

# Seeing the Invisible

## Student Activity Booklet

Name \_\_\_\_\_

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

**“SEEING THE INVISIBLE”  
Ultraviolet Radiation - Data Collection Sheet**

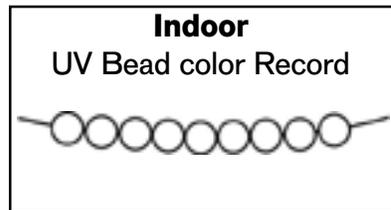
**Activity 1:** UV Detecting Bead Observations

**Background:** Since human eyes only respond to a narrow range of wavelengths of electromagnetic radiation (mostly visible light), other parts of the electromagnetic spectrum must be detected. UV detecting beads contain a special pigment that will change color only when exposed to ultraviolet radiation.

**1. Record Inside Observational Notes of UV Detecting Beads.**

- Color of UV Detecting Beads \_\_\_\_\_

\_\_\_\_\_



- Is Ultraviolet radiation present? Justify your answer using observational data from your experiment. \_\_\_\_\_

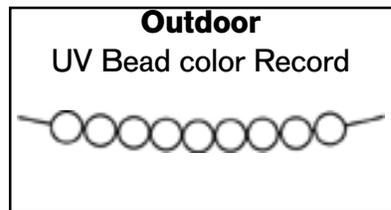
\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Place UV Detecting Beads on Wrist. Await instruction to go outside.**

**2. Record Outside Observational Notes of UV Detecting Beads.**

- Color of UV Detecting Beads \_\_\_\_\_

\_\_\_\_\_



- Is Ultraviolet radiation present? Justify your answer using observational data from your experiment. \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Q. Were there any differences between inside and outside UV detecting bead observations? Explain.** \_\_\_\_\_

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

**Q. Does the Sun emit ultraviolet radiation? How do you know?**

\_\_\_\_\_  
\_\_\_\_\_  
\_\_\_\_\_

NAME: \_\_\_\_\_

DATE: \_\_\_\_\_

**“SEEING THE INVISIBLE”  
Herschel Experiment - Data Collection Sheet**

**Activity 2:** Duplicating Sir William Herschel's Infrared Experiment performed in the 1800's.

**Directions:** You will be working in small groups outside today to duplicate an experiment performed by Sir William Herschel in the early 1800's to detect infrared radiation. Read through your task carefully and await teacher instructions.

**Materials:** Make sure your group has the following materials:

- Xerox box with equilateral glass prism attached
- 3 thermometers
- 2 pieces of white paper (8.5" X 11") to line the bottom of the box
- bring your student booklet and pencil to record observations

**Procedure:**

1. **DO NOT LOOK DIRECTLY AT THE SUN.** Move your box with the prism attached until sunlight passes through the prism and produces a good spectrum on the white paper lining the bottom of the box. If available, place a block underneath the tilted box to produce a wider spectrum. Place the 3 thermometers in a shaded area of the box for now.
2. What colors do you observe in the visible spectrum?

---

---

3. Place the bulb of one thermometer in the blue part of the spectrum, one in the yellow, and the last just past the red part of the spectrum. Leave the thermometers in the spectrum for at least 5 minutes, moving them carefully as the sunlight moves the spectrum. A class thermometer will be used to record the air temperature.
4. After 5 minutes, record the thermometer temperature readings in the table below:

Spectrum Location of Thermometer	Temperature Reading ° C
Blue	
Yellow	
Just Beyond Red End of Spectrum	
Air Temperature Thermometer	

**Important Question: Why was there an increase in temperature for the thermometer placed just beyond the red end of the spectrum when visible light was not hitting it?**

---

---

---

Q. Does the Sun emit infrared radiation? How do you know?

---

---

---

**NAME:** \_\_\_\_\_

**DATE:** \_\_\_\_\_

**“SEEING THE INVISIBLE”  
Data Collection Sheet**

**Activity 3:** Observing the Sun in Different Wavelengths: What Do You See?

Now that you have viewed the Sun in different wavelengths, what have you learned about the Sun that you would not have been able to detect viewing the Sun only in visible light?

---

---

---

---

---

---

**Q. Using the five images of the Sun provided for study, which wavelength would be best to use if you wanted to observe the Sun’s outermost atmosphere called the “Corona” and “Coronal Holes”?**

---

---

**Assignment:** Using what you have learned today, you are to write a persuasive newspaper article that will convince skeptical readers that the Sun does in fact emit invisible radiation other than the visible spectrum that we see.

**Extra Credit Assignments:**

- Research and be ready to share with the class one way a part of the electromagnetic spectrum is used in everyday life on Earth.
- Research and be ready to share with the class dangers of ultraviolet radiation. Also identify ways humans can protect themselves from these harmful rays.