

## Exploding Pumpkin Volcanos- Spooky Science

Grade levels k-5

Materials- Foam carvable pumpkin or real pumpkin, Baking soda, Food coloring, Vinegar, Dish soap

The classic baking soda and vinegar reaction works because baking soda is a base and vinegar is an acid. When these two substances mix, they create a chemical reaction that releases carbon dioxide gas. This is a form of endothermic reaction, because it uses more energy than it produces. The carbon dioxide gas gets trapped in the remaining water and dish soap, making foamy bubbles that are fun to watch for kids. When the pH of the mixture has stabilized and the conversion is complete, the mixture stops reacting and the bubbles deflate. Adding the dish soap makes the reaction last longer, because the soap bubbles hold air longer than the liquid vinegar alone.

You'll want to open up your pumpkin in advance and remove the guts if you're using a real pumpkin. If not, you may want to go ahead and cut the top off just so you don't have to have knives in class.

1. Fill the inside of the pumpkin with vinegar. Place the pumpkin on a tray or plate.
2. Dye the inside of the pumpkin with food coloring.
3. Add a few drops of dish soap. Add baking soda to the pumpkin and watch the reaction happen! Keep adding baking soda until the bubbling stops.

This experiment can be used to meet the following NGSS standards:

NGSS standard 5-PS1-4- Conduct an investigation to determine whether the mixing of two or more substances results in new substances

NGSS standard MS-PS1-2- Analyze and interpret data on the properties of substances before and after the substances interact to determine if a chemical reaction has occurred.

NGSS standard MS-PS1.B- Substances react chemically in characteristic ways. In a chemical process, the atoms that make up the original substances are regrouped into different molecules, and these new substances have different properties from those of the reactants.

NGSS standard K-2- Plan and conduct an investigation collaboratively to produce data to serve as the basis for evidence to answer a question. (NGSS standard 2-PS1-1); Analyze data from tests of an object or tool to determine if it works as intended. (NGSS standard 2-PS1-2); Make observations (firsthand or from media) to construct an evidence-based account for natural phenomena. (NGSS standard 2-PS1-3); Construct an argument with evidence to support a claim. (NGSS standard 2-PS1-4)

