Addendum 2

This exercise is intended to familiarize the student with the use of calculator based labs, or CBL's. CBL's enable students to obtain experimental data in an accurate and precise manner and to store this data in a calculator for further analysis. There are many different types of labs for which we can use CBL's. Each different lab requires the student to program the CBL in a unique manner. We will examine various ways of setting up the CBL.

Basic Set-Up of the CBL

1)   Obtain a CBL, a calculator and a link cable.
2)   Insert the link cable firmly into the bottom of both the calculator and the CBL.
3)   Turn on the calculator and CBL.
4)   On the calculator, press the Program (PRGM) key.
5)   When the next screen appears, select the CHEMBIO program, which is program number 1.
6)   On the next screen, you will see prgmCHEMBIO. Press enter on your calculator. Press enter when the next screen appears. You should now be at the MAIN MENU screen. Select option number 1, SET UP PROBES. At this point, you will follow one of the following options for setting up the CBL probes.

Using the Trigger Method of Data Collection
1)   Obtain the appropriate probe for your lab and plug it into Channel 1 on the top of the CBL.
2)   After selecting the SET UP PROBES option, the next screen will read ENTER NUMBER OF PROBES. Enter the number "1", since you will be using only one probe. Press ENTER.
3)   You will be back at the MAIN MENU. Select the appropriate option for the probe you are using.
4)   The next screen will ask you to enter the channel number. Since the probe is connected to channel number 1, enter 1 and then press ENTER. You will be back at the MAIN MENU. If you are using two probes, repeat the above procedure and press ENTER.
5)   Again you will be back at the MAIN MENU. You are now going to program the CBL to collect data, so select option #2, COLLECT DATA, and press ENTER.
6)   When the DATA COLLECTION screen appears, select option #4, TRIGGER, and press ENTER.
7)   The screen will now read MONITOR CBL. PRESS [TRIGGER] ON CBL TO STORE DATA. Your CBL is now programmed to collect data.
8)   Each time you store data, the calculator will ask if you wish to collect MORE DATA, STOP, or PAUSE. Choose the appropriate option.

Using the Time Graph Method of Data Collection

1)   Repeat Steps 1 – 5 under "Using the Trigger Method of Data Collection".
2)   When the DATA COLLECTION screen appears, select option #2, TIME GRAPH.
3)   The screen will ask you to ENTER TIME BETWEEN SAMPLES IN SECONDS. Your teacher will provide you with this time interval. Enter the number given and press ENTER.
4)   You will be asked to ENTER NUMBER OF SAMPLES. Again, enter the number given to you by your teacher and press ENTER.
5)   The calculator will now review the information you have just entered. Press ENTER.
6)   If the information you have entered into the calculator is correct, then select option #1, USE TIME SETUP, on the next screen. If a correction is necessary, select option #2, MODIFY SETUP, and the previous screen will appear and allow you to re-enter your information.
7)   Since the calculator will be graphing your data in this exercise, you must tell the calculator the minimum and maximum values to use for the y-axis. Again, your teacher will provide this information. On the same screen, you will now see Yscl = ? . This provides the intervals along the Y-axis, which will be given to you by your teacher.
8)   The calculator will now read PRESS [ENTER] TO BEGIN COLLECTING DATA. When you are ready, press ENTER.

Using the Trigger Prompt Method of Collecting Data

1)   Repeat Steps 1-5 under "Using The Time Graph Method of Collecting Data".
2)   When the DATA COLLECTION screen appears, select option #3, Trigger prompt. The new screen will read MONITOR CBL. PRESS [TRIGGER] TO COLLECT DATA. The TRIGGER button is on the CBL, not the calculator.
3)   After pressing the TRIGGER button, the screen will read ENTER VALUE ? Enter the appropriate value and press ENTER.
4)   The calculator will now ask you if you wish to collect more data or stop. Make the appropriate selection according to the lab you are performing. For example, if you are measuring pressure versus volume, when you press the TRIGGER button on the CBL, the value you will enter when the ENTER VALUE screen appears will be the volume of the gas measured.
5)   The calculator will ask if you wish to stop or collect more data. Respond accordingly.