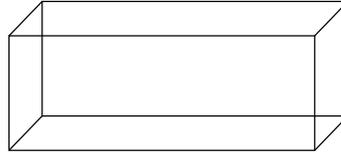


# Using Excel to find Perimeter, Area & Volume



$$V = lwh$$

**Level: LBS 4**

**Goal:** To become familiar with Microsoft Excel by entering formulas into a spreadsheet in order to calculate the perimeter, area and volume of basic shapes.

## Learning Outcomes:

- ◆ Use a spreadsheet to enter text and data into cell
- ◆ Use a spreadsheet to enter formulas into a cell
- ◆ Use the Protection feature in Excel

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- ❖ **Saving the Spreadsheet**
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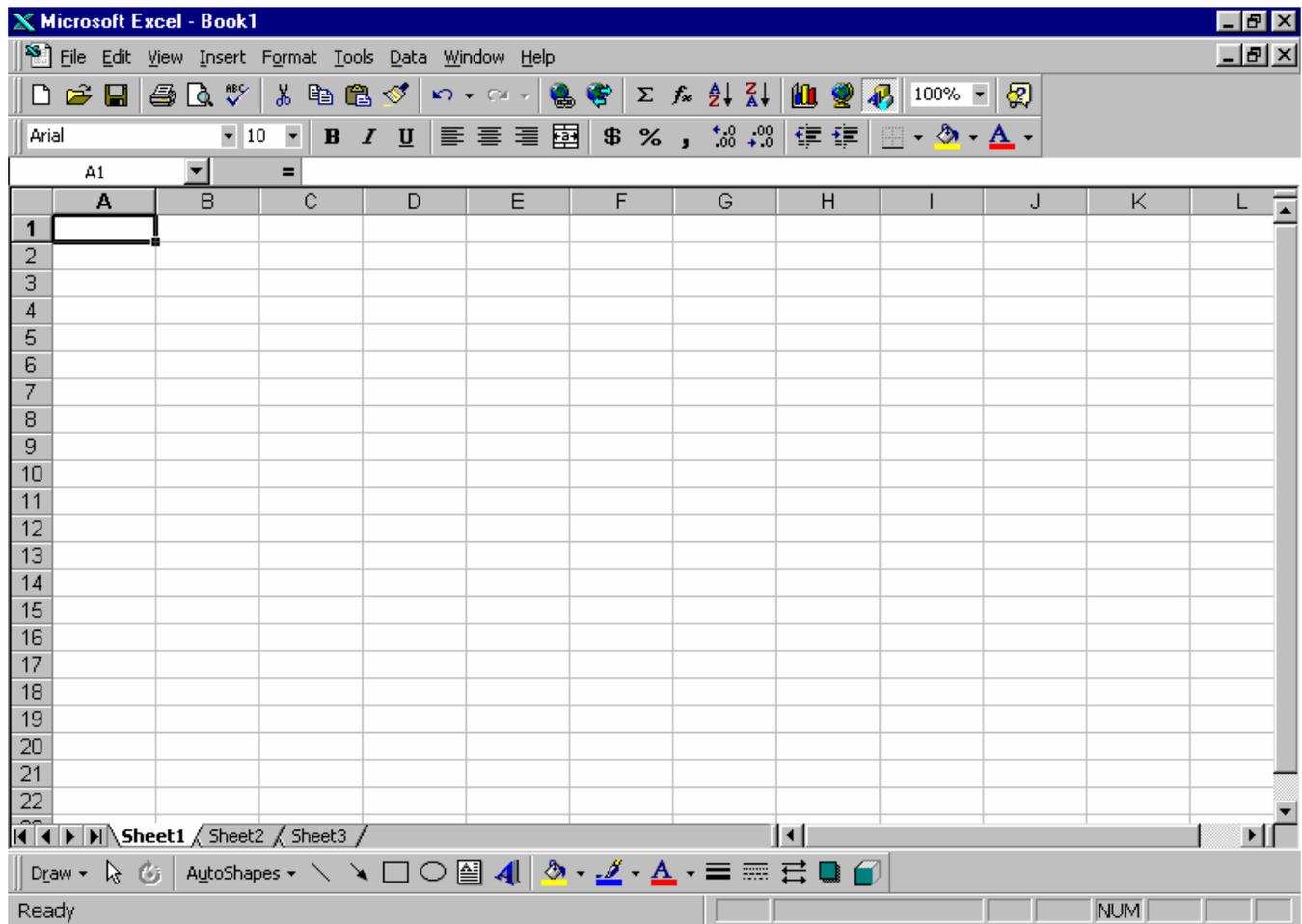
Prerequisite:

- ✓ Basic understanding of Computers
- ✓ Completed Foundations Math – Level 2 (FM2) – chapter G1 (Perimeter, Area & Volume)

## Getting Started

### Starting Microsoft Excel

Microsoft Excel is a member of the Microsoft Office Group. Using the left mouse button, click on the **Start** button and move the pointer up to Programs (it should be highlighted). A new menu will appear. Next, move the cursor across to the new menu and position the pointer over Microsoft Office. Yet another menu will appear. Again, move the pointer over to the new menu and find Microsoft Excel. With the mouse pointer positioned over the words "Microsoft Excel", click the left mouse button and Excel will open. The screen should look similar to the one below.



