



Sun Safe in the Middle School Years

HEALTH EDUCATION MANUAL



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Project Background

SunSafe in the Middle School Years is designed to improve sun protection behaviors of middle school students (10- to 13-year-olds). Originally developed in 2000, SunSafe in the Middle School Years was developed and tested using funding provided by the National Cancer Institute, and the project was directed by Ardis Olson, M.D. At the time, the project worked with schools, coaches, town recreation programs, parents, and health care providers in 10 communities throughout Vermont and New Hampshire.

This multi-component intervention demonstrates that community members can serve as role models and educators to change youth sun protection actions and thus reduce skin cancer risks. Findings from the original study includeⁱ:

- Youth in the intervention communities were more likely to use sunscreen and to apply it more thoroughly than those in the control communities.
- Youth in the intervention communities reported receiving sun protection advice from more adults than those in the control communities.
- Youth in the intervention communities protected more of their body from the sun than those in the control communities.

Why Middle School Students?

Middle school is an important time to work with youth. During this age, youth are making more independent health behavior choices but are still willing to listen to adults' advice, and they are still influenced by the role modeling of parents, teachers, and coaches.

- 80% of lifetime sun exposure occurs before age 18.ⁱⁱ Only 35% of middle school students protect themselves from sun damage.
- In 2019, 66% of VT middle school students reported having at least one sunburn in the past 12 months. The percent of students who had sunburns increased with each grade level.ⁱⁱⁱ
- One or more blistering sunburns in childhood or adolescence doubles the risk of developing melanoma later in life.^{iv}
- 84% of middle school youth understand protecting themselves from sun damage can prevent skin cancer. However, less than one third (29%) use sunscreen and only 7% wear a hat (data from baseline of study – unpublished).

Why Schools?

- Adolescents spend most of their time at school and in school-sponsored activities.
- Physical education classes, outings, and sports sponsored by schools are conducted outdoors, exposing youth to UV radiation.
- Health, science, and other curriculum offers opportunities to educate adolescents about harm from UV radiation and skin cancer.
- Teachers and school personnel also need protection from UV radiation while participating in school-sponsored events or classes, making a perfect opportunity for the students to learn by observing their teachers practicing sun safe behaviors.
- Students, teachers, and staff can all benefit from schools following the seven recommendations provided by the CDC to prevent skin cancer.

Guidelines for School Programs to Prevent Skin Cancer

The CDC developed the following seven recommendations for school programs to follow to prevent skin cancer:

1. Establish policies that reduce exposure of students and staff to UV radiation.
2. Provide an environment that supports sun safety practices.
3. Provide health education to teach students the knowledge, attitudes, and behavioral skills they need to prevent skin cancer.
4. Involve family members in skin cancer prevention efforts.
5. Include skin cancer prevention with professional development of staff.
6. Complement and support skin cancer prevention with school health services.
7. Periodically evaluate whether schools are implementing skin cancer prevention guidelines.

These recommendations were first published in 2002 by the National Center for Chronic Disease Prevention and Health Promotion, the report can be read in its entirety at <http://www.cdc.gov/mmwr/preview/mmwrhtml/rr5104a1.htm>.

The summary of these recommendations can be found on the following CDC website: www.cdc.gov/cancer/skin/what_cdc_is_doing/guidelines.htm.

Health Education Module: Sun Safety for Teens

Aims and Objectives

1. To provide health education to students on how to prevent skin cancer as recommended by CDC guidelines. This is accomplished through enhancing knowledge about sun safe behaviors and ultimately, changing youth's attitudes and behaviors to protect their skin.
2. To engage students in critical thinking and decision-making in the active creation of their own knowledge and attitudes.
3. To make learning useful and authentic by providing real-life images.

Presentation

This module includes 27 PowerPoint slides in the presentation: *The Sun: Friend or Foe?* The slides are meant to provide a broad range of facts about UV rays. Some text is on slides as they are projected to engage the audience. Additional dialogue should accompany each slide as it is presented. The presentation should take about 20 minutes.

What is in this Manual?

- The slides from *The Sun: Friend or Foe?* are outlined.
- Discussion points, dialogue, and additional information for each slide are provided. Please use the information that will best resonate with your students.
- Additional information on the history of tanning. Please use this information as it best suits the needs of your students. This can be read by students, you can take excerpts and share with students, or have a discussion of the history of tanning and how it has led to where we are now, with regulations to protect youth from indoor tanning.

