

Fun in the Sun

Integration: Health (Personal Health, Safety and First Aid); Science; Language Arts;
Art

Grade Levels: 2-3

Time: 2-3 class periods

Materials:

- diagram of the structure of skin
- bottle or tube of sunscreen
- drawing materials (paper, crayons, markers, etc.) or computer software to make a brochure
- sunglasses
- sunburn remedies (optional)
- flashlight (optional)
- mirror (optional)

Objectives:

Students will:

1. Understand the function of skin.
2. Describe why sunburn occurs.
3. Relate the risk of sunburn for Antarctic explorers.
4. Demonstrate knowledge of the ways to protect themselves from sunburn.

Lesson:

Full Group

1. Ask students to look at the skin on the backs of their hands and their arms.
2. Introduce students to the structure of skin. The skin is made up of two main layers, the epidermis and the dermis. Beneath these layers, a layer of fat, the subcutaneous layer, holds the skin in place, insulates, and provides a cushion.
 - a. Epidermis
The outermost layer of skin. It is the layer you see when you look at it.
Special cells in the epidermis produce the brown substance called melanin.
Melanin gives skin its color. The more melanin in the skin, the darker it is.
 - b. Dermis
The inner layer of skin that lies beneath the epidermis
The dermis contains blood vessels, nerves, and glands that produce sweat and oils.

3. In small groups, ask students to brainstorm some of the functions of skin.
 - a. Protection of internal organs
 - b. Barrier from the outside world.
 - c. Keeps your insides in.
 - d. Protection from infection from bacteria and viruses and other things that can cause disease.
 - e. Helps the body sense the outside environment (hot, cold, pain, rough, smooth, etc.).
 - f. Helps the body maintain temperature.
 - g. Prevents body fluids from evaporating and the body from drying out.
4. Have students share their responses with the other groups.
5. Ask students to suggest some reasons why the skin may not do its jobs properly (cuts, scratches, burns).
6. Reaffirm that if skin becomes burned, specifically sunburned, it will not perform its functions as efficiently. This can lead to other complications such as infections.
7. Write “ultraviolet (UV) rays” on the board. Lead a discussion about sun exposure and the mechanism of sunburn.
 - a. The harmful rays of the sun are called ultraviolet (UV) rays. They are not visible to humans.
 - b. UV rays can damage skin by causing wrinkling, aging, and skin cancer.
 - c. When skin is exposed to the sun, the UV rays react with the melanin in our skin. Melanin is a chemical that gives our skin color. People with darker skin have a higher concentration of melanin in their skin; people with fairer skin have less melanin. Melanin protects skin from the harmful UV rays by absorbing them before they do damage. The more melanin in the skin, the greater the protection from the sun.
 - d. When melanin is exposed to UV rays it increases and the skin tans. When the amount of sun exposure is greater than the melanin can protect against, the skin burns.

All skin, no matter what the concentration of melanin, can burn.
 - e. After prolonged exposure, the skin turns red and eventually peels off. If the sunburn is severe, there may be pain, swelling, and blistering.
8. Ask students for examples of places where and times when sun exposure is strongest.
 - a. Places

Places closer to the equator receive the strongest rays of the sun.
Places in higher altitudes are exposed to stronger sunrays because the cloud cover and the atmosphere, which absorb the rays, are thinner. More UV light is allowed through.
Places near water or snow/ice. UV rays reflect off of water and snow/ice.

