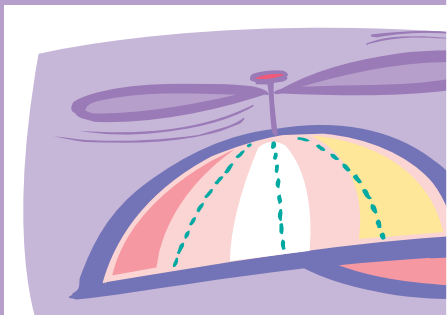
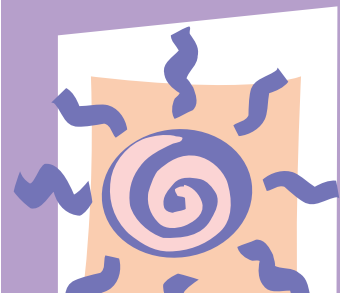
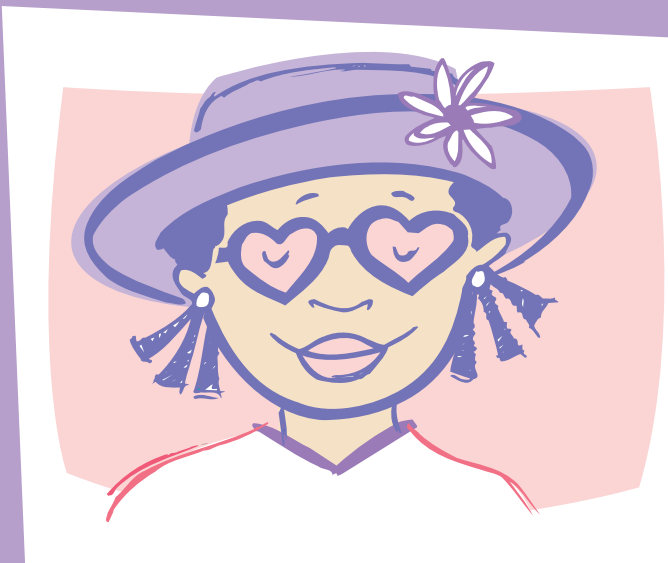
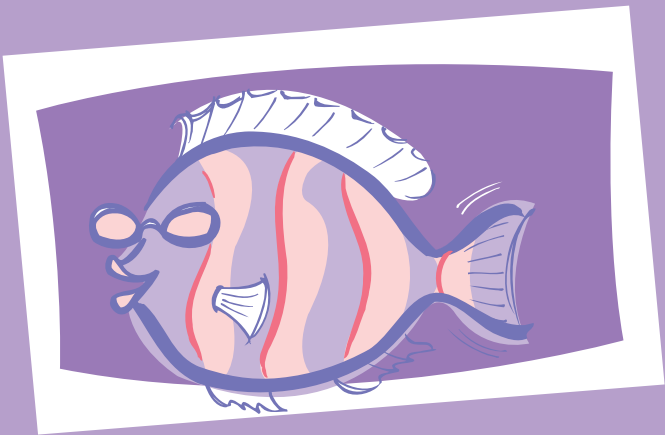
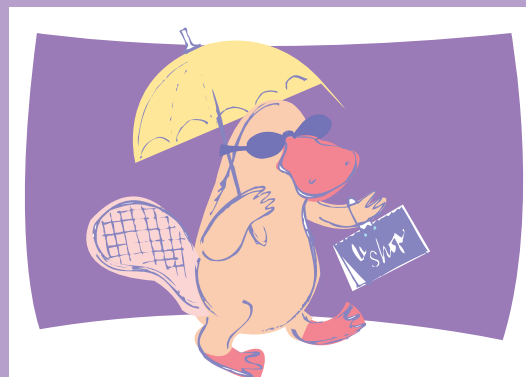
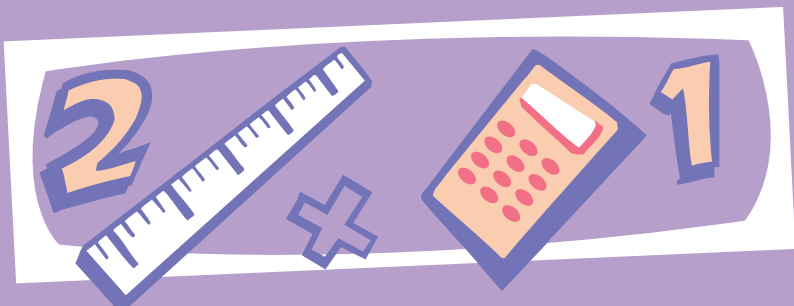
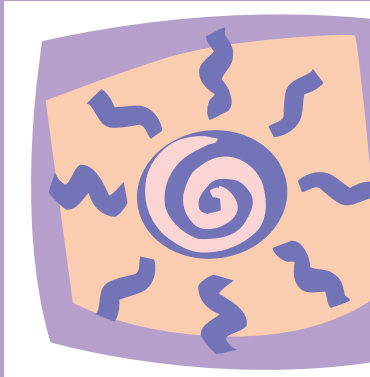
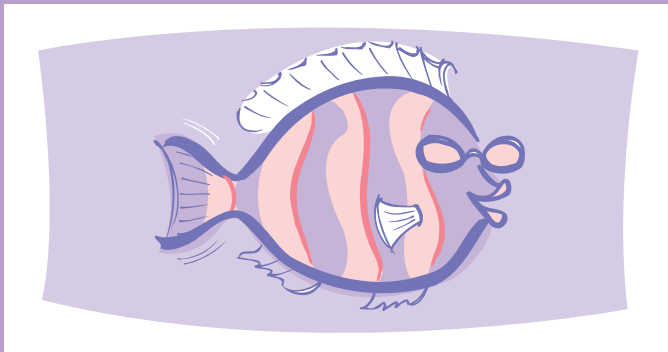
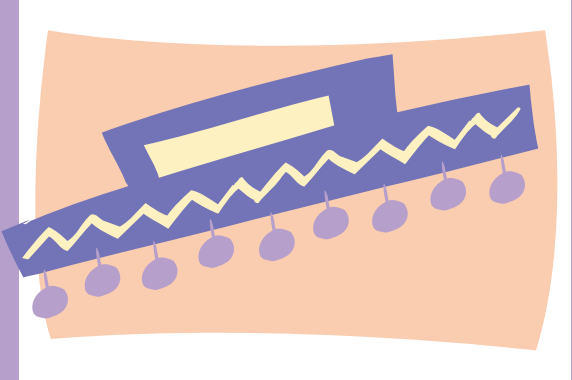


