

Science: Ghost Balloons!

Ages: 7 - 13

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.

Even though we can't be together right now, we can still learn how to make exciting projects each week!

This month's project: Ghost Balloons.

Ghost Balloons



It is so easy to set up this Halloween science experiment with balloons, baking soda and vinegar. Dip into the recycling bin for some water bottles and then you are all set.

Chemistry is all about the way different materials are put together, and how they are made up including atoms and molecules. It is also how these materials react under different conditions. Chemistry is often a base for physics so you will see overlap!

What might you experiment within chemistry? We can think of a mad scientist and lots of bubbling beakers, and yes, there is a reaction between bases and acids to enjoy. Also, chemistry involves matter, changes, solutions, and the list goes on and on.

Materials Needed:

- Baking Soda
- Vinegar
- Empty Water Bottles
- Balloons
- Measuring Spoon
- Funnel
- Felt Pen



Time: 30 minutes

Can you make a Ghost appear seemingly from nowhere? In this experiment, you will use vinegar and baking soda to magically blow up your ghost balloon. When baking soda and vinegar are combined, a gas is created that will make your balloon expand.

Steps:

1. Blow up your balloons to stretch them out a bit. Let the air out and then draw ghostly faces on the balloons using the felt pen.



2. Use the funnel and teaspoon to add baking soda to the balloon. Add about 3 teaspoons to each balloon.



3. Fill each of the water bottles about half-full with vinegar.



- Carefully attach the neck of your balloons to each water bottle. Try not to let the baking soda escape from the balloon until you are ready for the next step.



- Lift up each balloon to dump the baking soda into the bottle of vinegar. Watch what happens as the vinegar and baking soda mix together. You may get more gas by swirling the mixture in the water bottle.



6. Carefully take the balloons off the bottles, making sure that you don't lose any of the gas. Tie the neck of the balloon shut. You have now made your ghost balloons appear to grow magically.



The Science behind your Ghost Balloon

The science behind this balloon experiment, is the chemical reaction between the base (baking soda) and the acid (vinegar). When the two ingredients combine, the balloon experiment gets it's lift.

This "lift" is the gas that is produced. This gas is carbon dioxide or CO₂. The gas fills the space in the plastic water bottle, and then moves up into the balloon because of the tight seal that you have created. The balloon inflates, because the gas has nowhere else to go.

Real World Science – Lighter Than Air Ships



Unlike a balloon, a blimp has a shape and structure that enable it to fly and maneuver. The main part of a blimp is called the envelope. The envelope is the large bag that holds the gas, in this case, helium. The envelope is generally cigar-shaped, for aerodynamic purposes, and made of a durable airtight, lightweight fabric that is much like the fabric of a space suit. Since blimps are comparably light, they are much more fuel efficient than jets and other aircraft.

STEAM

This activity includes everything you need for a comprehensive STEAM project.

Science: Understanding how an acid and a base react to each other.

Technology: Understanding how the real world use of blimps could be the answer to energy conservation.

Engineering and Art: Construction of the ghost balloon.

Math: Measuring out the quantities (acid and base) needed to inflate your balloon.