

# Be Sunbeatable™

## A sun safety program for grades 3–5

### Dear Teacher,

Sun protection is an important part of children's overall health and well-being. Sunburn during childhood is a major risk factor for skin cancer, the most common cancer in the United States. You can help students develop good sun safety habits early to reduce their lifetime risk of skin cancer.

This sun safety program from Scholastic and **The University of Texas MD Anderson Cancer Center** will help encourage positive sun safety behaviors in students and families.

Use the poster, lessons, and activities in this guide to educate students about the power and dangers of the sun so they can be sun safe every day and everywhere they go.

Visit [scholastic.com/sunsafety](http://scholastic.com/sunsafety) for additional classroom activities and parent materials.

Keep the poster up all year long to remind your class to be sun safe every day!



## Two Ways You Could Win!

### 1 Student Assessments

Before teaching the unit, complete the "What Do You Know About Sun Safety?" quiz with your students. Make sure to check "pre-assessment" on the top of the sheet.

Conduct a post-assessment by using the same quiz after you have taught the unit. Make sure to check "post-assessment" at the top of the sheet.

You **MUST** submit both pre- and post-assessment results to be eligible for a chance to win.

TWO  
TEACHERS  
WILL WIN:  
**\$500**

### 2 Student Contest

Students will create their own graphic story that illustrates a sun safety message of their choice.

Distribute the student contest sheets, ensuring completed entries include both a drawing and written description.

For judging criteria please see the official rules: [scholastic.com/sunsafety/rules](http://scholastic.com/sunsafety/rules)  
All prizes provided directly by Scholastic.

TWO  
TEACHERS  
WILL WIN:  
**\$250**

TWO  
STUDENTS  
WILL WIN:  
**Tablet Computer  
+ set of  
Scholastic  
books**

*The University of Texas MD Anderson Cancer Center in Houston, Texas is one of the world's most respected centers focused on cancer patient care, research, education and prevention. It is ranked No. 1 for cancer care in U.S. News & World Report's Best Hospitals survey, and is one of only 49 comprehensive cancer centers designated by the National Cancer Institute.*

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**STUDENT  
INFORMATION**

Name:

Grade:

# What Do You Know About Sun Safety?

**Take the quiz below to find out how much you know about sun protection and sun safety behaviors.**

1.	A baseball cap is more protective than a wide-brimmed hat.	<input type="radio"/> True <input type="radio"/> False
2.	You can be sunburned in the winter.	<input type="radio"/> True <input type="radio"/> False
3.	The sun's rays are strongest between 6 a.m. and 10 a.m. every day.	<input type="radio"/> True <input type="radio"/> False
4.	When you are in the shade, you are always protected from the sun's rays.	<input type="radio"/> True <input type="radio"/> False
5.	All sunglasses protect your eyes against the sun's rays.	<input type="radio"/> True <input type="radio"/> False
6.	Sunscreen is not needed on cloudy days.	<input type="radio"/> True <input type="radio"/> False
7.	The sun's rays are most harmful when your shadow is shorter than you are.	<input type="radio"/> True <input type="radio"/> False
8.	You do not ever need to reapply sunscreen when you are outside.	<input type="radio"/> True <input type="radio"/> False

## How Did You Do?

**6–8 correct:** Congratulations! You know your stuff when it comes to keeping safe in the sun.

**3–5 correct:** You've got a good grasp of sun safety—nice work!

**0–2 correct:** You're off to a good start, keep learning about sun safety.

# Teacher Instructions

## Before You Begin

Copy and distribute the pre-assessment sheet to discover what students know about the sun and sun safety. At the end of the program, have students take the assessment again to assess their learning. When you help us evaluate the program, you'll be entered for a chance to win \$500! Go to [scholastic.com/sunsafety](http://scholastic.com/sunsafety) to learn more.

