



**KEEP THE LIGHTS BURNING,
ABBIE**
by
Peter & Connie Roop

Abbie Burgess was able to keep the lights burning in the lighthouse for four weeks until the storm was over and her father was able to return to Matinicus Rock. What a monumental task for a young girl to manage, even for one day!

The lights Abbie kept burning produced light and heat. A Light stick produces light without the heat through the chemical reaction chemiluminescence. Using lightsticks, you will try to see what conditions keep your lightstick glowing or burning as long as possible.

MATERIALS: three 4 inch lightsticks, three glasses 3/4 full of hot, room temperature, and ice water.

ACTIVITY: Do this activity first thing in the morning; set up three glasses with the three temperatures of water. Ask the students to predict which stick will glow the longest. "Break" the three lightsticks and put them in the three glasses. Observe what happens during the day and record the results. The chemical reaction in the light stick is giving off energy in the form of only light. There is no heat energy. At first, which glass contains the brightest light? Which glass has the dimmest? Which glass seems the same? Which glass loses its light first?

SOURCE: ICE Activities Workshop 1990, University of Wisconsin/Madison. Lightsticks are available from Educational Innovations, Inc.

STANDARDS:

BSL: 1.1, 1.4, 1.9, 3.1, 4.7, 4.10, 8.2, 9.7, 11.4, 12.7

NCTM: 4d, 10a

SCS: A1, B1, B3, D1, E3

TEACHER NOTES: Since the light is a result of a chemical reaction, the temperature of the water has a direct affect on the brightness and the longevity of the light. The heat of the water will speed up the reaction, BUT cause the light to burn out more quickly. The ice water will slow the reaction down allowing the light to last longer. Children know that if they put their lightsticks in the freezer they last longer.

This chemiluminescence can be observed in fireflies that use their light during mating and need a "cool" light. Read Sam and the Firefly by P. D. Eastman.

This activity could be done inside a model lighthouse. Use a box from oatmeal cereal or a plastic container used to hold tennis ball. Cut windows in the cereal box and decorate accordingly. Since the tennis ball container is clear, cut holes in a piece of construction paper and tape inside the container. Put the three cups inside the three "lighthouses". The students will be able to observe which light goes out first! This idea was shared by Kay Nardone.

Roop, Connie and Peter. Keep the Lights Burning, Abbie. Carolrhoda Books, 1985, ISBN#0-87614-454-7

Source of Light Sticks: Educational Innovations, Inc.: 1-888-912-7474.
Online: www.teachersource.com