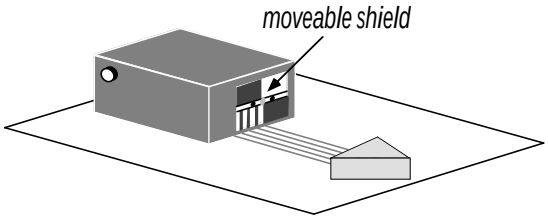
PhyzLab Springboard: Reflections II

• Apparatus •

___PASCO Basic Optics System:
- __light source
- __power supply (plug)
- __triangular mirror (*Star Trek* communicator pin)

___blank sheet of paper



• 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.

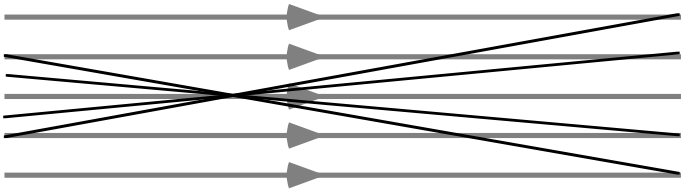
3. Place the light source and triangular mirror on the blank sheet.

• Procedure •

1. When the lights go out, examine the reflections from the two mirrors with curved surfaces.

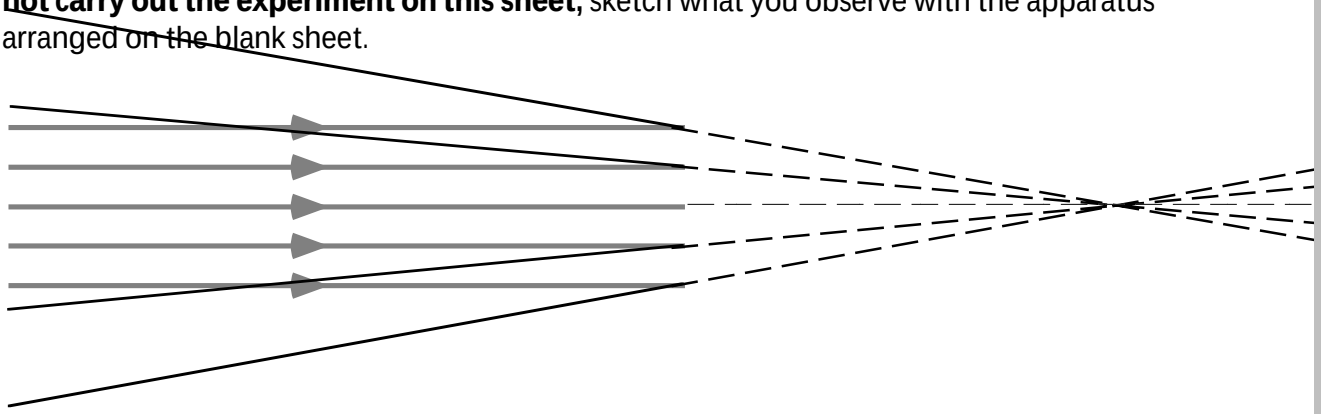
2. a. One of the curved mirrors is a converging mirror. It is the one that is _√_concave ___convex.

b. Sketch its effect on the five beams when the center beam is reflected straight back on itself. **Do not carry out the experiment on this sheet;** sketch what you observe with the apparatus arranged on the blank sheet.



3. a. One of the curved mirrors is a diverging mirror. It is the one that is ___concave _√_convex.

b. Sketch its effect on the five beams when the center beam is reflected straight back on itself. **Do not carry out the experiment on this sheet;** sketch what you observe with the apparatus arranged on the blank sheet.



4. With the ray box and **converging** mirror arranged (as in **part 2** above) on one side of the blank sheet, trace the mirror's surface and mark the reflected rays' focal point .

5. What is the **focal length** of the converging mirror and how is it measured?

The focal length is about 6cm; it's the distance between the mirror surface and the focal point.

6. What is the focal length of the **diverging** mirror and why is it more difficult to measure?

The focal length is about 6cm; since the rays diverge upon reflection, one must first extend the rays back behind the mirror to see where they meet.

7. Focal lengths of mirrors can be positive or negative based on the following convention. If incident parallel rays reflect and converge in front of the mirror, the focal length of the mirror is considered to be positive. If incident parallel rays reflect and diverge so that they meet behind the mirror, the focal length of the mirror is considered to be negative.

a. The focal length of the convex mirror is __+ √ – __0 __∞.

b. The focal length of the concave mirror is √ + __– __0 __∞.

c. The focal length of the plane mirror is __+ __– __0 √ ∞.
(How far from the mirror do reflected rays meet?)