**Answer key** 1. False; 2. True; 3. False; 4. False; 5. False; 6. False; 7. True; 8. False.

## Lesson One: The Power of the Sun

**Objective** Students will learn about the sun and how the energy it produces impacts Earth and people.

**Materials** Poster, copies of "The Power of the Sun" activity sheet, pencils, student pre-assessment sheet, access to a computer to research the UV Index

### Get Started

1. To introduce this lesson, challenge your students to describe three reasons why we need the sun as well as three ways the sun can cause damage to our skin. Make sure to discuss how Earth needs the sun for light and warmth and to grow food.
2. Ask students whether they think the light and warmth from the sun are the same everywhere on Earth and then discuss the different types of climates around the world. Ask: *Where is the sun stronger and where is it weaker?* Talk about the type of weather you have in your area; ask students: *Are you in the mountains or in the southern part of the country, closer to the equator?* Explain that no matter what climate you live in, the sun's rays reach Earth and your skin.

### Use the Student Activity Sheet

1. Distribute copies of "The Power of the Sun" activity sheet. Read it aloud as a group, or have older students read it on their own.
2. Explain that there are two main types of UV rays: ultraviolet A (UVA) rays, which penetrate into the dermis (the skin's thickest layer), and ultraviolet B (UVB) rays, which are responsible for producing sunburn on the skin's surface. After discussing how the UV Index helps warn us about harmful rays, share the day's UV Index for your area with students to reinforce the concept. Index numbers can be found at: [epa.gov/sunsafety/uv-index-1](http://epa.gov/sunsafety/uv-index-1).
3. After students have reviewed the text have them answer the following questions: 1. *What does the sun send to Earth?* 2. *What is the UV Index?* 3. *At what time of day is the sun the strongest?* 4. *How can you protect yourself from the sun?*

### Critical Thinking

Ask students to describe any sun safety practices they may follow and if there are any times when you don't need to protect your skin from the sun. Have students name those times. For each statement, make sure you counteract the myths with the facts. Make sure these points are addressed in the discussion:

- We have to protect our skin all year round; no matter what climate we live in and even on cloudy days.
- UV rays can damage anyone's skin, regardless of skin color.
- You need to apply sunscreen regularly throughout the day, and being in the ocean or a pool does not protect skin from the sun.

Review and encourage students to practice the sun safety tips on the poster.

**5th-grade extension** As an independent activity, have students select five diverse geographic locations. For a week, have them track the UV Index in these locations and compare them. Have students write a report on what they have found, specifically how geography and climate impact the number.

**Supporting Lesson** Complete the learning online with a **hands-on experiment** where students will learn about how their shadow length indicates when the sun's rays are most harmful: [scholastic.com/sunsafety](http://scholastic.com/sunsafety).

## Lesson Two: Understanding and Protecting Our Skin

**Objective** Students will learn about skin and how to protect it from the sun's UV rays.

**Materials** Copies of the "What Is Skin?" activity sheet (you'll find this in Part 2 of the program), pencils

### Get Started

1. Challenge your students to think of all the ways we keep our bodies healthy. (Answers may include eat healthy foods, get sleep, brush teeth, avoid things that could harm us, etc.). Ask students what job they think skin has and what we can do to keep it healthy. (Answers may include: keep it clean, take care of cuts, wear sunscreen, etc.). Explain that the sun is key to life on Earth but protecting our skin is key to healthy living.

### Use the Activity Sheet

1. Distribute copies of the "What Is Skin?" activity sheet. Read the page aloud or have older students read it independently.
2. Explain that UV rays can cause sunburns. They can also weaken our skin's cells, making it harder for the body to fight infection and disease. This is why we need to help our skin protect our bodies, no matter what color our skin is, and no matter what time of year it is.
3. After students have reviewed the text have them answer the following: 1. *List three things the skin does.* 2. *Name the layer of skin where skin cells are made.* 3. *List three things you can do to help protect your skin.*

### Follow-Up Activity

Using the poster as reference, encourage students to think about the sun protection adaptations that animals have adopted to protect themselves from the sun. Explore how animal behavior can be similar to the ways humans protect themselves from the sun and then review the sun safety tips.