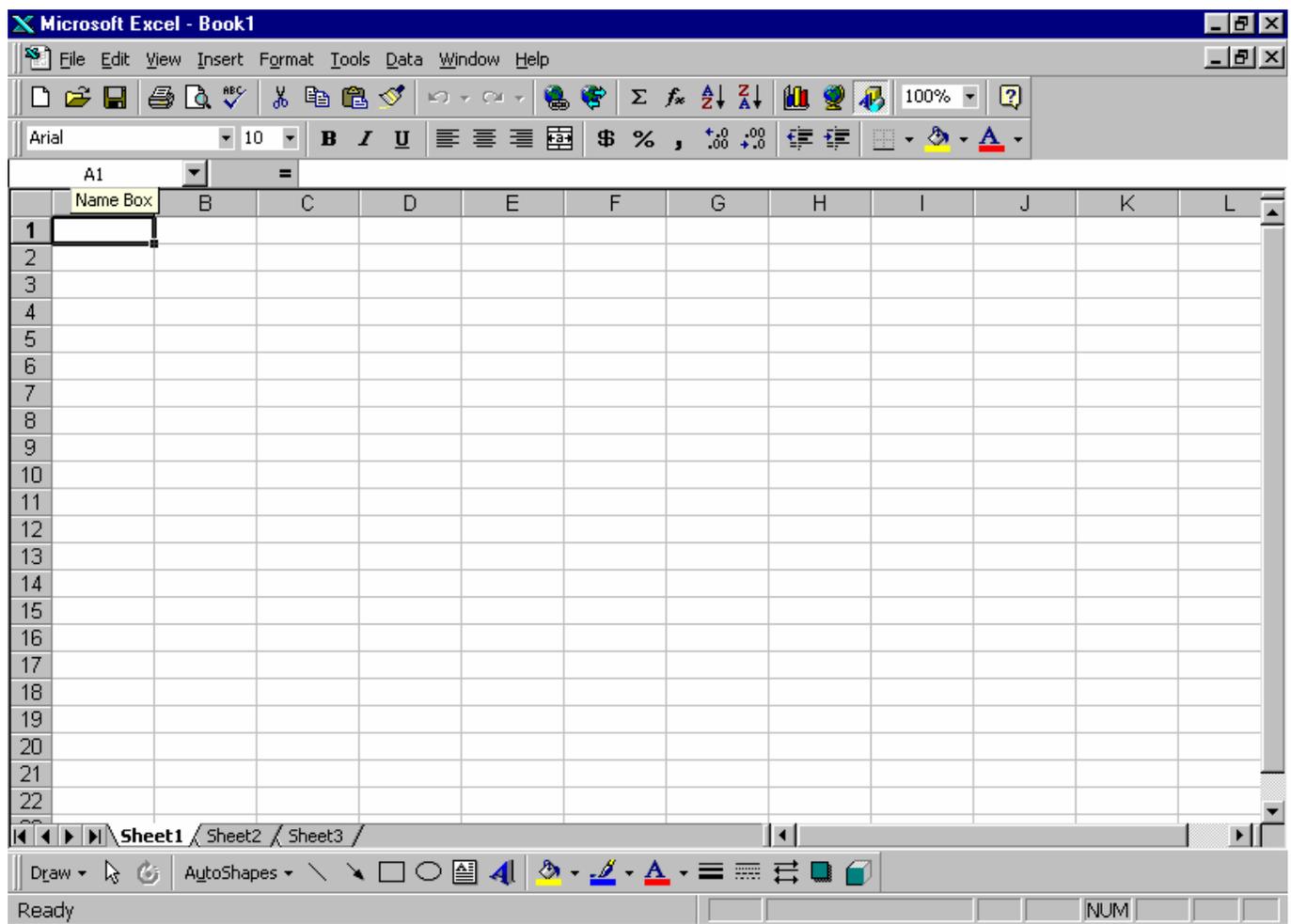
**This module will introduce you to Microsoft Excel and walk through the step by step process of entering data and formulas into a spreadsheet.**

# Introduction to Spreadsheets

## What is a Spreadsheet?

A spreadsheet is made up of a group of cells. It is set up as a grid with columns and rows. Each cell in the grid has an address. The highlighted cell on the previous page (the one with the box around it) is the **ACTIVE CELL**. This cell's address is **A1** since it is in *column A* and *row 1*. **All cells** have an address depending on which column as well as which row they are in. The address of the **ACTIVE CELL** is displayed in the **Name Box** in the upper left corner of the screen just above the row and column headers.

