

# Ultraviolet Beads

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## BACKGROUND

Ultraviolet light is one of the invisible frequencies of light that is given off by the sun. Over exposure to it can be harmful to many things including humans. Its effects can be seen in faded paper, a sunburn, or a cracked hose that has been left out in the sun.

Ultraviolet beads contain a pigment that changes color when exposed to ultraviolet light from the sun, or other UV sources. They are not affected by visible light and do not react to indoor light or when shielded from UV radiation. If sunlight is not available, a black light works well.

## CONCEPTS

- Energy from the sun comes to the earth as radiant energy or radiation (in rays).
- Some radiant energy we can see-it is visible light. Some radiant energy we can not see-it is invisible light. Ultraviolet light is a type of invisible light. We can not see it, but we can tell it is there with solar beads.
- Ultraviolet light can be stopped by some materials.

## MATERIALS

- Solar beads and a piece of string. Shielding materials: water, sunscreen, sunglasses, fabric, black and white paper, umbrella, glass and plastic containers, etc.

## EXPERIMENT IDEAS

- Have the students hold the bracelets close to an indoor light source and observe the beads. Take the students outside into the sun and have them observe the beads. Move into a shaded area. Does the color and/or intensity of the beads change?
- Determine if the time of day or weather conditions affect how quickly the UV beads change color. You will find that the beads change color much faster at noontime than early in the morning or late in the afternoon. Also, try exposing the beads to different weather conditions at the same time of day. Does cloud cover change the amount of UV light exposure?
- Place the beads in a glass jar and expose them to direct sunlight. Do the beads change color? Test a variety of glass and plastic containers to determine which materials block out UV light. Fill the containers with water. Does adding water have any effect?
- Test the ability of your sunglasses to block out ultraviolet light by covering a few beads with the lens. If the beads do not change color, your sunglasses block out harmful ultraviolet light. If not, you paid too much for the UV coating!
- Test the effectiveness of sunscreen by coating several beads with lotion. Expose the beads to direct sunlight and look for changes in color. Try a couple different SPF factors and note any differences.

*Solar beads can be purchased from Educational Innovations. [www.teachersource.com](http://www.teachersource.com)*