**5th-grade extension** Have students research three animals comparing and contrasting the way they protect themselves from the sun. Explain how behavior varies by climate.

**Supporting Lesson** Go online to continue the fun with a **hands-on project** to learn more about the skin: [scholastic.com/sunsafety](http://scholastic.com/sunsafety).

### Complete the Unit

Copy and distribute the post-assessment sheet to evaluate what students have learned about the sun and sun safety.

Learn about Ray and the Sunbeatables®, a curriculum for preschoolers, kindergarteners, and first-grade students at [sunbeatables.org](http://sunbeatables.org).

# The Power of the Sun

The sun is a star filled with gases that create energy. This energy makes the heat and light the sun gives off. It only takes eight minutes for the sun's light to get to Earth. That's pretty fast, considering the sun is about 93 million miles away!

Along with the light and heat, Earth uses the sun to grow plants and keep us healthy. The sun also sends out invisible ultraviolet (UV) rays. Even though we can't see or feel them, UV rays can be harmful. UV rays can burn and hurt our skin and eyes, so we need to protect ourselves from them.

UV rays reflect off snow and sand.



## What Is the UV Index?

The UV Index is like a warning code. It tells us the amount of UV rays coming from the sun. It lets us know how harmful the rays can be to our skin and eyes when we're outside. The UV Index ranges from 0 (low) to 11 or more (extremely high). We need to be extra careful when the index is high.

## How Do UV Rays Work?

There are things we can do to help protect ourselves from the sun. For example, apply sunscreen with a Sun Protection Factor (SPF) of 30 or higher at least 30 minutes before you go outside. SPF 30 blocks 97% of UV rays. We should also learn about the sun's strength.

- The sun's rays are strongest and most harmful when the sun is directly overhead between 10 a.m. and 4 p.m.
- The sun's rays are strongest in the summer, but its rays can also be harmful in the winter.
- UV rays go through clouds, so we need to protect ourselves on cloudy days, too.
- UV rays can reflect off snow, water, and sand at the beach, as well as pavement and sidewalks. This means the rays can reach our skin.
- The sun is strongest at or near the equator. UV rays travel a shorter distance to get to the area.
- UV rays are stronger at higher altitudes, such as in the mountains.

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## Two Ways You Could Win!

- 1 Student Assessments**  
Submit pre- and post-assessment quizzes.  
\$1,000 in prizes.
- 2 Student Contest**  
Submit your students' graphic stories. You and your students could win!  
**Find out more inside!**

See entry form inside for Abbreviated Rules. All prizes provided directly by Scholastic.



Send  
home to  
families

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# What Is Skin?

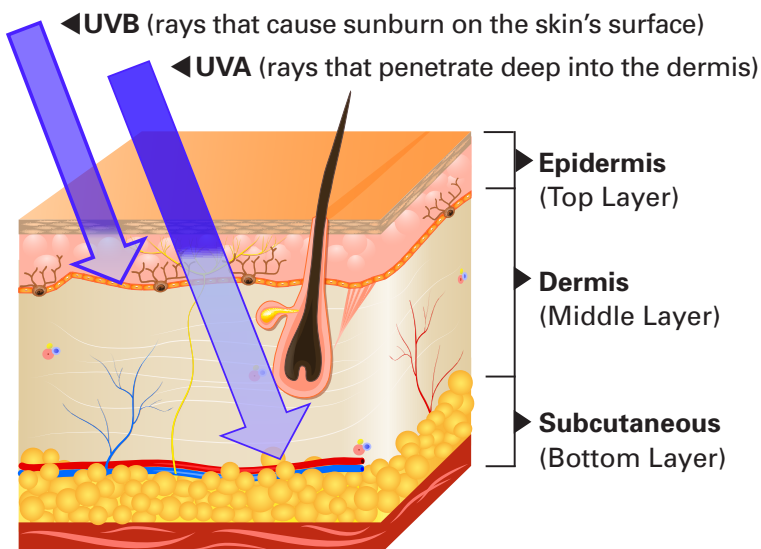
Skin has a big job. It's your body's largest organ. It protects your body. It keeps germs and dirt from getting inside your body. It keeps you cool and warm. And it has nerves that help you feel.

