

SunSafe in the Middle School Years: Art and Computer Activity



Sun Wise Flyerⁱ

Estimated Time

30 – 45 minutes

Supplies

Computers with applications (i.e. Canva, PowerPoint) that can be used to create flyers

Directions

Instruct the students that they will be creating a flyer that teaches people about protecting themselves from overexposure to the sun's harmful UV rays.

To help students get started, hold a brainstorming session. Touch on issues such as the health effects of overexposure to the sun and the ways we can protect ourselves.

Students should also incorporate the Sun Wise safety tips into their flyer. These tips can be found on the next page and on the *SunWise website* (www.NEEFusa.org/SunWise).

Depending on your resources, ask the students to print out their flyers in color or black-and-white and present them to the class. If printing is not available, the students can rotate around the computer lab to see each other's work, or you can put the posters into a PowerPoint presentation. If possible, post the students' work on bulletin boards around the school.

SunSafe in the Middle School Years: Art and Computer Activity



Directions for Students

Let's make a Sun Wise flyer on the computer. Use fun images and text to communicate your message. Your flyer should teach people how they can protect themselves from the sun's harmful UV rays. Brainstorm ideas with your teacher and classmates before you begin.

Helpful Ideas for Your Flyer

Decide on a theme. Your theme should focus on having fun and being sun safe.

Think about designing your flyer in a fun way that shows action. Show students participating in activities during all seasons. You could also focus on one season and make different scenes showing people being sun safe. For example, summer scenes at the beach or in the park). Make sure you show people wearing sun safe items to reinforce your flyer themes.

Safety Tips You Can Use for Your Flyer

- *Limit Time in the Midday Sun.* The sun's rays are strongest between 10a.m. and 4p.m.
- *Seek Shade.* Staying under cover is one of the best ways to protect yourself from the sun.
- *Always use Sunscreen.* Apply broad-spectrum sunscreen with a SPF 15 or higher on exposed skin every 2 hours when outdoors.
- *Wear a Hat.* A hat with a wide brim offers good sun protection for your eyes, ears, face, and back of your neck.
- *Cover Up.* Wearing tightly woven, loose-fitting, and full-length clothing is a good way to protect your skin from the sun's UV rays.
- *Wear Sunglasses that Block 99-100% of UV Radiation.* Sunglasses that provide 99-100% UVA and UVB protection will greatly reduce sun exposure that can lead to cataracts and other eye damage.
- *Watch for the UV Index.* The UV Index provides information to help you plan your outdoor activities in ways that prevent overexposure to the sun. Developed by the National Weather Service (NWS) and EPA, the UV Index is issued daily.

October 2023

ⁱ This activity was adapted from the SunWise Program Toolkit developed by the EPA. The SunWise Program is now run by the National Environmental Education Foundation (NEEF). The NEEF SunWise Program materials can be found at www.neefusa.org/sunwise.

SunSafe in the Middle School Years: Art and Social Studies Activity



What's in a Hat

Estimated Time

30 - 45 minutes

Learning Objectives

Students will understand the importance of wearing protective gear to block the sun and will learn which hats effectively protect them from the sun.

Introductory Discussion

Sunburns, skin cancers and sun related eye damage are largely preventable when sun protection behaviors are taught and practiced early. Popular hats such as baseball caps do not effectively protect us from UV radiation, because the neck and ears are not covered. Hats with brims of 2 inches or more are needed to protect you from the harm of UVR. Throughout history people have chosen hats both because of their function and their style.

Discuss the many reasons for wearing hats.

Directions

The art activity and social studies activity are separate. Use the information on the next page to have your class complete either or both activities.

Questions and Answers

1. Why do people wear hats?
 - a. *Protection - football helmet, bike helmet, hardhat*
 - b. *It's the law - motorcycle helmets*
 - c. *Job requires it - hardhat at construction site*
 - d. *Part of uniform - baseball cap, military cap*
 - e. *It's fashionable*
2. Do you ever wear a hat to protect your head from weather?

Winter hats and ski caps, baseball caps, visors, broad-brimmed hats
3. Do you choose what hat to wear because of how it looks on you, or because it is like the hats your friends wear?
4. What types of hats have you seen in the movies?

Cowboy hat, Indiana Jones hat, military uniform caps

SunSafe in the Middle School Years: Art and Social Studies Activity



Art Activity

Supplies

Ask students to bring in an old hat from home, cut out two-dimensional cardboard hats, or make paper hats for the students. Students may want to use the following materials to decorate their hats:

- Fabric pieces
- Colored construction paper
- Stapler, scissors, and glue
- Decorating materials—glitter, feathers

Directions

1. Have students attach fabric or paper pieces to their hats in a way that creates a sun safe hat. In other words, a hat with a rim, such as a wide-brimmed hat, or one with a flap that covers the ears and necks.
2. Decorate the hats.
3. Vote on which hat is the craziest, most colorful, etc. but still sun-safe.
4. Display the hats or have a parade.

