

BALLOON IN A JAR

Did you know air pressure is powerful enough to pull a balloon into a jar? This Balloon and Jar Air Pressure Experiment is a fascinating way to explore how air pressure works using just a few simple supplies you already have at home or in the classroom.

INSTRUCTIONS:

STEP 1: Prepare the balloon. Fill it with water (about 1/4 full) and blow air into it until it's about halfway full.

STEP 2: (ADULT SUPERVISION) Create heat inside the jar. Light a strip of paper and place it into the jar.

STEP 3: Place the balloon on top of the jar. As the fire burns, it consumes the oxygen, and once the flame goes out, the air inside the jar cools and creates lower air pressure. The balloon acts as a one-way valve, letting air push it partially inside the jar.

STEP 4: Record your observations.

THE SCIENCE

Atmospheric Pressure: The air around us constantly presses down on us from all sides. This pressure is called atmospheric pressure. In this experiment, the air inside the jar has less pressure after the flame goes out, while the air outside has more pressure. This higher pressure outside pushes the balloon into the jar!

New Air vs. Less Air: When the flame burns inside the jar, it heats up the air, causing some air to expand and escape. The flame also uses up oxygen to keep burning. After the flame goes out, the air cools down, leaving less air (and less oxygen) inside the jar. This leaves lower air pressure inside the jar.

One-Way Valve: The balloon acts like a one-way valve. It lets air from outside the jar push the balloon in but doesn't allow new air to flow back into the jar easily. As a result, the balloon gets sucked partway into the jar.

Lack of Oxygen: The flame inside the jar needs oxygen to keep burning. The flame dies out as it uses up the oxygen, and no new oxygen enters the jar. This helps create the lower pressure inside that pulls the balloon in.

Materials

Latex balloon
Glass bottle or jar
Matches or lighter
Water
Paper
(cut into long strips)
Scissors
Funnel (optional)

Balloon in a Jar Observations

Use this worksheet to process and evaluate your work.



What happened to the balloon after the flame went out?

Why do you think the balloon was pulled into the jar instead of pushed out?

What changes did you notice in the jar before and after you added flame?

How did the flame affect the air pressure inside the jar?

What role did the water in the balloon play in the experiment?
