



MicroLab "Template" Experiments

- There are three types of MicroLab experiments:
 - **Pre-written "template" programs** that produce quick, reliable data for proof-of-concept experiments.
 - **"MicroLab Experiments"**, in which students plan their experiment, select and calibrate their sensors, and set up their data display for easy data analysis.
 - **Instrument Experiments**, which use special multi-variable graphic displays and calculations for complex spectrophotometry and electrochemistry experiments.

This note concerns pre-written template programs.

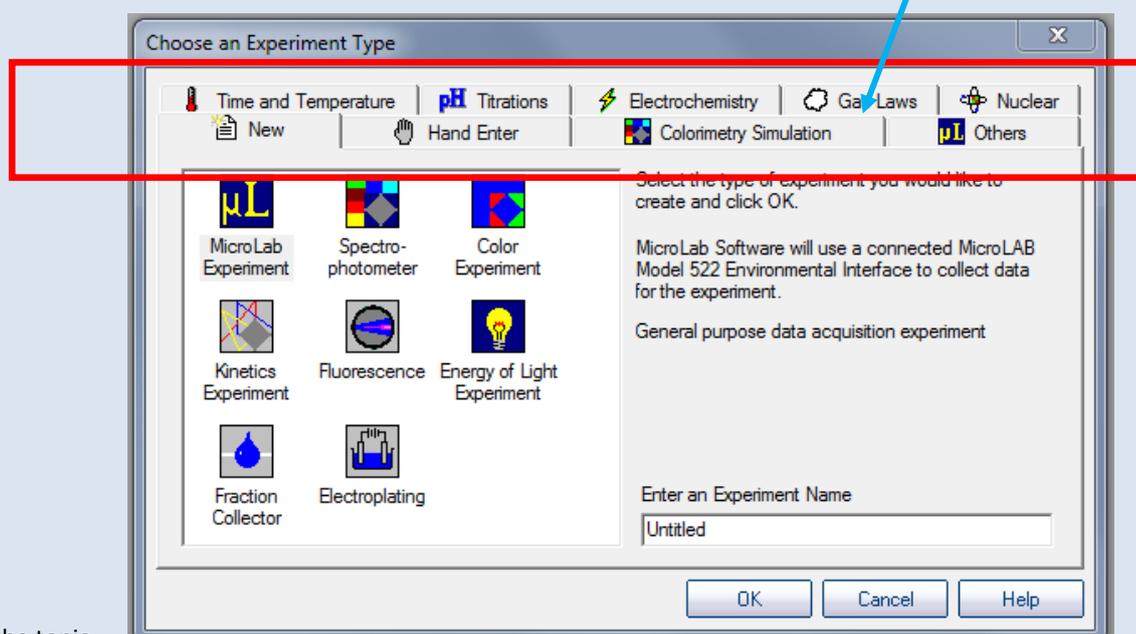
- **Pre-written "template" programs** are proof-of-concept experiments which are called up from tabs on the opening screen (below). Sensors are pre-selected, the screen display is set up, and any special parameters or equations are set. The experiment is ready to run. Students can quickly collect data to demonstrate or prove a concept.

Students can modify a template experiment to change their experiment during their lab period, and can update sensor calibration. However, the modifications cannot be saved back into the template. The next class will have a "clean" experiment. (Students can save their modification with a different name.)

MicroLab's software provides pre-written experiments in the seven topic areas indicated by the tabs in the figure below.

As we will see shortly, an instructor may write and save a template experiment that they have designed specifically for an experiment in their lab.

The blue arrow in the figure below indicates that the user is about to request a pre-written gas law experiment.



Once the topic

Figure 1: Pre-written or "template" experiments are selected by clicking the appropriate tab in the opening screen. One can also start an experiment to analyze hand-entered data.

area has been selected, MicroLab's software presents a list of the pre-written experiments available for this area. The red box below indicates that the user is about to select the pre-written program for a Boyle's Law experiment.

