Phone: 417.374.7431
Fax: 417.374.7442
service@gosciencecrazy.com
1747 North Deffer Drive
Nixa, Missouri 65714

Cloud Formation Apparatus
#4-30101

Warning:

- **Not a toy; use only in a laboratory or educational setting.**
- **Contains latex.**
- **California Proposition 65 Warning: This product can expose you to chemicals including nickel and lead, which are known to the State of California to cause cancer, birth defects, or other reproductive harm. For more information go to www.P65Warnings.ca.gov.**

Introduction

This apparatus is a fun and interesting way to demonstrate the principles behind the formation of clouds without ever leaving the classroom. The instructions for use are on the following page.

Clouds are made up of small water droplets, ice crystals, and whatever small particles are in the air at any given moment, such as dust, dirt, and pollen. A cloud forms when gaseous water vapor in the atmosphere condenses into ice and water using the particles in the air as nuclei of condensation.

Cloud formation is tied to pressure and temperature. Water vapor maintains its gaseous form as long as its temperature stays above what is known as the **dew point.** Though it varies depending on multiple factors, such as humidity and pressure, the dew point is the temperature where the air can no longer hold any more water vapor. When air gets colder than its dew point, the water vapor in it condenses into liquid or solid water. This liquid and solid water will attach to the particles in the air and form a cloud.

There are multiple ways in which air can cool to the point of forming clouds. Air can be warmed by the sun as it heats the ground. Since warm air rises, this air near the ground moves upward where it cools and experiences a drop in pressure. As it goes through this drop in temperature and pressure, it will pass its dew point and condense into a cloud. Air can also be forced upwards when it hits sloped terrain or areas of low pressure, which will lead to cloud formation as well.

Use our cloud formation apparatus to witness this phenomena in a controlled, closed system.

How to Use

1. Assemble the apparatus as it is shown below if it is not already set up properly. The pinch clamp on the hose will not be necessary until step 4. Keep the clamp off the hose so that air flows through it freely until then.

2. Place the edge of the rubber hose into any reservoir of water. Squeeze and release the rubber bulb one time to introduce a small amount of water into the system.

3. Light a match or anything that can produce smoke (not included). Hold this source of smoke beside the open rubber hose, and squeeze and release the rubber bulb one time to introduce smoke into the system. These smoke particles will act as nuclei for cloud formation.

4. With the rubber hose still open, squeeze the rubber bulb. Before releasing the compressed bulb, place the pinch clamp over the rubber hose to close it and seal the system. This will create a closed system inside the flask with a constant volume and a pressure that can be manipulated by the rubber bulb.

5. Release the bulb quickly. The drop in pressure caused by releasing the bulb will cool the water vapor inside the flask enough for it to condense around the smoke particles and form a cloud.

6. Squeeze the bulb once more. You will see that as the pressure increases once more within the flask, the cloud disappears.

7. You can repeat steps 8 and 9 as many times as you like. The cloud will continue to form and disappear as changes are made to the pressure within the flask.

Components

1. Side arm with Pinch Clamp and Rubber Hose
2. Flask
3. Rubber Bulb