



UV Radiation

BE SUNWISE

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, is responsible for sunburn and other adverse health effects. 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 substantial time outdoors:

- Skin cancer
- Suppression of the immune system
- Cataracts
- Premature aging of the skin

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. The stratospheric ozone layer absorbs some, but not all, of these types of UV radiation:

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.

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 a variety of 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. That absorption also has 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

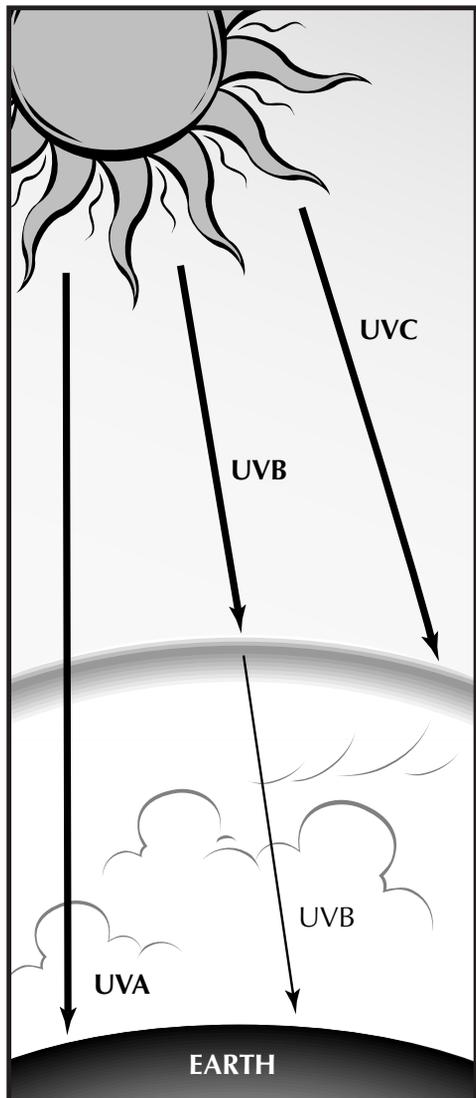
The sun is at its highest in the sky around noon. At this time, the sun's rays have the least distance to travel through the atmosphere and UVB levels are at their highest. In the early morning and late afternoon, the sun's rays pass through the atmosphere at an angle and their intensity is greatly reduced.

Time of Year

The sun's angle varies with the seasons, causing the intensity of UV rays to change. UV intensity tends to be highest during the summer months.

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. 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.



The stratospheric ozone layer screens out much of the sun's harmful 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 UV levels, but not completely. Depending on the thickness of the cloud cover, it is possible to burn—and increase your risk of long-term skin and eye damage—on a cloudy summer day, even if it does not feel very warm.

Reflection

Some surfaces, such as snow, sand, grass, 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.

EPA's SunWise School Program

In response to the serious public health threat posed by exposure to increased UV levels, the U.S. Environmental Protection Agency (EPA) is working with schools and communities across the nation through the SunWise School Program. SunWise aims to teach children in elementary school and their caregivers how to protect themselves from overexposure to the sun.



For More Information

To learn more about UV radiation, the SunWise School Program, and actions being taken to prevent ozone depletion, call EPA's Stratospheric Ozone Information Hotline at 800 296-1996 or visit our Web site at <www.epa.gov/sunwise>.