**Fun With Simulated Gases!**

Using the gas simulator at <https://ch301.cm.utexas.edu/simulations/js/idealgaslaw/>, answer the following questions:

1) What is the general relationship between the pressure and volume of a gas? (i.e. what happens to the pressure if I decrease the volume, and vice-versa). What information from the simulator leads you to believe this (give specific information that you gained from changing variables in the simulator).

2) What is the general relationship between the pressure and temperature of a gas? (i.e. what happens to the pressure if I decrease the temperature, and vice-versa). What information from the simulator leads you to believe this (give specific information that you gained from changing variables in the simulator).

3) What is the general relationship between the volume and temperature of a gas? (i.e. what happens to the volume if I decrease the temperature?). What information from the simulator leads you to believe this (give specific information that you gained from changing variables in the simulator)?

4) If you double the volume of a gas, how much does the temperature change? Use data collected from the simulator.

5) If you double the temperature of a gas, how much does the pressure change? Use data collected from the simulator.

6) If you double the volume of a gas, how much does the pressure change? Use data collected from the simulator.

7) At the top right of this page is a box labeled RMS (m/s) – this stands for “Root Mean Squared Velocity” – in regular English, this is just the average speed of the gas molecules. When you manipulate the other variables, how do they affect the speeds of the gas molecules? Show below:

* Relation of volume to speed:
* Relation of pressure to speed:
* Relation of temperature to speed:

8) At the top right of this page is also a box labeled “Ave KE (kJ/mol)” – this stands for the amount of energy that the gas molecules have. Use the simulator to determine how the variables of V, P, and T are related to the energy of gas molecules.

* Relation of volume to energy:
* Relation of pressure to energy:
* Relation of temperature to energy:

9) So, based on what you’ve heard about the behavior of gases and the KMT, are the things you’ve observed reasonable? Explain your answer in at least three sentences, using the observations you have collected.