

## West Side Science Club – Event # 4– “Light II”

### Original Presentation

Date: 15 December 2012  
Time: 10 am to 12 pm  
Site: West Side Science Club

### Big Questions

- These questions are meant to frame the day’s event and might be written on the chalkboard
  - (1) What is light made of?
  - (2) How can we measure light?
  - (3) What are other types of light that we can’t see?

### Concepts

- Concepts to cover from the “Work of CCI Solar” Mind Map: Light- absorb, reflect, transmit, part of the spectrum, wavelength, frequency, energy

### Lesson Plan

#### *Student Objectives*

- Understand how properties of light relate to its energy
- Understand what light is “made of” and how we observe it and measure it
- Make the connection between visible light and other parts of the electromagnetic spectrum

#### *Schedule/Agenda*

- Review: Event #3– “Light I” (20 min.)
- Activity: Diffraction gratings (45 min.)
- Activity: UV light (45 min.)
- Wrap-up (10 min.)

## Materials

### Activity: Diffraction gratings

- Diffraction gratings
- Red, green and blue laser pointers

### Activity: UV light

- UV lamp
- Tonic water
- Soda water
- 2 clear flasks
- Gummy bears (some soaked in tonic water, some in soda water)
- Money of various denominations

## Safety

- Do not look at the laser pointers! It can cause eye-damage.

## Review of Previous Event: Light I

- Recall the activities: What vocabulary was learned last time? Absorb, reflect, transmit, filter, cyan, etc.

## Facilitation Questions

- How are colors and light related?

## Activity: Diffraction gratings

### Procedure

1. Each student was handed a diffraction grating and allow to shine a laser of any color through it
2. Make observations of what occurred
3. The try using different color lasers and notice any differences
4. Try shining two or three colors onto the same diffraction grating at once. Make observations.

## Facilitation/Concept Questions

- What is the diffraction grating? What does it do to the light?
- Why do different colors separate into varying distances?
- Light is made up of waves. How could wavelength of the color of light be related to what you see in the diffraction grating?

## Activity: UV light

### Procedure

1. Fill two clear flasks, one with tonic water, one with soda water. Make observations of the two liquids
2. Shine a UV lamp on each flask. Does one glow? Make observations and draw conclusions about why this might be
3. Try the same experiment except shining light on gummy bears soaked in either tonic water or soda water. Do they have the same properties when illuminated with UV light?
4. Finally the UV lamp can be shone on to money, which can illuminate trace amounts of UV active organic substances. Higher denomination bills often have more specks to see...

### Facilitation Questions and Concepts

- What is UV light? Can we normally see it? Why not?
- How does UV light compare to the colors of visible light in terms of wavelength and energy?
- Why do certain substances glow in UV light? How does that relate to our perception of color?

### Check for Understanding

- How are energy and light related?
- What is light made of/ how does it travel?
- How can we measure light?