

Gas Properties & Buoyancy SIM

- I. In class, we have been discussing how gases behave and how we observe this behavior in our daily lives. In this homework assignment, you will need to use the [Gas Properties Simulation](#) to help you develop a visual and conceptual model of how the bulk properties of a gas (such as pressure, temperature and volume) relate to what the individual gas molecules are doing and how this enters into your everyday life.
- a. Put a moderate amount of gas into a constant volume box. Without varying any of the controls, what general information about the nature of gases can you extract from the simulation's representation? (Describe the visual picture you have of a gas, noting any characteristic features of gases that you observe from the applet. You should include at least 3 things. Think of things that make a gas unique and distinguishable from a solid.)

 - b. Look at the animation of the particles bouncing around in the volume. Describe what visual information you can use to get a sense of the pressure that the gas particles are exerting on the walls. Play around with controls and see how the pressure responds. What **visual** cues are associated with an increase in pressure? Be sure to focus not only on the walls, but also on the gas in the center of the box, what visual cues can you use to get a sense of the pressure of the gas at any point in the volume?
- II. Using the visual model of the behavior of gas molecules presented in the simulation explain how a suction cup works. The suction cup is being
- pulled towards the wall.
- pushed towards the wall.
- neither pushed nor pulled.

Explain what is happening with the forces that cause the cup to stay against the wall and that support your answer whether the suction cup is being pulled, pushed, or something else? Using your understanding of the forces, why does the suction cup start to fail if it leaks too much?