



Chemistry

# Vinegar Volcano

This classic science experiment can help demonstrate a simple chemical reaction. Vinegar contains acetic acid and baking soda is also called sodium bicarbonate. This reaction will result in carbonic acid; however, carbonic acid is unstable and will want to immediately break down into water and carbon dioxide ( $\text{NaHCO}_3 + \text{HC}_2\text{H}_3\text{O}_2 \rightarrow \text{NaC}_2\text{H}_3\text{O}_2 + \text{H}_2\text{O} + \text{CO}_2$ ). Carbon dioxide is both the gas we breathe out and the gas that causes our sodas to fizz. The eruption in this experiment is the same kind of fizz and the leftover solution in the bottle is water. Food coloring can be added for fun and dish soap can be added to capture more of the carbon dioxide for a foam-like effect.



## Supplies

- Two (2) Funnels
- Two (2) Cups of White Vinegar
- One (1) Recycled 2 Liter Bottle
- Half (1/2) Cup of Baking Soda
- Half (1/2) Cup of Water
- Optional: Red food coloring, dish soap



## Challenge

### Create your own volcano at home!

1. Place your bottle in a sink or over a tray
2. Use one funnel to pour the vinegar and water into the bottle
3. Agitate your solution by gently swirling the mixture in the bottle
4. If you want to add food coloring, now is the time to add 1-2 drops of red
5. If you would like to add some dish soap, add ½ a tablespoon now and slowly swirl solution again (do not shake for bubbles)
6. Next, grab the other funnel and begin to add the baking soda (note that you may not need all of the baking soda for a reaction to occur!)
7. Remove the funnel and watch the eruption!



## Questions

1. Did you pour in all the baking soda before you saw a reaction?
2. Try it again, can you make the foam thicker? How much more of the ingredient(s) do you need?
3. What kinds of volcanoes typically form from slow-moving eruptions like this one?