- b. Times (of year and of day)
 - UV rays are strongest during summer months.
 - UV rays are strongest when the sun is directly overhead. This is normally from in the morning until three in the afternoon (in the Northern Hemisphere).
9. Inform students that it is possible to get sunburned even if it is cloudy or cool outside.
 - a. UV rays can pass through clouds.
10. Ask students if they think that Antarctic explorers like Ann Bancroft and Liv Arnesen have to be concerned about sun exposure. (yes, they are very concerned)
11. Ask why the explorers need to be careful about sun exposure.
 - a. Summer in Antarctica means 24 hours of sunlight.
 - b. The ice on Antarctica reflects the sun's rays.
 - The explorers will become very dark quickly.
 - The sunlight bounces off of the ice. They are exposed to the rays that hit them directly as well as the rays that are reflected.
 - Optional:** Demonstrate the reflection of sunlight by shining a flashlight on a mirror that is resting on a table. Point out the light that reflects off the mirror and hits the ceiling.
 - They have to protect their eyes from the sun's rays, too. It is possible to burn your eyes in 20 minutes in Antarctica. This snow blindness is very painful and requires that they stay in one place for a number of days.
12. Ask students for suggestions of how Antarctic explorers protect themselves from too much sun exposure.
 - a. They keep their bodies covered, including their faces when possible.
 - b. They wear dark goggles called "glacier goggles" to protect their eyes.
 - c. They wear sunscreen.
13. Divide students into small groups and instruct them to brainstorm ways they prevent sunburn.
 - a. Avoid prolonged sun exposure.
 - b. Avoid sun exposure when the rays are the strongest.
 - c. Cover exposed parts of the body.
 - d. Wear sunscreen.
 - e. Wear protective eyewear.
 - Sun exposure can damage eyes. The best way to protect against damage is to wear sunglasses that block UV rays from passing through.
 - Another way to protect the eyes and face from the sun is by wearing a hat.
14. Initiate a discussion of sunscreen basics. Have students examine a bottle of sunscreen. Ask students what sunscreen is and what it does.
 - a. Sunscreen is a mixture of chemicals that block ultraviolet light.

15. Ask students if they know what SPF stand for and what number they should be looking for when their family buys sunscreen.
 - a. Sunscreen is rated by Sun Protection Factor, or SPF. SPF is how much longer you can stay in the sun without burning if you apply sunscreen compared to being exposed without the sunscreen.

Example: If you burn after being exposed to the sun for 30 minutes, applying a sunscreen with an SPF of 15 gives 15 times the protection. Therefore, in theory, you can expect to be protected from sunburn for 450 minutes or 7 _ hours.

However, sunscreen does not last this long. It should be reapplied every two hours.
 - b. Tell students that the higher the SPF number, the more protection they are getting.
 - c. The American Academy of Dermatology, an association of doctors that treat skin problems, recommends that children wear sunscreen with an SPF of 15 or higher.
16. Inform students that sunscreen has to be worn properly for it to work properly.
 - a. Write the steps for using sunscreen properly on the board and discuss.

Wear sunscreen every time you will be exposed to the sun.
Apply sunscreen 30 minutes before going out into the sun to give the sunscreen time to form a protective layer.
Do not be stingy—Apply sunscreen generously.
Reapply sunscreen every two hours or less. Always reapply if you sweat or go swimming.
17. Emphasize that people should cover up, wear sunscreen and sunglasses or a hat.
18. Tell students that some people are allergic to some of the ingredients in sunscreen. They sometimes use zinc oxide, another type of lotion or cream, as a way to protect themselves from the harmful sunrays.
19. Remind students that even wearing sunscreen does not totally protect skin from sunburn. Ask for suggestions of remedies, especially multicultural/family remedies for treating sunburn. Display products for relieving sunburn (optional).
 - a. Take a cool (not cold) bath or apply cool compresses to alleviate pain and heat.
 - b. Use a moisturizing cream to reduce swelling and to re-hydrate (add moisture to) the skin.

Do not use petroleum-based products (greasy). They prevent heat and sweat from escaping from the body.
 - c. Stay out of the sun until it heals.
 - d. Call a doctor if the sunburn is so severe that blisters appear.
 - e. Do not peel or scratch loose, sunburned skin. Peeling makes the skin underneath vulnerable to infection.

Small groups or partners

20. In small groups, students should design a health brochure that contains information about either:

a. The danger of sun exposure and how to prevent a sunburn

OR

b. How to treat a sunburn.

EXTENSION: Have a dermatologist come to talk to the class about protecting their skin.

Assessment:

Teachers will assess:

1. Student's understanding of the function of skin.
2. Student's ability to explain the mechanism of sunburn, its danger, and steps to prevention.
3. Student's ability to describe the risk of sunburn in Antarctica and the precautions that explorers take.
4. Student's synthesis of information.
5. Student's ability to work cooperatively.