# SunWisdom



**SunWise**<sup>®</sup>   
a program that **radiates** good ideas  
A Partnership Program of the U.S. Environmental Protection Agency  
[www.epa.gov/sunwise](http://www.epa.gov/sunwise)



## Action Steps for Sun Protection

*While some exposure to sunlight can be enjoyable, too much can be dangerous. Overexposure to ultraviolet (UV) radiation in sunlight can result in a painful sunburn. It can also lead to more serious health effects, including skin cancer, premature aging of the skin, and other skin problems; cataracts and other eye damage; and immune system suppression. Children particularly need sun protection education, since unprotected exposure to the sun during youth puts them at an increased lifetime risk for skin cancer.*

### **Be SunWise**

Most people are not aware that skin cancer, while largely preventable, is the most common form of cancer in the United States, with more than 3.5 million cases diagnosed each year. By following a number of simple steps, you can still enjoy your time in the sun while protecting yourself from overexposure. In cooperation with a number of leading public health organizations, the U.S. Environmental Protection Agency (EPA) is providing these action steps to help you and your family be “SunWise.” Other than staying

indoors, no single step can fully protect you from overexposure to UV radiation, so use as many of the following actions as possible.

### **Do Not Burn**

Overexposure to the sun is the most preventable risk factor for skin cancer.

### **Avoid Sun Tanning and Tanning Beds**

UV rays from tanning beds and the sun cause skin cancer and wrinkling. If you want to look like you’ve been in the sun, consider using a sunless self-tanning product, but continue to use sunscreen with it.

### **Generously Apply Sunscreen**

Generously apply sunscreen to all exposed skin using a Sun Protection Factor (SPF) of at least 30 that provides broad-spectrum protection from both ultraviolet A (UVA) and ultraviolet B (UVB) rays. Reapply every two hours, even on cloudy days, and after swimming or sweating.

### **Wear Protective Clothing**

Wear protective clothing, such as a long-sleeved shirt, pants, a wide-brimmed hat, and sunglasses, when possible.

### **Seek Shade**

Seek shade when appropriate, remembering that the sun’s UV rays are strongest between 10 a.m. and 4 p.m.

### **Use Extra Caution Near Water, Snow, and Sand**

Water, snow, and sand reflect the damaging rays of the sun, which can increase your chance of sunburn.

### **Check the UV Index**

The UV Index provides important information to help you plan your outdoor activities in ways that prevent overexposure to the sun’s rays. Developed by the National Weather Service and EPA, the UV Index is issued daily nationwide.

### **Get Vitamin D Safely**

Get Vitamin D safely through a diet that includes vitamin supplements and foods fortified with Vitamin D. Don’t seek the sun.

Early detection of melanoma can save your life. Carefully examine all of your skin once a month. A new or changing spot should be evaluated.

## Use as Directed: Getting the Most Out of Sunscreen

The U.S. Food and Drug Administration (FDA) is the federal agency responsible for regulating sunscreens. Effective June 18, 2012, FDA issued final regulations that established a standard test for over-the-counter (sold without a prescription) sunscreen products that determine which products are allowed to be labeled as “Broad Spectrum.” FDA extended the compliance dates for testing and labeling until December 17, 2012 for most over-the-counter sunscreen products.

Prior FDA rules on sunscreens dealt almost exclusively with protection against sunburn, which is primarily caused by ultraviolet B (UVB) radiation from the sun, and did not address ultraviolet A (UVA) radiation, which contributes to skin cancer and early skin aging. After reviewing the latest science, FDA determined that sufficient data are available to establish a “broad spectrum” test for determining a sunscreen product’s

UVA protection. Passing the broad spectrum test shows that the product provides UVA protection that is proportional to its UVB protection.