Note: **ACTIVE CELL** simply refers to the cell that is waiting to have information entered into it.



## What can a Spreadsheet Do?

Different types of information can be entered into the cells of a spreadsheet including **text**, **numbers** and **formulas**. Microsoft Excel can perform calculations, **create graphs** and many other things using the information from the cells.

## Moving Around the Spreadsheet

Moving around the spreadsheet can be done using the arrow keys on the keyboard. The right arrow key will move the *active cell* **right**, the left arrow key (←) will move the *active cell* **left**, the down arrow key (↓) will move the *active cell* **down**, and the up arrow key (↑) moves the *active cell* **up**.

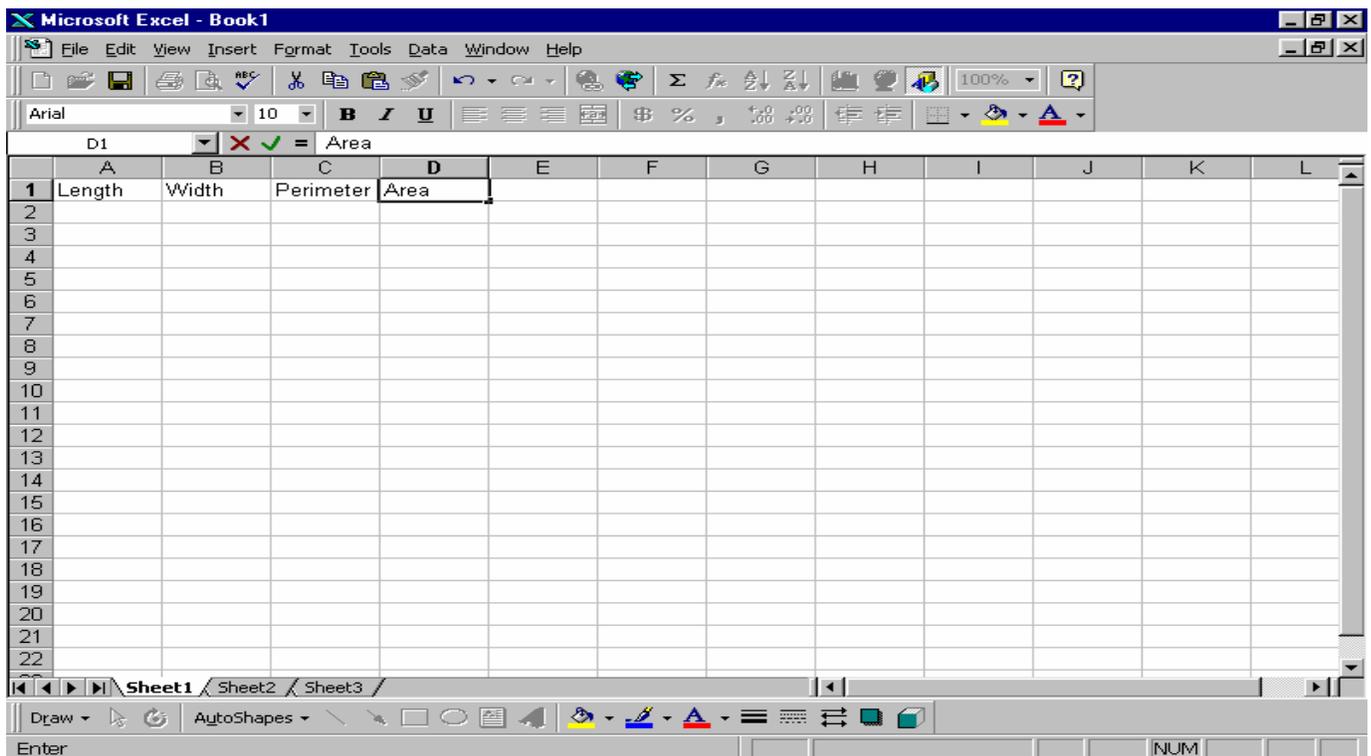
**Note:** There are other ways of moving around the spreadsheet:

- 1) Use the mouse pointer (it looks like an oversized plus sign). Just position the pointer over the cell you wish to make active and left click.
- 2) The “Tab” key on the left side of the keyboard can be used to move the active cell once to the right.
- 3) The “Enter” key (some keyboards label it “Return”) moves the active cell down one cell when pressed.

