

Light Energy Worksheet **Answers**



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.

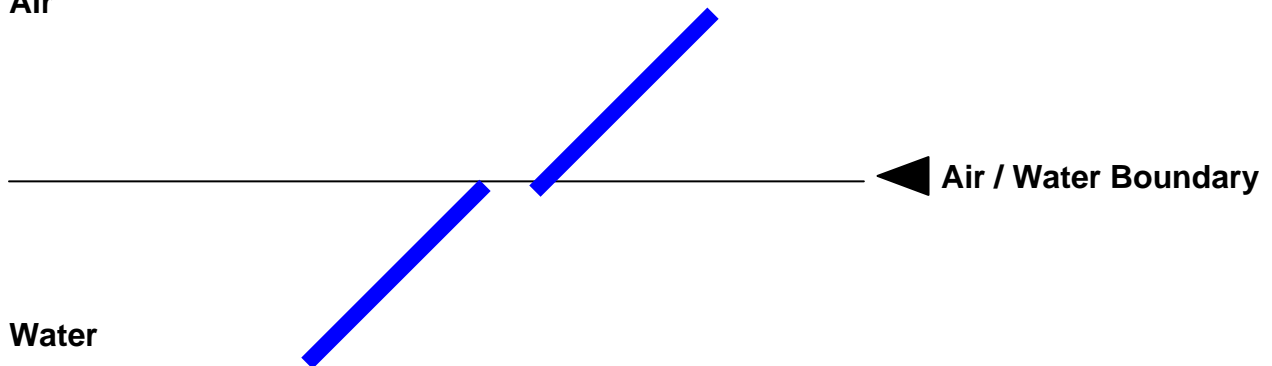
Information: Refraction is the bending of the path of light as it travels across the border of two transparent materials.

Your Observations:

1. The light traveled from air to water.
2. In the space below, draw how you see the object in your bowl:

Air

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?

swimming pool, magnifying glass, soda bottle,

eye glasses, drinking glass, etc.

Station 2: Lens and Light

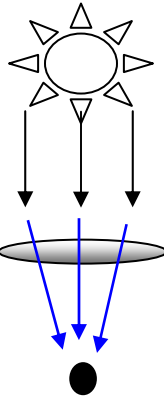
Instructions: Examine the pictures and words through the magnifying glass.

What happens if you hold the magnifying glass at different distances?

Your Observations:

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

Light source: Sun →



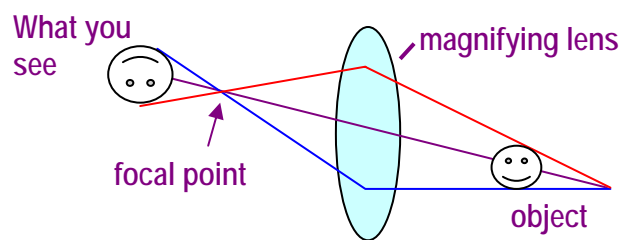
Magnifying glass →

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?

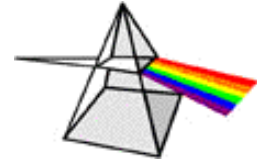
eye glasses, cameras, telescopes, microscopes,

medical equipment, contact lenses, door peep hole, etc.

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.

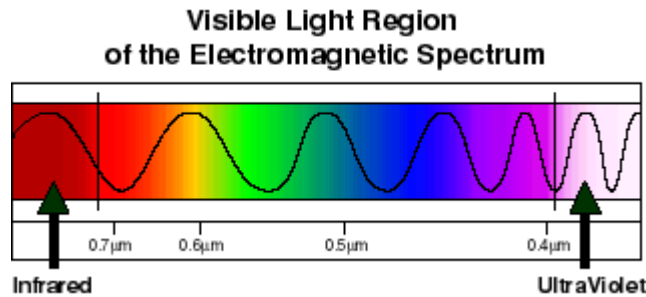


Your Observations:

1. When I hold a prism up to a light, _____

I see all the colors of the rainbow

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



red, orange, yellow, green, blue, indigo, violet

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

red, green, blue

3. Engineers use prisms to make telescopes and medical equipment.
What types of materials can make a rainbow?

glass, water, lenses, clear plastic, etc.

Station 4: Polarized Light

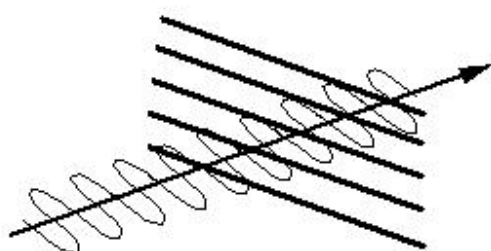
Instructions: Put on a pair of polarized sunglasses and hold the plastic polarized film in front of you. Then, slowly rotate the film in either direction.



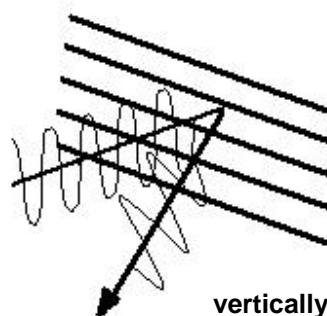
What do you notice when the film is straight up and down?

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, _____

I see fine when the film is turned one way.

It goes dark when the film is rotated 90 degrees.

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

In the sun, in snowy conditions, on water,

in bright areas of light, etc.