Fostering Health & Wellness Through SunAWARE™, Grades 6-8

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<u>Massachusetts Curriculum Frameworks Strands and Learning Standards Addressed</u>:

l. Comprehensive Health Curriculum (1999):

Strand: Personal and Community Health Information:

1. Learning Standard: Consumer Health and Resource Management

- 12.7: Evaluate both the physical effectiveness and cost effectiveness of health care products.
- 12.8: Identify ways consumer decisions and actions can influence physical and mental health.
- I2.10: Identify ways that family and friends can positively or negatively influence consumer choices

2. Learning Standard: Community and Public Health

- 14.4: Identify how individuals can be knowledgeable and active in the school and community to promote health.
- 14.5: Identify the origins and accuracy of facts in social messages that promote healthy and unhealthy behaviors.

II. Science and Technology/Engineering Curriculum Framework (2006):

A. Strand: Earth and Space Science

1. Learning Standard: Heat Transfer in the Earth System

- #4: Explain the relationship among the energy provided by the sun, the global patterns of atmospheric movement, and the temperature differences among water, land, and atmosphere.

2. Learning Standard: The Earth in the Solar System

- #11: Explain how the tilt of the earth and its revolution around the sun result in an uneven heating of the earth, which in turn causes the seasons.

B. Strand: Life Science (Biology)

1. Learning Standard: Systems in Living Things

- #6: Identify the general functions of the major systems of the human body ... including protection from disease ... and describe ways that these systems interact with each other.

2. Learning Standard: Reproduction and Heredity

- #8: Recognize that hereditary information is contained in genes located in the chromosomes of each cell.

3. Learning Standard: Evolution and Biodiversity

- #10: Give examples of ways in which genetic variation and environmental factors are causes of evolution and the diversity of organisms.

4. Learning Standard: Changes in Ecosystems Over Time

- #18: Recognize that biological evolution accounts for the diversity of species developed through gradual processes over many generations.

<u>Goal:</u>

Through information and awareness activities, middle school students will understand the need for ultraviolet radiation protection and choose to integrate the SunAWARE™ action steps into their daily life, thereby reducing the risk and incidence of skin cancer.

Objectives:
1. The student will define ultraviolet radiation and the factors that affect its intensity.
2. The student will identify inherent and acquired risk factors that affect an individual's chance of developing skin cancer.
3. The student will identify the physical effects of UV radiation on skin and eye health.
4. The student will identify proven methods of sun protection.
5. The student will define the five action steps in the SunAWARE™ acronym.

Materials: flashlight, earth model, eye model**,** UV Index, UV meter, UV Frisbee, Glow Vista™ (skin analyzer machine), photographs, sun protective gear (hats, shirts, sunglasses, umbrella), sunscreen (lotion, spray, lip balm, eye stick), measuring glass

Visuals
- UV reflectance and standard photographs illustrating pigment changes.
- Images of basal cell, squamous cell, and melanoma skin cancer.
- UV Intensity/Action Chart

Vocabulary: ultraviolet radiation (UV rays), ozone layer/depletion, pigmentation, melanin, melanocyte, mole, nevus, cumulative, sporadic, photokeratitis, cataract, melanoma, basal cell carcinoma, squamous cell carcinoma

Opening Motivator: How many of you have ever experienced a sunburn?

Lesson Sequence:
I. Understanding Ultraviolet Radiation (UVR)

1. Use a flashlight to represent the sun and ultraviolet radiation wavelengths to demonstrate the variation in intensity and impact on the skin.
2. Use an earth model and a flashlight to demonstrate variation in UV intensity caused by Earth's tilt and planetary movement including rotation and revolution. Include concepts of seasons, time of day, weather, ozone depletion, altitude, latitude, and surface characteristics.
3. Introduce UV monitoring tools including the UV Index, UV meter and UV detecting Frisbee. Include concepts of *actual* versus *predicted* UV intensity levels.
4. Introduce UV Intensity/Action Chart to illustrate the UV index levels and corresponding sun protection actions.
5. Discuss the health implications of exposure to UV radiation from artificial sources including tanning beds/lamps as they relate to cumulative dose and increased risk for squamous cell and melanoma skin cancer.