Slides	Additional Information to Discuss
1	Introduce the topic of sun safety.
2	<p>Audience can be asked if they learned about UV rays in science.</p> <p>Use slides 3-5 to describe UVA and B.</p>
3-5	<p>What Causes Sunburn and Skin Damage?</p> <p>There are two kinds of ultraviolet rays that reach the earth's surface: ultraviolet A (UVA) and ultraviolet B (UVB). UVB rays cause your skin to show signs of sunburn, but most sunscreens protect against them. These rays also are partially screened out by the ozone layer, an invisible shield that protects us from the sun. But over the years the ozone layer has become thinner, so we're getting more exposure.</p> <p>UVA rays don't burn your skin, but they do contribute the most damage. They penetrate your skin more deeply and affect the cells on a molecular level. That's why it's important to look for sunscreen that will protect you from both UVA and UVB rays. UVA damage results not only in wrinkles and sagging skin, but also can cause skin cancer. And UVA intensifies with altitude, so it's particularly important to protect yourself when skiing or mountain climbing.</p>
6 - 12	<p>The biggest danger of sun tanning is the risk of skin cancer. Another long-term hazard is wrinkles, which are caused by the sun destroying the collagen in the skin. A suntan ages the skin and there's nothing you can do to reverse it. Instead, protect your skin from excessive UV light. Save your skin now and it will look good for life.</p> <p>Although popular images in the media (even Barbie) may make it seem that tan skin is desirable, most of the bronze models and stars are using makeup and sunless tanners to achieve that look. It is not worth harming oneself for a current fashion trend. In time, tanning will hurt a person's looks with wrinkles and other problems.</p> <p>Historically, it was a sign of status to be pale, and in other parts of the world such as Asia and Africa, people want their skin to be lighter and do the opposite of tanning. They are bleaching their skin and causing harm by trying to look lighter. Lesson: the most beautiful and healthy color for us is our natural one.</p>

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Scientific data confirms that excessive exposure to the sun without the proper precautions can cause harm. In other words, exposure to the sun includes risk. Any choice we make that includes risk also includes specific ways to minimize such risk. The same holds true for UV exposure, whether from the direct sun or from indoor tanning technology. The sun weakens the skin's elasticity and can also cause dark patches and scaly gray growths, keratoses, which are often precancerous. Almost all of the more than 500,000 skin cancer cases developed annually in the U.S. are considered by the American Cancer Society to be sun related. Fortunately, if treated in time, the two most common forms of skin cancer, basal and squamous cell carcinoma are curable.

The risk factors for skin cancer:

- Heredity and excessive exposure (overexposure) to UV radiation (an adult who has had one severe sunburn as a child or adolescent has double the chance of developing melanoma).
- Fair skinned, skin type one, notably persons with red or blond hair, are at highest risk.
- Occupational exposure to coal tar, pitch, creosote, arsenic compounds, or radium.

The signs of skin cancer:

- A skin growth that increases in size and appears pearly, translucent, tan, brown, black, or multicolored.
- A mole, birthmark, or beauty mark that changes color, increases in size or thickness, changes in texture and is irregular in outline.
- A spot or growth that continues to itch, hurt, crust, scab, erode, or bleed.
- An open sore or wound on the skin that does not heal or persists for more than four weeks or heals and then reopens.

If you think you may have any of these signs or symptoms, please consult a physician!

14	<p>The ABCDs of skin cancer detection (self-examination of moles, freckles, and beauty marks):</p> <ul style="list-style-type: none"> • A -Asymmetry: common moles are round and symmetrical; early malignant melanomas are asymmetrical (a line drawn through the middle will not create matching halves) • B -Border: common moles have smooth, even borders; early malignant melanomas often have scalloped or notched (irregular) borders • C -Color: common moles usually have a single shade of brown; different shades of brown or black are often the first sign of a malignant melanoma • D -Diameter: common moles are usually the size of a pencil eraser (1/4") or smaller; early melanomas tend to be larger. <p>Melanoma, which makes up only 5% of all skin cancers, can be fatal.</p>
15	<p>Use the slide to point out this man is quite young. Also mention that former Boston Red Sox pitcher Derek Lowe had major surgery on his nose to remove skin cancer. He of course still spends a lot of time out in the sun but calls himself the sunscreen king.</p>
16	<p>If a person ever has a question or concern about something on the skin, check with your doctor and a dermatologist.</p>

17 - 18

The color of your skin is determined by the amount of melanin it contains. This substance called melanin protects the skin from the sun's ultraviolet rays. A tan is visible proof that your skin is being damaged. When the ultraviolet radiation of the sun hits your skin, it stimulates cells known as melanocytes, which make the brown pigment called melanin. The melanocytes respond to the sun by making even more melanin to protect your skin from the sun. The melanin acts sort of like a barrier for the skin's cells and can give people the brown tint that is a suntan. We can't possibly tell you that getting a tan is safe when it is not. Here are some examples of skin colors:

Fair skin

If you have fair skin, your hair is light-colored or red, your skin is fair, and it is always hard for you to tan. (Sometimes freckled.) You tend to burn easily and quickly.

