

Vinegar and Baking Soda: A Rocking Reaction

Simple STEM Activities You Can Do at Home

Purpose:	The purpose of this activity is for students to observe and investigate the changes that occur as vinegar and baking soda interact.
Standard:	<p>S2P1. Obtain, evaluate, and communicate information about the properties of matter and changes that occur in objects.</p> <p>S5P1. Obtain, evaluate, and communicate information to explain the differences between a physical change and a chemical change.</p> <p>S8P1. Obtain, evaluate, and communicate information about the structure and properties of matter.</p> <p>a. Develop and use a model to compare and contrast pure substances (elements and compounds) and mixtures.</p>
Materials:	Baking soda, vinegar, 1-2 balloons, small plastic bottle, spoon, funnel.
Procedures:	<ol style="list-style-type: none"> Add two teaspoons of baking soda to a clear cup. Observe closely. Add about 1/4 cup of vinegar to the cup. Observe what happens. Pour about 1/4 cup of vinegar into a small empty plastic bottle. Add 2 teaspoons of baking soda to a balloon using a funnel of some sort. Carefully attach the balloon to the bottle without adding the baking soda. Add baking soda to the balloon, observe carefully, and describe as many changes as you can detect. If time permits, repeat the experiment and change one factor that you think might change the amount of carbon dioxide gas produced. Explain why you think your balloon filled up with some kind of gas. If appropriate, try to classify the changes as physical or chemical.
Science Behind It:	<p>Close observation of these substances, and their interaction, can lead to a great discussion of a myriad of science concepts. At the start, differences in texture (feel), color, smell and viscosity (thickness) of the two reactants can be noted. Identifying each substance as a solid, liquid, or gas can also be helpful as students process the similarities and differences of each state of matter. After pouring the baking soda into the vinegar, observations and discussions with respect to mixing, dissolving, and reacting should ensue.</p> <p>As the baking soda and vinegar combine, the system is propelled into a fast moving and quickly changing arena. As students observe the gas bubbles, they may infer this as a sign of a chemical reaction. In this case, two chemical reactions between the baking soda and vinegar causes the production of carbon dioxide gas and sodium citrate (new substances). The less dense carbon dioxide gas quickly expands to blow up the balloon, bag, and film canister.</p>
Questions to Ask:	<ol style="list-style-type: none"> Explain why you think your balloon filled up with a gas if it wasn't there to start with. Based on your observations, explain why would you classify this type of change primarily as physical or chemical.