

Chemical Engineering is a discipline of engineering that deals with the application of chemistry, mathematics and physics to real world problems. They design equipment and find new ways to produce different chemically derived products. Many chemical engineers work in factories, refineries or plants to oversee the production processes. Chemical Engineers ensure everything works safely, efficiently and reliably.

You will find chemical engineers working in food production, energy, pharmaceuticals, consumer goods, and many other fields.

Today, you will make Elephant Toothpaste and learn a bit about the science that goes on behind the scenes for the experiment to be successful.

Elephant Toothpaste

Refer to the video link below the Procedure Section as well as the pictures in each step to get a better visual !

Materials Needed:

1. A clean 16-oz plastic soda bottle (or any similarly sized bottle)
2. 1/2 cup 3% hydrogen peroxide liquid
3. 1 Tablespoon (one packet) of dry yeast
4. 3 Tablespoons of warm water
5. Liquid dishwashing soap
6. Food coloring
7. Small cup
8. Safety goggles

* This reaction can get messy, so make sure you complete the experiment on a washable surface *

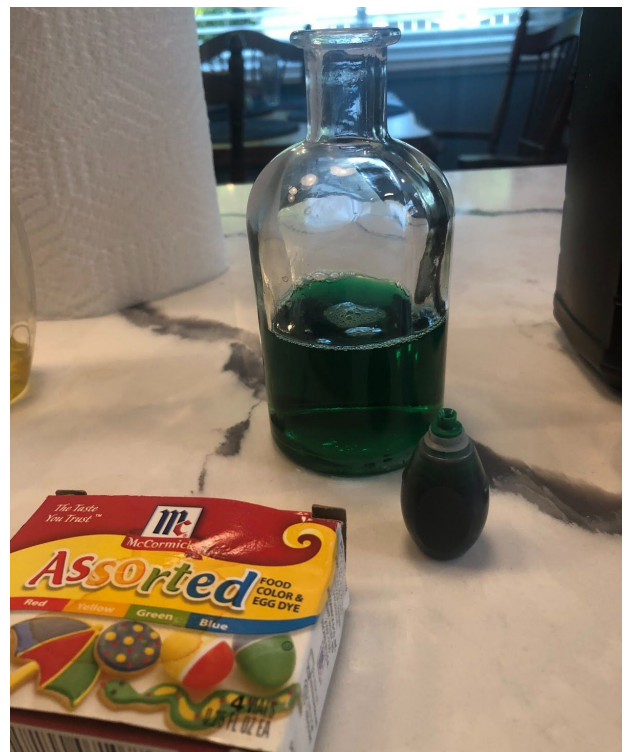


Procedure:

1. Carefully pour 1/2 cup of the hydrogen peroxide liquid into the bottle



2. Add 10 drops of your favorite food coloring into the bottle and swirl



3. Add about 1
tablespoon (15ml) of
liquid dish soap into
the bottle and swish
the bottle around a
bit to mix it



4. In a separate small cup, combine the warm
water and the yeast together and mix for
about 30 seconds. It should be about the
consistency of melted ice cream – add a bit
more warm water if needed



5. Now the adventure starts! Quickly pour the yeast-water mixture into the bottle and watch the foaminess begin!



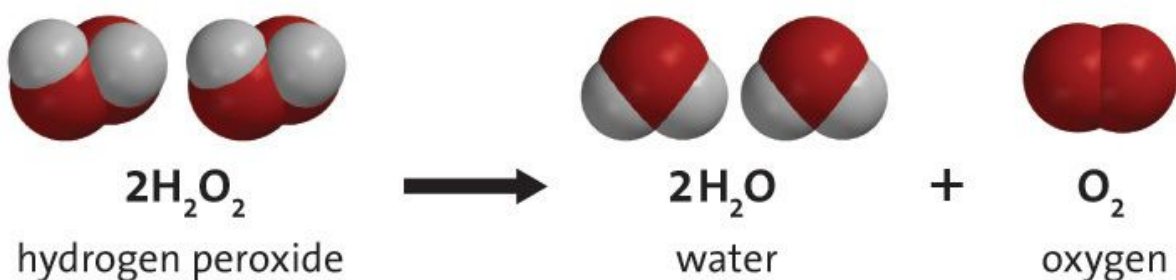
Video:

<https://www.youtube.com/watch?v=l3-hGx6PEMM>

Going Further:

1. What happens if you do not include dish soap?
How does the outcome change?
2. What happens if the bottle you use has a
larger or smaller opening?

The Science Behind the Reaction:



The yeast contains an enzyme called Catalase that breaks down hydrogen peroxide (H_2O_2) into oxygen gas and water. The oxygen gas gets trapped by the soap, and you get a large foamy solution that squirts out of the top of the bottle!

Elephant Toothpaste

Did you take any pictures? Send us pictures and videos of your experiments at swerutgersoutreach@gmail.com! Tag @rutgersswe on Instagram if you post about them and be sure to look out for November's SWE Learn Activity!