

Experiment 7: Fizzy Foam Fun

Learning Outcomes

Project skill: Uses a catalyst to speed up a chemical reaction

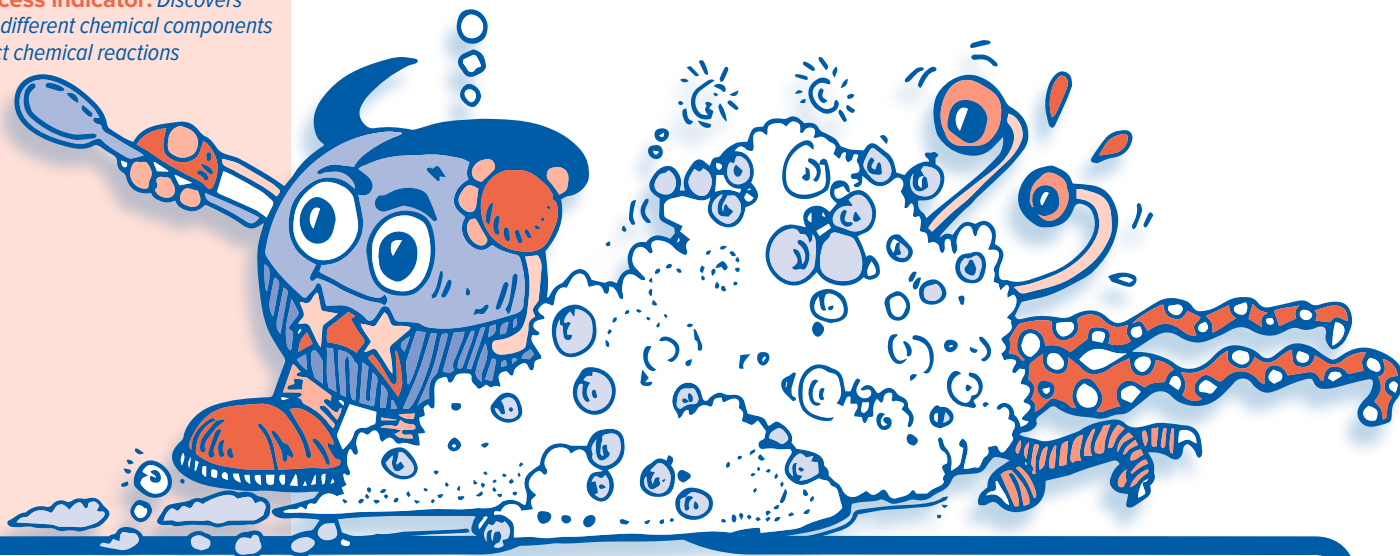
Life skill: Using scientific methods

Educational standard: Ohio Physical Science—Thermal energy is a measure of the motion of the atoms and molecules in a substance

Success indicator: Discovers how different chemical components affect chemical reactions

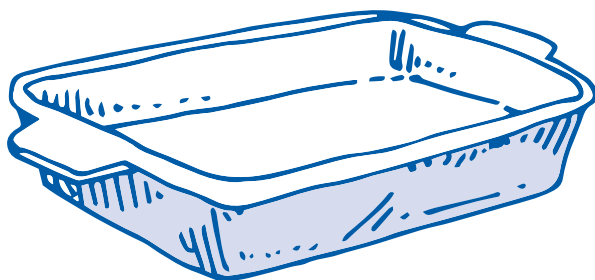
Introduction

Chemical reactions are sometimes fast and sometimes slow. But we can make them go faster by using a **catalyst**—a material that speeds up reactions but doesn't react itself. In this experiment you will produce lots of oxygen bubbles using yeast as the catalyst.



Supplies

- 24-ounce bottle, rinsed out and dry
- $\frac{1}{2}$ cup hydrogen peroxide, 3% or 6% solution
- dishwashing liquid
- food coloring
- 1 packet active dry yeast
- about $\frac{1}{4}$ cup water, very warm
- small bowl
- funnel
- large rectangular baking pan



What to Do

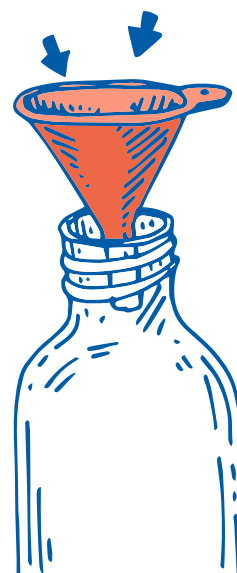
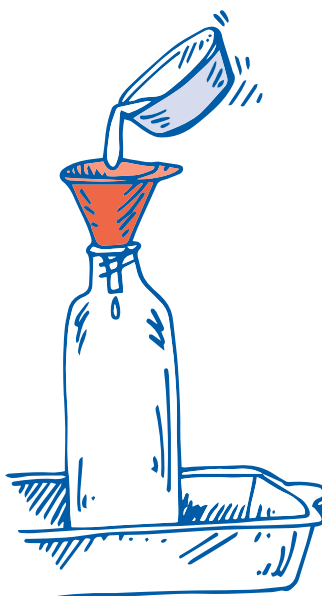
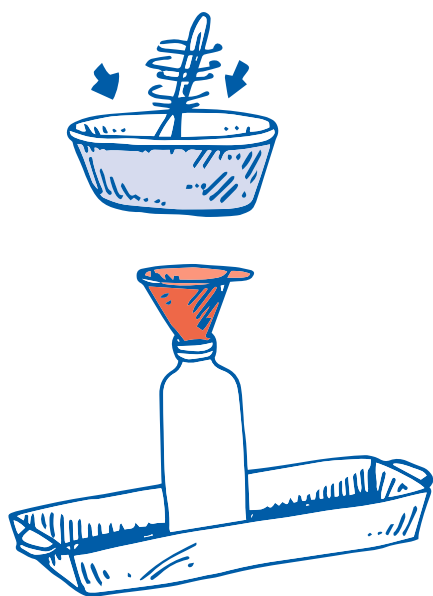
Time needed: 10 minutes. Pour the water into the bowl and stir in the yeast. Set it aside. Put the bottle in the baking pan (or you could do the experiment in the sink—it will get messy!). Using the funnel, pour the hydrogen peroxide into the bottle. Add a few drops of food coloring and a couple of squirts of dish soap. Use the funnel again to pour the yeast/water mixture into the bottle. Take out the funnel quickly and stand back!

Record your observations here:

Ensign Electron Says Be Safe!

Make sure you wash your hands when you are finished with this experiment.

Source: This experiment is in many science workbooks as well as the Internet. Sometimes it is called “Elephant Toothpaste” in reference to the large amount of foam created.



Explanation

Hydrogen peroxide breaks down slowly over time into water and oxygen. But the yeast—a catalyst—makes the hydrogen peroxide break down very quickly. The oxygen that is released combines with the dish soap to make lots of bubbles. The hydrogen peroxide commonly available at pharmacies is a 3% solution. Beauty supply stores have 6% hydrogen peroxide and will make even more foam. Don't use any concentration over 6% because it can be too dangerous.

This is also an example of an **exothermic** reaction—a reaction that gives off heat. If you touch the bottle or the foam after the reaction starts you will find it gets warmer than it was when you started. (In Experiment 6, the reaction was *endothermic*. The ice absorbed the heat from the milk mixture.)