Sun safety

Australia has the highest rate of skin cancer in the world, due to a combination of tropical latitude, fair-skinned population, outdoor lifestyle, and high amount of ambient ultraviolet radiation (UV). As a result, the Australian government has mounted a rigorous offensive against UV exposure, with a focus on school-aged children.

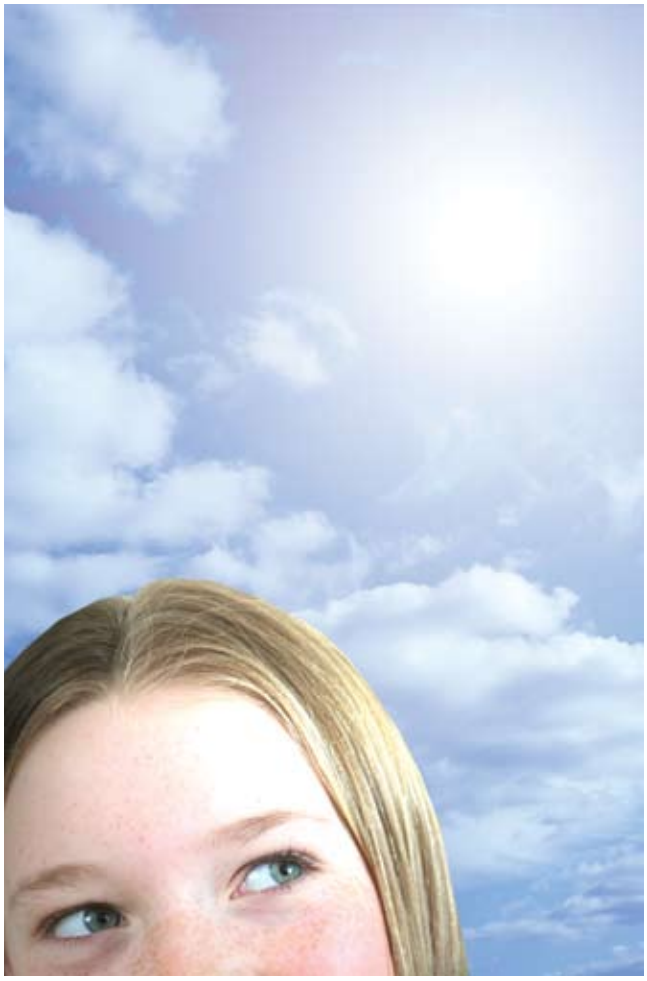
Australia is not alone in this effort. The Environmental Protection Agency (EPA) has a partnership program called SunWise. The goal of the program is to reduce children's lifetime risk of developing skin cancer. Why have more than 14,000 schools and 500,000 students become involved in this award-winning environmental and health education program? The statistics tell it all:

- Twenty-nine Americans die every day from skin cancer.
- Half of all cancers in the United States are skin cancers. One in five Americans will develop skin cancer during their lifetime.
- More than one million new cases of skin cancer will be found in the United States this year alone.
- The number of people with the deadliest form of skin cancer, melanoma, is rising at an alarming rate. It is 20 times higher than it was in 1930.
- More than 90% of all skin cancers are caused by sun exposure.
- Regular sun protection throughout childhood can reduce the risk of skin cancer by 80%.
- Skin cancer is preventable.

So, what does all this have to do with middle school science teachers, especially during the winter months? With the movement toward hands-on science and environmentally oriented curricula, more students and teachers in science classes are doing fieldwork in the sun year round. Unfortunately, many people still believe winter equates to little or no UV exposure. This is just not so. It does not matter what time of year, nor where you are—UV radiation is there and can be a danger. So what can middle school science teachers do to protect themselves and their students from exposure to the UV rays of the sun? First, some UV and health facts.

Beyond UV

The ozone layer has a critical role in skin cancer prevention by blocking out much of the UVB radiation from the Sun. It is the UVB rays that tan and sometimes burn the skin. The more UVB reaching the Earth, the more human health is put in harm's way. The retreat of the ozone layer in recent decades has been brought about by substances that upset the balance of stratosphere-level chemical reactions. The ozone layer does not absorb UVA rays, which penetrate more deeply into the skin and cause premature aging and potential suppression of the immune system. Reducing the effectiveness of the human immune system has a direct impact on infection rates and could limit the effectiveness of immunization against certain diseases. Research has also shown that overexposure to UV radiation can cause inflammations of the cornea and the conjunctiva in the eye, and cause or increase cataract development. Overall, UV exposure levels depend on several things—how intense the light is, how long the skin exposure is, and if the skin is protected by clothing and sunscreen.