II. Understanding Skin Sensitivity

1. Introduce concept of pigmentation as a protective mechanism and as a factor in vitamin D synthesis.
2. Describe indicators of sun sensitivity including skin color, eye color, freckling tendency, nevi count and characteristics.
3. Illustrate the most common location for different types of skin cancer as related to gender and skin type.
4. Use Glow Vista™ (skin analyzer machine) to illustrate the impact of the sun on the face, introducing the concept that freckles develop at sites of *cumulative* sun

exposure and moles develop at sites of *sporadic* exposure.
5. Show eye model to demonstrate the impact of UV rays on the external and internal eye including photokeratitis, cataracts, and melanoma of the eye.

III. Proven Methods of Sun Protection

1. Explore the impact of culture and trends on fashion and their impact on sun exposure levels.
2. Introduce the concept of sun protective gear including regular and specialized clothing and sunglasses. Define Ultraviolet Protection Factor (UPF), a rating system for sun protective clothing.
3. Demonstrate the variation in degrees of sun protection provided by various hats, shirts, bathing suits, and sunglasses.
4. Introduce the concept that sunscreen is an over-the-counter medication controlled by the Food and Drug Administration with a recommended dose and frequency of application.
5. Discuss sunscreen labeling including Sun Protection Factor (SPF), broad spectrum, water resistance, dose, and reapplication.
6. Discuss pros and cons of sunscreen formulations including lotions, spray-on, lip balm, and powders.
7. Discuss the role of media and peer influences on consumer choices and behaviors.

IV. Recognizing Skin Cancer

1. Identify the three most common forms of skin cancer: basal cell, squamous cell, and melanoma.
2. Describe the appearance and common locations of different types of skin cancers.
3. Discuss two acronyms used to aid recognition of skin cancer.
- PEER acronym for non-melanoma recognition (basal and squamous cell skin cancer) including persistent, enlarging, easily irritated, and recurrent.
- ABCDE acronym for melanoma recognition including asymmetrical, border irregular, color uneven, diameter larger than an eraser head, and evolving.

V. Sun**AWARE**™ Acronym

Review the rationale and significance of each action step in the "AWARE" acronym as it pertains to primary (sun protection) and secondary (early detection) skin cancer prevention.
Avoid *unprotected* exposure to sunlight, seek shade, and never indoor tan.
Wear sun protective clothing, including a long-sleeved shirt, pants, a wide-brimmed hat, and sunglasses year-round.
Apply recommended amounts of broad-spectrum sunscreen with a sunburn protection factor (SPF) $\geq$30 to all exposed skin and reapply every two hours, or as needed.
Routinely examine your whole body for changes in your skin and report concerns to a parent or healthcare provider.
Educate your family and community about the need to be SunAWARE™.

Reflection

1. Thinking back on a previous sunburn incident, how would you now protect yourself from overexposure?
2. Now that you know that UV rays are proven to cause cancer, how do you feel about family members visiting tanning salons?

3. How would you deal with negative peer pressure regarding sun protection now?

Closure
1. Review acronym "AWARE" in SunAWARE™ .
2. Emphasize that the "E" is for "educating others."
3. Enlist students as SunAWARE™ Ambassadors charged with educating their families and friends about sun protection and skin cancer prevention.

Plan for Independent Practice
1. Science NetLinks:
www.scincenetlinks.com/skindeep
www.sciencenetlinks.com/pdfs/skincells2factsheet.pdf
2. Environmental Protection Agency SunWise Program:
www.epa.gov/sunwise/educator_resources

Special Needs Adaptations
1. For visually impaired students, use large print handouts.
2. Provide Paraprofessional Aides with guidance for supporting the SunAWARE™ lesson in the school environment.
3. Use visuals such as earth model, eye model, flashlight, clothing, and Glow Vista™ (skin analyzer machine) to reinforce lesson.
4. Support active involvement by special needs students in the lesson presentation.
5. Select from audiovisuals listed in "Teacher Resources: Audiovisual".

Extensions
1. Provide schools with UV monitoring equipment including meter and reporting station. Instruct the designated faculty member to enlist a student to check the UV intensity level daily in the spring and report to school population. Obtain UV Index from the *Children's Melanoma Prevention Foundation* homepage by clicking UV meter on graphic, available at:
www.melanomaprevention.org

Assessment Based on Objectives
1. Conduct an informal survey of students regarding sunburn and tanning incidence following vacations.
2. Utilize the SunAWARE™ Grades 6-8 Post-Test to assess knowledge of key topics: ultraviolet radiation, skin sensitivity, proven methods of sun protection, skin cancer recognition, and the SunAWARE™ acronym.
3. Evaluate student responses to open-ended "reflection" questions.
4. Evaluate student performance on independent practice sheets, extension lessons and activities.