Social Studies Activity

Throughout history people have chosen to wear both fashionable and functional hats. Hats can tell us a great deal about the lifestyle of those who wear the hats. For example, a cowboy hat has a broad brim, which protects the neck, ears, and face. Why? Cowboys spend long days out in the sun. Students might also think of early trappers and pioneers and the types of hats they wore (fur caps, sun bonnets).

Supplies

Computers with internet access

Directions

1. Have students research different types of hats worn in different cultures over time. Students should develop a timeline showing 3 different types of hats worn in the US, or in another country, during different time periods.
2. Ask students to evaluate how effective each hat they find would be in protecting the wearer from the sun

SunSafe in the Middle School Years: Art and Social Studies Activity



Optional Reading

A hat can be the difference between life and death for a soldier.
A rancher's wide-brimmed felt often provides the only shade he may see for days.
A fisherman's yellow oilskin gives him snug comfort in the midst of bitter salt billows.

Yet a hat offers more than shelter alone.
A hat, when tipped politely, tells a pretty girl that you like the way she looks.
Held over the heart, when the flag goes by, a hat is a badge of patriotism and a strong belief in freedom.

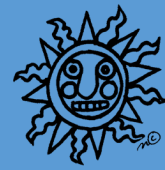
The right hat can make a golfer feel lucky.
Celebrities often wear them to be noticed. Plainclothes police wear them to be unnoticed. A salesman's hat can be his office.
There are hats with built-in radios, hard hats, soft hats, fur hats, paper hats, all useful in different ways to different people.

Hats have won a deserved place in the day-to-day speech of the entire world. Secrets are figuratively kept under hats.
Politicians throw them into the ring. Voters bet them on elections.
People promise, if wrong, to eat them.
Cocked hats are what schemes get knocked into.

Most important of all, a hat is worn in the mind as well as on the head.
When a man is seen in a hat, the whole world knows he has invested some special effort and expense in his appearance. He has set himself apart from the lazy, the careless, and the irresponsible.
He is a man with purpose... and purpose is the making of man.

-John B. Stetson Company

SunSafe in the Middle School Years: Computer, English, and Social Studies Activity



Sun Wise Virtual Vacation¹

Estimated Time

45 minutes

Supplies

- Computers with internet access
- Paper/pen or software to compose the letter on

Learning Objectives

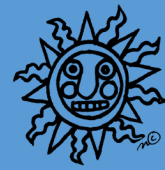
This activity gives students the opportunity to learn about different cultures, develop research skills, and think about their interaction with the sun during recreational activities. It may alert them to the risks associated with these activities.

Assess what they have learned about sun safety risks during recreational activities by checking to ensure they include sun safety tips for their classmates in the letter they compose.

Directions

1. Divide the students into small groups suitable for your classroom size and setup.
2. Discuss possible vacation spots they would like to visit.
3. Have each group pick a vacation spot or location and use the suggested websites to research the answers to the questions. You may want to develop a list of possible sites and make sure there are no duplicate locations.
4. Have students compose a letter to their classmates that includes the answers to the questions.
5. Have the groups share their letters with the class.

SunSafe in the Middle School Years: Computer, English, and Social Studies Activity



Directions for Students

People all over the world enjoy the sun in very different ways. Some may enjoy the beach, while others may take hiking trips in the mountains. No matter where you go, it is important to be sun safe.

Plan a class trip, and make sure you have everything you need to protect yourself from overexposure to the sun's harmful UV rays. Pick a location and use the suggested websites to help answer questions about it. Write a letter to your classmates and tell them about your trip and what you have learned. Be sure to give your classmates tips on how to be sun safe. Use the ten questions below as a guide for your letter. Read your letter to the class.

Have fun on your trip! You'll do some research and discover many things about different people, their countries, and the sun.

Resources to learn about your vacation spot and sun safe practices:

- Weather Channel (www.weather.com)
- Weather Underground (<https://www.wunderground.com/intellicast>)
- EPA, Sun Safety (<https://www.epa.gov/sunsafety>)

SunSafe in the Middle School Years: Computer, English, and Social Studies Activity



Questions

1. How are you going to protect your skin and eyes while on your vacation?
2. What did you do on your trip?
3. What did you pack for your trip?
4. What do people in the country (or state) do for recreation? Where do they vacation?
5. What kind of outdoor activities do they like?
6. What is the climate like?
7. How do the local people stay cool/warm?
8. How do people protect their skin and eyes?
9. What kinds of clothes do people wear?
10. What type of houses do people live in?