Children and UV exposure

The exposure of elementary and middle school students to UV radiation has a major impact on the de-

velopment of both basal cell cancer and melanoma. Another important risk factor for skin cancer is the development of moles during childhood. Childhood exposure to sun may in fact increase the risk for melanoma by increasing the number of moles. Good sun sense during childhood years reduces the risk for melanoma in adulthood years.

Children's developing bodies require special protection when it comes to UV radiation. The United Nations Convention on the Rights of the Child states that children require special protection as they are at a higher risk than adults of suffering damage from exposure to UV radiation.

- A child's skin is thinner and more sensitive and even a short time outdoors in the midday sun can result in serious burns.
- Epidemiological studies demonstrate that frequent sun exposure and sunburn in childhood set the stage for higher rates of melanoma later in life.
- Children have more time to develop diseases with long latency, more years of life to be lost, and more suffering to be endured as a result of impaired health. Increased life expectancy further adds to people's risk of developing skin cancers and cataracts.
- Children are more exposed to the sun. Estimates suggest that up to 80% of a person's lifetime exposure to UV is received before the age of 18.
- Children love playing outdoors, but usually are not aware of the harmful effects of UV radiation.

Skin cancer types

There are three basic types of skin cancer that exist: basal cell carcinoma, squamous cell carcinoma, and melanoma.

1. Basal cell carcinoma—This type of skin cancer is identified by pale, pink skin eruptions or by red, scaly patches. It may also be an open sore that does not heal or heals only temporarily. It usually develops on the ears, face, nose, and other sun-exposed areas.
2. Squamous cell carcinoma—These are scaly patches or nodules/wartlike growths.
3. Melanoma—This is characterized by dark, black, or brown patches. It often looks like a mole but usually "stands out," not fitting in with a person's other moles. Many describe it as an "ugly duckling." Unless it is caught early, a melanoma can spread and be fatal.

Again, the greater the exposure to UV radiation at the elementary and middle school levels, the greater the risk to these adulthood skin cancers.

Sun tools for schools

The National Center for Chronic Disease Prevention and Health Promotion developed a publication titled "Guidelines for School Programs to Prevent Skin Cancer." The Center has made the following recommendations for skin cancer prevention in schools:

- Establish policies that reduce exposure to ultraviolet radiation.
- Provide an environment that supports sun-safety practices.
- Provide health education to teach students the knowledge, attitudes, and behavioral skills they need to prevent skin cancer.
- Involve family members in skin cancer prevention efforts.
- Include skin cancer prevention with professional development of staff.
- Complement and support skin cancer prevention with school health services.

The following skin cancer protective measures should be adopted:

- Minimize exposure to the Sun during peak hours (10 a.m.–4 p.m.).
- Seek shade from the midday Sun (10 a.m.–4 p.m.).
- Sand, snow, and water reflect rays of the Sun, which increase chances of sunburn and skin damage.
- Wear clothing, hats, and sunglasses that protect the skin
- Use a broad-spectrum sunscreen (UVA and UVB protection) with a sun-protection factor of 30 or greater.
- Avoid sunlamps and tanning beds.

Sun sense programs make a difference

Sun sense programs are needed to help reverse the trend toward the increasing frequency of skin cancers worldwide. This approach not only will provide health benefits, it will help to decrease future cost increases in the health industry. Middle school science teachers can have a direct impact on this growing phenomenon by providing curriculum and instruction relevant to effects of UV radiation exposure, and fostering sun-sense behaviors for out-of-door field activities.

Resources

American Academy of Dermatology—*www.aad.org*
American Cancer Society—*www.cancer.org*
Children's Melanoma Prevention Foundation's Learn Not

Question of the month

Do I need to have a fire blanket in my middle school science laboratory?

Answer

Yes! Fire blankets are not only good for smothering small fires on a person's clothing, they also can keep accident victims warm, contain a spill, or be used as a pillow to raise a victim's head or legs. However, make sure your blanket is made of flame-retardant wool, and not asbestos. (If you do have an old asbestos fire blanket, consult with your school's director of facilities to determine the best way to dispose of it.) Also, have the blanket case mounted in an easily accessible location with signage (Fire Blanket) visible from any part of your laboratory.

Do you have a question?

Submit questions relative to safety in the middle school science laboratory to Ken Roy at *Royk@glastonburyus.org*.

2 Burn Program—*www.melanomaprevention.org/learn_not2.html*
EPA's SunWise program—*http://epa.gov/sunwise*
SHADE Foundation of America's school partnership programs—*www.shadefoundation.org/schools.php*
Protect the Skin You're In!—*www.dhs.ca.gov/ps/cdic/CPNS//skin/images/park/skin_pk_shldknow.pdf*

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Acknowledgment

Special thanks to dermatologist Andrew V. Atton, M.D., from Glastonbury, Connecticut, for his professional review and contributions to this article.

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