

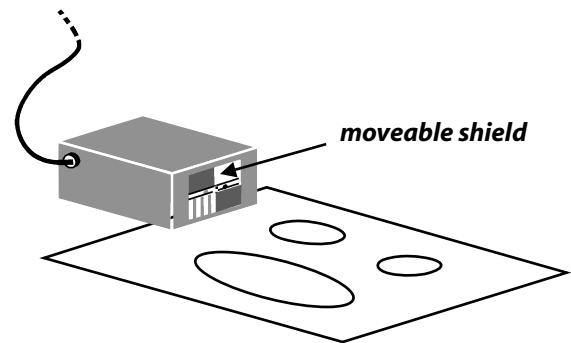
PHYZLAB SPRINGBOARD: A BURNING VISION



• Apparatus •

___ PASCO Basic Optics System:

- ___ light source
- ___ power supply (plug)
- ___ 3 convex lenses
- ___ concave lens
- ___ small rubber band (optional)
- ___ Optometry Sheet (one per group)



• Set-Up •

1. Attach the power supply to the light source and plug it in.

2. Arrange the light source to be a ray box and adjust the moveable plastic shield so that five beams are emitted.

• Procedure •

1. SURVIVAL LENS

a. Suppose you were lost in the woods with sparse provisions. Which kind of lens—convex or concave—might be useful and why?

b. Draw a diagram in the space to the right showing why this lens might be useful and why the other is not.

c. During winter months, hiking supply stores once sold shallow aluminum bowls several centimeters in diameter. Why? **It has something to do with this lesson.**



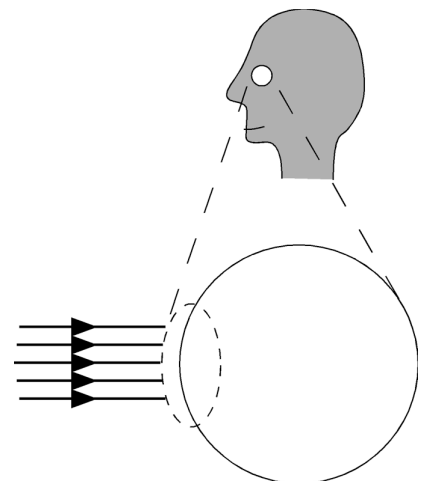
This bowl is too shallow to use for cooking and has a dull aluminum finish.

2. PERFECT VISION

a. Place two of the convex lenses (in series) at the eye's lens position of the Perfect Vision Eye on the Optometry Sheet. You can bind the lenses together with the rubber band for convenience.

b. Shine the five beams from the ray box toward the Perfect Vision Eye so that they are parallel to the gray lines.

c. Sketch the resulting ray pattern to the right. Where do the refracted rays meet?

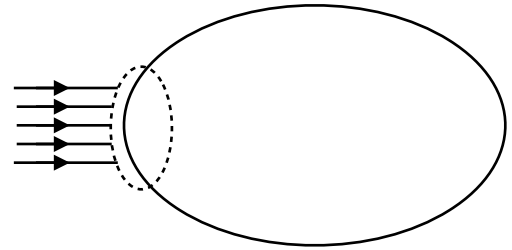


3. CORRECTING MYOPIA (NEARSIGHTEDNESS)

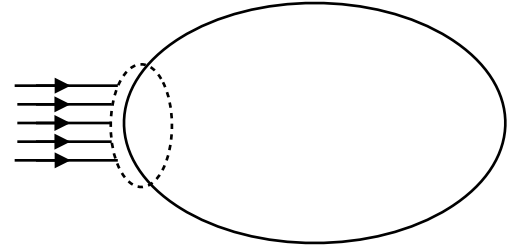
a. Place two of the convex lenses in the eye's lens position of the Nearsighted Eye on the Optometry Sheet.

b. Shine the five beams from the ray box toward the Nearsighted Eye so that they are parallel to the gray lines.

c. Sketch the resulting ray pattern to the right. Where do the refracted rays meet?



d. Use another lens to correct the Nearsighted Eye's vision. Describe your **workable** solution and sketch its effect.

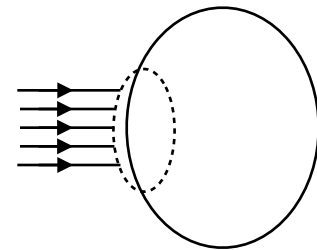


4. CORRECTING HYPEROPIA (FARSIGHTEDNESS)

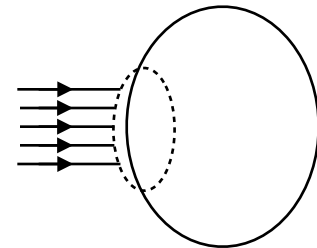
a. Place two of the convex lenses in the eye's lens position of the Farsighted Eye on the Optometry Sheet.

b. Shine the five beams from the ray box toward the Farsighted Eye so that they are parallel to the gray lines.

c. Sketch the resulting ray pattern to the right. Where do the refracted rays meet?



d. Use another lens to correct the Farsighted Eye's vision. Describe your **workable** solution and sketch its effect.



5. LORD OF THE FLIES

a. Who could start a fire with their glasses, __a nearsighted or __a farsighted person?

b. Do most people who wear glasses in this class have __firestarting or __non-firestarting glasses?

c. In William Golding's *Lord of the Flies*, several English schoolboys are stranded on an island. One of them, Piggy, wears glasses. Without them, we are told, his vision would be myopic. Eventually, there is a struggle for possession of Piggy's glasses due to their firestarting ability. The author has

__cleverly incorporated a subtle lesson in geometric optics into the plot.

__completely goofed: Piggy's glasses could not be used to start a fire.

Explain.