Sunscreen products that pass the broad spectrum test are allowed to be labeled as “Broad Spectrum.” These “Broad Spectrum” sunscreens protect against both UVA and UVB rays. Scientific data demonstrated that products that are “Broad Spectrum SPF 15 [or higher]” have been shown to reduce the risk of skin cancer and early skin aging when used with other sun protection measures, in addition to helping prevent sunburn. Other sun protection measures include limiting time in the sun and wearing protective clothing.

EPA follows the recommendation of the National Council on Skin Cancer Prevention in recommending the use of SPF 30 or higher sunscreen. The SPF value indicates the level of sunburn protection provided by the

sunscreen product. All sunscreens must be tested according to an SPF test procedure. The test measures the amount of ultraviolet (UV) radiation exposure it takes to cause sunburn when a person is using a sunscreen in comparison to how much UV exposure it takes to cause sunburn when they do not use a sunscreen. The product is then labeled with the appropriate SPF value indicating the amount of sunburn protection provided by the product. Higher SPF values (up to 50) provide greater sunburn protection. Because SPF values are determined from a test that measures protection against sunburn caused by ultraviolet B (UVB) radiation, SPF values only indicate a sunscreen’s UVB protection. However, sunscreens that pass the new broad spectrum test will have demonstrated that they also provide ultraviolet A (UVA) protection that is proportional to their UVB protection. To pass the broad spectrum test, sunscreens with higher SPF values

will provide higher levels of UVA protection as well. Therefore, under the new label requirements, a higher SPF value for sunscreens labeled “Broad Spectrum SPF [value]” will indicate a higher level of protection from both UVA and UVB radiation.

FDA advises the public to be aware that no sunscreens are “waterproof” because all sunscreens eventually wash off. Sunscreens can only be labeled as “water resistant” if they are tested according to the required SPF test procedure. Sunscreens labeled “water resistant” will also be required to state whether the sunscreen remains effective for 40 minutes or 80 minutes when swimming or sweating, and all sunscreens will be required to provide directions on when to reapply.

In summary, the final rule includes the following requirements:

- **Broad Spectrum designation.** Sunscreens that pass FDA’s broad spectrum test procedure, which measures a product’s ultraviolet A (UVA) protection relative to its ultraviolet B (UVB) protection, may be labeled as “Broad Spectrum SPF [value]” on the front label. For Broad Spectrum sunscreens, SPF values also

indicate the amount or magnitude of overall protection. Broad Spectrum SPF products with SPF values higher than 15 provide greater protection and may claim additional uses, as described in the next bullet.

- **Use claims.** Only Broad Spectrum sunscreens with an SPF value of 15 or higher can claim to reduce the risk of skin cancer and early skin aging if used as directed with other sun protection measures. Non-Broad Spectrum sunscreens and Broad Spectrum sunscreens with an SPF value between 2 and 14 can only claim to help prevent sunburn.
- **“Waterproof,” “sweatproof” or “sunblock” claims.** Manufacturers cannot label sunscreens as “waterproof” or “sweatproof,” or identify their products as “sunblocks,” because these claims overstate their effectiveness. Sunscreens also cannot claim to provide sun protection for more than 2 hours without reapplication or to provide protection immediately after application (for example— “instant protection”) without submitting data to support these claims and obtaining FDA approval.

- **Water resistance claims.** Water resistance claims on the front label must indicate whether the sunscreen remains effective for 40 minutes or 80 minutes while swimming or sweating, based on standard testing. Sunscreens that are not water resistant must include a direction instructing consumers to use a water resistant sunscreen if swimming or sweating.
- **Drug Facts.** All sunscreens must include standard “Drug Facts” information on the back and/or side of the container.

### Additional Resources

[www.fda.gov/downloads/forconsumers/consumerupdates/ucm258718.pdf](http://www.fda.gov/downloads/forconsumers/consumerupdates/ucm258718.pdf)

[www.fda.gov/forconsumers/consumerupdates/ucm258468.htm#Q1\\_Why\\_is\\_FDA](http://www.fda.gov/forconsumers/consumerupdates/ucm258468.htm#Q1_Why_is_FDA)

If used as directed with other sun protection measures, this product reduces the risk of skin cancer and early skin aging, as well as helps prevent sunburn. Only products labeled with both “Broad Spectrum” AND SPF 15 or higher have been shown to provide all these benefits.



