PRELIMINARY ACTIVITY FOR

# UV Investigations

The stratosphere contains an ozone layer that shields the surface of Earth from much of the ultraviolet radiation coming form the sun. The depletion of the ozone layer is subject of much concern.

Figure 1 shows the location of UV radiation in the electromagnetic spectrum. Notice that the ultraviolet band is broken into three types referred to as UVA (with wavelengths of 320 to 400 nm), UVB (280 to 320 nm), and UVC (200 to 280 nm). The most harmful of these three, UVC radiation, is absorbed by oxygen and ozone in the atmosphere and does not reach the Earth's surface. The ozone layer absorbs much, but not all, incoming UVB radiation. Some UVB radiation reaches the surface of Earth. UVA radiation is not affected by the ozone layer, and most reaches the surface of Earth.

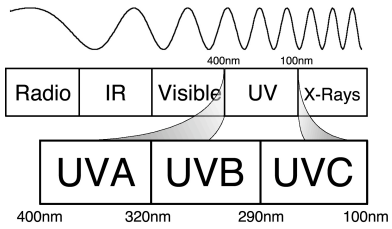


**Figure 1**

UVB radiation is responsible for many skin problems such as sunburns and several forms of skin cancer. UVA radiation is deep-penetrating and causes tanning, wrinkles, and some forms of skin cancer. Scientists are also concerned that increased UV levels will disrupt ecosystems.

In the Preliminary Activity, you will gain experience using a UVB Sensor and learn UV intensity measuring technique as you determine outdoor UVB intensity at your location.

After completing the Preliminary Activity, you will first use reference sources to find out more about ultraviolet radiation and ozone depletion before you choose and investigate a researchable question. Some topics to consider in your reference search are:

- ultraviolet radiation
- ozone depletion
- effects of ozone depletion
- UV-blocking clothing
- UV-transparent materials

## PROCEDURE

1. Connect the UVB Sensor and the data-collection interface.
2. Take your equipment outside.
3. Use a ring stand and a utility clamp to suspend the UVB Sensor aiming directly at the sun. When it is aimed directly at the sun, its shadow is a small round circle. **CAUTION:** *Do not look directly at the sun*.
4. When everything is ready, start data collection.

**Figure 2**

5. Stop data collection after about 20 seconds. Use the Statistics function to determine the mean UVB intensity (in $mW/m^2$). Record the value.

## QUESTIONS

1. What was the UVB intensity (in $mW/m^2$) measured in the Preliminary Activity?

2. List three factors that you think might affect the amount of UV radiation reaching a specific location on Earth.

3. List three factors that you think might affect the amount of UV radiation reaching your skin and eyes.

4. List at least one researchable question for this experiment.