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SunSafe in the Middle School Years: English, Science, and Social Studies Activity



Sun Mythologyⁱ

Estimated Time

30 – 45 minutes

Supplies

Sun myth texts listed below or others you discover on your own.

Krupp, Dr. E.C. *Beyond the Blue Horizon: Myths and Legends of the Sun, Moon, Stars, and Planets*. 1992.

McDermott, Gerald. *Arrow to the Sun: A Pueblo Indian Tale*. 1974. O'Hara, Gwydion. *Sun Lore*. 1997.

St Rain, Tedd. Ed. *Sun Lore of All Ages: A Survey of Solar Mythology, Folklore, Customs, Worship, Festivals, and Superstition*. 1999.

Luomals, Katharine. *Oceanic, American Indian and African Myths of the Snaring Sun*. 1988.

Learning Objectives

Students will learn that people from all over the world have different stories about the sun. Before reading the story, ask students what they know about the sun. For example, what is its location in our galaxy, its life as a star, and its importance to the ecosystem of our planet? Write their ideas on the board.

After reading the story, assess what students have learned by comparing their own knowledge about the sun with that of other ancient cultures (the Norse, for example).

Directions

Read the sun myth provided on the next page or another sun myth as a catalyst for a classroom discussion about the many cultures that have myths and folklore associated with the sun. Read one or two sun myths aloud or make photocopies of additional texts for silent reading.

Instruct your students to write their own sun myth. To get them started, have them answer the questions listed after the reading. Encourage students to use descriptive and colorful language. Their myths should focus either on a fictitious or actual cultural group or figure.

Once your students complete their assignment, have volunteers read their myths aloud to their classmates. After sharing several original sun myths, engage students in a discussion about the importance of the sun as a powerful energy supply and a source of life on Earth.

Discussion

Why do so many cultures, past and present, revere the sun?

Possible answers include:

- In ancient times, people were afraid of the sun because they did not understand its motion across the sky
- The sun is a producer of crops, and as such they consider the sun a generous god
- Scientists study the sun as an example of a medium-sized Class III star that is merely one of 200-300 billion in this galaxy alone but sustains all life on Earth.

SunSafe in the Middle School Years: English, Science, and Social Studies Activity



Directions for Students

Read the Sun myth *Odhinn, One-Eyed Warrior* for inspiration, and then write your own original sun myth. Be creative. Your sun myth may focus on a fictitious or actual cultural group or figure.

Odhinn, One-Eyed Warrior¹

Odhinn is a Norse Sun God. Odhinn is also known as Woden. The Germanic word *wuten* means to rage.

Befitting a lord of the Sun, Odhinn is often depicted dressed as a warrior. His armor is forged in the sacred metal of solar deities. He wears a chest-plate of pure gold. On his head is a golden-horned helmet. His weapon is the golden spear forged magically by dwarfs and he rides an eight-legged horse across the sky.

As a *warrior lord*, Odhinn is served by the Valkyries, warrior maids who participate in every Earthly battle and determine its outcome. Odhinn is also the inspiration behind the famed berserkers, warriors crazed with the fury of the battle.

The Sun God has one eye. It is said that he gave the other eye for the gift of magic mead, a drink of poetic inspiration and knowledge. Odhinn plucked his eye from its socket and dropped it into the well of Mimir so he could drink from the magic waters and gain infinite wisdom.

The great inspiration of the enchanted well had a powerful effect on the warrior. He became known as a great healer and as the God of Poetry. Still, he retained his position as the Sun God, and in his battle fury, he was known as the One-eyed Warrior.

To start writing your own Sun myth, answer the following questions:

1. During what period does your sun myth take place?
2. Where does your sun myth take place?
3. In your sun myth, who are the main characters(s)?
4. What powers does your main character(s) have?
5. What effect or change has your character made?

¹ Adapted from the book *Sun Lore-Folktales and Sagas from Around the World*, Gwydion O'Hara

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SunSafe in the Middle School Years: English Activity



Sun Scoopⁱ

Estimated Time

30 – 60 minutes

Supplies

- Video camera (optional)
- Audio recorder (optional)
- Paper and pencils
- Research materials (encyclopedias, newspapers, or computers with internet access)

Learning Objectives

This activity uses journalism to raise awareness about the science and risk of overexposure to the sun's harmful UV rays and ways to be sun safe.