<b>Drug Facts</b>	
<b>Active Ingredients</b> Avobenzone 3% Homosalate 10% Octyl methoxycinnamate 7.5%	<b>Purpose</b> Sunscreen
<b>Uses</b> • helps prevent sunburn • if used as directed with other sun protection measures (see <b>Directions</b> ), decreases the risk of skin cancer and early skin aging caused by the sun	
<b>Warnings</b> <b>For external use only</b> <b>Do not use</b> on damaged or broken skin <b>When using this product</b> keep out of eyes. Rinse with water to remove. <b>Stop use and ask a doctor</b> if rash occurs <b>Keep out of reach of children.</b> If product is swallowed, get medical help or contact a Poison Control Center right away.	
<b>Directions</b> • apply liberally 15 minutes before sun exposure • reapply: • after 40 minutes of swimming or sweating • immediately after towel drying • at least every 2 hours • <b>Sun Protection Measures.</b> Spending time in the sun increases your risk of skin cancer and early skin aging. To decrease this risk, regularly use a sunscreen with a broad spectrum SPF of 15 or higher and other sun protection measures including: • limit time in the sun, especially from 10 a.m. – 2 p.m. • wear long-sleeve shirts, pants, hats, and sunglasses • children under 6 months: Ask a doctor	
<b>Inactive ingredients</b> aloe extract, barium sulfate, benzyl alcohol, carbomer, dimethicone, disodium EDTA, jojoba oil, methylparaben, octadecene/MA copolymer, polyglyceryl-3 distearate, phenethyl alcohol, propylparaben, sorbitan isostearate, sorbitol, stearic acid, tocopherol (vitamin E), triethanolamine, water	
<b>Other information</b> • protect this product from excessive heat and direct sun	
<b>Questions or comments?</b> Call toll free 1-800-XXX-XXXX	

These products have not been shown to protect against skin cancer and early skin aging. They have been shown only to help prevent sunburn.



<b>Drug Facts</b>	
<b>Active Ingredients</b> Avobenzone 3% Homosalate 10% Octyl methoxycinnamate 7.5%	<b>Purpose</b> Sunscreen
<b>Uses</b> • helps prevent sunburn	
<b>Warnings</b> <b>Skin Cancer/Skin Aging Alert:</b> Spending time in the sun increases your risk of skin cancer and early skin aging. This product has been shown only to prevent sunburn, <b>not</b> skin cancer or early skin aging. <b>For external use only</b> <b>Do not use</b> on damaged or broken skin <b>When using this product</b> keep out of eyes. Rinse with water to remove. <b>Stop use and ask a doctor</b> if rash occurs <b>Keep out of reach of children.</b> If product is swallowed, get medical help or contact a Poison Control Center right away.	
<b>Directions</b> • apply liberally 15 minutes before sun exposure • reapply: • after 40 minutes of swimming or sweating • immediately after towel drying • at least every 2 hours • children under 6 months: Ask a doctor	
<b>Inactive ingredients</b> aloe extract, barium sulfate, benzyl alcohol, carbomer, dimethicone, disodium EDTA, jojoba oil, methylparaben, octadecene/MA copolymer, polyglyceryl-3 distearate, phenethyl alcohol, propylparaben, sorbitan isostearate, sorbitol, stearic acid, tocopherol (vitamin E), triethanolamine, water	
<b>Other information</b> • protect this product from excessive heat and direct sun	
<b>Questions or comments?</b> Call toll free 1-800-XXX-XXXX	



# Health Effects of Sun Overexposure

*Since the appearance of an “ozone hole” over the Antarctic in the 1980s, Americans have become aware of the health threats posed by depletion of stratospheric ozone, which protects the Earth from the sun’s harmful ultraviolet (UV) rays. This fact sheet provides a quick overview of the major health problems linked to overexposure to UV radiation:*

- Skin cancer (melanoma and nonmelanoma)
- Premature aging of the skin and other skin problems
- Cataracts and other eye damage
- Immune system suppression

Understanding these risks and taking a few sensible precautions will help you enjoy the sun while lowering your chances of sun-related health problems later in life.

## **Skin Cancer**

One in five Americans will develop skin cancer in their lifetime. Medical research is helping us understand the causes and effects of skin cancer. Many health and education groups

are working to reduce the incidence of this disease, of which more than 3.5 million cases are diagnosed each year.

## **Melanoma**

Melanoma, the most serious form of skin cancer, is characterized by the uncontrolled growth of pigment-producing cells. One American dies of melanoma every hour. By 2015, it is estimated that one in 50 Americans will develop melanoma in their lifetime. Many dermatologists believe there may be a link between childhood sunburns and melanoma later in life. The rate of new melanoma cases in this country has nearly doubled in the past two decades, and the rise is expected to continue.

## **Nonmelanoma Skin Cancers**

Nonmelanoma skin cancers are generally less deadly than melanomas. Nevertheless, left untreated, they can spread, causing disfigurement and more serious health problems. More than 2 million Americans are diagnosed with nonmelanoma skin cancer each

year. There are two primary types of nonmelanoma skin cancers.

*Basal Cell Carcinomas* are the most common type of skin cancer tumors. They usually appear as small, fleshy bumps or nodules on the head and neck, but can occur on other skin areas. Basal cell carcinoma grows slowly, and rarely spreads to other parts of the body. It can, however, penetrate to the bone and cause considerable damage.

*Squamous Cell Carcinomas* are tumors that may appear as nodules or as red, scaly patches. This cancer can develop into large masses, and unlike basal cell carcinoma, it can spread to other parts of the body.

These two cancers have a cure rate as high as 95 percent if detected and treated early. The key is to watch for signs and seek medical treatment.



