

Grade 5

Health Objective 2.05

Evaluate environments (time of day, level of shade/cover, geographic location) and/or activities that might expose someone to harmful rays of the sun and create actions that can be taken to avoid sun damage.

Language Arts 3.06

Conduct research (with assistance) from a variety of sources for assigned or self-selected projects (e.g., print and non-print texts, artifacts, people, libraries, databases, computer networks).

Materials Needed:

SPF 25 Sunscreen

Tonic Water

Black construction paper

Flashlight

Weather (for one consecutive week) including temperature, and UV index from the media

Appendix 1 - UV Index Chart

Appendix 2 - City Temperature Study

Appendix 3 - Expose: UV Ray

Appendix 4 - Sun Certified Quiz

[For these and additional resources for sun safety/skin cancer prevention visit:
www.sunsafetyalliance.org]

Focus:

Ask students what they know about the sun and how it can affect their health. Record these responses.

Fill one clear plastic cup with tonic water. Put the cup in direct, overhead sunlight and hold black paper behind it. Have students describe what they see. (The tonic water should have a blue glow at the surface.) Explain that a special ingredient in tonic water (quinine) glows in UV light. Spread a thin coating of sunscreen on a clear overhead transparency sheet. Place the coated sheet between the sun and the cup. What happens? (The sheet should absorb some UV rays and decrease the glow effect.) Have students predict: Would a lower sun position affect your results? Have students repeat the experiment to find out. (Less UV should decrease the glow.) Try the experiment again with plain water to show how UV rays are invisible.

Teacher Input:

Introduce the concept of solar noon. The earth's exposure to UV rays increases between 10 A.M. and 4 p.m. It peaks every day between 11a.m. and 1p.m. (solar noon) At this time, the travel path for UV waves is short and direct, and it is less hindered by the air molecules and particles that normally scatter UV radiation at lower angles. Use a flashlight to represent the sun's rays, and shine it at a medium size object to make long and short shadows.

Ultraviolet radiation (UV) which is found in sunlight is an invisible form of energy that travels through air and objects. There are three types of UV rays: UVA, UVB and UVC. UVA rays, while less powerful than UVB, penetrate deeply into the skin and contribute to skin aging and wrinkling. UVB penetrates deeply into the skin and is the most dangerous, causing sunburns

and skin cancer. Lethal UVC rays are completely absorbed by the ozone layer and do not reach earth. Most sunscreens contain molecules that absorb UV rays. However, some sunscreens contain zinc oxide or titanium dioxide that deflect, scatter and absorb UV rays to protect the body.

During the Solar Noon concept explain that when the sun is low in the sky (early morning or evening) shadows will be longer. Point out that while you should always protect your skin, it is especially important when the sun is high. In pairs, have students measure each other's shadows from head to toe. Repeat several times over the course of a day, charting times and measurements. Ask: *when are your shadows the shortest?* (This is solar noon.) *How does the sun's angle affect shadow length?*

Ask students: *Can you see UV rays? Do UV rays shine only in summer? What can help stop a UV ray? (A solid barrier such as clothing or sunscreen.) What makes these things less effective? (If clothing is wet or has holes; if sunscreen isn't applied liberally; or if sunscreen is rubbed or washed off.)* (www.sunsafetyalliance.org)

Practice & Assessment:

Activity 1

Tracking UV chart (1-2 week long research project)

Photocopy several weather forecasts from a newspaper or internet source to review with students.

Explain a forecast and what the UV index measures. Then create a classroom weather board (based on the chart below) where you post daily high and low temperature, weather conditions, and the UV index.

Greensboro	Monday	Tuesday	Wednesday	Thursday	Friday
High Temperature					
Weather (sunny, cloudy, rainy)					
UV Index					

- Explain the UV index by using a chart similar to Appendix 4: UV index Chart. Ask: *what numbers show a high UV index? What should you do when there is a UV index of 2? (Wear sunglasses, hat, and sunscreen.) What UV index numbers indicate you could burn in 30 minutes? (5-6)*
- Check the newspaper, weather channel or the internet (www.coppertone.com has this information) and click on the UV Index tab to search for any city's UV index. As a class, study a city for two weeks. Create a weather board based on the chart to track the weather in your selected city.
- Designate a daily time for students to gather data for the weather board using the internet, newspapers, and/or television.
- Assist students in noticing patterns and drawing conclusions from their data.

- Have students draft an essay based on the information collected which makes a case for sun prevention policies.

