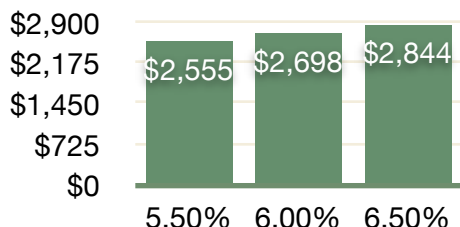


Monthly Payment by Interest Rate



Chapter 13

Spreadsheets

pages	263	-	265	ENTER THE WORLD OF SPREADSHEETS
pages	265	-	266	TWO BITS OF HISTORY
pages	266	-	267	BASIC SKILLS AND CONCEPTS
pages	267	-	268	GETTING STARTED
pages	269	-	272	A TO Z OF EXCEL SPREADSHEETS
pages	272	-	273	GRAPHING DATA IN EXCEL
pages	274			COMMON MISTAKES & WARNINGS
pages	274	-	275	TIPS & TRICKS FOR INTERMEDIATE USERS
pages	275	-	276	MORE SOPHISTICATED CONCEPTS
pages	277	-	278	CURRICULUM IDEAS FOR SPREADSHEET PROJECTS

Enter the World of Spreadsheets

A spreadsheet is an electronic piece of paper divided into rows and columns. We can use a spreadsheet to tabulate grades, budgets, bank loans, inventory totals, or calculate experiments in science. We can use a spreadsheet to make population projections or as a tool for charts. Most word processors incorporate features for columns and tables, but it can be tedious to manipulate columns using a word processor; the spreadsheet is easily the more natural tool!

Unlike word processors and database packages, most spreadsheets tend to have a similar look. Of the three software tools, we sometimes say that spreadsheets are 75% conceptual and only 25% knowing the commands. Consequently, the real challenge in using a spreadsheet package properly is learning the general concepts to accomplish the necessary data storage.

Rows & columns

A spreadsheet consists of rows and columns. Just like the pillars that hold up a building, columns are vertical. And just like radishes in a garden, the rows are horizontal. The intersection of each row and column is called a Cell. As you move around the spreadsheet with your arrow keys or your mouse, one cell is always lit up; this is called the Cell marker and indicates the place you will be typing information. As you start typing, your data appears at the top or bottom of the screen in a separate section. Once you push Return, the entry is locked into the designated cell.

The rows of a spreadsheet are labeled on the left with numbers 1,2,3 and so on, going down usually for at least 1000 rows. The columns are labeled on the top with letters from A to Z. Although beginners think there are only 26 columns, the notation of AA, AB, AC through AZ allows for another 26 columns. Although some spreadsheets have just 52 columns, most have several hundred using BA through BZ, CA through CZ and so on.

Labels & values

Each entry you put into a cell can be a label or a value. Labels are generally words or phrases, used for column headings, row headings or special comments - labels are generally considered “cosmetic.” In contrast, values include numbers, functions and formulas. Try typing a word or a number into a cell and watch how it automatically jumps to the left or right of that cell. Words - i.e. labels - are automatically left justified while numbers - i.e. Values - are automatically right justified.

	A	B	C	D	E	F
1	First Name of	Last Name	Test 1	Test 2	Test 3	Average
2	Antoine	Walker	43	99	86	76.00
3	Chauncy	Billups	67	69	59	65.00
4	Ron	Mercer	86	97	97	93.33
5	Travis	Knight	34	87	78	66.33
6	Dee	Brown	89	69	88	82.00

System formulas

Each spreadsheet software package comes with a number of built-in formulas such as Sum and Average. These are called System formulas. Each formula begins with the = symbol and is followed by the appropriate code and the specified cells in parentheses. Although we present below a summary of examples, note that many spreadsheet users get by using just 1 or 2 of these formulas. Do not feel overwhelmed by the variety of formulas. Like learning to program in Logo and learning to speak English, we have a language here with no threshold and no ceiling! Start with just one or two, please, and learn to use those formulas skillfully!

=AVERAGE(B1:B12)	Averages the 12 cells
=SUM(C5:C9)	Finds the sum of the numbers in these 5 cells
=SQRT(D7)	Finds the square root of the number in this cell
=MIN(B3:B100)	Finds the minimum value in these 98 cells
=MAX(B3:B20)	Finds the maximum value in these 18 cells
=COUNT(A1:A10)	Counts how many non-blank entries are here
=IF(D3>90,5,0)	Checks the value of D3 to see if it is bigger than 90. If so, put a 5 into the current cell. If not, put in a 0. Very useful for converting data.
=LOOKUP(D3,B20:B30)	Looks up the value of D3 amongst the “LOOKUP TABLE” that has B20-B30 for a left edge; returns with the corresponding value from this table. On some SS programs, you must provide both ranges e.g. =LOOKUP(D3,B20:B30,C20:C30).

Creating formulas

Additionally, you create your own formulas by starting the entry with a = sign. Your own formula will look algebraic, containing numbers and variables. The variables will not be X, Y and Z but instead will be other cells on the spreadsheet, such as A3, B4 or C6. You will use parentheses around certain expressions when the order of operations is significant, just as we learn in ninth grade algebra.

The four operations symbols are

+ **ADD- SUBTRACT** * **MULTIPLY** / **DIVIDE**

Here are some examples:

=C5-B4	Computes difference of two cells
=B3+(B3*.12)	Computes 12 percent increase from B3
=B3*1.12	Another way to calculate 12 % increase
=(B3*12/100)	And still another way
=(C3*.1)+(D3*.5)+(E3*.4)	Computes weighted average of C3,D3 & E3
=(C3+(D3*5)+(E3*4))/10	Computer weighted average another way
=B3*1.07	Finding 7% population increase
=C3-B3	Finding \$ salary increase from B3 to C3
=100*(C3-B3)/B3	Finding % salary increase from B3 to C3
=B3+1	Adds 1 to B3; very useful for generating 50 to 100 integers or years quickly

Using a spreadsheet, you can lay out a small or huge chart of words and numbers. Columns can be made the desired width. You can insert or delete rows or columns. Each spreadsheet package comes with many built-in formulas for finding SUMS, AVERAGES and other computations; you can enter your own custom formulas as well to accomplish almost any specific task.

Spreadsheets can be printed in sections or sideways down the paper. You can move part or all of a spreadsheet into a word processing document. Most importantly, spreadsheets are dynamic. Change one number and the rest of the sheet is automatically updated and re-calculated.

In summary, you might say that a spreadsheet is to a calculator what a word processor is to a typewriter. To quote one 4 year old named Sam who spotted an old Olivetti typewriter in the basement one day, "Hey, Daddy, look, I just found one of those old computers."

Two Bits of History

In 1979, two students at the Harvard Business School, Bob Frankston and Dan Bricklin, refused to do the daily homework assignment which involved several hours of calculations using pencil, paper and a calculator. Instead they wrote a computer program to do the job for them and thereby enabled a business executive to do multiple projections in minutes instead of hours. They named their product VisiCalc which stood for VISible CALculator.

Within one year, thousands of businesses were buying the Apple II computer in order to run the VisiCalc software which had been designed for that specific machine. No, they didn't want a