### Other Skin Damage

Other UV-related skin problems include actinic keratoses and premature aging of the skin. Actinic keratoses are skin growths that occur on body areas exposed to the sun. The face, hands, forearms, and the “V” of the neck are especially susceptible to this type of lesion.

Although premalignant, actinic keratoses are a risk factor for squamous cell carcinoma. Look for raised, reddish, rough-textured growths and seek prompt medical attention if you discover them. Chronic overexposure to the sun also causes premature aging, which over time can make the skin become wrinkled, thick, and leathery. Since it occurs gradually, often manifesting itself many years after the majority of a person’s sun exposure, premature aging is often regarded as an unavoidable, normal part of growing older. With proper protection from UV radiation, however, most premature aging of the skin can be avoided.

### Cataracts and Other Eye Damage

Cataracts are a form of eye damage in which a loss of transparency in the lens of the eye clouds vision. If left untreated, cataracts can lead to blindness. Research has shown that UV radiation increases the likelihood of certain cataracts. Although curable with modern eye surgery, cataracts diminish the eyesight of millions of Americans and cost billions of dollars in medical care each year. Other kinds of eye damage include pterygium (tissue growth that can block vision), skin cancer around the eyes, and degeneration of the macula (the part of the retina where visual perception is most acute). All of these problems can be lessened with proper eye protection.

### Immune Suppression

Scientists have found that overexposure to UV radiation may suppress proper functioning of the body’s immune system and the skin’s natural defenses. All people, regardless of skin color, may be vulnerable to effects, including impaired response to immunization and an increased sensitivity to sunlight that may result from interactions with certain medications.

### EPA’s SunWise Program

In response to the serious public health threat posed by overexposure to UV radiation, EPA is working with schools and communities across the nation through the SunWise Program. SunWise aims to teach children and their caregivers how to protect themselves from overexposure to the sun.

# Ozone: Good Up High, Bad Nearby

## What is Ozone Anyway?

Ozone ( $O_3$ ) is made naturally in the atmosphere when three oxygen atoms join together to form a colorless gas. Ozone can have good or bad effects, depending on where it's located in the atmosphere. One way to remember this is, "good up high, bad nearby."

## Good Up High

### The "Good" Ozone Layer: Earth's Sunscreen

The earth is wrapped in layers of air called the atmosphere. "Good" ozone is in the earth's upper atmosphere, 10 to 30 miles above the surface. Life couldn't exist without this protective ozone, which is also called the "ozone layer."

The sun gives off light, heat, and other types of radiation. Too much UV (ultraviolet) radiation can cause skin cancer, cataracts, and harm plants and animals. Ozone high in the atmosphere absorbs, or takes in, some of the sun's harmful UV rays before they reach the ground. Just as sunscreen helps protect your skin from getting burned, ozone up high works like Earth's sunscreen.

## The Ozone Hole is Not a Hole

Although we say "hole in the ozone layer" or "ozone hole," there's no actual hole. Instead, the protective layer contains less good ozone than it used to. This thinning is found all over the earth, but the biggest losses are over the North and South Poles. That's because ozone destruction is worse when it's very cold.

To see current levels of ozone over the South Pole, go to:  
[ozonewatch.gsfc.nasa.gov](http://ozonewatch.gsfc.nasa.gov).

The trouble with ozone destruction starts when certain chemicals used in air conditioners, fire extinguishers, insulating foams, and solvents are let out during use. These chemicals eventually reach the upper atmosphere and are broken down by the sun's radiation, releasing chlorine and bromine atoms. These atoms take away one of the oxygen atoms from ozone and use them to make other substances. Chlorine and bromine atoms are catalysts, meaning they can speed up a chemical reaction without changing, and can repeat the destructive cycle again with another ozone molecule. So one chlorine or

bromine atom can destroy thousands and thousands of ozone molecules, causing ozone to disappear much faster than nature can replace it.

People often confuse the ozone hole with global warming, but they are two different problems.

## Is Anyone Doing Anything About the Ozone Hole (That's Not a Hole)?

The Montreal Protocol is an international treaty that protects the ozone layer by phasing out the manufacture and use of ozone-depleting chemicals. It was enacted in 1989, and all of the countries in the world have signed it. Many ozone-depleting chemicals are now illegal to use, or are only used in small quantities. If all countries meet the terms of the Montreal Protocol, scientists expect the ozone layer to heal by around 2050.

Because of the Montreal Protocol, levels of most ozone-depleting chemicals in the atmosphere have slowly gone down. As a result, the size of the ozone "hole" has remained pretty much the same in recent years.

Today, any products in the U.S. containing CFCs and other ozone-depleting chemicals must have warning labels. The U.S. also prohibits the release of refrigerants used in car and home air conditioners into the air, because they still use ozone-depleting chemicals.

#### **Why Can't We Just Make More Ozone?**

Ozone molecules are constantly being made and destroyed by the sun's ultraviolet light in natural processes. Normally, the amount made and the amount destroyed is about the same, so nothing changes. Think of the amount of ozone as the water level in a bathtub with the faucet running and the drain open. If you turn on the water just right, you can make the amount of water leaving the bathtub equal to the amount coming in, so that the water level never changes. But right now, the drain has gotten faster, and the amount of ozone destroyed is more than the ozone being made.

