

# Brewing Bubbles



It may bubble up like a witch's brew, but it's actually an experiment that will show you how to control the amount of gas produced in a chemical reaction.

## Materials Required

- ★ vinegar
- ★ baking soda
- ★ liquid dish detergent
- ★ measuring spoons
- ★ plastic soda bottle
- ★ plastic cups
- ★ masking tape
- ★ paper

## Procedure:

1. Pour 3 tablespoons of vinegar and 3 tablespoons of water into a plastic cup.
2. Pour the vinegar and water solution into the plastic soda bottle. Add    teaspoon of dish detergent. Swirl gently to mix. DO NOT SHAKE.
3. Make a funnel out of a piece of paper and tape it so that it doesn't come apart.
4. Place 3 teaspoons of baking soda into a clean plastic cup. Use the funnel to dump all the baking soda into the bottle at once. Swirl the mixture. What do you observe? Even if you think the reaction has stopped, keep swirling because there may be lots more bubbling still to come.





## Understanding the Science

In chemical reactions, the change that occurs can be controlled by the amount of each reactant used. In this experiment, the reactants are vinegar, which is an acid, with baking soda, which is a base. When you mix them together, the result is bubbles filled with carbon dioxide gas. By adjusting the amounts of baking soda and vinegar, you can change the amount of carbon dioxide gas bubbles that are produced.

The detergent solution used in the investigation is not involved in the reaction itself. Instead, it causes the bubbling liquid to become foamy, which creates a longer lasting bubble and is useful for measuring the chemical reaction that occurs.

## Questions to Consider:

After experimenting with how the amount of bubbling is affected by using more or less vinegar and baking soda, consider investigating the following questions:

1. Does the order in which the substances are poured into the plastic bag affect the level of foam?
2. Would mixing or shaking the plastic bag create more foam?
3. Would different types of vinegar affect the reaction?
4. Would warming the vinegar ahead of time create more foam?

## Science Safety

1. Wear safety glasses when you conduct an experiment.
2. Clean up any spills immediately to avoid slip hazards.
3. Wash hands immediately after completing any experiment. Do not put hands or fingers in mouth, or rub eyes, until after hands have been washed.