There are millions of skin cells on your body. Did you know that you lose thousands and thousands of skin cells every day? The good news is that your skin grows back quickly.

## Exploring Skin's Layers

Skin has three layers.

- 1. Epidermis**—New skin cells are made here. It is also where melanin is made. Melanin is what gives skin its color.
- 2. Dermis**—It has nerves that help you feel sensations. It's also where sweat, oil, and goose bumps are made. It helps bring blood to your skin. It is also where hairs start.
- 3. Subcutaneous**—It connects the dermis to your muscles and bones and stores fat to help protect them from bumps and falls. It helps your blood vessels and nerve cells reach the rest of your body. This layer helps keep your body from getting too hot or cold.



## Protecting Your Skin

Whenever you go outside, your skin is exposed to the sun. The sun has ultraviolet (UV) rays that can burn and hurt your skin. You can help protect your skin from UV rays with important sun safety habits:

- Apply sunscreen at least 30 minutes before going outside. Reapply every 1–2 hours and after swimming or sweating. Spread sunscreen generously and evenly from head to toe. Don't forget your nose, ears, neck, hands, and feet. Make sure your sunscreen protects against UVA and UVB rays.
- Wear a wide-brimmed hat. It will protect your face, head, ears, and neck more than a baseball cap.
- Wear sunglasses to protect your eyes. Make sure they are UV protective. Check the label to ensure they block 99–100% of UV rays.
- Wear clothes that cover your skin, like long sleeves, long shorts, pants, and socks and shoes.
- Find shade outside to play in.
- Be extra protected between 10 a.m. and 4 p.m., when the sun's rays are most harmful.

# Teacher Instructions

## Lesson Three: How Shadows Indicate the Sun's Strength

**Objective** Students will learn how shadow lengths vary at different times of the day and indicate when the sun's rays are most harmful.

**Materials** Copies of the "Shadow Observations" student activity sheet; yardsticks, rulers, yarn or string for measuring shadows; tape; access to an outdoor area before 10 a.m. and again between 12 p.m. and 4 p.m.; sidewalk chalk

### Planning for the Experiment

Determine the following before beginning the experiment:

1. Pair each student with a partner or have them work in small teams.
2. Find a safe area outdoors where you will have students measure their shadows.
3. Select a time before 10 a.m. and another time between 12 p.m. and 4 p.m. to take the measurements.
4. Decide how students will measure their shadows. If students use rulers only, they should mark the place where they stand with chalk and have their partners mark the top of their shadow with a chalk mark. They will then use rulers to measure the distance between chalk marks. If using string or yarn, give each student a long piece of string or yarn and two pieces of tape. The student creating the shadow will tape one end of the string where he or she is standing, while their partner will tape the string or yarn at the other end of the shadow. They will then measure the distance between tape marks.
5. Look up the UV Index number on the day of the experiment to share with students.

### Getting Started

1. Ask students to recap what they've learned about when the sun's rays are most harmful. Remind them that the sun's rays are most harmful when the sun is high in the sky and directly overhead, between 10 a.m. and 4 p.m.
2. Next ask them what they observed about shadows when they were outside.
3. Explain that you're going to do an experiment to observe how shadows appear at different times of the day and the connection between shadow length and the strength of the sun's rays.
4. Follow all sun safety precautions before going outdoors.

### Using the Activity Sheet

1. Distribute copies of the "Shadow Observations" student activity sheet and review it with students.
2. Assist students with measuring their heights. Have them record their height and complete the first five columns of the chart.
3. Take students outdoors to view and measure their shadows.
4. Explain how students will mark and measure their shadows.
5. Have students complete their charts, including their observations and explanations.
6. Review the results. Explain to students that the lengths of their shadows can determine when sun rays are most harmful. During early morning and late afternoon, shadows are longer. During the midday hours (10 a.m. to 4 p.m.), the sun is directly overhead and shadows are shorter (or there is no shadow). The sun's rays are more intense and harmful at this time.

