

Lesson Plan: Air Pressure Science Experiment Balloon in a Jar

Content	Audience	Method	Output/Products	Outcomes/Impact
Air Pressure	Ages kindergarten-3rd	1. Define air pressure. 2. Facilitate brief discussion with students about air pressure, and ask questions. 3. Have the students hypothesize what they believe will happen. 4. Watch Video https://youtu.be/qPK2_N-CweY 5. Hands-on Activity	(1) Brief discussion/info on Air Pressure	1. Students will be able to work with instructor supervision for this Science Experiment 2. Students will conduct a visual hands-on Experiment with adult supervision.

Supplies

- One large glass jar (a big maraschino cherry jar from a bar works well)
- One balloon
- Water
- Paper
- Matches/Lighter

Subject

Physical Science

Prep

Optional: Have intern/instructor have all supplies ready and waiting for group.

Method

- Define air pressure.
- Give a brief introduction of the experiment.
- Ask questions.
- Conduct Hypothesis

Definition

Air pressure is the weight of air molecules pressing down on the Earth. ¹

Intro to Experiment/Questions

When you set the water balloon on the jar lid, what do you notice? The air pressure outside the jar and the air pressure inside the jar are the same. Burn a small piece of paper. What happens? As the fire burns, the heated air rises and pushes its way out of the jar. The hot air pushing out past the balloon causes the balloon to sink. However, while hot air is going out, no new air is coming in and the balloon is now a one-way valve, letting air out not in. Now, that there is less air taking up space in the jar, the pressure inside the jar is less than it used to be, and less than the air pressure outside the jar.

Hypothesis

Hypothesis for Air Pressure Experiment: Balloon in a Jar: Since the pressure outside the jar is now greater than the pressure inside the jar, what will happen to the balloon? The balloon will begin to shake.

Watch Video: https://youtu.be/gPK2_N-CweY

Perform the Air Pressure Experiment

1. Fill the balloon with water until it is too big to fit through the mouth of the jar.
2. (Teachers) Strike a match or use a lighter to burn a bit of paper on fire and drop it into the jar.
3. Quickly place the balloon on top of the jar.
4. Observe carefully. The balloon will begin to be suck in the jar and then fall to the bottom.

The Science behind the experiment Air Pressure: Balloon in a Jar

The reason the balloon is sucked into the jar is due to air pressure. When the piece of paper is heated, it creates hot air, which escapes around the balloon. The hot air escaping is what makes the balloon shake at first. Since the balloon is made of latex, no new air enters the jar, creating a low-pressure system inside the jar, which sucks the balloon inside.

Resources:

<https://scienceexplorers.com/how-to-teach-kids-about-air-pressure/#:~:text=The%20term%20%E2%80%9Cair%20pressure%E2%80%9D%20is%20used%20in%20reference,down%20on%20every%20square%20inch%20of%20our%20bodies.>

<https://www.giftofcuriosity.com/3-air-pressure-activities-for-kids/>

¹ <https://scienceexplorers.com/how-to-teach-kids-about-air-pressure/#:~:text=The%20term%20%E2%80%9Cair%20pressure%E2%80%9D%20is%20used%20in%20reference,down%20on%20every%20square%20inch%20of%20our%20bodies.>

Arkansas Education Standards

Kindergarten Science

K-PS2-1	Plan and conduct an investigation to compare the effects of different strengths or different directions of pushes and pulls on the motion of an object.
---------	---

1st grade Science

1-ETS1-1	Ask questions, make observations, and gather information about a situation people want to change to define a simple problem that can be solved through the development of a new or improved object or tool.
----------	---

2nd grade Science

2-PS1-4	Construct an argument with evidence that some changes caused by heating or cooling can be reversed and some cannot.
---------	---

3rd grade Science

3-PS2-1	Plan and conduct an investigation to provide evidence of the effects of balanced and unbalanced forces on the motion of an object.
---------	--

NGSS Cross-Cutting Concepts

- Cause and Effect

NGSS Science and Engineering Practices

- Asking Questions and Defining Problems
- Engage in Argument from Evidence
- Planning and Carrying Out Investigations