Additional Cross-curricular Connections
1. Math: use of math factorials as they relate to SPF calculations.
2. Language Arts: use of SunAWARE™ books for discussion and as writing prompts.
3. Physical Education
- Use of sun protection lessons to reinforce safe sun practices for sports and outdoor activities, available at:
http://wwwsciencenetlinks.com/lessons.php?DOCID=445
- Sports and recreation ideas and initiatives from the Collette Coyne Melanoma

Awareness campaign available at:
http://www.ccmac.org/index.php?option=com_content&view=article&id=148&Itemid=4

Teacher Resources

Books:

Barrow, Mary Mills, and Maryellen Maguire-Eisen. *Lake Vacation.* Langdon Street Press, Minneapolis: 2008.

Barrow, Mary Mills, and Maryellen Maguire-Eisen. *Pretty Prom.* Langdon Street Press, Minneapolis: 2008.

Barrow, Mary Mills and John F. Barrow. *Sun Protection for Life.* New Harbinger Publications, Oakland: 2005.

Audiovisuals

DVD: *The Dark Side of the Sun.* Available from Mollie Biggane Foundation at: www.molliesfund.org

Video: "*Gear Up for Summer*". Available from the MD Anderson Cancer Center, Project Safety Program: http://www.mdanderson.org/patient-and-cancer-information/cancer-information/cancer-topics/prevention-and-screening/studies-and-programs/additional-prevention-resources/project-safety/-gear-up-video/index.html

Websites:

- Children's Melanoma Prevention Foundation: SunAWARE™ Curriculum, UV index, news items, articles and resources: www.melanomaprevention.org
- U.S Environmental Protection Agency: Sun Wise Curriculum, UV materials: www.epa.gov/sunwise
- National Council for Skin Cancer Prevention, *Don't Fry Day* resources: www.skincancerprevention.org/node/282
- Center for Disease Control: Guidelines for Schools to Prevent Skin Cancer: www.cdc.gov/mmwr/preview/mmwrhtml/rr5104a1.htm
- World Health Organization
    - Health Topics: UV Radiation www.who.int/topics/ultraviolet_radiation/en/
    - *Sun Protection A Primary Teaching Resource* www.whqlibdoc.who.int/publications/2003/9241590629_v2.pdf
- Colette Coyne Melanoma Awareness Campaign: online public service announcements on tanning and melanoma: www.ccmac.corg
- Skin Cancer Foundation activity sheets: www.skincancer.org/school/teacherresources
- Science NetLinks "Skin Deep" Project Lesson Plan & Resources Grades 6 -8: www.sciencenetlinks.com/lessons.php?DocID=552
- Sun Safety for Kids: Curriculum resource: www.sunsafetyforkids.org/sunprotection/curriculum

Articles

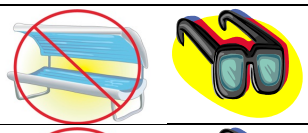
Demierre MF, Maguire-Eisen M, Cabral H, et al. for Dermatology Nurses Association, A Sun Protection Community Intervention in Quincy Middle Schools: Insights from the Use of Ultraviolet Photography and its Impact on Sunburn. Journal of the Dermatology Nurses Association, 2009: Vol 1 (2): 111-118.

Maguire-Eisen M, Demierre M, Rothman K. The ABC's of Sun Protection for Children. Dermatology Nursing 2005: Vol 17, (6) 419-433.

Maguire-Eisen M, Demierre M. Educating Teens and Parents in Effective Sun Safety. Practical Dermatology, 2005: 2 (4) 39-45.

Maguire-Eisen M. Risk Assessment and Early Detection of Skin Cancers. Seminars in Oncology Nursing, 2003: Vol 19, No. 1 (February), 43-51.

UV Intensity Level/Action Chart

UV	Level	SunAWARE™ Actions
1-2	**Low**	
3-5	**Moderate**	
6-7	High	
8-10	**Very High**	
11+	**Extreme**	