## **Entering Information into the Spreadsheet**

### Entering Text Headings

As noted previously, **text** can be entered into a cell. In cell **A1** (currently the **ACTIVE CELL**), type the word Length and press the right arrow button on the keyboard. The active cell should now be **B1**. Type the word Width and again press the right arrow button on the keyboard making **C1** the active cell. Type Perimeter in **C1** and Area in **D1**. These are the headings for our template. Your screen should look like the one below.



## Entering Data

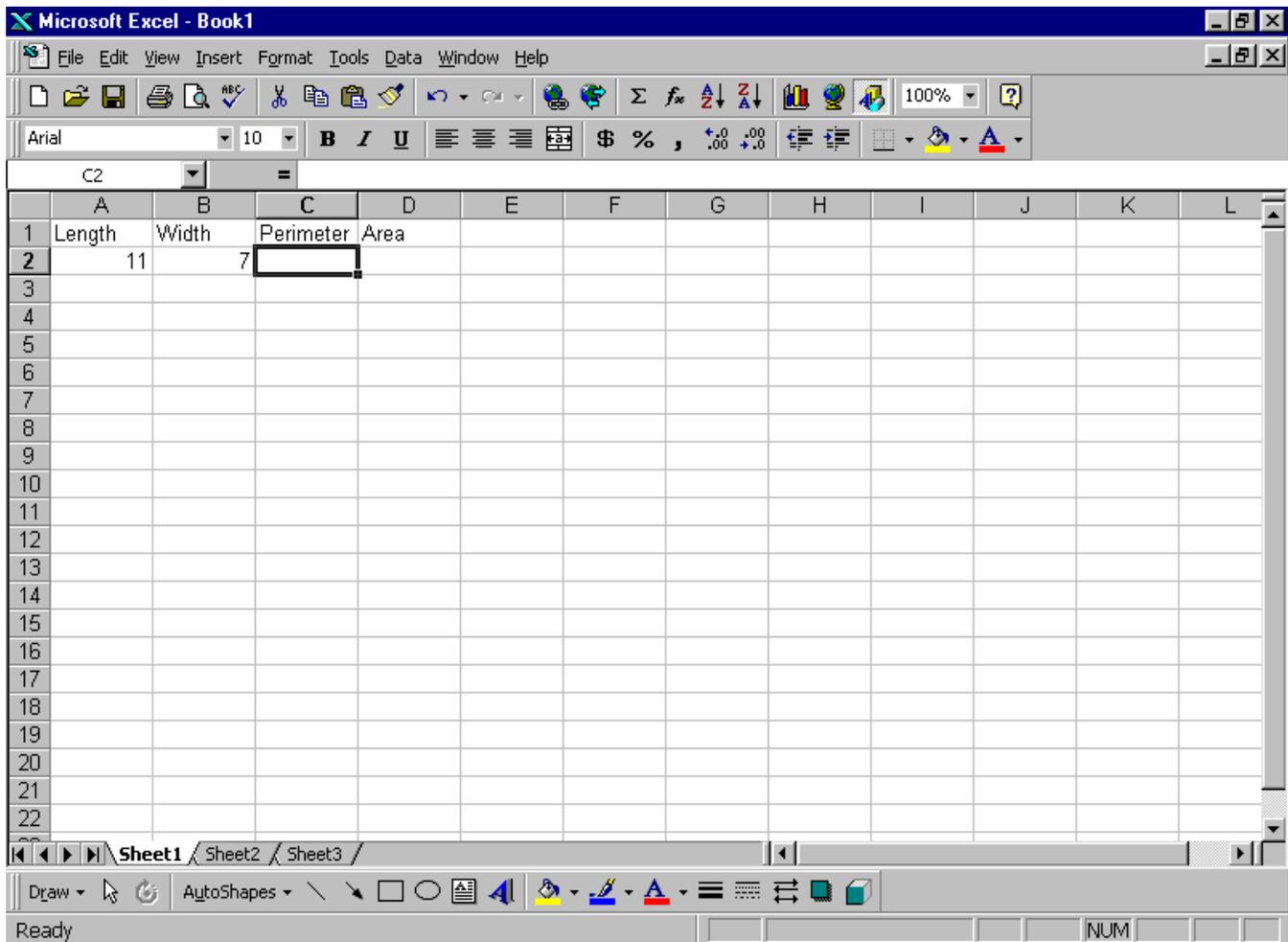
Consider a rectangle with a length of 11 cm and a width of 7 cm as pictured below.



Width = 7 cm

Length = 11cm

Using the arrow keys (or the mouse), make cell **A2** the active cell. In cell **A2**, enter the length of the rectangle. Press the arrow key (→), and enter the width in **B2**. Press (→) again. This is the data that Excel will use to perform calculations such as the perimeter and the area. The screen should now look like the one below.



