

Atmosphere Activity Bag

Properties of Air: Student Activity Guide

Have your ears ever popped? When and where did it happen? Did you have any idea why it was happening? Someone might say that it happened because the air pressure changed. But, what is air pressure and how can it change? In this activity, we will explore some of these questions.

These directions will get you started. Your teacher will be in contact to guide you and provide information.

Materials From The Bag

- 9 oz. Tall Plastic Cup
- 1 Rubber Band
- 1 oz. Small Plastic Cup
- 4 Cotton Balls
- 1 Craft Stick
- Double-Stick Tape (1 in. Square)
- Raisins

You Will Supply These Materials

- Water
- Clear, Non-Diet Soda (1 can)
- Scissors

Part 1: Keep the Cotton Dry - Engineering Challenge

Your challenge is to submerge one cotton ball in a tall cup of water and remove it **without the cotton ball getting wet**.

For this challenge, you are **only** allowed to use the following items:

- Rubber Band
- 1 oz. Plastic Cup
- One Cotton Ball
- Craft Stick
- 1 Small Piece of Double-Stick Tape (Cut the large square into four small squares.)

The cotton ball must remain completely dry after being submerged.

1. Fill the tall cup $\frac{1}{2}$ full of water.
2. Design a plan.
3. Test your plan. It is ok if it doesn't work at first. Keep changing your design and try again. If needed, get a new cotton ball and a small square of tape.
4. Draw your final design.

If your plan was successful, explain what you did. If not, how did your design(s) fail? When you did this challenge, describe how the cotton ball was able to stay dry when submerged in the water?

What's happening...

Air takes up space. When you submerge the cup, the air inside the cup pushes the water down, allowing for the cotton ball to remain dry. This demonstrates air pressure.

Clean and rinse the tall cup for Part 2. Part 2 is on the back of this sheet.

Part 2: The Rise and Fall of Raisins

In this activity, we will explore how pockets of air behave.

1. Fill the tall cup $\frac{3}{4}$ full of clear, non-diet soda.
2. Take five raisins and cut them in half.
3. Drop the individual raisin pieces into the soda.
4. Observe the raisin pieces for a couple of minutes. Record all of your observations.

What's happening...

The raisins represent pockets of air. This model shows one of the ways that air keeps moving around.

Sometimes air rises and sometimes it falls, just like the raisins.. Air that falls is more dense (like the raisin with fewer bubbles). More bubbles make the raisin less dense, so the raisins rise when they have a lot of bubbles. As air picks up a gas that is lighter in weight (like the raisin with bubbles) it becomes less dense and rises.

Meteorologists, scientists who study the weather, use this information to locate high and low-pressure systems, which help to forecast the weather. **Low-pressure systems have air that is rising, air that is warmer, and air that is more moist. High-pressure systems have air that is falling, air that is cooler, and air that is more dry.**