Assess what students have learned by asking them to include the following in their story:

1. At least three ways to be sun safe
2. The effects of ignoring these precautionary measures, and
3. Background information about the sun and UV radiation.

Directions

Assign each student, or group of students, a story angle. If possible, arrange for a science teacher, nurse, or local weather forecaster to come to your classroom. Let the students interview the "expert." Have the students respond to the questions below as a class and then write their stories individually or in groups.

Questions and Answers

1. What questions will you ask the expert?
Students should list 3 - 5 questions.
2. What is the most important part or lead of your story? *Students should select one fact as the lead.*
3. Of the facts gathered, which ones should be included in your story? *Students should list the other facts they will include in their story.*

Additional Resources

The New York Times, Learning Network
www.nytimes.com/section/learning

SunSafe in the Middle School Years: English Activity



Directions for Students

Use a video camera, tape recorder, or pencil and paper to develop a news story. Story angles could include: the health effects of overexposure to the sun, sun protection, or how the UV Index works.

First, gather the facts (who, what, when, where, why, and how) using resources, such as the Internet, encyclopedias, or your local newspaper. Interview an expert. This could be a science teacher, nurse or other healthcare provider, or local weather forecaster. Write a lead and the rest of the story. As a guide, answer the three questions below. Be prepared to share your news story with your class.

Talk with the editor of your school or local paper about printing the news story. Ask your teacher or principal if you can read it over the PA system during morning announcements.

Vocabulary Words

Story Angle – The topic or approach to a news story.

Who, What, When, Where, Why, and How –

Questions that form the basic building blocks of any news story. A story might answer some or all of these questions.

Lead – The most important part of the story. The lead is always the first paragraph, and it explains some of the Who, What, When, Where, Why, and How questions.

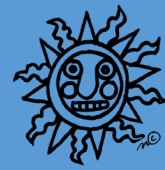
Questions

1. What questions will you ask the expert?
2. What is the most important part-or lead-of your story?
3. Of the facts gathered, which ones should be included in your story?

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SunSafe in the Middle School Years: English and Social Studies Activity



The Sun Shines Around the Worldⁱ

Estimated Time

20 – 45 minutes

Supplies

- Map of the world (for display)
- Research materials (encyclopedias, travel or geography magazines, or computers with Internet access)

Learning Objectives

This activity will teach students about a variety of ways people all over the world protect themselves from overexposure to the sun's harmful UV rays.

After completing the activity, students should be able to describe different ways individuals from the country researched practice sun safety.

Directions

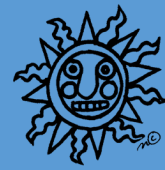
Assign a student or pair of students to research a country. Instruct the students to use the questions below as a guide.

Additional Resources

Geographia offers a variety of information on housing, clothing, and customs of countries throughout the world.

www.geographia.com

SunSafe in the Middle School Years: English and Social Studies Activity



Directions for Students

Use encyclopedias, magazines, periodicals (National Geographic, for example), or books to research your assigned country and answer the questions below. Be prepared to share your findings with your classmates.

Questions

1. What is the name of the country you researched?
2. What continent is the country in?
3. What countries or physical features border the country?
4. What types of houses do people of this country live in?
 - What are the houses made of?
 - How do the houses help the people of this country protect themselves from the sun?
5. What kinds of clothes do the people of this country wear?
6. Describe a few customs that people in this country have that protect themselves from the sun.
7. What are at least three differences between your state and the country you researched?

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SunSafe in the Middle School Years: Health Activity



Me and My Shadow

Estimated Time

60 minutes total (20 minutes at 3 different times)

Supplies

- Chalk
- Sticky note paper
- Ruler
- Worksheet to record findings.

Learning Objectives

Students will understand how their shadow changes as the earth orbits the sun and how to determine what time of day the sun's rays are the strongest.

Directions

1. Have students predict the size of their shadow before going outside.
2. Take class outside to chart their shadows.
3. Draw a line on the sidewalk or blacktop for the student to stand.
4. Ask a student to stand straight with their toes on the line.
5. Have another student mark the top of the head of the first student's shadow.
6. Measure the distance between the 2 marks and record. (Complete this measurement for each student.)
7. Discuss what time the students are going to do the second measurement.
8. Ask the students to predict whether their shadow will be longer, shorter, the same or no different.
9. Have the students enter their prediction on their worksheet.
10. Complete this exercise at 3 different times of the day: morning, midday, and afternoon.
11. Discuss how the length of their shadow can remind them to practice sun safe behaviors.