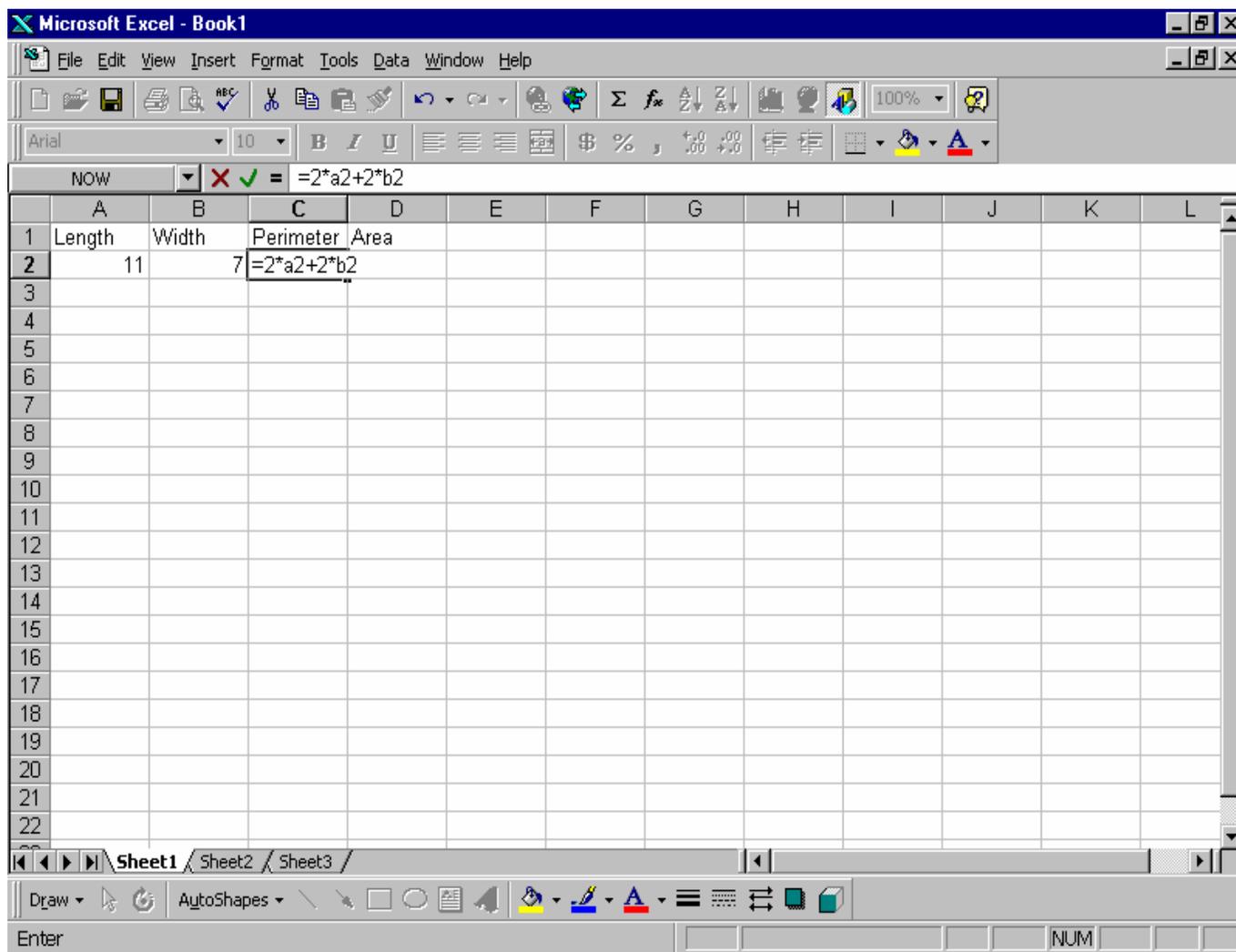
## Entering Formulas

Cell **C2** is the **ACTIVE CELL** (the one with the box around it). To this point we have entered text and data (numbers) into our cells. We will now enter a **formula** into cell **C3** to calculate the perimeter of our rectangle.

### ALL formulas used in Excel begin with the equal sign (=)

The formula to calculate the perimeter of a rectangle is given by,  $P = 2L + 2W$ . Formulas can use information entered in other cells to calculate answers; therefore, the information entered in a formula usually contains cell addresses.

In cell **C3**, type the following formula:  $=2*a2+2*b2$ .



When you press the Enter key, 36 should appear in the cell.

## Explanation of the Formula

By typing the = sign, Excel recognizes that a formula is going to be entered. In words, the formula that we entered says: **C2 equals 2 times** the value in cell **A2** plus 2 **times** the value in cell **B2**.

Notice that the asterisk sign (\*) represents multiplication. Division is represented by the forward slash (/). Also note that it makes no difference whether cell addresses are entered in upper or lower case (**A2** or **a2** will work).

