Investigating Gas Laws

Purpose

To understand gas laws based on their relationships to temperature, pressure and volume.

PRE-LAB

1. What is Boyle’s Law?

2. What is Charles’s Law?

3. What is the Temperature- Pressure Relationship?

**Labs**

**A. Popcorn**

Place about ¼ cup of popcorn in the brown paper bag. Fold the bag close with 3 short folds. Microwave for 2 minutes. Listen carefully. As soon as the vigorous popping stops, turn off the microwave. Add salt and enjoy at your table.

1. What do you think makes the popcorn pop? (This is about temperature and volume)

2. What law or relationship is demonstrated here?

**B. Cartesian diver in a soda bottle.**

Squeeze and release the bottle.

1. What happens to the “diver” in the bottle?

2. Why does the diver move? (This is a relationship between pressure and volume)

3. What law or relationship is demonstrated here??

**C. Marshmallow in a Vacuum**

Place a mini-marshmallow in the syringe. Put plunger into syringe. Cover the needle end with your palm or finger.

1. Depress the plunger. What happens to the marshmallow?

2. Release the plunger. What happens to the marshmallow?

3. Why does the marshmallow shape change? (this is a relationship between pressure and volume)

4. What law or relationship is demonstrated here?

**Demonstrations**

**A. Erlenmeyer flask and balloon**

1. What happens to the balloon when the water is heated?

2. What happens to the balloon when the water is cooled?

3. Why does the balloon change (this is a relationship between temperature and volume)

4. What law or relationship is demonstrated here?

**B. Inverted soda can**

1. What happens to the can?

2. Why does this happen (this is a relationship between temperature and pressure)

3. What law or relationship is demonstrated here?