Discussion

As the earth rotates around the sun, the intensity of the UV rays changes. That is why it is warmer in the summer and cooler in the winter. The intensity of the sun's rays also varies during each day. They are more intense in the middle of the day than in early morning or late afternoon. This is because UV (sunlight) rays travel in straight lines, and during midday, the angle of the sun is more directly overhead.

The shorter their shadow, the more intense the UV rays are, and the more important it is to seek shade.

SunSafe in the Middle School Years: Health Activity



Questions and Answers

1. What would make your shadow grow or shrink? *Sunlight travels in straight lines so as it rises from the horizon, the number of rays that reach the ground increase until the sun is directly overhead.*
2. When is your shadow the longest? *Your shadow is longest early in the morning and late in the afternoon. Also, your shadow is longer as you come nearer the earth's north and south poles.*
3. When is your shadow the shortest? *Your shadow becomes shorter as it gets closer to noon. It also becomes shorter as you get closer to the earth's equator.*
4. Is there a time of the day that you have no shadow? *When the sun is directly overhead at noon, you don't have a shadow. **Teach your students the shadow rule: No shadow, seek shade!***

Activity Extenders

Math

Have students graph the times of day vs. shadow length.

Language Arts¹

Have students read the following folklore story and ask them to write a myth about how we learned to wear white to protect our skin and keep us cooler in the summer.

Title: Spider and the Sun
Tribe: Cherokee
Region: Tennessee, North Carolina

In the beginning there was only darkness and people kept bumping into each other. Fox said that people on the other side of the world had plenty of light but were too greedy to share it. Possum went over there to steal a little piece of the light. He found the Sun hanging in a tree, lighting everything up. He took a tiny piece of the Sun and hid it in the fur of his tail. The heat burned the fur off his tail. That is why possums have bald tails. Buzzard tried next. He tried to hide a piece of Sun in the feathers of his head. That is why buzzards have bald heads. Grandmother Spider tried next. She made a clay bowl. Then she spun a web (Milky Way) across the sky reaching to the other side of the world. She snatched up the whole sun in the clay bowl and took it back home to our side of the world.

¹ Western Washington University (2023). *Native American Starlore*.
<https://astro101.wvu.edu/indianstarlore.html#Spider%20and%20Sun>

SunSafe in the Middle School Years: Health Activity



Questions for Students

1. What would make your shadow grow or shrink?
2. When is your shadow the longest?
3. When is your shadow the shortest?
4. Is there a time of the day that you have no shadow?

Directions for Students

Use the worksheet to record each of your shadow measurements.

- The first time you go outside with your class, your teacher will show you how to measure your shadow's length. Record this information (date, time of day, and measurement) in the Measurement 1 record area.
- After your class has completed the first measurement, you will decide what time of day to do the second measurement. Record this information in the Measurement 2 record area. Use what you have learned from the activity to estimate the length of your shadow at measurement 2 and record that prediction.
- Follow the same steps for measurement 3.



Me and My Shadow Activity Worksheet

Measurement 1 Date of Measurement: Time of Day: Measured Length of Shadow:	
Measurement 2 Predicted Length of Shadow: ---- Date of Measurement: Time of Day: Actual Measured Length of Shadow:	
Measurement 3 Predicted Length of Shadow: ---- Date of Measurement: Time of Day: Actual Measured Length of Shadow:	

SunSafe in the Middle School Years: Health Activity



Directions for Optional Math Extender

Use your shadow measurements to graph the time of day vs. shadow length.

Length of Shadow Vs. Time of Day

Directions for Optional Language Arts Extender

Read the following folklore story. When you are done, write a myth about how we learned to wear white to protect our skin and keep us cooler in the summer.

Title: Spider and the Sun
Tribe: Cherokee
Region: Tennessee, North Carolina

In the beginning there was only darkness and people kept bumping into each other. Fox said that people on the other side of the world had plenty of light but were too greedy to share it. Possum went over there to steal a little piece of the light. He found the Sun hanging in a tree, lighting everything up. He took a tiny piece of the Sun and hid it in the fur of his tail. The heat burned the fur off his tail. That is why possums have bald tails. Buzzard tried next. He tried to hide a piece of Sun in the feathers of his head. That is why buzzards have bald heads. Grandmother Spider tried next. She made a clay bowl. Then she spun a web (Milky Way) across the sky reaching to the other side of the world. She snatched up the whole sun in the clay bowl and took it back home to our side of the world.

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SunSafe in the Middle School Years: Health Activity



Personal Skin Assessmentⁱ

Estimated Time

30 minutes during one class period

15 minutes during second class period (for optional homework exercise)

Supplies

- Markers or crayons
- Magazines (optional)
- Glue (optional)

Learning Objectives

After completing this activity, students will understand the need to be careful when at risk of overexposure to the sun's harmful UV rays.

