

Imagine Your Story™



2020 Summer Reading

15-MINUTE SCIENCE EXPERIMENT

Elephant Toothpaste

Empty plastic bottle
Dry yeast (found in the baking section of the grocery store)
Warm water
Liquid dish soap
3% hydrogen peroxide
Measuring cups
Measuring spoons
Large tub or tray to catch the foam
Liquid food coloring (optional)

1. Measure 1/2 cup of hydrogen peroxide, and carefully pour it 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 one tablespoon of yeast and three 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! What happens? How long does the reaction last?

EXTRA--Try the activity without the dish soap. What happens? How was the result different?
Try the activity with different-shaped containers. What happens if you use a bottle with a narrower or wider neck—or a cylindrical drinking glass with no neck?

What's Happening?

Elephant toothpaste is an illustration of an exothermic reaction, meaning that the reaction creates heat. As you make this, you can feel the warmth of the reaction and see it producing a puff of smoke right as the mixtures combine.

When hydrogen peroxide breaks down, it turns into oxygen (O₂) and water (H₂O). Normally this breakdown happens very slowly. But you can make that reaction happen faster! How? By adding a catalyst. Yeast is an organism that contains a special chemical called catalase that can act as a catalyst to help break down hydrogen peroxide. This means that if you mix yeast with hydrogen peroxide, the hydrogen peroxide will rapidly break down into water and oxygen gas. The oxygen gas forms bubbles. These bubbles would usually escape from the liquid and pop quickly. But adding a little dish soap provides additional surface tension, allowing the bubbles to get trapped and creating lots of foam. This foam looks like a giant squeeze of toothpaste—almost big enough for an elephant!



Thank You to the Rotary Club of Attleboro for sponsoring this project



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