

Boyle's Law Computer Activity

Follow instructions from your teacher to access and open the Gas Properties Simulation. Or you can go to <http://phet.colorado.edu/simulations/> and find the simulation link in the "Chemistry" simulations.

Open the simulation.

Click on the "Measurement Tools" button. Click on the Ruler. This will cause a ruler to appear. The rulers units are in nanometers (nm) but we are going to use the ruler to give us an estimated measurement of volume. You will use the ruler to measure the width of the box. We will then change the units of measurement to liters. For example: initially the box should have a width of 6.6 nm which will be recorded in your data table as 6.6 L (liters). When you are asked to change/measure the volume of the box, use the ruler to do so.

What are the graduations on the ruler? (How much is each notch worth?) _____

First, you need to add a gas to your container. Click on the handle of the pump, and add ONE PUMPFUL of gas to your container. Locate the "Gas in Chamber" data on the right.

How many gas particles did you add to your container? _____

What type of gas did you add? _____

Describe the motion of the particles: _____

Boyle's Law looks at the relationship between volume and pressure when there is a constant temperature. You must set your container to constant temperature. Click on the Temperature button in the "Constant Parameters" on the upper right corner. This will cause the temperature to automatically adjust to whatever the initial value is set at.

Set your temperature to constant. What is the temperature of your box? _____

You are going to adjust the volume of the container by clicking on the handle on the left side of the container and dragging it to various widths.

Dramatically change the volume of the container to a smaller size. Initially, what happens to the temperature of the box? _____

What does the simulation automatically do to your container to achieve constant temperature?

Change the gas to 100 molecules of the HEAVY species by manually setting this in the right box.

According to the Kinetic Molecular Theory, what action causes pressure on the inside of the container? -

Hypothesize: If you will make the container smaller, how will this affect the answer to the previous question?

If you make it larger? _____