

**Objective:**

- Discover the relationships in the ideal gas law.

**Materials:**

- Fire syringe
- Cotton ball
- 12 mL (or 20 mL) syringe
- Mini marshmallow
- Hot plate
- Aluminum soda can
- Pan of ice water

**Procedure***Station 1 – Marshmallow Syringe*

1. Take the plunger out of the syringe and insert a marshmallow, and then reinsert the plunger.
2. With the plunger extended all the way, cover the end of the syringe with your finger. Push the plunger down. What happens to the marshmallow? \_\_\_\_\_
3. Take your finger off the end of the syringe and push the plunger so that it almost touches the marshmallow. Cover the end with your finger again, and then pull the plunger out. What happens to the marshmallow? \_\_\_\_\_
4. In this station, you changed the pressure. What happens to volume when the pressure increases? \_\_\_\_\_
5. Do volume and pressure have a direct or inverse relationship? \_\_\_\_\_

*Station 2 – Fire Syringe*

1. Unscrew the top the syringe and take it off.
2. Pull off a tiny portion of cotton ball and fluff it.
3. Push the cotton to the bottom of the syringe.
4. Screw the top back on.
5. Quickly and firmly, push the plunger down while watching the cotton. If nothing happens, push the plunger faster. You may have to take the cotton out and re-fluff it.
6. What happens to the cotton when the syringe works? \_\_\_\_\_
7. In this station, you changed the pressure. What happens to temperature when the pressure increases? \_\_\_\_\_
8. Do pressure and temperature have a direct or inverse relationship? \_\_\_\_\_

*Station 3 – The Soda Can*

1. Put a 15mL of water in the soda can and put it on the hot plate.
2. After the water is boiling for 30 s, carefully, but quickly, turn the can upside down into the pan of ice water.
3. What happened? \_\_\_\_\_ Why? \_\_\_\_\_
4. How could this be used in real life? \_\_\_\_\_
5. In this station, you changed the temperature. What happens to the volume when the temperature decreases?  
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6. Do volume and temperature have a direct or inverse relationship? \_\_\_\_\_