## The Power of a Formula Template

The power of Excel is that if our rectangle sizes change, we simply change the values we entered in the length and width cells. The formula refers to cell addresses, so by entering different lengths and widths, the new perimeter is automatically calculated without changing the formula.

Suppose our rectangle's dimensions change such that the new length is 21 cm and the new width is 3 cm.



Width = 3 cm

Length = 21 cm

Simply go back to cell A2 and enter 21 (it will automatically replace the previous contents of that cell). In cell B2 enter 3 and press Enter. Cell C3 should have the number 48 in it, which is the perimeter of a rectangle with dimensions 21 cm x 3 cm.

## **Protecting the Worksheet**

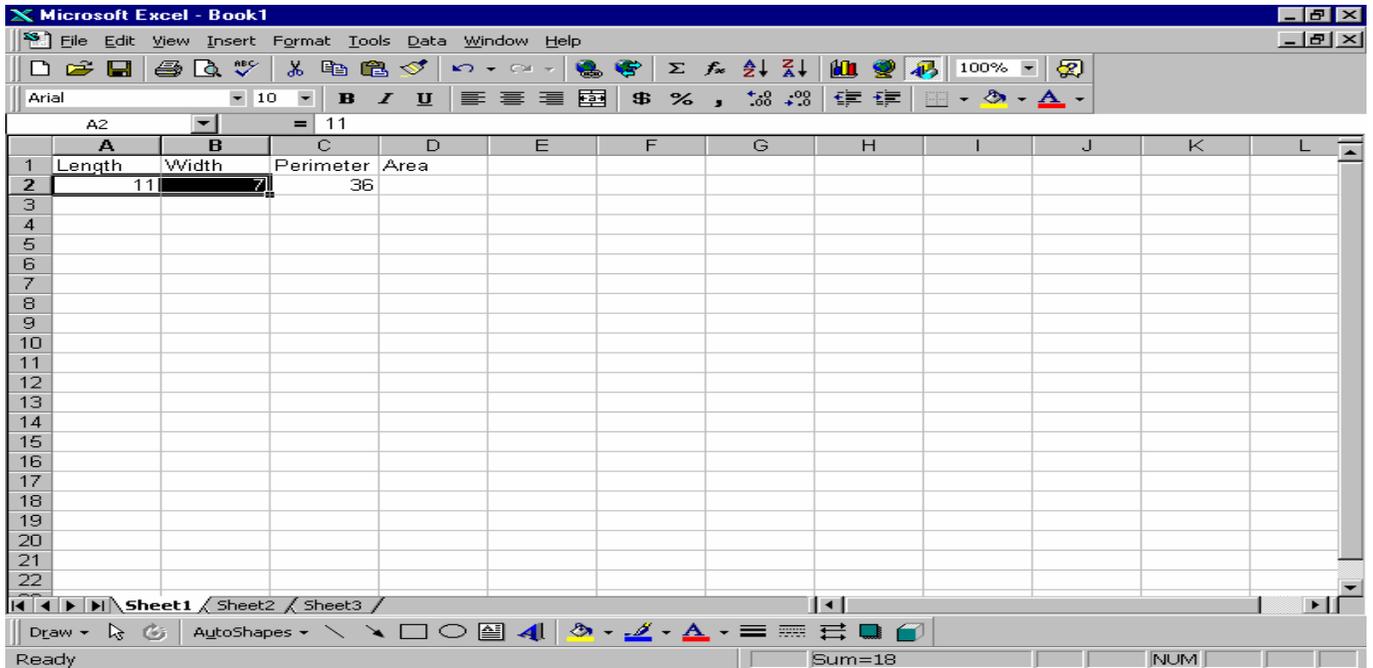
It is extremely easy to calculate to perimeter for many different sized rectangles by leaving the formulas unchanged and only changing the values in the length and width boxes. Since formulas refer to CELL ADDRESSES, once the formula has been entered correctly, there is no need to change it. To avoid "accidentally" changing or deleting the formula, we can **protect** the worksheet.

