

# DIY Elephant Toothpaste



## FUN FACT

Seaweed is in our toothpaste! Seaweed acts as a thickening agent that allows toothpaste to be squeezed from its tube!

## MATERIALS

- Yeast
- Dish soap
- Measuring spoons
- Empty plastic bottle
- Cup with warm water
- 3% Hydrogen peroxide

## DIFFICULTY



## CHEMICAL REACTIONS

Chemical reactions take place when the molecular or ionic structure of a substance is rearranged. When a chemical reaction occurs, a new substance is created and the process is irreversible. Today we will be making elephant toothpaste!

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**Why are chemists great at solving problems?**

\*Answer on the next page

## DIY Elephant Toothpaste

### EXPERIMENT

**Step 1:** Gather materials.

**Step 2:** Place 2 tablespoons of yeast into 3 oz of warm water.

**Step 3:** Mix yeast and warm water, let stand until it gets frothy (about 3 minutes).

**Step 4:** Pour 4 ounces of hydrogen peroxide into an empty bottle.

**Step 5:** Squirt 1 tablespoon of dish soap into the hydrogen peroxide.

**Step 6:** Pour your yeast mixture into the bottle.

**Step 7:** Observe what happens!

### WHY IT WORKS

"Elephant toothpaste" is created when a chemical reaction takes place and releases one oxygen atom from the hydrogen peroxide ( $H_2O_2$ ). Hydrogen peroxide decomposes, or breaks down, into water ( $H_2O$ ) and oxygen ( $O_2$ ) naturally over time, but the yeast causes this to occur faster. The yeast has an enzyme in it called catalase. Catalase is a catalyst, something that increases the speed of the reaction. The catalyst is what causes the oxygen to be released quickly to create our "elephant toothpaste." So why did we add soap? We wanted to capture all of the released oxygen (gas) from the chemical reaction!

### EXTEND YOUR LEARNING

- Would the experiment still work if you added more yeast?
- What happens if you don't add the soap?
- Does the shape or the size of the bottle change how the elephant toothpaste flows?

### WORKFORCE CONNECTION

Cosmetologists, people who study the application of beauty treatments, work carefully with chemical reactions on a daily basis to help color people's hair. When someone's hair is bleached, a chemical reaction takes place to change the melanin from brown to a colorless (pale yellow) color. This irreversible process (chemical change) then allows the cosmetologist to apply a new color to the hair.

