Producing Oxygen Gas
Grades K – 12

Introduction
In this chemistry activity, children can witness and feel a chemical reaction in their hands. It is the creation of oxygen gas from simple household materials.

CAUTION! HEALTH & SAFETY
Goggles are required. Materials are safe to pour down the drain.

Materials
- 1 plastic teaspoon
- dry yeast
- 5mL plastic pipette
- hydrogen peroxide
- zip-close bag
- food coloring

Preparation
1. Add hydrogen peroxide to three small cups.
2. Add drops of food coloring to the hydrogen peroxide in order to make a stock.
   Note: Hydrogen peroxide is photosensitive, meaning it degrades slowly with sun exposure. It is also sensitive to open. Only color the peroxide in small quantities in order to have a fresh preparation.

Procedure
1. Using a plastic spoon, add one teaspoon dry yeast into the zip-close bag.
2. Add 5 mL of colored hydrogen peroxide into the zip-close bag and seal quickly.
3. Observe the mixture and note any changes in texture and temperature.

Where’s the Chemistry?
Hydrogen peroxide (H_2O_2) is a reactive molecule that readily decomposes into water (H_2O) and oxygen gas (O_2):

\[ 2H_2O_2 \rightarrow 2H_2O + O_2(g) \]

In this demonstration, yeast catalyzes the decomposition so that it proceeds much more rapidly than normal, producing foam. Food coloring can color the film of the bubbles so that you get colored foam. Besides being a good example of a decomposition reaction and a catalyzed reaction, the reaction is also exothermic, so heat is produced and can be felt by the participants when holding the bag.