Olive skin

Your skin, hair and eyes are all brown or dark brown. You can tan quickly without burning.

Black skin

Your skin, hair and eyes are very dark, and you don't burn easily. Black skin can burn in strong sunlight.

Knowing your skin type will help you decide how long you can expose yourself to the sun without burning. If you have dark skin, you will be able to stay out longer than someone with pale skin, and you will burn less easily. ***However, everyone needs to protect their skin from excessive UV rays.***

Melanin can only protect your skin so much. If you continue to be exposed to the sun, the UV radiation can eventually damage your skin. That damage shows up on fair-skinned and olive-skinned people as brown age spots, freckled skin, skin cancer, sagging skin that looks older than it is, WRINKLES!!!, AND MORE WRINKLES and brown age spots too!

19	<p>Researchers have been studying the long-term effects of sunlight on the human eye. Several studies have shown a relationship between eyes that are unprotected from the sun's rays and conditions of the eyes such as cataracts (the clouding of the focusing lens inside the eye) and macular degeneration (results in a permanent loss of central vision). You may have a grandparent with either of these.</p> <p>Cataracts, the leading cause of blindness in the world, can be caused by UV-A and UV-B rays. According to the "Vision Problems in the U.S." report by Prevent Blindness America, there are over 20 million people in America alone that suffer from the disease. UV-A penetrates deep into the eye and may injure the macula, the part of the retina responsible for sight in the center of the field of vision. UV-B is mainly absorbed by the cornea and lens of the eye and can damage these tissues. Photokeratitis, or "corneal sunburn," is a result of intense exposure to UV-B. The condition is extremely painful, and sufferers can experience vision loss for 1-2 days. "UV rays are harmful to everyone," said Daniel Garrett, senior vice president of Prevent Blindness America. "Adults, children, men, women, no matter what your background, you are susceptible to eye damage from the sun if you don't take the necessary precautions."</p> <p>Fortunately, effective eye protection is as simple as two easy steps. Wearing both a wide-brimmed hat or cap and the proper UV-rated sunglasses are all it takes to ward off the damaging effects.</p> <p>Sunglasses should block out 99-100 percent of both UV-A and UV-B radiation, and don't have to be expensive to be effective. Consumers need to remember when purchasing sunglasses that just because the lenses may be tinted, it does not guarantee that they will block out UV radiation. Wraparound sunglasses are ideal.</p>
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20 - 25	<p>Have fun outside but protect yourself.</p> <p>Mention the various methods of UV protection: hats, cover-up clothing, sunglasses, shade, sunscreen. There are many different sunscreen formulas available now. Everyone could find one they liked using.</p> <p>Use broad-spectrum, water-resistant sunscreens with SPF 30+. Broad-spectrum sunscreen means that it blocks both UVA and UVB rays of the sun.</p> <p>Sunscreen should be applied at least 15 minutes before going out as it takes a while to bond with the skin and start working.</p> <p>If you are going to be outside for a while, reapply sunscreen at least every 2 hours and after swimming or sweating. The ingredients wear out after 2 hours. Use sunscreen with SPF 30+.</p>
26 - 27	<p>Closing slides. The sun's rays are necessary for life on earth, but we also need to protect ourselves from too much UV exposure. We should go outside and have fun but be SunSafe while we are out.</p>

Download SunSafe in the Middle School Years resources:
<https://cancer.dartmouth.edu/cancer-community/resources>

Additional Information on the History of Tanning

It was over 400 years ago that Copernicus declared that the sun was the center of our universe. Throughout history, humans have had a special relationship with the sun. Primitive societies in every continent have worshiped the sun as the god that provided warmth and made the crops grow.

There are many examples, throughout history (and the history of tanning), of societies who **valued pale skin**. The Romans and Greeks, for example, used lead paints and chinks to whiten their skin, often with disastrous long-term effects like lead poisoning.

Arsenic was another favorite skin whitener, further demonstrating that people throughout history have shown poor judgment!

By the mid-10th century, arsenic became the preferred skin whitener, once again with sometimes deadly results. Other methods of making the skin white were less poisonous -- during the reign of Queen Elizabeth, women painted thin blue lines on their foreheads to give their skin a translucent look, and carried parasols or wore masks whenever they ventured outdoors.

These fashion trends found their way to America, where no Southern belle or Northern society debutante dare go out in the sun without her parasol to protect her delicate pallor. It wasn't until the 20th century that society began accepting bronzed skin.

For many years, people have associated a deep bronze tan with health and beauty, but this was not always the case.

The beginning of the history of tanning is quite interesting...