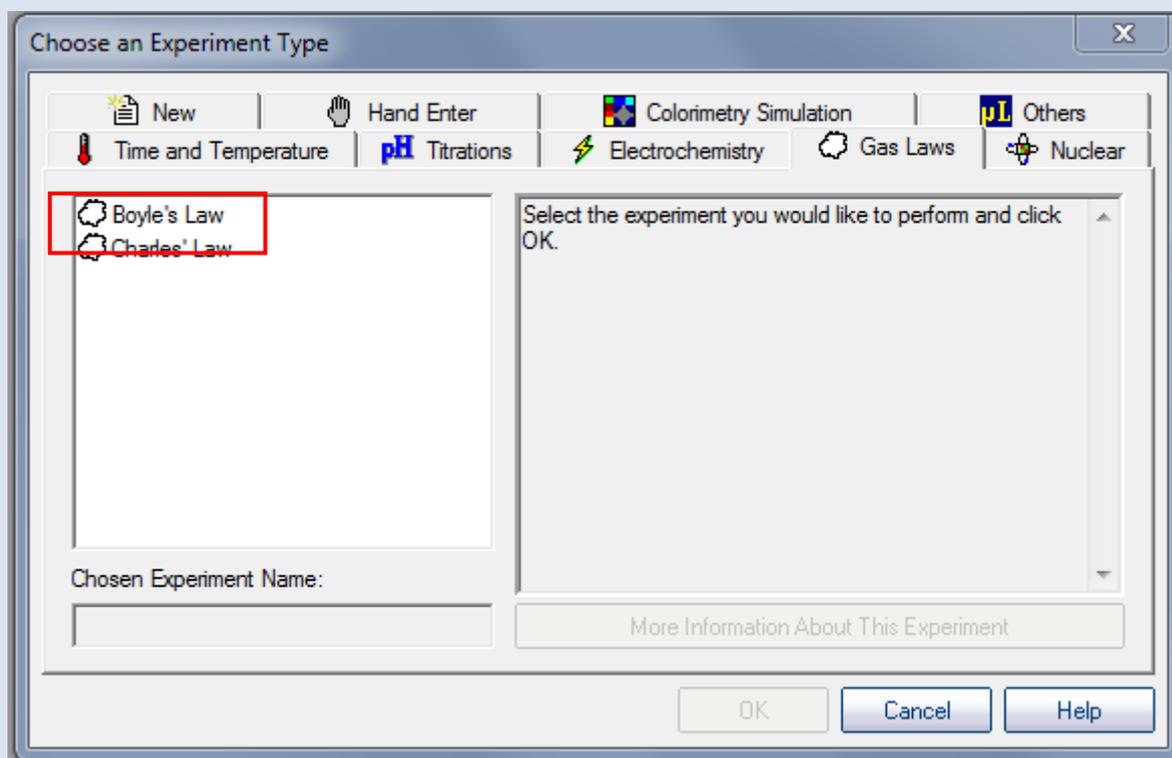


Figure 2: When the tab is selected for the topic area, a list of pre-written experiments appear.