### Steps to Follow to Protect the Worksheet

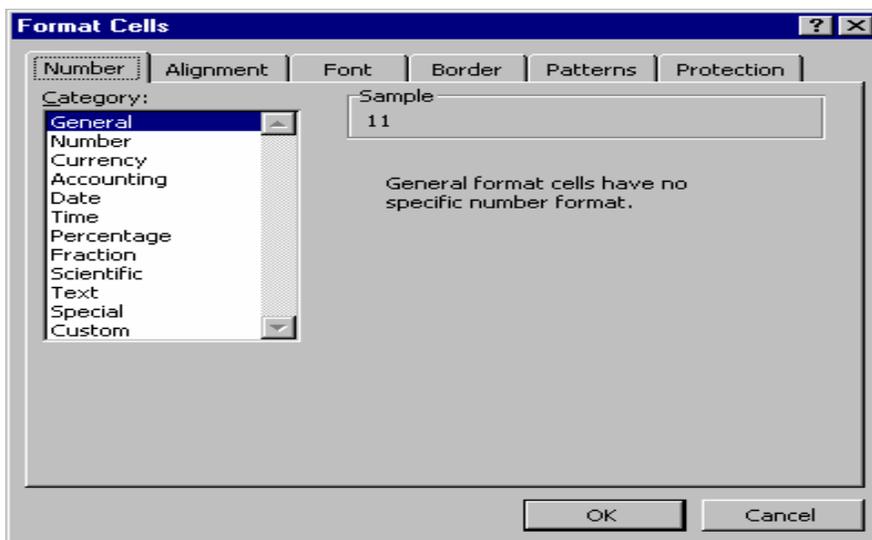
The first thing to do is let Excel know which cells in the worksheet are allowed to be changed (the length and width cells are the one that we would like to be able to change).

- ✓ Select cell A2 & A3 (the one we wish to be able to make changes to) by left clicking in cell A2, holding the mouse button down, dragging the pointer so it's over cell A3 and releasing the mouse button.

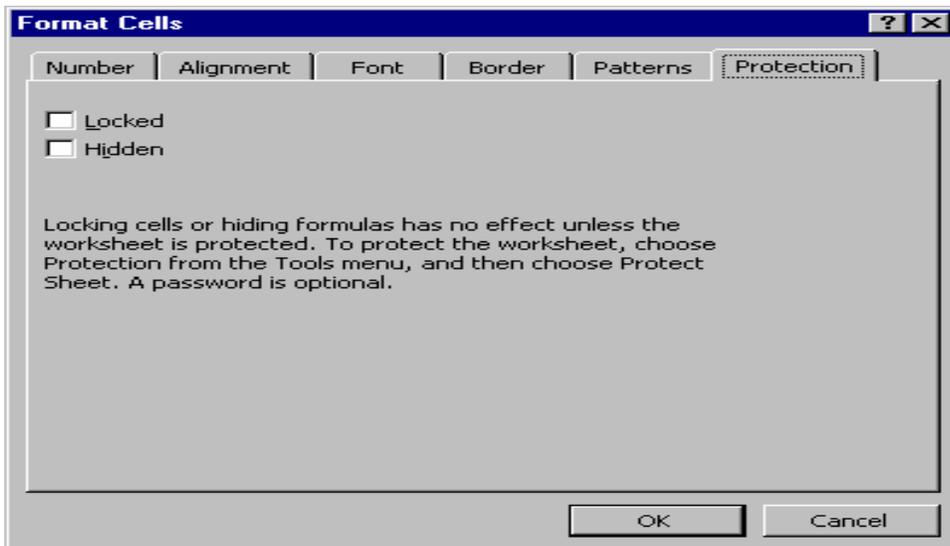
Your screen should appear similar to the one on the [next page](#).



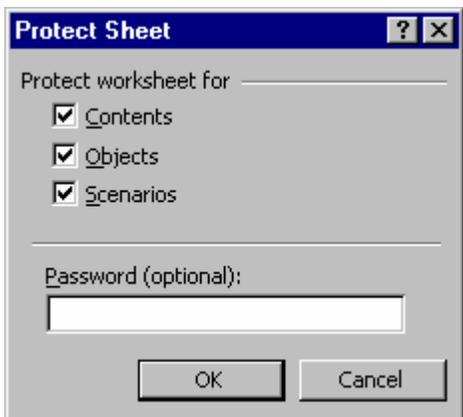
- ✓ From the Format menu (click on the word Format located across the top of the screen). A menu of options called a **dropdown** menu will give you a list of options.
- ✓ Click on Cells...
- ✓ A dialogue box will appear similar to the one below.



- ✓ Click on the Tab called “Protection” and remove the check mark beside the word Locked (just click on the check mark, and it will disappear). Again, the screen should look similar to the one on the next page.



- ✓ Click the OK button (or press Enter on the keyboard) to complete the unlocking step.
- ✓ The next and final step to protecting the formula (actually all cells except **A2 & A3** will be protected) is to click on the Tools menu across the top of the screen and select Protection from the **dropdown** menu. A second menu will appear. Move the pointer over to Protect sheet... A dialogue box will appear asking for a password.