Tanning came into vogue by accident. In 1923 French designer, Coco Chanel was seen leaving a nobleman's yacht with a deep suntan after cruising from Paris to Cannes. Although she later claimed to have stayed out in the sun too long, her tan soon set a fashion trend. The looser clothes, which became fashionable during the "Jazz Age", meant that women were freed from clothes that covered all their skin, which naturally led to more tanning.

Further into the history of tanning we discover...

It also became fashionable to spend holidays baking at the beach; F. Scott Fitzgerald's novel *Tender is the Night* showed off the world of celebrities spending time on the beaches of the French Riviera.

From the thirties onward, tanning became even more popular.

At the same time fashions were changing, so were lifestyles. Women came out of the house to enjoy outdoor life, with hiking, picnics, lawn tennis and other "acceptable" yet still "feminine" activities.

Soon, fashionable women everywhere threw away years of tradition to be tanned.

On beaches throughout Europe, women sunbathed, wearing decorative sun hats and shawls not for protection but as fashion statements. Brown and beige-tinted powders and creams were created to be brushed on the places the sun had missed. The fashion world featured clothes for women who wanted to flaunt their new tans; shoes were worn without stockings and sleeveless dresses became stylish. Bathing suits that had covered women's legs with bloomers, now bared the leg, and swimming became an acceptable sport for women. The suntan had arrived and was a symbol of wealth and leisure. A tan in the winter meant someone had enough money and status to afford a vacation in an exotic, warm climate.

The History of Tanning: Bikinis!

The fifties saw the very first bikinis, and the "all-over" tan became even more popular. Self-tanning products such as brown creams and dyes also became available, allowing people to "patch" any white spots in their tan or even to simulate a tan.

Even with these products, however, tanning was mostly restricted to the summer months, except for a privileged few who could make winter trips to warmer climes like Florida or the Caribbean.

By the 1970s, an entire generation had baked their bodies in the sun, totally oblivious to the fact that the sunburn they had acquired in their youth would develop into skin cancers 10 to 20 years later.

It wasn't until 1979 that the FDA concluded that sunscreens could help prevent skin cancer and developed the first rating system for SPFs. In 1985, alarmed at the growing incidence of skin cancer, the American Academy of Dermatology (AAD) became the first medical society to start a public education skin cancer campaign, warning the public about the dangers of overexposure to the sun. In 1988, the AAD held a consensus conference on photo aging and photo damage. The conclusion from that conference was that **"there is no safe way to tan."**

The indoor tanning industry first became popular in the 1970s and by the 1980s had taken hold in the United States.

1997:

In a survey in Seventeen magazine, 2/3 of the teens say they look better with a tan and feel healthier, more sophisticated, and 50% say they looked more athletic.

1998:

A report from the Annual Meeting of the American Association for the Advancement of Science questions the value of sunscreens, leading to national publicity. Some products promising UVA and UVB protection do not protect adequately against UVA and may give sunbathers a false sense of protection, the report says.

1999:

The AAD continues to urge Americans to use sunscreens, avoid sunbathing and cover up. It was estimated that more than one million Americans would develop skin cancer in 1999, with 9,800 dying from the disease— 7,800 of them from malignant melanoma. Yet despite these alarming figures, men and women still enjoy the tanned look. Just look around you on any warm summer day - you'll see them, the seekers of the sun.

2000 - now:

The skin cancer rates were still growing, but the sun-worshippers are still out there or still tanning at the tanning salon all year round. Today the effects of sun exposure are becoming an increasing concern due to the decline in the earth's ozone layer. The ozone layer screens out the most harmful of the ultraviolet rays, but is becoming thinner all over the world, and holes that fluctuate in size have developed in various places. This situation increases the risk of skin cancer and of sunburn.

Sun protection is very important. Cover up with clothes and sunglasses; seek shade; and apply broad-spectrum, water-resistant sunscreen with an SPF 30+ at least every two hours when outdoors!

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ⁱ Ardis L. Olson, Cecelia Gaffney, Pamela Starr, Jennifer J. Gibson, Bernard F. Cole, Allen J. Dietrich; SunSafe in the Middle School Years: A Community-wide Intervention to Change Early-Adolescent Sun Protection. *Pediatrics* January 2007; 119 (1): e247–e256. 10.1542/peds.2006-1579.

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ⁱⁱ Cleveland Clinic (2022). Ultraviolet Radiation and Skin Cancer.

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ⁱⁱⁱ Vermont Department of Health. (2020). 2019 Vermont Youth Risk Behavior Survey Report, 173.

www.healthvermont.gov/sites/default/files/documents/pdf/CHS_YRBS_statewide_report.pdf

^{iv} Skin Cancer Foundation. (2021). Sunburn & Your Skin. www.skincancer.org/risk-factors/sunburn/