SUN UP, SUN DOWN

By

Gail Gibbons

We could not live without the sun, and yet it is important that we all understand the need to protect ourselves from the sun when we plan to spend a long period of time in it. This is especially true in the summer when we don't wear any outer clothing to protect us; it is too hot. The girl in the story says: "It is summer. Because it is hot, I don't need to wear a coat or sweater today. The sun is high in the sky, and the days are long."

Your students can do a simple sunscreen experiment and then reinforce what they have learned with the ultraviolet detecting beads. It is the ultraviolet part of sunlight that we are concerned about. You can use the beads to show students when the sun is strong. If the beads change color and they are going outside to play, they should put on sunscreen. It is important not to frighten them, just educate them.

MATERIALS: newspaper, scissors, quart Ziploc™ bags, staplers, several brands of sunscreen of different sun protection factors (SPF), permanent markers, UV detecting beads, white construction paper, pipe cleaners

ACTIVITY #1:

- Cut a strip of newspaper 5 cm by 15 cm; divide in thirds.
- Cover 1 /3 of newspaper at one end with a piece of white construction paper.
- Put strip of newspaper into Ziploc bag and staple it to hold it in place. Zip the bag up.
- On the OUTSIDE OF THE BAG, cover the other end of the newspaper with sunscreen. Be sure to write the type and SPF # of sunscreen used on the outside of the bag with a permanent marker. The middle of the strip will have no covering except the plastic bag.
- Put the bag outside in a sunny spot for 24-48 hours; use a rock to keep bag from blowing away.

- Record the changes observed on all three areas of the newspaper strip.

ACTIVITY #2. Make a "ring" with one UV bead and a small piece of pipe cleaner; wear out in the sun and observe what happens. What conclusions can you make'? When, where, and why do the UV beads change color?

SOURCE: Adapted from an activity of the Chlorine Chemistry Council. UV (ultraviolet) beads are available from www.teachersource.com. A package of assorted colors (#UV-AST)which contains 250 beads costs $6.95.

STANDARDS:
BSL: 1.1, 1.2, 1.3, 1.5, 1.8, 1.13, 3.3, 4.8, 4.11, 6.3, 8.3, 11.2, 11.4, 12.1, 12.5
NCTM: 4d
SCS: A1, A2, B1, B3, D2, F1, F4, H2

Gibbons, Gail. Sun Up, Sun Down. Harcourt Brace & Company, 1983, ISBN#0-15-282782-X.

Notes: Sun Up, Sun Down

Data Chart:

Sunscreen SPF	WHITE	UNCOVERED	SUNSCREEN
1-5			
6-10			
11-15			
16-20			
21-25			

1. Wear ring for three days and try to observe it under these conditions:

- Outside/sunny
- Outside/cloudy
- Inside by window/sunny
- Inside by window/cloudy
- In car windshield/sunny
- In car side window/sunny

2. Observe how long it takes to change color and how long it takes to change back.

3. My students did the original sunscreen experiment in the spring of 1995. I discovered the ultraviolet beads in the fall of 1995 when I returned to school. We had conducted the sunscreen experiment with the 4th-6th graders. We had the returning 5th-6th graders make rings, test them, and discuss their findings. More than 60% made the connection that the ring is an "indicator" of the presence of ultraviolet rays. I will do the sunscreen experiment this spring with my fourth graders. When they made their rings in September, they were studying materials like the Touch-It™ and Goldenrod papers that change color.

4. I had shown them the segment in the "WILD WEST" program from the *Scientific American Frontiers* Series in which scorpions in the California desert can be located and studied during nighttime hours because they glow in the presence of ultraviolet light.

Sunscreen Experiment
Name:
Date:

When the New England Energy show came to our school last week, we learned about the some of the sun's benefits. With the sun, we can produce electricity, heat water, and turn windmills. The sun, however can also be harmful to us. Since the depletion of the ozone layer, more of the ultraviolet light from the sun reaches earth. This has resulted in an increase in the instances of skin cancer.

In this activity, we will learn about the protection that is available for our skin. We will test sunscreens with different SPFs (sun protection factors).

Problem or purpose: To test different sunscreens and discover more about SPF.

Materials:
newspaper
white construction paper
plastic bags
sunscreens of different SPFs

Procedure:
1) Take the pieces of newspaper and staple a piece of white construction paper over one end of the newspaper strip. Place in a plastic resealable bag. Close the bags and put a staple through the construction paper and the bag to prevent slippage.
2) Apply a layer of sunscreen to the outside of the plastic bag, directly over the opposite end of the newspaper strip. Leave the middle section untreated. Each group will test a different SPF value. Allow the bag to remain in the sun for a few hours. Record your results.