and Shift Tab in word processing; they indent and de-indent text within a cell. To see the effect:

Step 1: Enter text in a cell, and then press Ctrl ↵Enter to lock the contents and stay in that cell.

- If you press ↵Enter alone, you will have to press ↑ to return to the cell.

Step 2: To increase the indent by one preset distance, click the Indent tool,  ; to decrease the indent, click  .

Each click of these icons increases (or decreases) the indent by one preset—about three monospaced characters.

BORDERS PALETTE

A quick way to apply a border to a selection is to click the Borders palette icon,  . If you click the arrow, ▾, to its right, it will expand to give you several options. Simply click the option that you want to apply to the active cell.

UNDOCK THE PALETTE

To keep the Borders palette handy, you can undock it. This technique can be used on all such menu palettes that have a bar across the top.

Step 1: On the Formatting toolbar, expand the Borders palette,  .

Step 2: Click the thin blue bar atop the Borders palette and drag it to a new location, as shown in Figure 115.

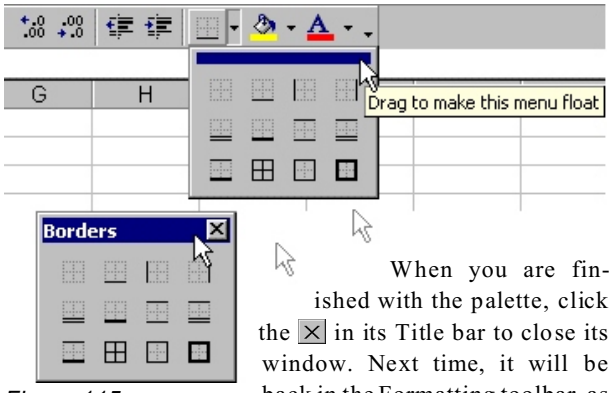


Figure 115

When you are finished with the palette, click the in its Title bar to close its window. Next time, it will be back in the Formatting toolbar, as usual.

FORE COLOR

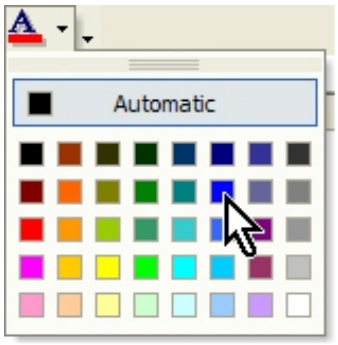
You can change the Fore color, which is also called the Font color:

Step 1: Select a cell.

Step 2: Click the arrow, ▾, to the right of the Font color icon,  , it will expand the color pallette.

- If you simply click the icon,  , itself, you will get the default color, indicated by the color of the bar under the "A"—in this case, red.

Step 3: Click the color that you want to apply—say blue—to the text in the active cell.



FORMAT PAINTER

To copy the formatting of the active cell (but not its contents), click the Format Painter icon,  . Note the change in the pointer's appearance. Select the range to be changed, and the format from the active cell will be applied instantly.

One drawback of this technique is that it works only once. To overcome this and apply the new format to multiple ranges:

- as you recall, Ctrl V is the shortcut for paste; modify it slightly—Ctrl Shift V—and you will paste the format repeatedly; or,
- double-click the format painter icon when you first select it. The pointer will paste the format wherever you click, until you toggle the Format Painter icon,  , again.

CLEAR FORMATTING

To delete the contents of the active cell, simply press Delete. This has no effect on the formatting. To clear the formatting as well:

- From the pull-down menu, select Edit, Clear, All.

SELECTIVELY FORMAT TEXT

When we format a cell, its contents become bold, italic, or whatever. You can also selectively format text within a cell. For example, you might want this effect:

To do this:

Step 1: Enter the text and then press Ctrl ←Enter to lock the contents and stay on that cell.

Step 2: Press F2 to enter Edit mode.

Step 3: Select the word "unusual," as you would in a word processor.

Step 4: Apply the indicated formatting:

- press Ctrl I to italicize the word; and,
- press Ctrl B to make it bold.

Step 5: If the bar under the Font color icon,  , is red, simply click it.

- if the bar under the A is ***not*** red, click the arrow, ▾, to the right of the Font color icon,  , and select red from the color pallette.
- The results will resemble this:

Step 6: Press ←Enter to lock the results in the cell.

NOTES