Making Goggles

Directions for construction used with permission from Pacific Science Center - Brain Power

Supplies - Order safety goggles and magnifying sheets (Fresnel lenses) using the following information. Information subject to change - the following is accurate as of July 11, 2010.

- Carolina Biological — www.carolina.com — 800-334-5551
  Safety Goggles — Catalog # GEO9205 — $5.10 each
- SCIENCECompany — www.sciencecompany.com — 800-372-6726
  Fresnel lenses/page magnifier — Catalog # NC-11089 — $2.50 each*
  *sheet size is 10.25" x 7"
- 3Dlens.com — www.3dlens.com — Internet sales only - no phone
  Fresnel page magnifier 7"x10" — Product # 406 — $1.60 each (offers volume discount)
- Your local bookstore - many sell Fresnel lenses as page magnifier sheets.

Directions for construction

Fresnel lenses (page magnifiers) inserted into safety goggles will shift the wearer's vision approximately 10 degrees to the left or the right. One piece of Fresnel lens will be placed over each side of the goggle; one over the left eye and one ever the right eye. You will use the template provided to make sure that both pieces of Fresnel lens shift the wearer's vision to the left or the right and not up or down.

Step 1. Cut the Fresnel lens into four pieces (see Figure 1). One Fresnel lens will make two pairs of goggles; you will be using the corner pieces of the lens as shown in Figure 1.

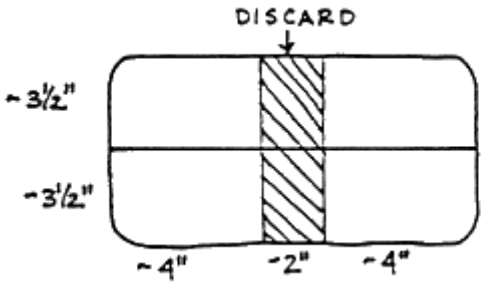

FIGURE 1

Step 2. Place the goggles over the template so that the image is centered in the goggles. See the end of instructions for the template and refer to Figure 2 for placement of the goggles over the template.

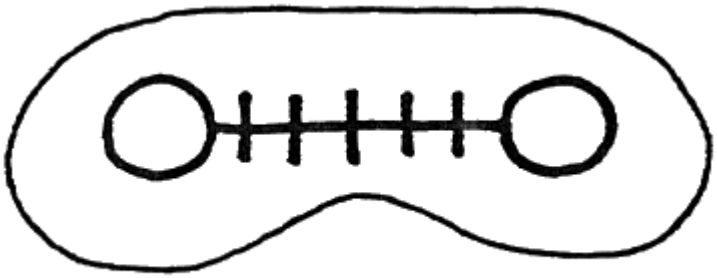

FIGURE 2

Step 3. The template is used to make sure that the lens is shifting to the left or the right, and not up or down. Take one of the corners of the Fresnel lens and, holding it rough side down, place it over the left side of the goggles. When you place the lens on the goggles, the template image shifts to the left or right, and when you rotate the lens notice how the template image moves up or down.

The objective is to rotate the lens so that the shifted image (on the left side) is in line with the right side of the template image. Figure 3 shows how the image shifts left or right and up or down. Figure 4 shows how the image with the lens on the left should be parallel with the image on the right.

FIGURE 3

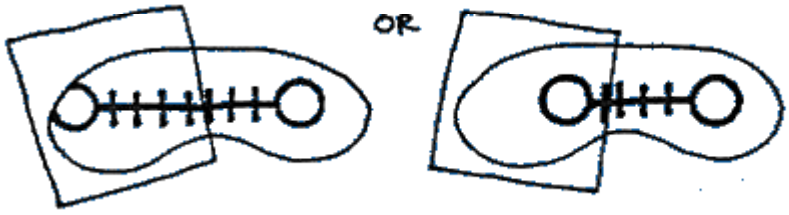

FIGURE 4

Once the image on the left side is parallel with the right side, outline the lens shape with a Vis-à-vis pen, cut it out, then snap the cut piece into the outside of the goggles fitting it into the plastic lip on the goggle edge.

Step 4. Now you are ready to complete the right side. Place the goggles over the template and put a piece of the Fresnel lens over the right side of the goggles; make sure the image shifts in the same direction as it did on the left side. (HINT: the grooves in the Fresnel lenses need to be oriented in the same direction as shown in Figure 5).

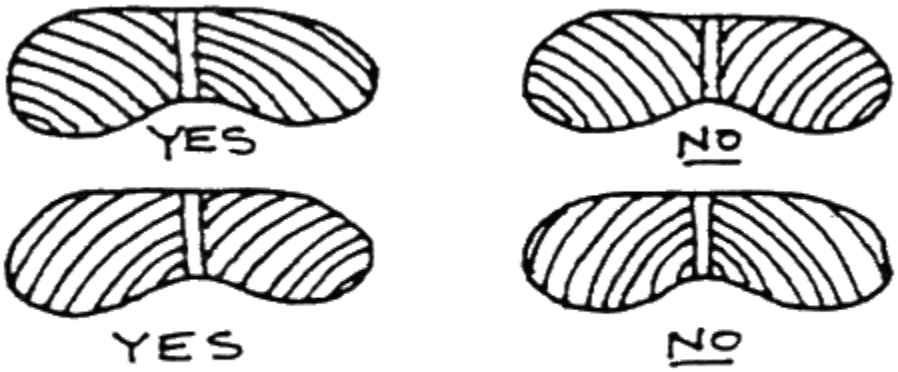

FIGURE 5

The image may shrink in size and that is OK, but make sure the image stays in line on the left and right sides; see Figure 5. Once it is lined up as in Figure 5, outline the lens shape with a Vis-à-vis pen, cut it out, and snap the lens piece into the outside lip of the goggles. Do not worry if you have a space between the two lens pieces, or if the two lens pieces overlap a little.

Look through your goggles to see if they work – look straight ahead and focus on an object – when you take the goggles off, the object you saw straight ahead should really be located to the left or right of straight ahead. If you are seeing double, something is wrong and the lenses need readjustment.

Pair 1 - R

top

Pair 2 - L

top

top

Pair 2 - R

top

Pair 1 - L