Electricity and Light

SciWorks™
The Science Center and Environmental Park of Forsyth County

4-9+

AFTER-VISIT ACTIVITY

Triboluminescent Candy Experiment

During the presentation of the atomic demonstration device at SciWorks, your students saw how light is emitted by an atom when an excited electron falls back to its ground level, or orbital.

This experiment demonstrates how pressure or friction can cause the electrons of certain atoms to move to a higher orbital, then produce light as they fall back to ground level. “Tribo” is from the Greek word *tribein*, or to rub. For a detailed explanation, check out the essay by Linda M. Sweeting, from the Department of Chemistry at Towson University: pages.towson.edu/ladon/wg/candywww.htm

Materials:

Opaque Wintergreen candy (WintOGreen Lifesavers work well)
Sugar cubes
A dark room
Mirrors

Steps:

1. Distribute a mirror, two or three lifesavers, and two sugar cubes to each student. Tell them not to eat any of the candy until the class is ready for the experiment.
2. Turn out the lights and give the students 5-10 minutes for their eyes to adapt to the darkness.

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Steps Continued:

3. Instruct the students to take their two sugar cubes and strike one against the other as if they are striking a match (you may need to demonstrate ahead of time). They should be able to see a blueish white glow.

4. Next, remind students that the wintergreen candy experiment should be done quickly, before the candy gets soggy. They can either look at each other or in a mirror. Have them place a piece of wintergreen candy between their teeth, keeping their mouth open, and bite down. They should see a blue light coming from their mouth.

As an option, students could try experimenting with other kinds of candy, as well as sugar-free candy. We know that the wintergreen candy works because the wintergreen (methyl salicylate) oil itself is fluorescent. As the essay by Linda Sweeting explains, the ultraviolet light produced by the breaking of the sugar molecules in the candy is absorbed by the wintergreen. This ultraviolet light, which we cannot see, excites the wintergreen electrons, and when they fall down, they emit light that is visible to humans.