Station Five: What Was Happening?

CHEMICAL ENERGY

Part One: Glow Sticks

What is in a glow stick?

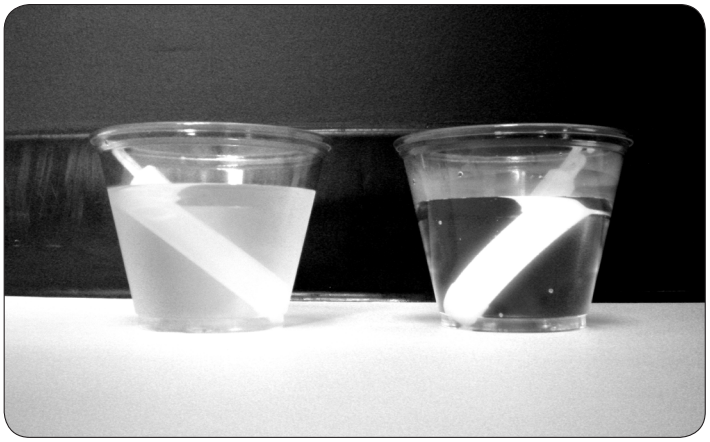
The glow sticks are filled with a chemical compound and a fluorescent dye. Inside the glow stick you can see a small container. This container contains a different compound called hydrogen peroxide. The two chemicals do not touch each other until the inside container is broken to let them mix.

What is chemical energy?

Chemical energy is the energy stored in the bonds between molecules. In the glow sticks there is a certain amount of energy used to keep the compounds together. When you break the inside container, the chemicals mix together to form new chemicals. These new chemicals use less energy to hold the compounds together. The remaining energy is released as light.

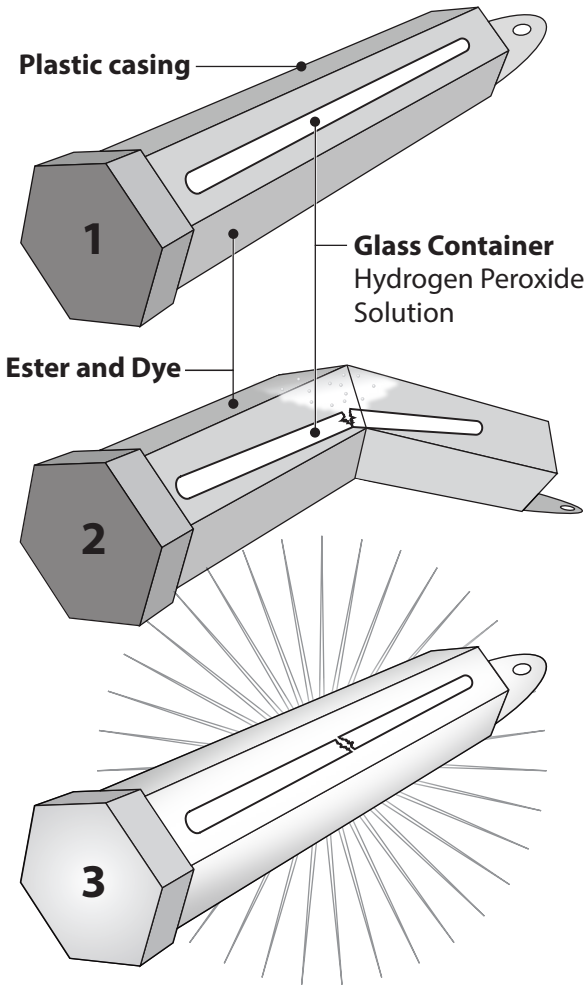
What energy transformations do we see?

The chemical energy transforms to radiant energy. We placed one glow stick in cold water. The cold water absorbed some of the heat energy from the glow stick, which slowed down the reaction. The glow stick then was not as bright. We placed one glow stick in hot water. The glow stick absorbed some of the heat energy from the hot water. The added energy made the chemicals react faster, producing more light.



The glow stick in the hot water (right) glows brighter than the glow stick in the cold water (left) because the higher temperature increases the speed of the chemical reaction.

How a Glow Stick Works



1. The glow stick is filled with a chemical compound called an ester and dye. Inside, a small glass container is filled with hydrogen peroxide.
2. When the glow stick is bent and the container is broken, the chemicals from the ampule and the glow stick mix, causing a chemical reaction.
3. During the chemical reaction, energy is released as light.