Students who possess any of several risk factors will develop a heightened sense of their own risk. To assess student comprehension of the risk and prevention message, ask them to make a flier, poster, or collage for the classroom or school that depicts individuals practicing sun safety.

Directions

Instruct students to evaluate their own risk factors by checking yes or no in each column. Have students go back to their seats and by a show of hands, take a count of the responses on the risk assessment. Ask students to predict on paper the risk level of their family members. As a homework assignment, have students evaluate their families for risk factors.

During the next class period, assign one student to be a recorder on the chalkboard of five to ten randomly selected responses you read aloud. Discuss risk factors with the class and ask students to list ways to prevent overexposure to the sun. Have them relate what they learned to tanning booths.

Using the fact sheets (located in the SunWisdom section of the Toolkit) as your guide, discuss the prevention steps with the class. Stress the importance of protection from the sun's harmful UV rays, especially for individuals who have several risk factors.

SunSafe in the Middle School Years: Health Activity



Directions for Students

In this activity, you will complete the personal skin assessment listed below for yourself and up to 3 family members. For each risk factor, check “yes” if it present or “no” if it is not present.

Personal Skin Assessment

Risk Factor	SELF		Family Member (1)		Family Member (2)		Family Member (3)	
	Yes	No	Yes	No	Yes	No	Yes	No
Light or fair skin								
Blue, green, or hazel eye color								
Blonde or red hair								
Freckles when in the sun								
Burn when in the sun								
40 or more moles								
Family or personal history of melanoma								
Living in the Sunbelt								
Living in high altitudes								
Two or more blistering sunburns								
Exposure to UV radiation from tanning machines or medical treatment								
Taking medications that increase the skin’s photosensitivity (some antibiotics and antihistamines)								

*Adapted from Project S.A.F.E.T.Y., *Risk and Risk Factors*, Elementary Safety Lesson Five.

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SunSafe in the Middle School Years: Health Activity



Beach Partyⁱ

Estimated Time

30 - 45 minutes

Supplies

- Frisbee
- Foam rubber ball (“Nerf-like”)
- Hackey sack
- Zinc cream in different colors Volleyball equipment
- Summer food (fruits, chips, water, peanut butter and jelly sandwiches)

Learning Objective

The objective of this activity is to demonstrate and practice sun- safe behaviors.

Directions

Before the students engage in the activity, discuss how this event will be different from a real day at the beach.

Discuss pros and cons. Suggest ways to protect yourself when you are at the beach (e.g., hats, shirts, sunscreen and the importance of reapplication, an umbrella for shade).

Assess what students have learned by asking what they would do differently when indoors versus outdoors.

Questions and Answers

1. Dermatologists believe there might be a link between childhood sunburns and malignant melanoma later in life. What can you do to prevent this from happening?

Answers will list prevention tactics, such as wearing sunscreen, limiting time in the sun between 10 am and 4 pm, wearing a hat and sunglasses, etc.

2. What does the sunscreen SPF stand for and how does it affect you and what you do when you are outdoors?

SPF stands for Sun Protection Factor and it helps protect us from the suns harmful UV rays when we are outside.

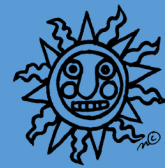
3. What does UV stand for, and how does it affect you?

UV stands for ultraviolet. UV rays can cause skin cancer, premature aging of the skin, cataracts, and immune suppression.

4. Sunscreen with SPF 15+ helps protect you from the most harmful UV radiation. What does that mean to you?

Answers will vary.

SunSafe in the Middle School Years: Health Activity



Directions for Students

Pretend that the class is at the beach and set the gym up like it is the beach. Start an indoor volleyball game, throw a frisbee, play a game with the nerf ball or gather some friends for a game of hackey sack. Set up face painting using zinc cream.

Vocabulary Words

Melanoma – Dark-pigmented malignant moles or tumors.

Malignant – Inclined to cause harm; very dangerous or harmful

Questions

1. Dermatologists believe there might be a link between childhood sunburns and malignant melanoma later in life. What can you do differently to prevent this from happening?
2. What does SPF stand for and how does it affect you and what you do when you are outdoors?
3. What does UV stand for, and how does it affect you and the Earth?
4. Sunscreen with SPF 15+ helps protect you from most harmful UV radiation. What does that mean to you?