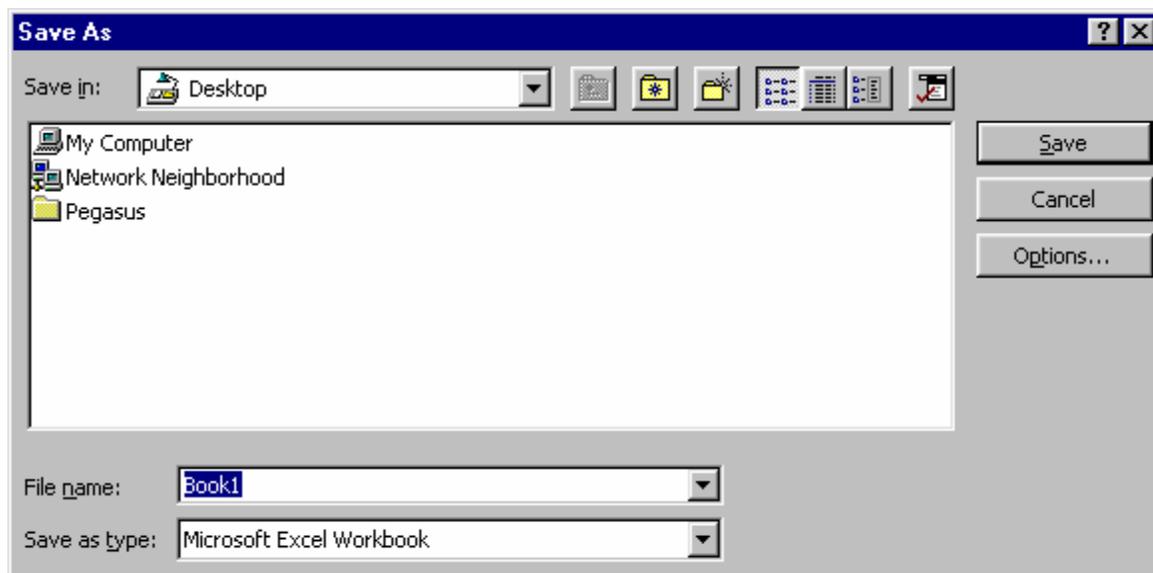


- ✓ Since the password is optional, skip it and just click on the OK button (or press Enter on the keyboard).
- ✓ If you do choose to enter a password, a "Confirm Password" dialogue box will appear with a note of caution about remembering your password.

## Saving the Spreadsheet

### Saving for the First Time

Now is a good time to save what we've done so far. Position the mouse pointer over the word File located in the upper left part of the screen. Left click and a menu will drop down (called a drop-down menu). Move the pointer over the word Save, and left click again. A box will appear similar to the one below.



Type Geometry Formula1 in the File name: box (it should currently say Book1 and be the colour blue) and click on the Save button. Just type the file name as directed above and it will replace the word Book1. Your work is now safe should there be a power failure or the computer “crashes” for some unknown reason.

### Saving Changes

If you wish to make changes to the file we just saved, you will need to save those changes after they are made. Each time you Save a file after the first time, the file is updated to what is currently on the screen. It is important to save regularly to avoid losing information that you have worked hard on. Each time you save changes, you are replacing the file with the most current version you have.

Check with your instructor if you have any questions or concerns about this module before proceeding the demonstrations on the next page.

## Demonstrations (Exercises to be handed in or checked by the instructor)

### Demonstration # 1

Enter the formula to calculate the area of the rectangle from the previous page (page 6). Recall that for a rectangle,  $A = L \times W$ . Use the current template and enter your formula into cell **D2**. The worksheet will need to be unprotected (click on the Tools menu, select Protection and then Unprotect Sheet). Be sure to save your work when you've finished calculating the area— just click File then Save, and your work will automatically be updated. No need to type in a File name after it's been done once.

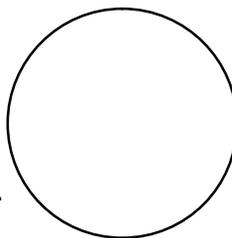
### Demonstration #2

Using a new sheet, create a formula template that calculates both the circumference and the area of the circle pictured below (Simply click File then click New and a new blank sheet will appear on the screen).

Recall that the formula for the circumference of a circle is given as  $C = \pi d$ . Also recall that the formula for the area of a circle is given as  $A = \pi r^2$

Note: You will need to enter headings onto the new sheet.

Diameter = 4.5 mm



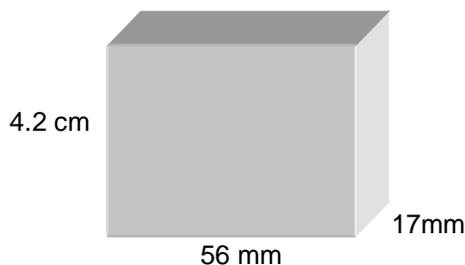
Save this demonstration as Geometry Formula2.

### Demonstration #3

Using a new sheet, create a formula template that calculates the volume of the rectangular solid pictured below (Simply click File then click New and a new blank sheet will appear on the screen).

Recall that the formula for the volume of a rectangular solid is given as  $V = L \times W \times H$

Note: You will need to enter headings onto the new sheet.



Save this demonstration as Geometry Formula3

**Please show the completed demonstrations to the instructor**