

Science: Hot Chocolate Surprise

Ages: PreK

Hello everyone. This is Bill from the Okanagan Regional Library System. Welcome to the fun and inventive world of making STEAM projects in your own home. Each month, I will share a fun and interesting project that you can make using materials commonly found in your own home.

This month's project: Hot Chocolate Surprise

Hot Chocolate Surprise



Hot Chocolate Surprise is a science experiment that can be used to show a variety of scientific principles: chemical reactions, properties of matter, scientific process, making observations, and recording results.

This is a very simple experiment, which makes it ideal for young learners. It requires a minimal amount of inexpensive materials, but gives you a maximum wow factor.

Materials Needed:

- 1 package of hot chocolate mix
- $\frac{1}{4}$ cup baking soda
- vinegar
- clear glass or plastic cup
- measuring cups
- observation sheet (optional)



Time: Approximately 30 minutes

Steps:

1. Open the hot chocolate packet and empty the contents into the clear glass or plastic cup. Add the baking soda and mix the two together.
2. Slowly pour some vinegar into the glass.



3. Observe. What do you see happening? (Because of the extra ingredients in the hot chocolate packet, the chemical reaction you see may be slower than a traditional vinegar and baking soda experiment)



4. Record your observations.



Read World Science: Hot Chocolate Surprise

In this experiment, mixing baking soda and vinegar will get you a chemical reaction. The hot chocolate mix is simply used to make the reaction more evident.

Baking soda and vinegar react chemically because one is a base and the other is an acid. Baking soda is a basic compound called sodium bicarbonate. Vinegar is a diluted solution that contains acetic acid.

The baking soda and vinegar reaction is actually two separate reactions. The first reaction is the acid-base reaction.

When vinegar and baking soda are first mixed together, hydrogen ions in the vinegar react with the sodium and bicarbonate ions in the baking soda. The result of this initial reaction is two new chemicals: carbonic acid and sodium acetate.

The second reaction is a decomposition reaction. The carbonic acid formed as a result of the first reaction immediately begins to decompose into water and carbon dioxide gas.

Just like carbon dioxide bubbles in a carbonated drink, the carbon dioxide (that formed as the carbonic acid decomposed) rises to the top of the mixture. This creates the bubbles and foam you see when you mix baking soda and vinegar.

STEAM Concepts:

- Measurement
- Ratio
- Chemical Reactions