October 2023

ⁱ This activity was adapted from the SunWise Program Toolkit developed by the EPA. The SunWise Program is now run by the National Environmental Education Foundation (NEEF). The NEEF SunWise Program materials can be found at www.neefusa.org/sunwise.

SunSafe in the Middle School Years: Math Activity (Supplemental)



4. Two UV rays, one UVA and one UVB, are traveling towards your school's baseball field, where they will arrive at the same time. They start out at the same time from the sun. Since they are different wavelengths, they travel at different velocities, but both travel in a straight line. The UVB ray travels through the atmosphere at an average velocity of 20 kilometers per second for the first 5km, 40 km/s for the next 5 km, 30 km/s for the next 5 km and 50 km/s for the final 5 km. Uninterrupted, the UVA ray travels at a constant velocity. What is the velocity of the UVA ray in km/s?

October 2023

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SunSafe in the Middle School Years: Math Activity



Bargain Shopper¹

Estimated Time

45 minutes

Students may also spend some time doing research as homework

Supplies

- Newspaper sales flyers
- Catalogs
- Computer with Internet access

Learning Objective

The objective of this activity is to help students understand the variety of ways they can protect themselves from the sun's harmful UV rays.

After completing this activity, students should understand that using sunscreen, hats, and sunglasses are examples of sun safe behaviors.

Directions

Instruct students to create a list of items that they would use to protect themselves against the sun's harmful UV rays. For example: sunscreen, sunglasses, long sleeve shirts, umbrellas, etc.

Have the students "go shopping" for these items by looking up prices online or in stores. The students should then develop a list of prices for each item they found.

The list may duplicate some items (e.g., one cost for Brand X sunscreen and another for Brand Y).

Tell the students that they have \$50 with which to purchase protective items for a day at the beach, a ski trip, or any type of outing. They should figure out how to maximize their budget while still buying all the necessary items. Students can include "free" items, such as "staying indoors" or "eating lunch in the shade" in their budget.

Ask the students to share their lists with the class and see who was able to buy the most for \$50.

SunSafe in the Middle School Years: Math Activity



Directions for Students

Make a list of items you might purchase to use as protection against the sun's harmful UV rays.

Now "go shopping" for these items. Look for them online or in-store. You can also check your home to determine if you have some of the products at home - they may even still have a price tag on them!

Compare the prices of different items (and brands) that you would use to protect yourself from the sun.

Imagine that you have \$50 to spend on your protective items. Describe how you will use that money to buy sun safe items. Keep in mind that some items may be free.

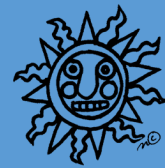
Share your list with the class and see who was able to buy the most for \$50.

Item	Cost

October 2023

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SunSafe in the Middle School Years: Science Activity



Sun: Friend or Foe

Estimated Time

20 minutes initially plus 2 minutes every 30 minutes for 3 hours

Supplies

- Four 15 oz. cans of the same size per group of students. Groups with 4-6 students is ideal for this activity.
- Four mercury-free thermometers per group.
- Clear plastic wrap
- Flat (non-shiny) white, blue, yellow, and black paint
- Paintbrushes
- Water

Learning Objectives

At the end of this activity, students should:

1. Understand why the sun is important to life on Earth and
2. What colors absorb or reflect ultraviolet rays.

Directions

Divide the class into small groups of 4-6 students. Have the students:

- Paint each can a different color (white, blue, yellow, and black).
- Fill each can with 1 cup of water.
- Tape each thermometer onto the side of a can with end in water.
- Put plastic wrap on each can.
- Put cans in direct sunlight.
- Check the temperature of the water for each can at set intervals (baseline, every 30 minutes thereafter for 3 hours).
- Record the temperature for each can at the time intervals.
- Answer questions.

Questions and Answers

- What is the type of rays from the sun that we can see?
Visible light –rainbow
- What are the types we can't see? *Ultraviolet rays, UVA and UVB.*
- What are some of the benefits from the sun?
warmth, photosynthesis, colors
- What are some of the harmful effects of the sun's rays. *sunburns, skin cancer*

SunSafe in the Middle School Years: Science Activity



Background

Life on earth could not exist without the sun. Living things need the light and heat energy that the sun provides. The sun also helps plants grow which gives us food to eat and oxygen to breath (photosynthesis). Sun emits light rays we see by and rays invisible to the naked eye. These invisible rays are ultraviolet radiation (UVR). The sun keeps us warm and helps us make vitamin D, but it can also harm humans. Skin damage from overexposure to UV rays includes sunburns, wrinkles, and skin cancer. UV radiation can also suppress the immune system and damage eyes (cataracts).

