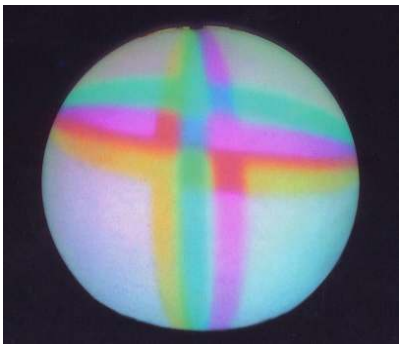
COLOR EXPLORATION

Ping Pong Ball Color Mixer



1. Observe the ping pong ball as the colors are projected on the top of the ping ball change. Notice that only three colors appear as projected spots on the surface of the ball. These colors are known as the additive primaries. What are they?

2. Notice that the entire ball takes on the color of the projected spot. That is, if the spot on the top is red, the entire ball appears red. What happens when two colors are projected simultaneously?

   Complete the following "color equations" by observing the overall color of the ball.

   red light + blue light = _____

   red light + green light = _____

   blue light + green light = _____

   red light + blue light + green light = _____

3. Can you think of any common devices that employ the type of color mixing demonstrated by the Ping Pong Ball Color Mixer?

Light Wave Communication System

Notice that there is no electrical connection between the speaker producing the sound and the radio.

1. How do you suppose the information (voice and music) is transmitted to the speaker? Examination of the figure below may help you formulate your answer.

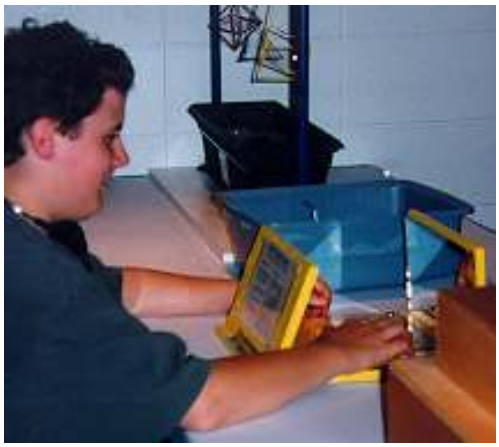
2. Place your hand in front of the red light emitting diode (LED). What happens? Why?

3. How is light wave communication used in today's world?

THE LOVELY VANNA???

Watch Vanna as she rotates. Can you explain why her image on the left changes from gorgeous to gruesome?

Mirror Drawing
("The Tantalizer")

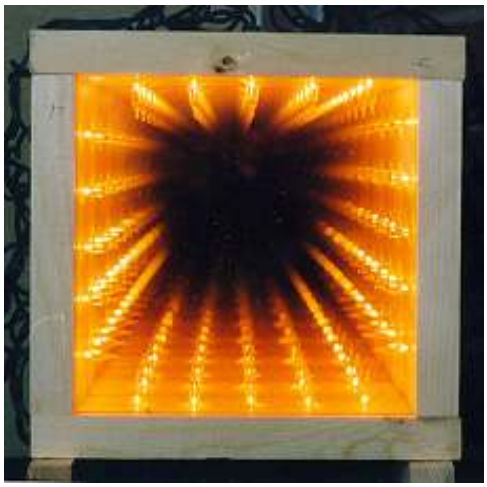


Your eye-brain system has been trained to receive and process stimuli based on past experiences. What happens when the input is not what the brain has come to expect? The Tantalizer will allow you to answer this question.

Using your finger, try to trace the patterns while looking in the mirror.

- Which lines are most difficult to trace? Least difficult?
- Does practice seem to improve your ability to trace certain patterns?
- Why is mirror writing hard for most people?
- Can you think of a profession that requires working with mirror images on a regular basis?

Look into Infinity



1. To get a feel for infinity, look into the box.

2. Can you count the number of lights in the box?

3. How do you think this device works?

3. What happens to the brightness of the lights as they appear to get farther and farther away? Why do you suppose this happens?

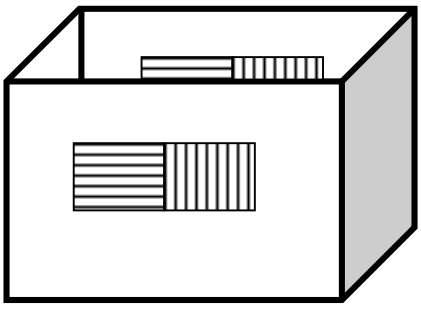
4. Have you ever seen this effect before? (Hint: See photo below.)

The Bogus Barrier

1. Examine the inside of the shoebox by looking through the tinted windows on either side. DO NOT OPEN THE BOX! Note that a wall divides the interior of the box into two regions.

2. Tilt the box so that the ball rolls back and forth. Does the ball pass through or bounce off the wall? Can you explain this mysterious behavior?

3. If you are totally baffled, you may take the lid off the box. To discover why the "bogus barrier" exists, look through each of the windows with one of the square Polaroid filters provided at this station. You may find rotating the filter while looking through each window quite revealing!



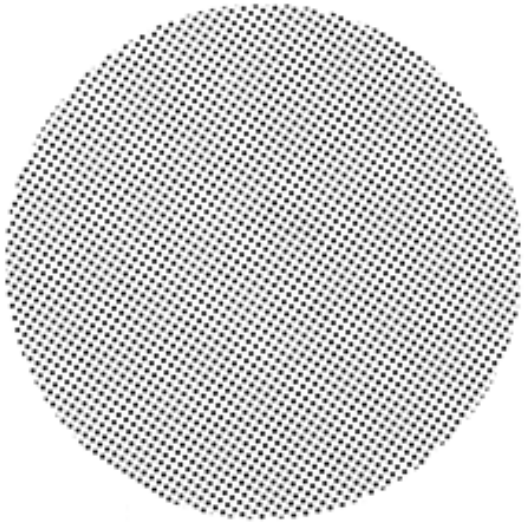
The Ghostly Apparition

1. Can you pick up the little ghost?

2. How is the image of the ghost produced?

3. Shine the laser on the ghost. Does a red dot appear on the ghost even though he isn't there? What's going on here?!

Spinner



1. Stare at the center of the spinning disk for 30 seconds. After 30 seconds of staring, look at the palm of your hand.

2. Does your flesh seem to be oozing? Does it appear to turn in the same direction as the disk or in the opposite direction?

3. Try looking at a friend's face or other objects in the room after staring at the disk for 30 seconds.

4. What do you think causes the illusion of oozing?

Reverse Mask

1. Notice that the mask is concave. That is, sunken in.

2. Stand about ten feet back from the mask, close one eye and look at the face. You may be surprised to find that the face now looks normal, that is, convex.

3. Walk to the left, then to the right, while you look at the face with one eye. What happens?

4. Now open both eyes and look at the face. Does it remain convex with both eyes open?

Black Hole

1. Examine the black hole at the center of the box.

2. From what you observe, what is the color of the inside of the box?

3. Open the box to check your prediction.

4. After seeing the inside of the box, can you explain why the hole appears black when the box is closed?

The Magic Wand

1. Hold the “Magic Wand” in your hand and wave it rapidly up and down over the strip of tape on the floor.

2. Look at the side of the stick that faces the projector. What do you see?

3. What happens when you reduce your rate at which you wave the wand? Is there a speed at which the image on the wand is no longer visible?

4. How do you think the magic wand works?

5. Do you of any devices or phenomena in everyday life that behaves like the magic wand?