A big reason we can't make more ozone to send into the upper atmosphere is because it would take a LOT of energy. In fact, to make the amount of ozone normally found in

the upper atmosphere, you'd need about double the electricity that we use in the U.S. every year. In the atmosphere, this huge amount of energy comes from the sun. We also don't have a way to transport the ozone to the right places in the atmosphere.

Since we can't make more ozone, the solution is to slow the flow down the drain back to its normal rate. And the only way to do *that* is to stop using ozone-depleting chemicals.

#### **Bad Nearby**

##### **What Causes "Bad" Ozone?**

"Bad" ozone is found at ground level. In cities, it's made when emissions from vehicles, power plants, chemical plants, and other sources react with heat and sunlight. The hotter the day and the stronger the sun, the more ozone is formed. That's why ozone is usually worst on windless, hot summer afternoons. High levels of ozone are mainly a concern for people from April 1–September 30.

You're most likely to find high levels of "bad" ozone in urban areas. You might hear it called "smog." However, other areas can also have high ozone

levels when winds blow pollution hundreds of miles from their original sources.

#### **How Does "Bad" Ozone Affect Me?**

Even at low levels, breathing ozone can cause chest pains, coughing, nausea, throat irritation, and congestion. It can also worsen heart and lung diseases, like emphysema, bronchitis, and asthma. The more ozone pollution a person breathes, the more permanent damage it can do to her lungs.

Healthy people can also find it harder to breathe when exposed to ozone pollution. Because it usually forms in hot weather, anyone who spends time outdoors in the summer may be affected, particularly children, older people, outdoor workers, and people exercising. Millions of Americans live in areas where ozone levels are higher than the national health standards, and should pay attention to ozone levels when the weather is hot and sunny.

### Ways to Protect Your Health on Bad Ozone Days:

- Use the Air Quality Index (AQI). The AQI uses colors and numbers to tell you how much pollution is in the air: [www.airnow.gov](http://www.airnow.gov).
- Use the EPA's Activity Guidelines at your school and sports practices to keep your kids healthy: [www.epa.gov/airnow/school\\_flag/school-chart-2013.pdf](http://www.epa.gov/airnow/school_flag/school-chart-2013.pdf).
- Do outdoor activities early in the morning and after 6 p.m.
- Pay attention to any breathing or lung problems you might have.

### How Are We Dealing With Ozone Pollution?

The Clean Air Act Amendments of 1990 require the US Environmental Protection Agency, the States, and cities to carry out programs that reduce emissions of ozone-forming chemicals from sources like cars, industry, power plants, and consumer products. Power plants are reducing emissions, companies are developing cleaner cars and fuels, many gas stations are using special nozzles at the pumps to recapture gasoline vapors, and vehicle inspection programs are being improved to reduce emissions.

### What Can I Do?

We can control some things, and some things we can't. Here are some things you can do. And remember, lots of small steps add up to big differences!

#### To Limit "Bad," Nearby Ozone

- Keep your car tuned-up and running well.
- Carpool, use mass transit, walk, bicycle, and plan trips efficiently to reduce driving, especially on hot summer days.
- Be careful not to spill gas when filling up your car or gas-powered lawn equipment. During the summer, fill your gas tank during cooler evening hours.
- Make sure your car's tires are properly inflated and your wheels are aligned.
- Participate in your local utility's energy conservation programs.
- Seal containers of household cleaners, workshop solvents, and garden chemicals to prevent chemicals from evaporating into the air. Dispose of them properly.

### To Protect "Good" Ozone Up High

- Have your car, home air conditioning, and refrigerator checked for leaks.
- Make sure that the technicians working on your air conditioners and refrigerator are certified to recover the refrigerant, as required by law.
- Find out from your local government the best way to get rid of old refrigerators and air conditioners.

### How Can I Protect Myself from UV Rays?

- Use the UV (ultraviolet) Index: The UV Index tells you how strong the sun's rays will be for the day: [www2.epa.gov/sunwise/uv-index](http://www2.epa.gov/sunwise/uv-index).
- Don't Get Burned: Sunburns, especially for children, significantly increase the risk of getting skin cancer over your lifetime.
- Avoid Sun Tanning and Tanning Beds: The UV radiation causes skin cancer and wrinkling.

**Use Enough Sunscreen:** At least 15 minutes before going outside, put on about one ounce of sunscreen over all exposed skin. Sunscreen should have a Sun Protection Factor (SPF) of at least 30 and provide protection from both ultraviolet A (UVA) and ultraviolet B (UVB) rays. Reapply every two hours, even on cloudy days, and after swimming or sweating.

