Light Energy Worksheet

Thinking Questions

⇒ What is energy?
⇒ What are some types of energy we discussed?
⇒ What is the largest source of energy in our solar system?

Station 1: Bending Light

Instructions: Place the ruler (or pencil or Popsicle stick) straight up in the water and slowly lower it towards horizontal.

Information: Refraction is the bending of the path of light as it travels across the border of two transparent materials.

Your Observations:

1. The light traveled from __________________________ to __________________________.

2. In the space below, draw how you see the object in your bowl:

   Air

   ____________________________________________ –── Air / Water Boundary

   Water

2. Engineers must understand refraction when deciding the type of windows to put in a building. Where else have you seen refraction that uses air, water or glass?

   ____________________________________________

   ____________________________________________

   ____________________________________________
Station 2: Lens and Light

Instructions: Examine the pictures and words through the magnifying glass. What happens if you hold the magnifying glass at different distances?

Your Observations:
1. A lens is a curved piece of ________________ that makes light bend.
2. As light comes into the lens, it converges at one point. Draw the arrows to the focal point:

   ![Diagram of light source, magnifying glass, and focal point]

3. If you hold the magnifying glass at a certain distance, the image on the other side is:
   Circle one: Right-side up  Upside down

4. Engineers use lenses in many products they create. Can you list two things that use lenses?
   __________________________________________
   __________________________________________

Energy: Lesson 3, Stations of Light Activity — Light Energy Worksheet
Station 3: Prism Rainbows

Instructions: Shine light through the prism to create a rainbow.

Information: The rainbow of colors we can see are called the visible spectrum. White light contains all of the colors in the visible spectrum.

Your Observations:
1. When I hold a prism up to a light, ____________________________________________
   ______________________________________________________________________
   ______________________________________________________________________
   ______________________________________________________________________

2. List the colors that correspond to ROY G BIV:
   ______________________________________________________________________
   ______________________________________________________________________
   ______________________________________________________________________

2. What three colors make up all other colors by their combination?
   ________________________________________________________________
   ________________________________________________________________
   ________________________________________________________________

3. Engineers use prisms to make telescopes and medical equipment. What types of materials can make a rainbow?
   ______________________________________________________________________
   ______________________________________________________________________
   ______________________________________________________________________
Station 4: Polarized Light

Instructions: Put on a pair of polarized sunglasses and hold the plastic polarized film in front of you. Then, slowly rotate the film in either direction.

What do you notice when the film is straight up and down?
What do you notice when the film is rotated 90 degrees?

Information: Only waves moving in the same plane as the openings in a polarizing filter go through (like putting a letter in a mail slot). All other waves are blocked. Polarized sunglasses work by blocking some light waves so you can see better in very bright conditions.

horizontally polarized (side to side)

vertically polarized (up and down)

Your Observations:
1. When I put the polarized sunglasses on, __________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________

2. Where might you, or an engineer, want to use a polarized lens?
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________
   ___________________________________________________________________