

Elephant Toothpaste

Introduction

Create a giant foaming reaction and wow your friends with this classic science demonstration! With just a few simple ingredients, you can make something that looks like toothpaste being squeezed from a tube—but so big, it must be for elephants!

Credits

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<https://www.sciencebuddies.org/stem-activities/elephant-toothpaste>

Materials

- Empty plastic bottle
- Dry yeast
- Warm water
- Liquid dish soap
- Liquid food coloring
- 3% hydrogen peroxide. See the Further Exploration section for instructions on using a higher concentration of hydrogen peroxide.
- Measuring cups and spoons
- Safety glasses
- Large tub or tray to catch the foam, or outdoor location to do the experiment



Prep Work

1. Wear safety glasses to do this experiment, since hydrogen peroxide can irritate your eyes.
2. The elephant toothpaste will bubble up out of the bottle. Do the experiment in a tray or tub (or outside) so it is easy to clean up all the foam.

Procedure

1. Pour 1/2 cup of hydrogen peroxide into the bottle.
2. Add a big squirt of dish soap into the bottle, and swirl gently to mix.
3. If you want to make your foam a single color, add a few drops of food coloring directly into the hydrogen peroxide, and swirl the bottle gently to mix. If you want to give your foam stripes like some toothpastes, put the drops along the inside rim of the bottle's mouth. Let them drip down the inside of the bottle, but do not mix.
4. In a measuring cup, mix together 1 tablespoon of yeast and 3 tablespoons of warm water. Stir for about 30 seconds.
5. Pour the yeast mixture into the bottle, then quickly step back and watch your reaction go!



Cleanup

Wash the foam down the sink when you are done with the experiment.

What Happened?

You probably saw lots of bubbles and foam in this activity. What made the foam appear? When the hydrogen peroxide comes into contact with the yeast, it starts breaking down into water and oxygen. Oxygen is a gas and therefore wants to escape the liquid. However, the dish soap that you added to your reaction traps the gas bubbles, forming a foam. The reaction continues as long as there is some hydrogen peroxide and yeast left. Once one of them runs out, it stops making new foam. If you try the experiment without dish soap, the reaction will still make bubbles, but not foam.

For Further Exploration

- Try the experiment with differently-shaped containers. What happens if you use a bottle with a narrower or wider neck, or a cylindrical drinking glass with no neck?
- You can do this experiment with higher concentrations of hydrogen peroxide. The higher the concentration, the more vigorous the reaction will be

Safety warning: additional safety precautions and adult supervision are required when working with higher concentrations of hydrogen peroxide:

- It is not safe to get this hydrogen peroxide on your skin, so you will need protective gloves and clothing.
- Make sure you wear eye protection.
- The foam will shoot up very high out of the bottle, so you will need to do the experiment outdoors.
- Do not touch the resulting foam, which may still contain some unreacted hydrogen peroxide.