The UV Index

Name:_____ Period: ____

Some exposure to sunlight can be healthy, while too much is dangerous, causing immediate effects such as blistering sunburns, as well as longer-term problems including skin cancer and cataracts (clouding of the eye lens resulting in vision loss). Thus, the National Weather Service and the U.S. Environmental Protection Agency have created the Ultraviolet Index to provide valuable information to help you plan your outdoor activities in ways that prevent overexposure to the sun's damaging ultraviolet (UV) rays.

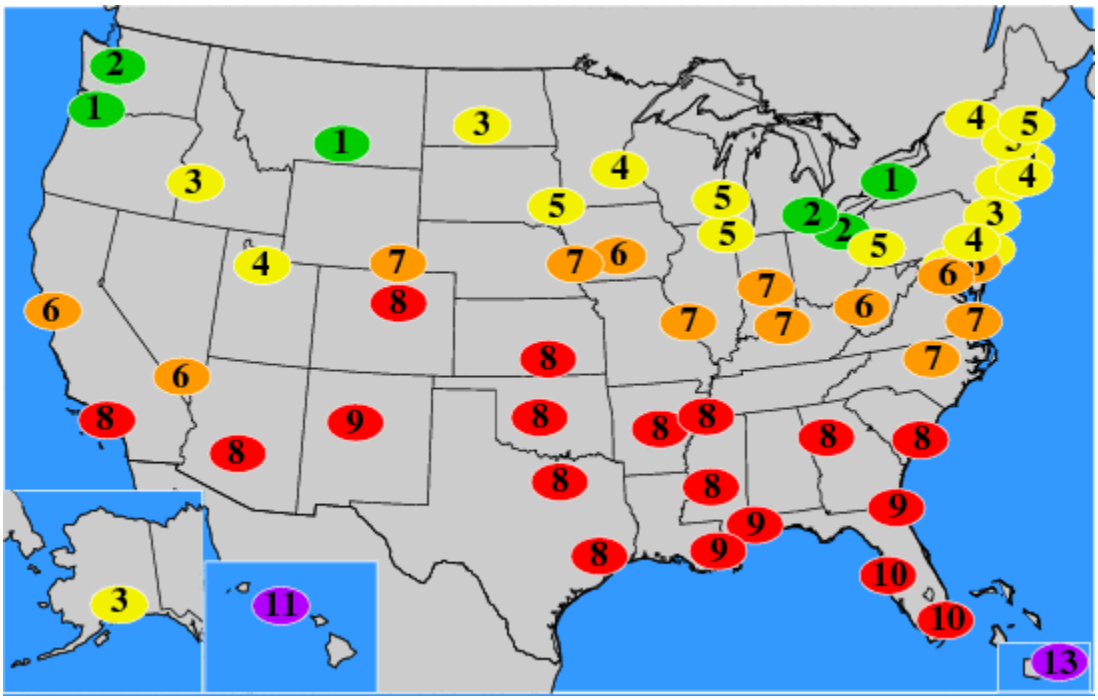
The Ultraviolet Index predicts the day's solar-noon levels of direct-radiation exposure to ultraviolet (UV) rays for selected cities around the U.S. A number of factors are considered in the determination of Index values.

Cloud cover is the factor included in the Index that causes the greatest short-term changes in the amount of UV arriving at the Earth's surface at mid-day. Simply stated, the more the cloud cover the less the UV. The altitude of the receiving surface is also important. Every 1000-foot rise in elevation is accompanied by about a 2% increase in clear-sky UV levels because the UV passes through less and less atmosphere. Also, the greater the distance of a location from the equator (an increase in latitude), generally the lower is the average UV received.

Variations in the amount of radiation received also arise from the seasonal changes in the path of the sun through the sky. Especially critical is the changing altitude of the mid-day sun because clear-sky UV levels increase dramatically when the sun is more that 45 degrees above the horizon. Variations in atmospheric ozone concentration affect UV values. With more ozone, less UV rays penetrate the atmosphere.

Just as it is not possible to predict with perfect accuracy the next day's cloud cover, the UV index cannot always be relied upon. The best bet is to be prepared to protect yourself from overexposure to UV in case a predicted cloudy day turns out to be sunny. Also, the Index forecasts only the intensity of incoming radiation. Other factors can increase UV exposure. Snow and most beach sands, for example, are excellent reflectors of UV rays.

The following table lists the UV Index scale of 0 to 10+, the level of exposure, and the minimum recommended sun protection.



UV Index	Exposure Level	Recommended Sun Protection
0 to 2	Minimal	hat
3 to 4	Low	hat, sunscreen
5 to 6	Moderate	hat, sunscreen, seek shade
7 to 9	High	hat, sunscreen, seek shade, limit outdoor activity in the middle of the day
10 +	Very High	hat, sunscreen, stay indoors if possible

Use the table and the UV Index Map to answer the following questions.

1) What is the UV Index for Seattle, WA? _____
2) What is the UV Index for Miami, FL? _____
3) What is the UV Index for Las Vegas, NV? _____
4) What is the expected UV exposure level for Chicago, IL? _____
5) What is the expected UV exposure level for Birmingham, AL? _____
6) What is the expected UV exposure level for New York City, NY? _____
7) What is the expected UV exposure level for Boise, ID? _____
8) What would be the recommended sun protection for Minneapolis, MN?

   _____

9) What would be the recommended sun protection for Boston, MA?

   _____

10) What would be the recommended sun protection for Phoenix, AZ?

    _____

11) Imagine you head to Colorado for some skiing. The Denver UV Index (Denver is at approximately 5,000 ft.) has a value of 5. You are skiing on fresh snow in the mountains at 9,000 ft. with clear skies. State two reasons why your UV exposure may be equivalent to a UV Index as high as 8.

    1. _____
    2. _____

12) Explain why at lower latitudes (like Florida) UV protection is still necessary during winter.

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