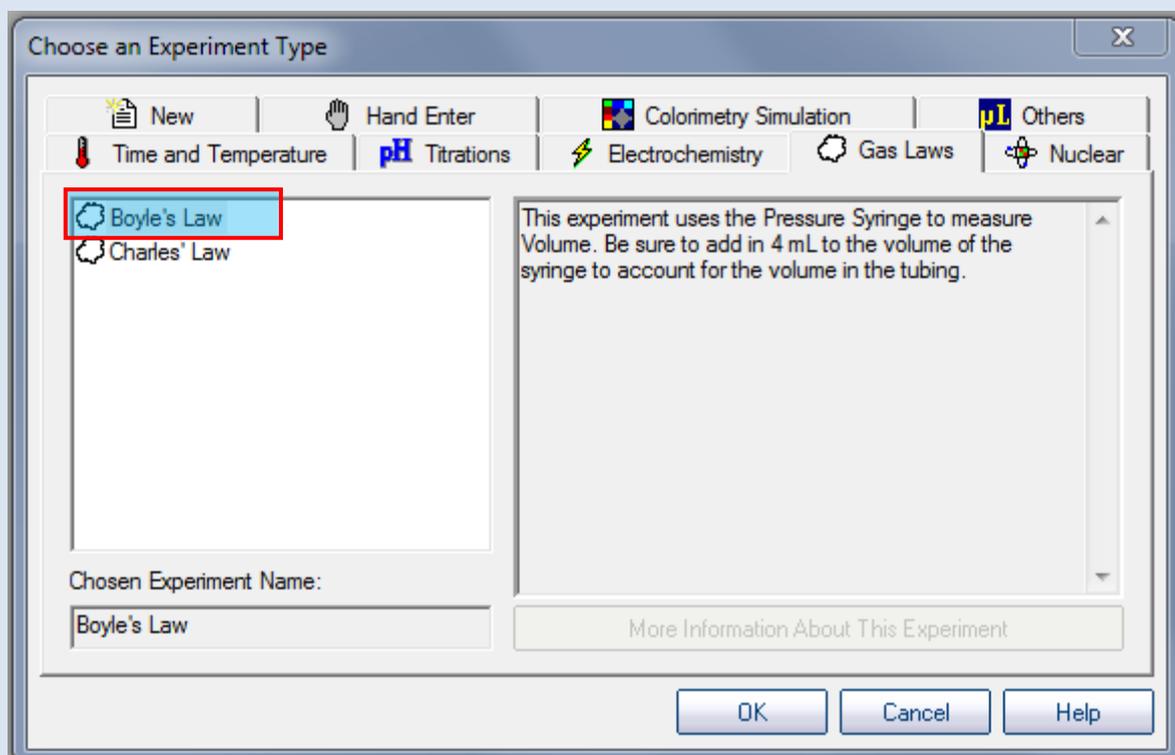


Figure 3: When an experiment is selected, special instructions are presented.

After reading the special instructions, the student clicks "OK", and the experiment screen appears. In this experiment, the student enters the volume of gas set by the syringe plunger (corrected for the volume of the hose to the MicroLab). The software plots volume (x) vs pressure (y) on the left hand graph, and pressure (x) vs 1/ pressure (y) on the second graph.