**Wear Protective Clothing,** such as a long-sleeved shirt, pants, a wide-brimmed hat, and sunglasses, when possible.

**Seek Shade** when you can. Remember, the sun's rays are strongest from 10 a.m. to 4 p.m.

**Use Extra Caution Near Water and Sand:** They reflect the sun's rays, which can increase your chance of sunburn.

**Get Vitamin D Safely:** Choose foods fortified with Vitamin D or take vitamin supplements. Don't seek the sun.

### **The Shadow Rule**

Look for your shadow to estimate your UV exposure:

- If your shadow is taller than you are (in the early morning and late afternoon), you're probably getting less UV exposure.
- If your shadow is shorter than you are (around midday), you are getting higher levels of UV radiation. Seek shade and protect your skin and eyes.

# UV Radiation

The sun radiates energy over a broad spectrum of wavelengths. Ultraviolet (UV) radiation, which has a shorter wavelength than either visible blue or violet light and is not visible to the human eye, is responsible for sunburns and other adverse health effects (Diagram A). Fortunately for life on Earth, our atmosphere's stratospheric ozone layer shields us from most UV radiation. What gets through the ozone layer, however, can cause the following problems, particularly for people who spend time outdoors without sun protection:

- Skin cancer
- Premature aging of the skin
- Suppression of the immune system
- Cataracts and other eye damage

Because of these serious health effects, you should limit your exposure to UV radiation and protect yourself when outdoors.

## Types of UV Radiation

Scientists classify UV radiation into three types or bands—UVA, UVB, and UVC.

**UVA:** Not absorbed by the ozone layer.

**UVB:** Mostly absorbed by the ozone layer, but some does reach the Earth's surface.

**UVC:** Completely absorbed by the ozone layer and oxygen in the atmosphere.

UVA and UVB that reach the Earth's surface contribute to the serious health effects listed above.

## UV Levels Depend on a Number of Factors

The level of UV radiation that reaches the Earth's surface can vary, depending on many factors. Each of the following factors can increase your risk of UV radiation overexposure and its consequent health effects.

## Stratospheric Ozone

The ozone layer absorbs most of the sun's UV rays, but the amount of absorption varies depending on the time of year and other natural phenomena. This absorption has also decreased as the ozone layer has thinned, due to the release of ozone-depleting substances that have been widely used in industry.

## Time of Day

The sun is at its highest in the sky around noon. At this time, the sun's rays have the least distance to travel through the atmosphere and UVB levels are at their highest. In the early morning and late afternoon, the sun's rays pass through the atmosphere at an angle and their intensity is greatly reduced.

## Time of Year

The sun's angle varies with the seasons, causing the intensity of UVB rays to change. UVB intensity tends to be highest during the summer months. The intensity of UVA rays is relatively constant throughout the year.



### Latitude

The sun's rays are strongest at the equator, where the sun is most directly overhead and UV rays must travel the least distance through the atmosphere (Diagram B).

Ozone also is naturally thinner in the tropics compared to the mid and high latitudes, so there is less ozone to absorb the UV radiation as it passes through the atmosphere. At higher latitudes the sun is lower in the sky, so UV rays must travel a greater distance through ozone-rich portions of the atmosphere and, in turn, expose those latitudes to less UV radiation.

### Altitude

UV intensity increases with altitude because there is less atmosphere to absorb the damaging rays. Thus, when you go to higher altitudes, your risk of overexposure increases.

### Weather Conditions

Cloud cover reduces UVB levels, but not completely. Depending on the type and thickness of the cloud cover, it is possible to burn—and increase your risk for long-term skin and eye damage—on a cloudy day.

### Reflection

Some surfaces, such as snow, sand, concrete, or water, can reflect much of the UV radiation that reaches them. Because of this reflection, UV intensity can be deceptively high even in shaded areas.

