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Science education

Report on experiment:

Blowing Up a Balloon With Baking Soda and Vinegar

Objective

Students learn about gas and chemical reactions by discovering how to inflate a balloon using baking soda and vinegar.

Aim

The aim of the project is to demonstrate the power of gas produced when of baking soda and vinegar are mixed. The goal is for the balloon to be blown up by the gas created.

Introduction:

The baking soda and the vinegar create an acid-base reaction and the two chemicals work together to create a gas -carbon dioxide. Gasses need a lot of room to spread out and the carbon dioxide starts to fill the bottle, and then moves into the balloon to inflate it.

Equipment and materials:

Most materials can be found at an all-purpose store and they are easily accessible. There is no special equipment required.

Materials:

- 1 Balloon
- 1 Small bottle
- 1 Small funnel
- Baking soda (2 tablespoons)
- Vinegar (1/4 of the bottle)

Preparation and timing:

Try the experiment first at home before you do it in the classroom.

Timing is about 5 minutes for the experiment itself, but more time should be spend on the discussion.

Procedure:

Before you start ask your students a question:

What do you think will happen when baking soda and vinegar come in contact (what will be produced)? Let them guess and then start the experiment.

1. Using your funnel pour vinegar into your bottle.
2. Pour baking soda into your balloon.
3. Cover the top of the bottle with you balloon. Make sure you don't let the baking soda spill into the bottle prematurely.
4. When ready, lift your balloon and let the baking soda fall into the vinegar.
5. Watch as the mixture fizzes and expands your balloon!
6. Discuss how the baking soda and vinegar produce a gas which fills the balloon.

Safety guidelines and troubleshooting:

A potential pitfall could be adding too much baking soda or vinegar. Due to this issue students will be closely monitored so that no issues arise that might create the balloon to blow up and get baking soda all over the place. It is important to not go over the maximum amount to avoid explosion of the balloon.

Additional investigation:

If we were to continue on in this experiment we could look deeper into why the balloon blows up and with what it fills with. The balloon fills with carbon dioxide because of a chemical reaction between the baking soda and vinegar which gives off the gas of carbon dioxide. Also, given more time we could alter the amounts of both the baking soda and vinegar used greater than we already have in the experiment. We could then observe the different amounts of carbon dioxide given off each time.