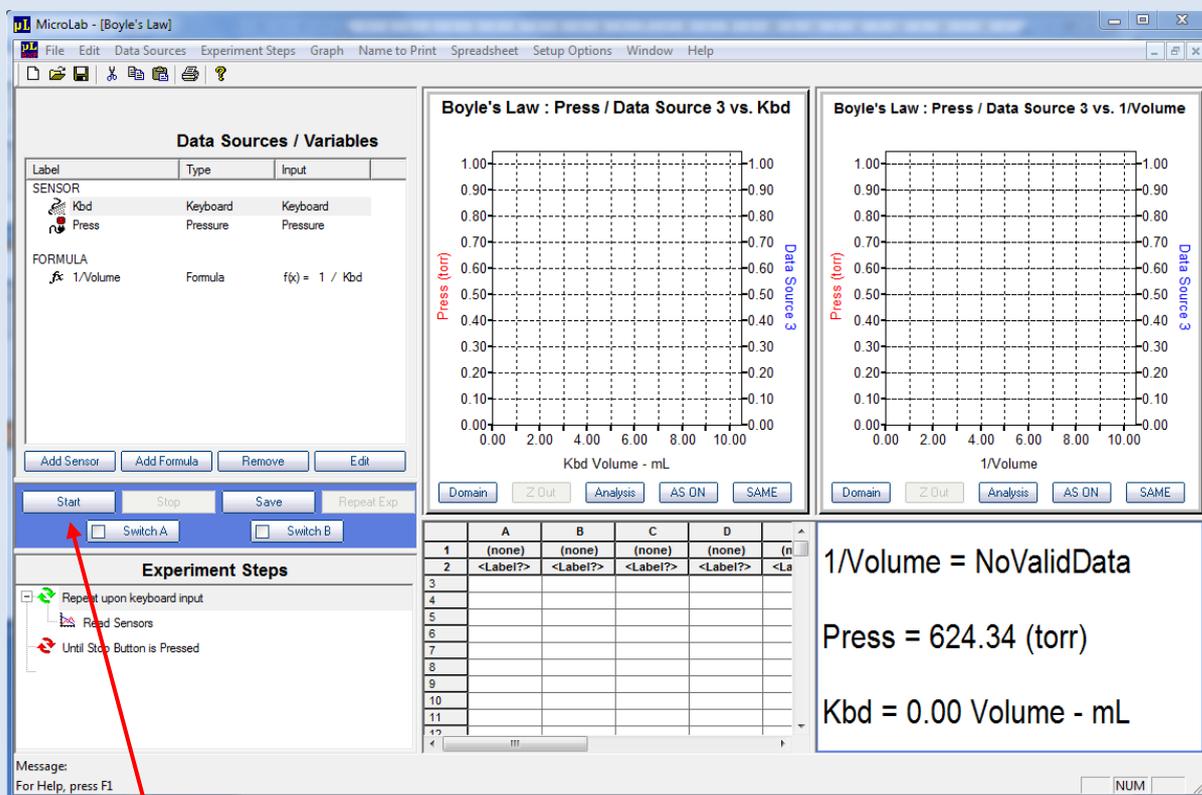


Figure 4: The template experiment selects the sensors, defines formulas, and sets up the screen for data acquisition. Because no volume data has yet been entered, the 1/Volume number is undefined.

When the "Start" button is pressed, a dialog box requests hand-entered volume data, read from the syringe. The student enters the data, and presses "Enter and Continue". Volume and pressure are recorded and the next data point is entered. When the last data point is entered, the student presses "Stop" and moves on to analyze his or her data.

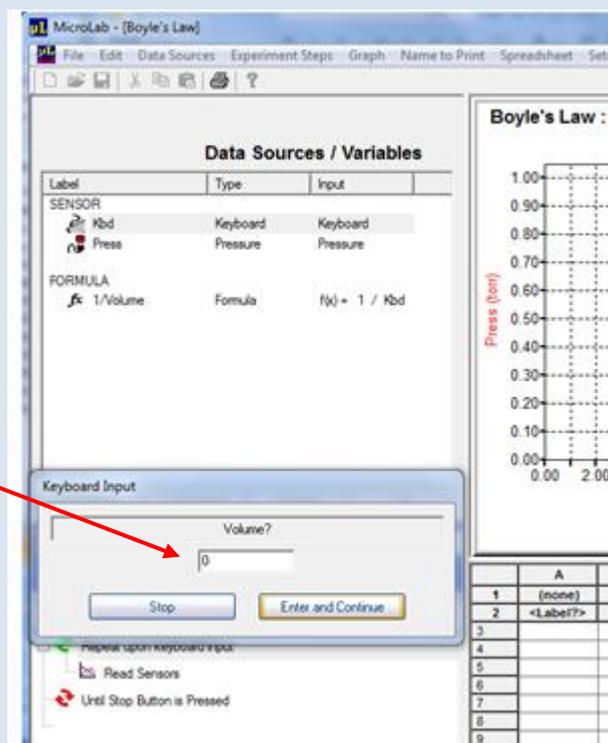


Figure 6: Volume data is hand-entered into a dialog box. Pressure and volume are recorded when the Enter and Continue button is pressed.

- **Instructor-written Template Experiments:**

Instructors can write their own Template experiments. They simply design an experiment using the "MicroLab Experiment" design tools, and then save it as a Template experiment. This save command is accessible from the "File" menu.

When "Save as Template" is clicked, a dialog box appears (Figure 8). The instructor picks the subject area tab in which to store the experiment, names the experiment, and enters any special instructions that are necessary. Note that in this example, the instructor worded the experiment description differently than the pre-written experiment presented above.

When loaded on student computers, the experiment will be available to all students, but students cannot modify the template experiment.

