

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

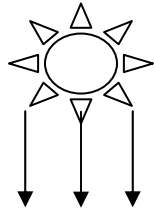
Instructions: Examine the pictures and words through the magnifying glass.

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:

Light source: Sun →



Magnifying glass →

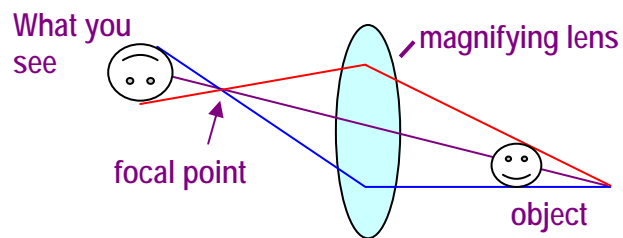


Focal point →



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

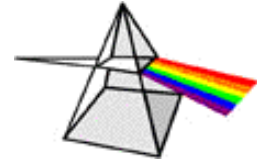


4. Engineers use lenses in many products they create. Can you list two things that use lenses?

Station 3: Prism Rainbows

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

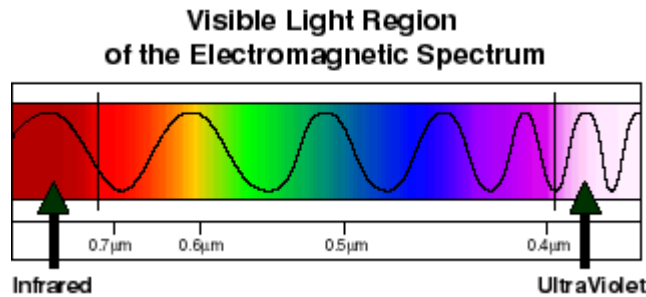
Information: The rainbow of colors we can see are called the visible spectrum. White light contains all of the colors in the visible spectrum.



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

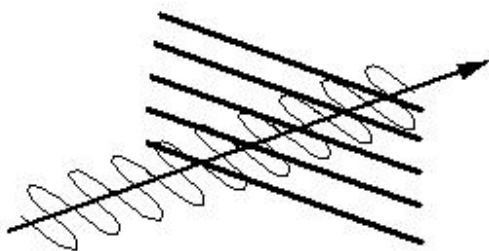
Instructions: Put on a pair of polarized sunglasses and hold the plastic polarized film in front of you. Then, slowly rotate the film in either direction.



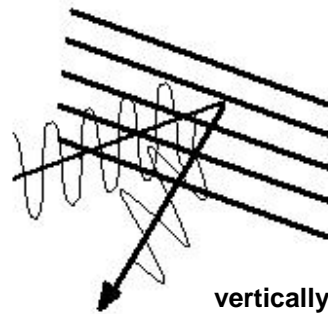
What do you notice when the film is straight up and down?

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?