7. Remind students that it is important to be extra protected if they plan to be outside during midday hours; they should use as many forms of sun protection as possible. Review sun safety tips (e.g., sunscreen, protective clothing, wide-brimmed hats, sunglasses, and shade).

**Follow-up Activity** To further explore how powerful the sun's rays are, create a solar-powered oven with your class. While this is a positive use of the sun's energy, it also demonstrates the sun's strength. Check out the example at [climatekids.nasa.gov/smores](http://climatekids.nasa.gov/smores).

## Lesson Four: Building a 3-D Model of the Skin

**Objective** Students will be guided to make 3-D models of the skin. This will provide a better understanding of the skin's layers, the difference between healthy and damaged skin, and how UV rays penetrate the skin.

**Materials** Copies of the "3-D Skin Model Project" student activity sheet.

**Suggested Model Materials** Tissue box, toothpicks, pipe cleaner, cotton balls, plastic wrap

### Getting Started

1. As a class, review the "What Is Skin?" lesson. Ask students to recap what they learned and prompt responses that start a discussion about the layers of the skin and what they do.
2. Review UV rays and the different types, specifically how UVA and UVB rays impact the skin.

### Planning for the Project

1. Explain to students that they will be creating 3-D models of the skin and distribute copies of the "3-D Skin Model Project" activity sheet.
2. As a class, brainstorm materials that could be used to build skin models and write the list on the board.
3. Divide students into groups of four. In each group, each pair will work on two versions of the model: One pair will produce a model of healthy skin and one pair will produce a model of sunburned skin.
4. Have students sketch their model designs and make a list of which materials they will use. Tell students to bring items they don't have in class from home on the day of the project.

### Project Day

Student groups will build their designs ensuring each model is labeled accurately and shows how UV rays penetrate the skin.

**5th-Grade Extension** Have students write an accompanying report about what the skin does, how the sun can affect the skin, and how we can stay healthy by protecting our skin. Students can also research other elements of the skin, such as blood vessels and hair follicles, to build on their models.

**Follow-Up Activity** Have students spread the message of sun safety with schoolmates, family, and friends by becoming sun safety ambassadors! Students can design sun safety message cards to distribute at home or with other classes at school. You can also create a display on a hallway bulletin board.

### Complete the Unit

Copy and distribute the "What Do You Know About Sun Safety?" post-assessment sheet to find out what your students have learned. Submit your students' assessments and you could win \$500!

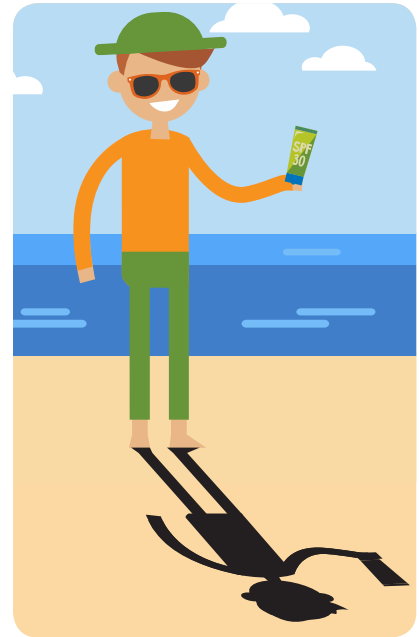
# Shadow Observations

Try the experiment below. Measure your shadow at different times during the day. See how your shadow's length changes depending on the time of day.