Students can save a modified template experiment as a MicroLab experiment, but with a different name.

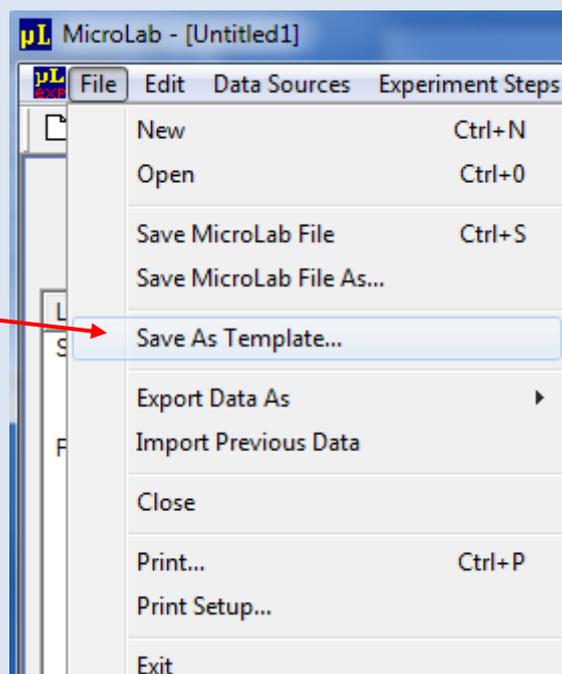


Figure 7: After an experiment has been written, it may be saved as a standard "MicroLab" file, or as a Template. Template files cannot be modified after they have once been saved.

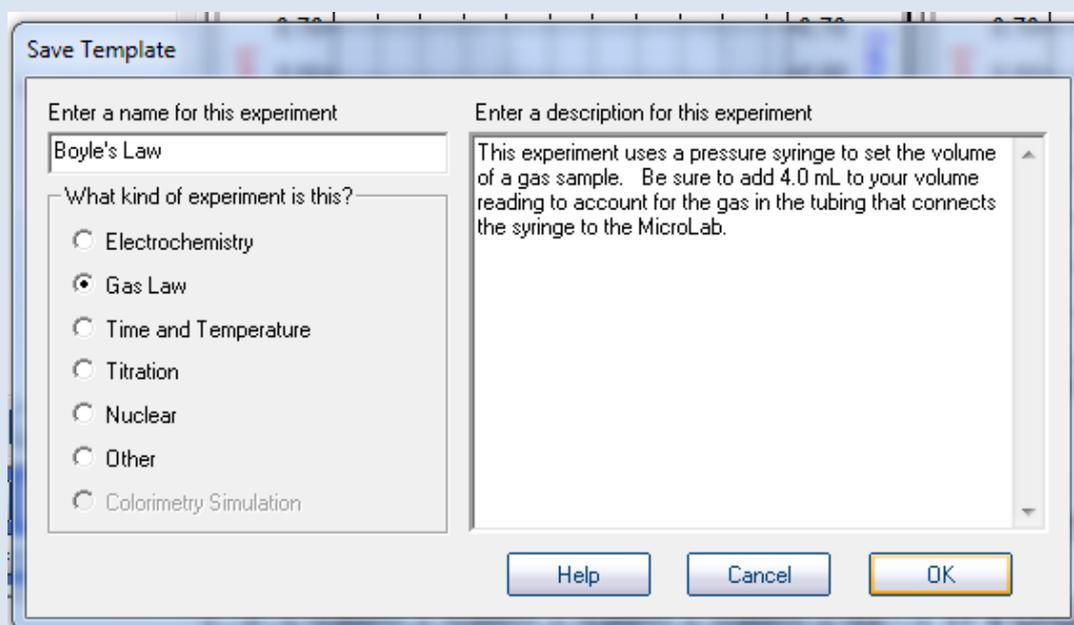


Figure 8: Before the template experiment is saved, the instructor gives it a name, selects a subject tab in which it will be saved, and provides any special instructions that will be presented when a student calls up the template experiment.