One of the good qualities is that the sun keeps us warm. Some colors reflect the sun's rays and other colors absorb the sun's rays. UVR, like visible light rays, bends and is reflected off surfaces. Some colors reflect UVR, and other colors absorb the sun's rays. When UVR is absorbed, the object becomes warmer.

Benefits of the Sun and Risks of the Sun for Humans

Benefits	Risks to Humans
Warmth	Sunburn
Vision	Cataracts
Photosynthesis	Skin cancer
Vitamin D synthesis	Suppresses immunity
Kills germs	

SunSafe in the Middle School Years: Science Activity



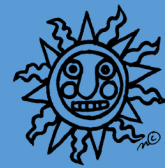
Directions for Students

1. Paint each of the four cans you are given a different color (white, blue, yellow, and black).
2. Fill each can with 1 cup of water.
3. Tape a thermometer onto the inside edge of each can. The thermometer should have one end in water, and the other end should be in a spot that you can read the temperature easily.
4. Put plastic wrap on each can.
5. Put cans in direct sunlight.

Questions

1. Which can kept the water cool?
2. What do you think the relationship is between color and heat?
3. Can you relate what you know about the colors and temperature to protecting yourself from the sun's rays?

SunSafe in the Middle School Years: Science Activity



Detecting UV Light Using Tonic Waterⁱ

Estimated Time

40 – 50 minutes

Supplies

- Tonic water
- Tap water
- Two beakers, labeled “tap water” and “tonic water”
- Black paper or cloth
- Sunlight

Learning Objectives

This activity will demonstrate the presence of UV light in sunlight. When a photon of UV energy is absorbed, it is re-emitted by the quinine in tonic water as a photon of visible light. This process is called fluorescence. The amount of fluorescence that occurs is influenced by the amount of UV light. This will reinforce the concept that UV light is always present in sunlight, although invisible to the naked eye.

Students should demonstrate the ability to research scientific background for a certain phenomenon. Students should show comprehension of the idea that it is the size of the UV wavelengths that cause them to appear invisible, but that when a photon of UV energy is absorbed in the tonic water, the quinine re-emits the energy as a photon of visible light.

Directions

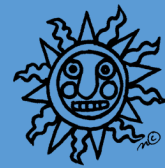
Fill the beaker labeled “tonic” almost to the brim with tonic water. Fill the other beaker almost to the brim with tap water. Place the beakers outside, so that direct sunlight strikes the surface of the liquid in both beakers. Ask the students to predict what they might observe. Hold a black piece of paper or cloth behind the beakers. Have the class look across the surfaces of the two beakers.

Have students write a paragraph explaining what has happened in this experiment, using the following words: fluorescence, wavelengths, photon. The students should demonstrate the ability to research scientific background for a certain phenomenon. Students should show comprehension of the idea that the size of the UV wavelengths cause them to appear invisible, but when a photon of UV energy is absorbed in the tonic water, the quinine re-emits the energy as a photon of visible light.

Questions and Answers

1. What differences do you see? *The top ¼ inch of the tonic water should glow blue.*
2. What time of day is it? Where is the sun in the sky? *Answers will vary.*
3. How might the position of the sun affect your results? *Best results occur around noon when the sun is directly overhead. The higher the sun is in the sky, the shorter the distance the UV light must travel through the ozone layer, allowing more UV radiation to reach the Earth’s surface.*
4. What is contained in the sunlight that causes these results? *UV radiation. Students should grasp the concept that UV light is always present in sunlight.*

SunSafe in the Middle School Years: Science Activity



Directions for Students

In this activity, you will use tonic water to do an experiment with *ultraviolet light*. Fill the beaker labeled “tonic” almost to the brim with tonic water. Fill the other beaker almost to the brim with tap water.

Place the beakers outside, so that direct sunlight strikes the surface of the liquid in both beakers. Hold a black piece of paper or cloth behind the beakers.

Observe the surfaces of the tonic and tap waters in the two beakers. Answer the questions below.

Vocabulary Words

Fluoresce – To exhibit fluorescence (luminescence) caused by the absorption of radiation at one wavelength followed by nearly immediate reradiation usually at a different wavelength, and that ceases almost at once when the incident radiation stops.

Ultraviolet light – Of or pertaining to the ultraviolet spectrum of invisible light/radiation.

Wavelength – In a periodic wave, the distance between two points of corresponding phase in consecutive cycles; a measurement of light/radiation.

Questions

1. What differences do you see between the two beakers?
2. What time of day is it? Where is the sun in the sky?
3. How might the position of the sun affect your results?
4. What is contained in the sunlight that causes these results?

October 2023

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