

Protection from Ultraviolet



What's this Activity About?

Objectives:

1. Explore ultraviolet (UV) light and how it can be blocked by different materials
2. Explore different kinds of energy: heat, visible light and invisible light from UV rays
3. Understand that Earth's atmosphere protects us from most of the harmful UV rays
4. Understand ways we can protect ourselves from the Sun's harmful rays

Presenters: A minimum of one person.

Visitors: UV beads are appropriate for families with children, the general public, and school groups in third grade and up. Any number of visitors can participate.

Duration: A few minutes, up to a half hour, depending on the number of topics covered.



Materials:

What materials do I need?

- Handful of UV beads in an opaque bag
- (Optional) Prepare a few pipe cleaners by placing 4-6 UV Beads on each and wrapping in a ring, as seen here. This helps avoid loss and makes them easier to handle, especially for young children.
- You and your visitors provide various items / materials / conditions for testing UV blocking, for example:
 - ✓ Sunglasses
 - ✓ Hat
 - ✓ Sunscreen in plastic baggie
 - ✓ Clear plastic cup with water
 - ✓ Sunny spot and shady spot
 - ✓ Cloth



Where do I get materials?

1. UV beads can be found many places including Educational Innovations: www.teachersource.com
2. Pipe cleaners or "chenille stems" can be found at craft stores or online.

© 2012 Astronomical Society of the Pacific www.astro.society.org

Copies for educational purposes are encouraged.

Additional astronomy activities can be found here: <http://nightsky.jpl.nasa.gov>

Activity Script

To do:

Before participants arrive, place some UV beads in your pocket or in a container that will block any exposure to the Sun. Set up a station that includes a sunny and shady spot, and put out the materials for participants to test UV blocking. If you have sunscreen, squeeze some into plastic baggie and drop in a bead.

To say:

The Sun gives off different kinds of energy, including heat, visible light, and invisible light such as ultraviolet (or UV) energy. UV is high in energy and can therefore be harmful to living things, but luckily the Earth's atmosphere protects us from most of the harmful UV rays. Some of it still gets through, but we can protect ourselves in other ways. In my pocket, I have beads that turn color when they are exposed to UV rays. The beads detect the ultraviolet light coming from the Sun and the darker the bead, the more ultraviolet is getting through the atmosphere to us on Earth.



Engage visitors with questions such as:

- Where do you think the beads will turn the darkest?
- Do sunglasses protect our eyes from UV? How about regular glasses?
- What will happen if we put some beads in this cup of water?
- Are we protected from UV in the shade?
- What other conditions or materials might protect us from UV?

To do:

Get visitors to make predictions and try them out by observing what happens when UV beads are placed in a sunny spot, a shady spot, under sunglasses, under eyeglasses (provided by a participant perhaps), in the cup of water. Then participants can try other materials and conditions, for example, how are their own shirts and hats for blocking UV?



Presentation Tip:

If using this activity in classroom setting, excellent extensions -- including assessment and mapping to national standards -- can be found here:

<http://solar-center.stanford.edu/activities/uv.html>