

GLOW STICKS

💡 BIG IDEA

Experiment with chemiluminescence, chemical reactions, and a variable by exposing glow sticks to different temperatures.

READY...

Gather materials:

- 2 cups (plastic, 9 oz.)
- 2 glow sticks
- water (warm and cold)

SET...

1. Get enough cold water to fill the “Cold” cup in Step 2.
2. An adult helper should heat enough water to fill the “Warm” cup in Step 3. (For safety, do not use boiling water.)

GO!

1. Label one cup “Warm,” and label the other cup “Cold.”
2. Pour cold water in your cup labeled “Cold.”
3. Ask an adult to add warm water to your cup labeled “Warm.”
4. Consider turning off the lights. This will allow the glow sticks’ light to be seen more clearly.
5. Activate the glow sticks by bending them until you hear a crack.
6. Place one glow stick in the “Warm” cup and one in the “Cold” cup, and then place the cups side by side for observation.
7. After 2-3 minutes, you should notice that the stick in the warm water is glowing much brighter than the one in the cold water. The stick in the cold water will barely appear to be glowing.



WHY IS THIS SCIENCE?

When a glow stick is bent or cracked, it will begin to glow. A chemical reaction occurs. During a chemical change, two chemicals react with each other to form a brand-new chemical. The glow stick has two substances—one inside the plastic case, the other inside a glass tube within the plastic case. When the stick is bent, the smaller glass tube breaks, allowing the two substances to mix and react—and causing the stick to glow. When light is produced from a chemical reaction, like this one, the light is called chemiluminescence.

A variable in an experiment is something that is different. Having just one variable helps the scientist identify the source of any changes in the experiment. In this glow stick experiment, the variable is the temperature of the water: one cup has cold water, and one cup has warm water. All the other elements in the experiment are the same.

[continued from front]

The stick in the warm water glows more brightly than the stick in the cold water. The reaction that causes the stick to glow is happening much faster in the hot water, which makes the glow appear brighter. The cold water is slowing down the reaction. This is the reason people sometimes put glow sticks in the freezer. Freezing the glow stick slows down the reaction until you warm it up again, and it extends how long the stick will glow.

WITH THANKS AND FOR MORE INFORMATION, VISIT:

This activity has been adapted from "Light Sticks—Liquid Light," *Steve Spangler Science* (<https://www.stevespanglerscience.com/lab/experiments/light-sticks-the-science-of-liquid-light/>).