Activity 2: UV Ray Expose

- As a class, read UV Ray Expose interview aloud. Write down and define difficult words or concepts.
- Have students write their own questions for UV Ray on the lines provided
- Have students trade pages with a partner. Challenge them to find the answer to their partner's question using print or online resources-assign this task as homework. Have students list the resources that they used to answer the question.
- Have students read the question and their answers aloud.

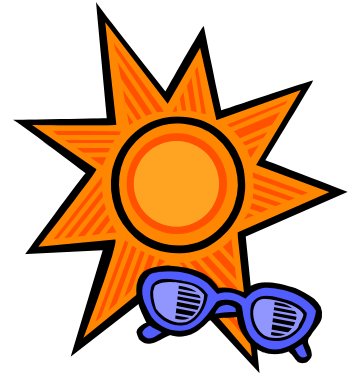
Distribute Appendix 3: Sun Certified Quiz to assess student comprehension.

UV Index Chart

UV Index	1-2 Very Low	3-4 Low	5-6 Medium	7-9 High	10+ Very High
					Try to stay inside
How to					Stay in shade
	Wear a hat	Wear a hat	Wear a hat	Wear a hat	Wear a hat
Protect yourself	Use Sunscreen	Use Sunscreen	Use Sunscreen	Use Sunscreen	Use Sunscreen
	Wear Sunglasses	Wear Sunglasses	Wear sunglasses	Wear sunglasses	Wear sunglasses
Minutes to burn based on fair skin	60	45	30	15-24	10

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City Temperature Study



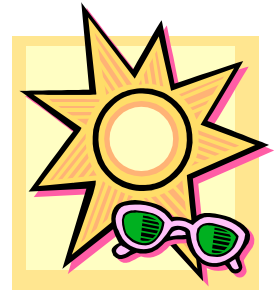
1. Choose a U.S. city. Use an encyclopedia or the internet to find the city's elevation (height above sea level).
2. My City: _____
3. My city's elevation: _____ feet above sea level.
4. Look at a weather report for your city every day. Record your city's high temperature, weather, and UV index for two weeks.
5. Look over your data. Does temperature seem to change the UV index? _____ How do you know? _____
6. Do clouds or rain seem to change the UV index? _____ How do you know? _____
7. Compare your chart with a classmate's. Which city has a higher elevation? _____ Which city has a higher UV index? _____
8. Does elevation affect the UV index? _____ How do you know? _____

On the back of this page, write a sun-safety alert for your city. Tell people in your city what weather to expect for the next week. Describe what they can do to protect themselves from the sun. Warn them how long it will take to burn if they don't follow your advice!

www.sunsafetyalliance.org

Sun Certified Quiz

Sun safety quiz



1. It's a cloudy day—but you still have soccer practice. Should you skip the sunscreen?
 - a. No. clouds can't stop all of the sun's burning rays
 - b. Yes. Clouds are natural sun blockers!
 - c. What's sunscreen?
2. Years of summer suntans mean:
 - a. A job as a pro bodybuilder.
 - b. A future of wrinkles, age spots, and alligator hide! Yuck
 - c. A few moles later in life.
3. Your mom wants to put some SPF 30 sunscreen on you. You say:
 - a. "No thanks, Mom!"
 - b. "Thanks, Mom! Now I don't have to worry for the rest of the day!"
 - c. "Thanks, Mom! Keep that close so we can reapply it later!"
4. One bad sunburn with blisters:
 - a. Is just a pain!
 - b. Can double your risk of certain types of skin cancer later in life.
 - c. Is the quickest way to tan!
5. You'll be spending the day at the park! What will you wear to protect yourself?
 - a. A wide-brimmed hat, sunglasses, and sunscreen
 - b. Sunglasses
 - c. In-line skates
6. You want to be at the movies during solar noon to get away from the sun's burning rays. What time is solar noon?
 - a. Between 4 and 5 P.M.
 - b. Between 9 and 10 A.M.
 - c. Between 11 A.M. and 1 P.M.
7. When you go to the beach, bring a sunscreen that:
 - a. Deflects, scatters, and absorbs UV rays
 - b. Has SPF 4.
 - c. Magnifies UV rays.
8. You want to shoot hoops with your friend, but the UV index is very high (level 10 or higher). What should you bring?
 - a. SPF 30 sunscreen
 - b. SPF 4 sunscreen
 - c. SPF 45 sunscreen, a hat, and sunglasses