**Experiment Question:** What can our shadows tell us about the strength of the sun's rays?

**Directions:** Observe your shadow at least twice on the same day. Be sure to protect yourself from the sun before going outside. And be sure to have a grown-up with you. Follow these steps:

- Write your height on the line below.
- Fill in the day and date, weather, and UV Index for the day of your experiment.
- Before going outside, predict whether your shadow will be shorter, taller, or the same height as you, or whether you will have no shadow.
- Write your prediction on the chart.
- Go outside with a grown-up at the following times to measure your shadow.
  - Early morning (before 10 a.m.)
  - Midday (between 12 p.m. and 4 p.m.)
- Mark the spot where you will stand with chalk. Stand in the same spot both times.
- Have a partner mark the top of your shadow with chalk.
- Measure the length of your shadow with a ruler, yardstick, or piece of string. Write your shadow measurement in inches, on the chart below.
- On the lines under the chart, write your observation. Also describe what your shadow measurements tell us about the strength of the sun's rays.



My Height: \_\_\_\_\_

Day & Date	Weather	UV Index	Time	My Shadow Prediction (short, tall, same as my height, no shadow)	Shadow Measurement

My Observation and Explanation: \_\_\_\_\_

**Optional:** Measure your shadow midmorning (between 10 a.m. and 12 p.m.) and late afternoon (between 4 p.m. and 5 p.m.). What do you notice?

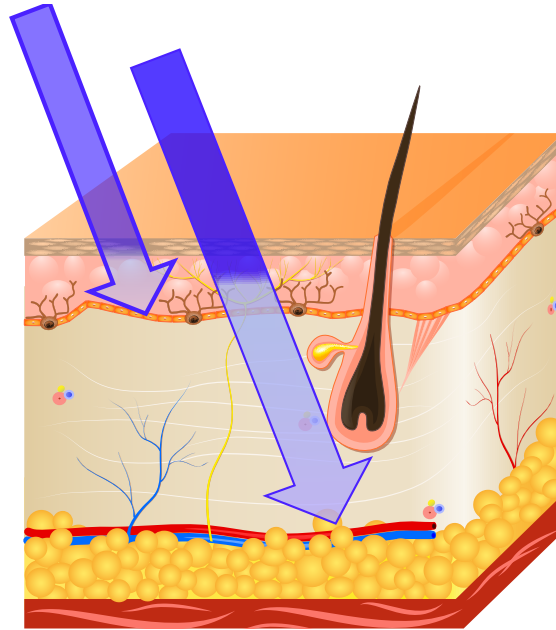


# 3-D Skin Model Project

You will create a 3-D model of the structure of the skin. Use the checklist to label the diagram below and make sure your model has all the elements represented.

## Model Checklist

- ☐ Epidermis
- ☐ Dermis
- ☐ Subcutaneous
- ☐ UVA rays
- ☐ UVB rays



Sketch a design of your model here and make a list of all the materials you plan to use to build it. Have fun and be creative!

### Materials I will use:

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# Sun Protection in Action

## Adaptations in the Animal World



### Hippos Wear Sunscreen?

The hippopotamus protects its skin by leaking an oily pink substance. This oil keeps the hippo's skin from drying out and protects it from the sun!



### Elephants Get Dirty!

Elephants actively seek out shelter and shade on a regular basis, but it is even more common for elephants to coat themselves with mud. The mud dries and acts as a barrier between their skin and the sun.



### Cool as a...Meerkat!

Meerkats have found a way to survive in the harsh sun of the desert. They have black rings around their eyes to absorb the sun's rays, protecting their eyes from sun damage. It's like they have built-in sunglasses!

## How Can You Be Sun Safe?



### Use Sunscreen

We can't make our own sunscreen like the hippo can, but we can make sure to apply it! Wear sunscreen and lip balm with SPF 30 and apply at least 30 minutes before going outside. Make sure to spread generously and evenly from head to toe. Remember to reapply!



### Find Shade

Rolling around in mud isn't really practical for humans, but we can seek shade when sunburn-causing UV rays are most intense. Be extra protected when the sun is directly overhead between 10 a.m. and 4 p.m., when shadows are shorter.



### Cover Up

Unlike meerkats, our eyes and skin need help when it comes to sun protection. Look cool and protect your skin by covering up year-round. Wear wide-brimmed hats (not baseball caps), UV-protective sunglasses, and sun-safe clothing that is tightly woven.

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