

Dalton & Graham's Law Simulation Activity

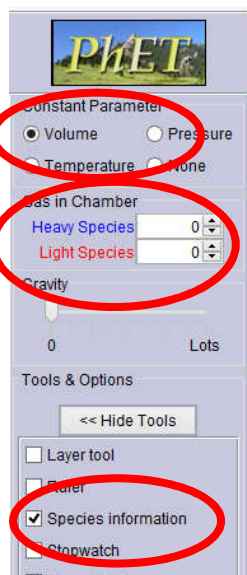
Honors Chemistry

Name _____
Date _____ Block _____

Go to: <http://phet.colorado.edu/en/simulation/gas-properties>

Run the java application. Set up the simulation according to the instructions and answer the questions.

Follow the directions and complete the data table:



1. Set **volume as a constant parameter**
2. Enter **50 heavy species** of the gas into the chamber
3. Wait for the gas particles and numerical values to equalize.
4. Record the temperature (**T1**)
5. Check “**species information**” and record the average speed
6. Record the **Pressure**.
7. Change the number of **heavy species from 50 to 100** and Record the **average speed and pressure**.
8. Change the number of **heavy species to 0 and enter 100 light species** of gas into the chamber. Record the **average speed and Pressure** for the light species.
9. Keeping the number of light species at 100, change the number of **heavy species from 0 to 50**. Record the **average speed of each species and the pressure**.
10. **Reset** the simulation.
11. Enter **50 heavy species** of the gas into the chamber
12. Wait for the gas particles and numerical values to equalize.
13. Use the **heat control** to add or remove heat and change the temperature of the system. Record this as your **T2** and repeat steps 5-9.

		50 heavy particles only	100 heavy particles only	100 light particles only	50 heavy + 100 light particles
T1 = _____ K	Average speed (m/s)				
	Pressure (atm)				
T2 = _____ K	Average speed (m/s)				
	Pressure (atm)				

Pressure & particle relationship

1. What is the definition of pressure?

2. Looking at your data for **50 heavy particles only**

a. What happened to the pressure when you went from T1 to T2?

b. *Based on your definition of pressure, explain why changing the temperature affects pressure in terms of molecules and kinetic energy.

3. Looking at your data for **50 heavy particles only and 100 heavy particles only.**

a. What happened to the pressure when you doubled the amount of heavy particles?

b. Predict the pressure if you had 200 heavy particles only.

c. Summarize the relationship between pressure and the number of particles.

Dalton's Law:

1. Looking at pressures for **50 heavy particles only, 100 light particles only, and 50 heavy + 100 light particles at T1.**
 - a. What is the pressure exerted by 50 heavy particles?

 - b. What is the pressure exerted by 100 light particles?

 - c. What is the pressure exerted by 50 heavy + 100 light particles?

 - d. Describe what happens to the pressure when 50 heavy and 100 light particles are combined in the same container.

 - e. What conclusion could you make about pressures of individual particles?

2. Predict what the pressure would be for 100 light + 100 heavy particles at T1. (use your data table values)