



Mystery Beads Teacher Notes

Purpose: To lead an open-inquiry based activity designed to allow students to discover the source of UV radiation using UV sensitive beads.

Target audience: 3rd through 12th grade

Background Information: Ultraviolet (UV) light is a portion of the electromagnetic spectrum that is more energetic than visible light, but less penetrating than x-rays or gamma radiation. Although it is not visible to the naked eye, it is responsible for the tanning effects that we get from sunlight. It has been linked to increased occurrences of skin cancer and cataracts. Therefore, much attention has been focused on the ability of certain substances to block the UV out.

The UV beads change color because of the UV energy that alters the structure of the dye molecule in the bead. A change in shape results in a change in color. The new shape affects the light colors the molecule absorbs and reflects. For example, red beads absorbed all but red light and reflected the red. When the bead is no longer exposed to the energy, the dye molecule goes back to the original shape.

<http://scienceprojectideasforkids.com/2010/uv-detecting-beads/>

Materials:

(per student)

UV sensitive beads (4-6)

Twine or leather string for a bracelet

Procedure:

1. Have students each make a bracelet to observe for the remainder of the day.
2. Get students to write observations they make as they wear the bracelets during the day.
3. Next, have them write questions they have regarding the bracelets.
4. They should then design an experiment to test the prediction they have regarding the bracelet and the changes they observe.
5. Finally, have student conduct an experiment and build on the experiment to draw a final conclusion on the observations.

Mystery Beads



Student Page

Materials:

(per student)

4-6 beads

Twine for a bracelet

Procedure:

1. Make a bracelet out of the beads. Wear them for the remainder of the day.
2. As you go throughout the day, make at least **two** observations about the beads. Write these observations in your notebook.
3. Write down at least two questions that you have about the beads. Write these questions in your notebook. What do you **WONDER?**
4. Design an experiment to test what you wonder.



Mystery Beads Experiment

Now that you have observed the beads and “wonder” about what you observe, design and carry out an experiment to answer one of your questions. Use the following form.

My Question:

I predict that:

My procedure (be sure to describe a control for the experiment):

My data and analysis (be sure to provide a table for your data...as always, your table should be written BEFORE the experiment is conducted so that its' ready to record your feelings.)

My conclusion (reference the question):

I can improve my experimental procedure if I:

Here are additional questions that I still have (or have developed) about the beads.