

## MoLE Gas Laws Activities

To begin this assignment you must be able to log on to the Internet using Internet Explorer (Microsoft) 4.5 or higher. If you do not have the current version of the browser, go to <http://www.microsoft.com/downloads> and follow the instructions on the page. You will need Internet Explorer for your particular operating system. If you have any difficulties contact your instructor.

Once the browser is running, type the following address into the location-input line near the top of the Internet Explorer window:

<http://cheminfo.chem.ou.edu/faculty/mra/mra/GLP.HTM>

<http://intro.chem.okstate.edu/1314F00/Laboratory/GLP.htm>

This should load the Gas Simulation. Once you have the simulation running your screen should look like what is shown in Figure I. below.

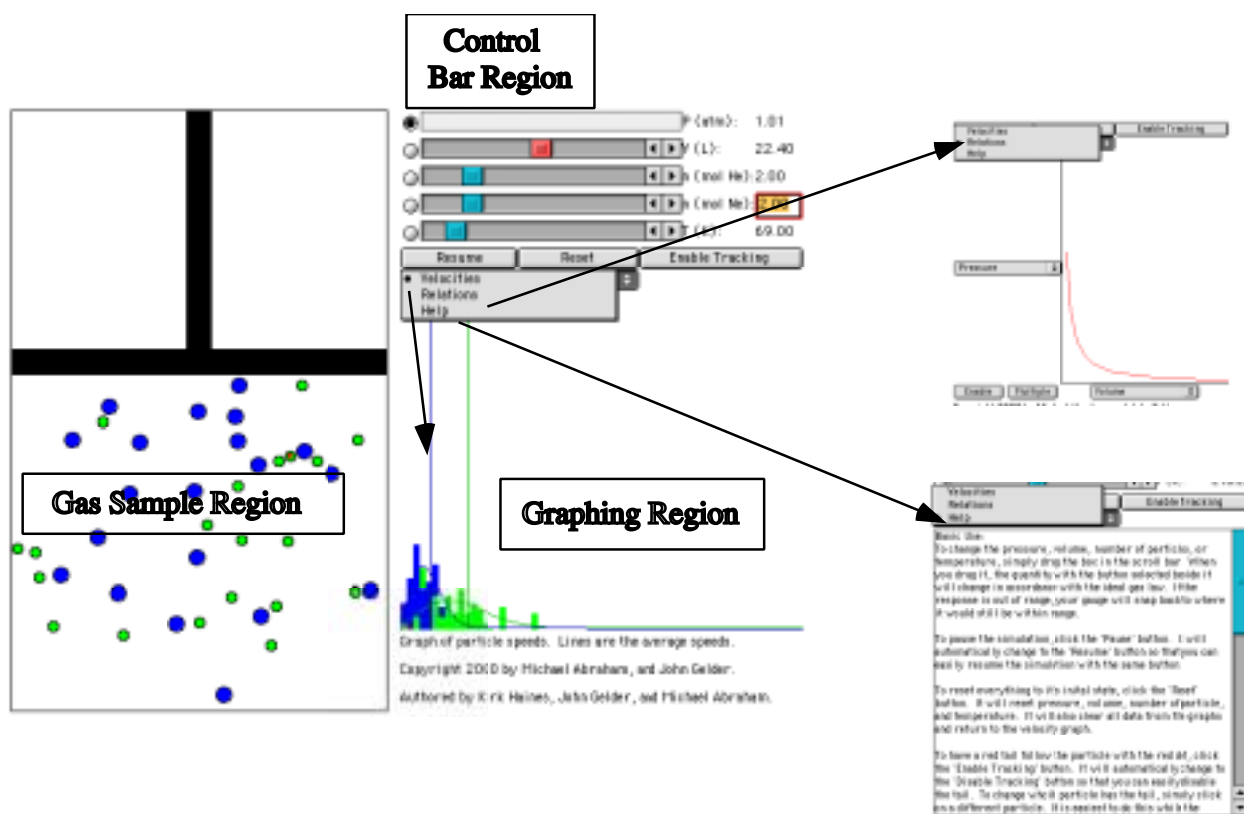


Figure I.

There are three important regions that require some discussion. The Gas Sample Region has the most activity. It is a container with a plunger. To explore the behavior of the gas sample you can change the variables located in the Control Bar Region. The Control Bar Region shows five scrollbars bars, one for pressure (in units of atmospheres), one for volume (in units of liters), two for mol of gas (one for He gas and the other for Ne gas), and one for temperature (in units of Kelvins). To the left of each scrollbar is a radio button. When selected, that particular variable (called the dependent variable) is calculated based on the value of the other four variables. In the

default mode the pressure scrollbar's radio button is selected so the pressure of the gas sample is being calculated.

As a simple exploration try moving each of the scrollbars and observe the effect on the gas sample. These effects will be addressed in more detail in this experiment. You can click the mouse on the Reset button located below the temperature scrollbar to return to the original conditions. The Pause button will suspend the motion in the gas sample while the Enable Tracking button will turn the red tracking line on and off.

Below the Pause Button is a fourth button different from the previous three in that it is a dropdown button. Clicking and holding the mouse button will reveal three choices: velocity (default); Relations (graphing); and Help.

The default mode is Velocities. The Velocity Distribution Region shows a plot of the velocity distribution in the gas sample. Observe the behavior of this region while changing each of the variables in the Control Bar Region.

The Relations view reveals an xy graph with a popup menu on each axis. Selecting the popup menu on either axis provides a list of the variables shown in the Control Bar Region. The two buttons, Enable and Multiple are used when plotting pairs of variables. For example, in Figure II pressure has been selected on the y-axis and 1/volume is selected on the x-axis.

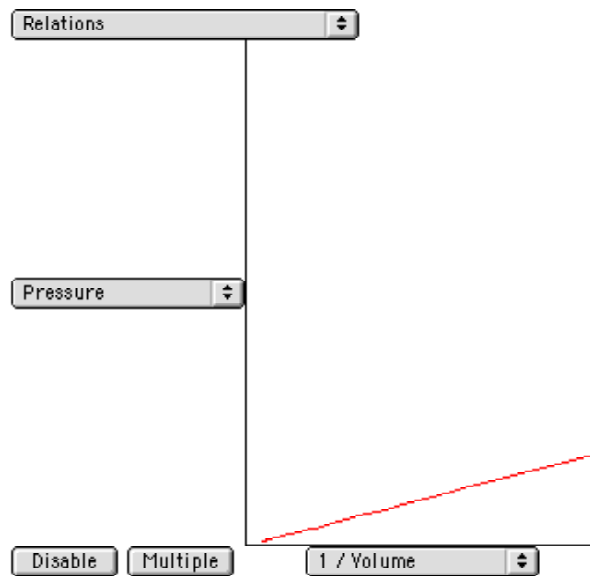


Figure II.

Clicking on the Enable button causes a change in the Control Bar Region, activating the pressure and volume scrollbars, and deactivating the mol and temperature scrollbars. Moving either the pressure or volume scrollbar will generate a plot of those two variables in the Plotting Region. What kind of plot is shown? The Multiple button allows two or more plots to be superimposed.

When you are finished exploring this plotting feature click the buttons until they read Enable and Multiple.

Got the hang of it? If you have any questions check with another student in the class, your instructor.