Diagram A

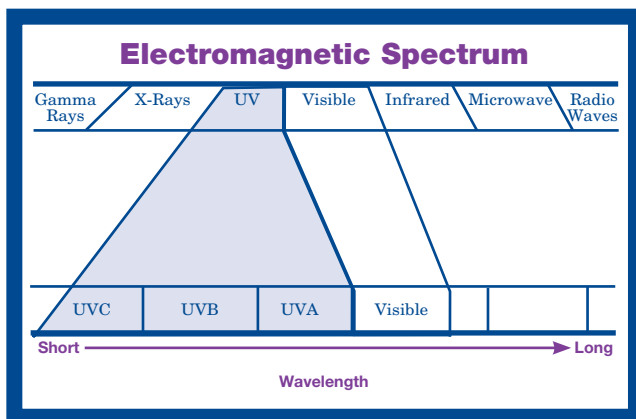
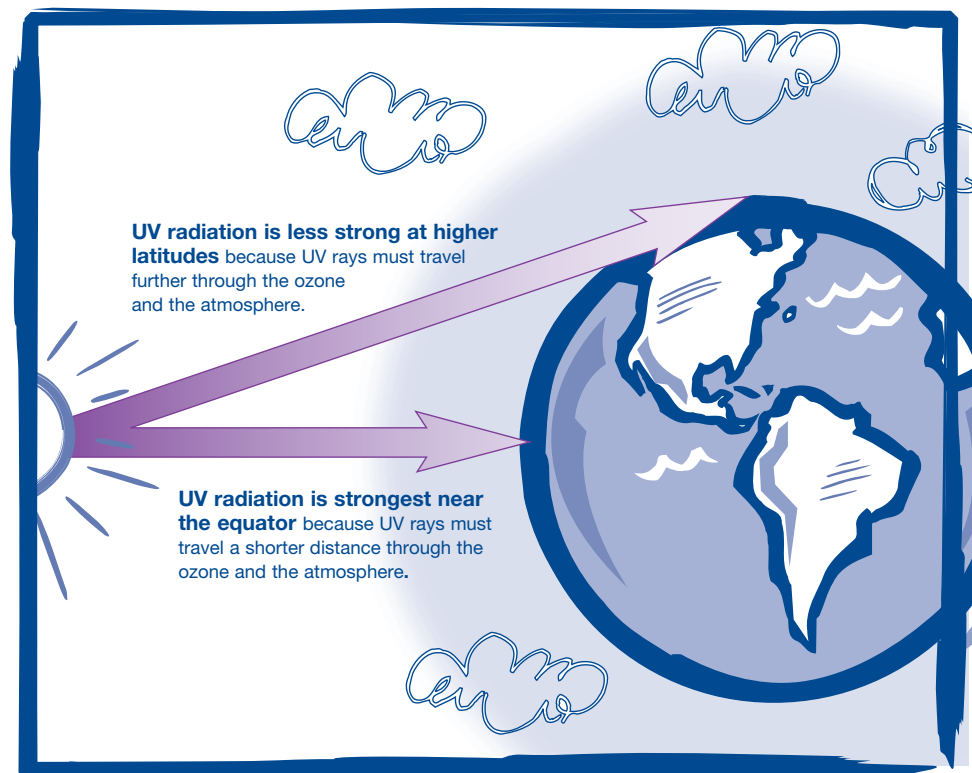


Diagram B



## What Is the UV Index?

Some exposure to sunlight can be enjoyable; however, too much could be dangerous. Overexposure to the sun’s ultraviolet (UV) radiation can cause immediate effects, such as sunburn, and long-term problems, such as skin cancer and cataracts. The UV Index, which was developed by the National Weather Service and EPA, provides important information to help you plan your outdoor activities to prevent overexposure to the sun’s rays.

The UV Index provides a daily forecast of the expected risk of overexposure to the sun. The Index predicts UV intensity levels on a scale of 0 to 11+, where  $\leq 2$  indicates a low risk of overexposure and 11+ signifies an extreme risk. Calculated on a next-day basis for every ZIP Code across the United States, the UV Index takes into account clouds and other local conditions that affect the amount of UV radiation reaching the ground in different parts of the country.

UV Index Number	Exposure Level
2 or less	Low
3 to 5	Moderate
6 to 7	High
8 to 10	Very High
11+	Extreme

### SunWise Action Steps

By taking a few simple precautions daily, you can greatly reduce your risk of sun-related illnesses. To be SunWise, consider taking the following action steps daily:

- Do Not Burn
- Avoid Sun Tanning and Tanning Beds
- Generously Apply Sunscreen

- Wear Protective Clothing, Including a Hat, Sunglasses, and Full-Length Clothing
- Seek Shade
- Use Extra Caution Near Water, Snow, and Sand
- Check the UV Index
- Get Vitamin D Safely

Early detection of melanoma can save your life. Carefully examine all of your skin once a month. A new or changing spot should be evaluated.

### What is the UV Alert?

EPA issues a UV Alert when the level of solar UV radiation reaching your local area is predicted to be unusually intense for the time of year. The UV Alert is a warning, and it offers simple steps you can take to protect yourself and your family. The UV Alert consists of the SunWise action steps and is posted by ZIP Code and City, State at [www.epa.gov/sunwise/uvindex.html](http://www.epa.gov/sunwise/uvindex.html).

**What does the UV Alert mean?**

The UV Alert is based on the UV Index, which EPA provides with the support of the National Weather Service. EPA only issues a UV Alert when the UV Index is predicted to be 6 or higher and unusually intense for the time of year. In some parts of the United States, the UV Index rarely or never reaches this level, so your local area may never receive a UV Alert.

UV Alert days are not the only days you need to protect yourself. EPA recommends that you take the SunWise action steps every day, regardless of the season. Because

children typically spend more time outdoors than adults, it is especially important that children take these steps. Even if you have darker skin, EPA recommends that you act SunWise to reduce your risk of skin cancer, cataracts, and other UV-related health problems.

**Where can I find the UV Index and UV Alert forecasts for my area?**

You can find the UV Index and UV Alert forecasts for your area in your local newspaper, on television, and by visiting EPA's SunWise website at [www.epa.gov/sunwise](http://www.epa.gov/sunwise). Enter your ZIP Code. The resulting UV forecast will indicate if there is a UV Alert.

The SunWise website will direct you to EPA's EnviroFlash website, where you can sign up to receive the daily UV Index and occasional UV Alerts directly by email.

The National Weather Service is currently offering a national UV Alert map as an experimental product. The map indicates which parts of the country have a UV Alert forecast for the coming day. Follow the link from the SunWise website to the map.