



# Sun-Earth Day

Celebrate the Connection!

## Public Outreach - Make and Take Activities

## Exploring Ultraviolet (UV) light from the Sun

### About this Activity



The Sun gives off different kinds of energy: including heat, visible light, and invisible light in the form of ultraviolet (UV) rays. While the Earth's atmosphere protects us from most of the Sun's harmful UV rays, there is still an abundance of UV rays around us. This activity explores UV rays from the Sun and ways we can protect ourselves from these potentially harmful UV rays.

*Left: Comparing UV detectors with and without the covering of a pair of eye-glasses.*

*Below Right: Examples of materials that can be used for this activity.*

### What You'll Need

- "UV detectors" a.k.a. UV beads. These can be ordered inexpensively from <http://www.teachersource.com>
- container or covering to prevent the Sun from hitting the detectors prior to the activity. (Black film canisters work very well, so does a closed fist or a pocket!)
- a cup with water
- sunscreen and a zip-lock bag
- sunglasses
- Sun and shade (When doing this activity indoor, you can use a UV lightbulb / blacklight or an opened sunny window – the glass in the window might block out most of the UV rays!)
- (optional) pipecleaners or strings to hold the "UV detectors" if distributing beads to participants to take away.  
(We suggest our participants to hang the beads from a purse or shoelace to continue detecting UV wherever they go.)

### Preparation

Set up 5 stations: a sunny spot, a shady spot, sunglasses, a cup with water, and sunscreen. For the sunscreen station, squeeze a little sunscreen into the zip-lock bag and drop in a bead (this keeps sunscreen from getting all over.) If doing this activity indoor, use an opened sunny window (the glass in the window might block out most of the UV) or use a UV lightbulb / blacklight to imitate the Sun.



### To Do and Notice

- 1) Explain that you have "detectors" (UV beads) which turn color when they are exposed to UV rays. The beads detect the ultraviolet coming from the Sun and the more UV there is, the darker the beads become. We prefer using beads in only one color and in a deeper color, like purple, to make the color changes and comparisons more obvious.
- 2) Ask participants to make predictions. Some questions to consider:
  - Where do you think the bead will turn the darkest?
  - What happens in the water?
  - Do sun glasses protect eyes from UV? What about regular glasses?
  - What do you think happens to UV on a cloudy day?
  - Is the shade really free of UV?
- 3) Demonstrate or ask the participants to try out the UV detectors at different stations.
- 4) Ask your participants if there are other conditions that they think will block UV. They may want to test out other materials that they have on hand, such as clothing and regular glasses.
- 5) The beads will turn back to the original color when no longer exposed to UV. Give away "UV detectors" so participants can attach them to their jackets or purses to continue detecting UV!

### Activity Notes

This activity demonstrates that different materials will block UV rays to different extends. When proper Sun protection is not used, UV can damage our skin and eyes. To learn more about UV, other forms of energy emitted by the Sun, or how UV affects our skin, follow the links under Related Websites below.

### Related Websites

**NASA's Imagine the Universe: Electromagnetic Spectrum**  
[http://imagine.gsfc.nasa.gov/docs/science/known\\_11/emspectrum.html](http://imagine.gsfc.nasa.gov/docs/science/known_11/emspectrum.html)

**American Academy of Dermatology: UV Index**  
<http://www.aad.org/public/Publications/pamphlets/UltravioletIndex.htm>

