Freaky Faces

Description:

This exhibit consists of a sheet of Plexiglas and two floodlights controlled by dimmer switches. Users sit on opposite sides of the Plexiglas and adjust each light's intensity until the image of one person's face merges with the image of their partner's face. It should be noted that for this to occur, each person must be equidistant from the reflecting surface. Only one participant at a time is able to observe the effect.

Purpose:

This apparatus demonstrates that the image produced by a plane mirror is located as far behind the reflecting surface as the object is in front of the reflecting surface. The device also clearly shows that a transparent material may be an effective reflector as well as transmitter of light.

Classroom Instructions:

1. Lights on apparatus may have to be adjusted so they shine on the students who will be sitting on each side.

2. Have two students sit, one on each side of apparatus, approximately the same distance away from the apparatus.

3. Students need to line up their eyes and nose as best as they can.

4. Have students adjust the lights so that one is relatively bright while the other is dim. (Have observers view the results from the bright side. Remind the student sitting on the dim side that they will not observe the effect.

5. Have students reverse the lighting conditions so the student initially on the dim side will have an opportunity to see the unusual effect.

References:

Science Snackbook, Exploratorium, San Francisco, CA. 2. Exploratorium Cookbook III, recipe # 171, Exploratorium, San Francisco, CA.

Construction Details for

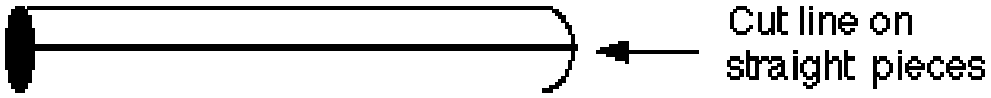
Everyone is You and Me

Supplies needed:

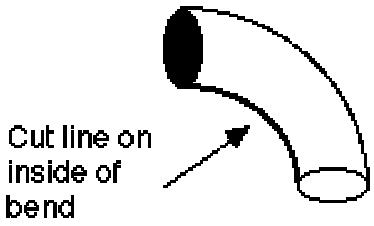
- 2 elbow PVC pieces
- 2 28" PVC straight pieces
- 2 20" PVC straight pieces
- 2 "T" PVC pieces
- 2 light receptacles for floodlights
- 2 power cords
- 2 dimmer switches and boxes
- 1 1" x 6" x 30" piece of wood
- 1 24" x 30" piece of plexi-glass.2 white flood lights

Instructions:

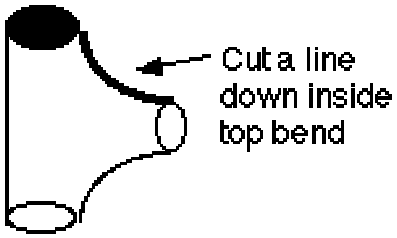
1. With a table saw, cut a straight line lengthwise down one side of each PVC straight piece. This will act as a track to hold the plexi-glass.



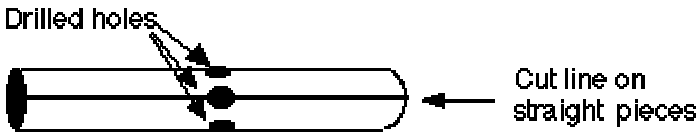
2. Cut a line down the inside of the PVC elbows.



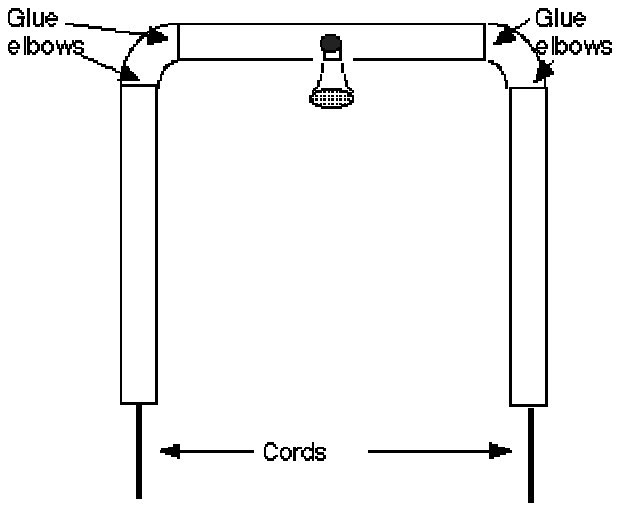
3. Cut a line down the inside of the top bend of the PVC "T" joints.



4. Using one of the 20" pieces, drill 3 holes. One on the side with the straight line cut and the other 2 on the sides of the pipe, directly across from one another.



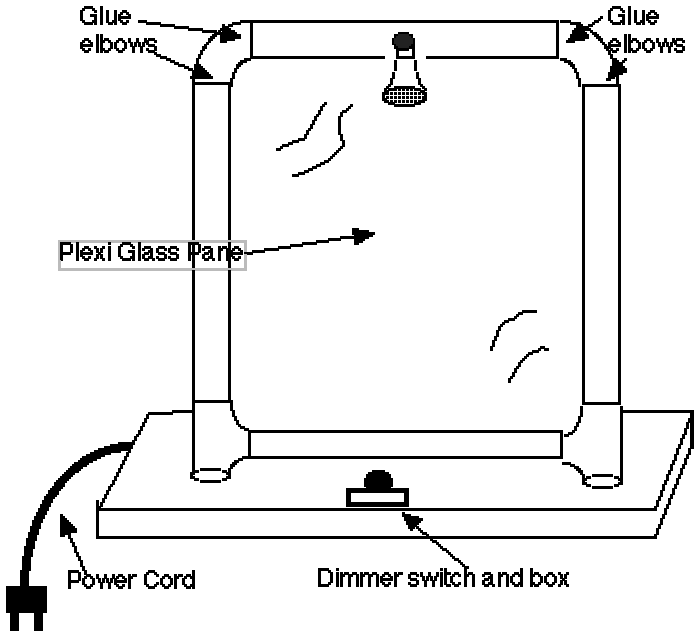
5. Insert the light receptacles and their cords into the two side holes. The hole on the bottom is just there to give you access to the light receptacle bases.



6. Thread cords from light receptacles down the sides of the apparatus.

7. Glue the elbows to the top and side PVC pieces.

8. Slide the plexi glass, up the cut out groove, all the way up and into the top PVC piece.



9. Add the "T" pieces and the bottom PVC piece. You may want to glue these corners if you don't intend to take this apparatus apart for storage.

10. Attach dimmer switches to the cords coming through the side pieces.

11. Mount the dimmer switches and the PVC frame to the 1" x 6" board.

Special thanks to Ann Marie Min, Beardsley Middle School, Crystal Lake, Illinois, for preparing these construction directions and diagrams!

FREAKY FACES

To Do and Notice:

1. **Sit on one side of the plastic sheet with a friend on the other side.**

2. **Position yourselfs so that your faces are equidistance from the plastic sheet.**

3. **Using the control knobs, adjust the intensities of the lights until you see the reflection of your face superimposed on the face of your partner. To achieve this effect, one light must be dim while the other light is bright.**

What's Going On?

This demonstration illustrates that a transparent material, such as glass or plastic, reflects light as well as transmits it. When the light is brighter on your side of the plastic, you not only see your partner through the plastic, but you also see a reflection of yourself as well.