



OBJECTIVE

Investigate chemical reactions and gases.

MATERIALS

Vinegar, baking soda, paper towels, a Ziplock (resealable) bag

INSTRUCTIONS

- Place a teaspoon of baking soda on a paper towel.
- Fold the towel so it fits in the Ziplock bag.
- Put the folded paper towel in the Ziplock bag.
- Pour $\frac{1}{4}$ cup of vinegar into the bag and quickly seal it.

KEY SCIENCE CONCEPTS

- **Gas in Reactions:** This experiment showcases how gases are produced in chemical reactions.
- **Pressure and Volume:** The reaction demonstrates how gas expands to fill its container, which in this case is the balloon.

ASK

Why do you think the bag expands?

SHARE

This investigation demonstrates a chemical reaction that produces gas, inflating the bag.

THE CHEMICAL REACTION

Vinegar + Baking Soda = Carbon Dioxide Gas

- Vinegar is an acid (acetic acid), and baking soda is a base (sodium bicarbonate).
- When combined, they react to form carbon dioxide gas (CO_2), water (H_2O), and sodium acetate (CH_3COONa).

Gas Production

- During the reaction, bubbles of carbon dioxide gas are released as the vinegar and baking soda interact.



WHY DOES THE BAG INFLATE?

Gas Expands

- Carbon dioxide gas takes up much more space than the liquid and solid reactants.
- As the gas is produced, it needs somewhere to go, so it rises and fills the bag.

The Bag Acts as a Container

- The bag traps the gas, and as more CO_2 is created, the bag expands to accommodate the increasing volume of gas.