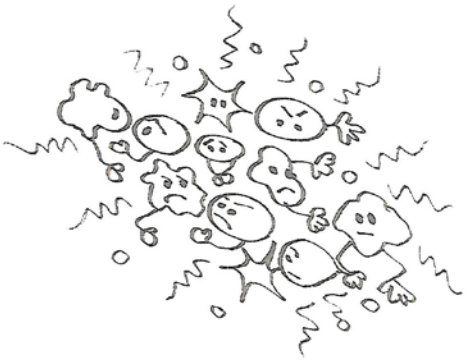
Making Lightning: In Your Mouth!



Activity: #4
Related Subject: Climate and Weather
Group Size: 10-15
Length of Activity: 10 minutes

Introduction
Review lightning:

Objective
Demonstrate that crunching on a wintergreen LifeSaver® creates a mini lightning storm in your mouth.

Overview
Through a hands-on demonstration, participants will see sparks of electricity and make a comparison to lightning.

Materials and Supplies
- Wintergreen LifeSaver®
- dark room
- mirror

Activity Description
- Give each participant a wintergreen candy
- Ask the children to go into a really dark room and stand in front of the mirror.
- Wait a few minutes until their eyes get accustomed to the darkness.
- Ask the participants to place the mint lifesaver in their mouth.
- While keeping their mouth open, ask them to break the candy with their teeth and look for sparks. If they do it right, they should see bluish flashes of light.

Discussion

- What did you see?
- Why does this happen? (When you break the lifesaver apart, you're breaking apart sugars inside the candy. The sugars release little electrical charges in the air. These charges attract the oppositely charged nitrogen in the air. When the two meet, they react in a tiny spark that you can see.)
- How does lightning form?
- When lightning forms, where is the positive charge? Where is the negative charge?
- Discuss lightning and thunderstorms.

What is lightning? Lightning is a bright flash of electricity produced by a thunderstorm. All thunderstorms produce lightning and are very dangerous. If you hear the sound of thunder, then you are in danger from lightning. Lightning kills and injures more people each year than hurricanes or tornadoes; between 75 to 100 people.

What causes lightning? Lightning is an electric current. Within a thundercloud many small bits of ice (frozen raindrops) bump into each other as they move around in the air. Those collisions create an electric charge. After a period of time, the whole cloud fills up with electrical charges. The positive charges, or protons, form at the top of the cloud and the negative charges, or electrons, form at the bottom of the cloud. Since opposites attract, that causes a positive charge to build up on the ground beneath the cloud. The ground's electrical charge concentrates around anything that sticks up, such as mountains, people, or single trees. The charge coming up from these points eventually connects with a charge reaching down from the thundercloud and lightning strikes!

Have you ever rubbed your feet across carpet and then touched a metal door handle? If so, then you know that you can get shocked! Lightning works in the same way.

Lightning Safety Tips

IF YOU'RE OUTDOORS: Keep an eye at the sky. Look for darkening skies, flashes of lightning, or increasing winds. Lightning often proceeds rain, so don't wait for the rain to begin. If you hear the sound of thunder, go to a safe place immediately. The best place to go is a sturdy building or a car, but make sure the windows in the car are shut. Avoid sheds, picnic areas, baseball dugouts and bleachers. If there is no shelter around you, stay away from trees. Crouch down in the open area, keeping twice as far away from a tree as far as it is tall. Put your feet together and place your hands over your ears to minimize hearing damage from thunder. If you're with a group of people stay about 15 feet from each other. Stay out of water, because it's a great conductor of electricity. Swimming, wading, snorkeling and scuba diving are not safe. Also, don't stand in puddles and avoid metal. Stay away from clotheslines, fences, and drop your backpacks because they often have metal on them. If you're playing an outdoor activity, wait at least 30 minutes after the last observed lightning strike or thunder.

IF YOU'RE INDOORS: Avoid water. It's a great conductor of electricity, so do not take a shower, wash your hands, wash dishes or do laundry. Do not use a corded telephone. Lightning may strike exterior phone lines. Do not use electric equipment like computers and appliances during a storm. Stay away from windows and doors and stay off porches.

IF SOMEONE IS STRUCK BY LIGHTNING: Call for help. Call 9-1-1 or send for help immediately. The injured person does not carry an electrical charge, so it is okay to touch them.

Source: www.weatherwizkids.com/lightning3.htm

More info:
http://www.srh.weather.gov/jetstream/lightning/lightning_intro.htm

National Science Education Standards:

NSES K-4:
- Science as Inquiry (4ASI)
  - Abilities necessary to do scientific inquiry (4ASI 1)
  - Understandings about scientific inquiry (4ASI 2)
- Physical Science (4BPS)
  - Light, heat, electricity, and magnetism (4BPS 3)
- Earth and Space Science (4DESS)
  - Changes in earth and sky (4DESS 3)

NSES 5-8:
- Science as Inquiry (8ASI)
  - Abilities necessary to do scientific inquiry (8ASI 1)
  - Understandings about scientific inquiry (8ASI 2)
- Physical Science (8BPS)
  - Transfer of energy (8BPS 3)
- Earth and Space Science (8DESS)
  - Structure of the earth system (8DESS 1)
- Science in Personal and Social Perspectives (8FSPSP)
  - Natural hazards (8FSPSP 3)

NSES 9-12:
- Science as Inquiry (12ASI)
  - Abilities necessary to do scientific inquiry (12ASI 1)
  - Understandings about scientific inquiry (12ASI 2)
- Physical Science (12BPS)
  - Motions and forces (12BPS 4)
- Earth and Space Science (12DESS)
  - Energy in the earth system (12DESS 1)
- Science in Personal and Social Perspectives (12FSPSP)
  - Natural and human-induced hazards (12FSPSP 5)