

Whirling Watcher

In this activity, you'll make a *stroboscope*—a spinning disk with slits around the edge that you'll look through. Brief but frequent glimpses of images seen through the slits lead to a surprising result.

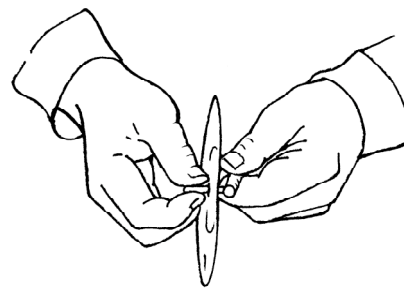
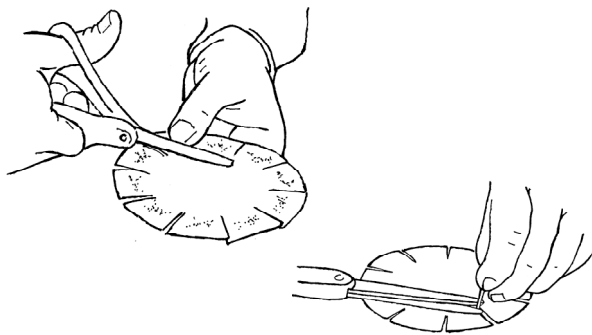
What Do I Need?

- paper plate or card stock
- glue stick
- pattern of galloping horses
- pushpin
- pencil with eraser
- mirror (wall mirror or plastic hand mirror)

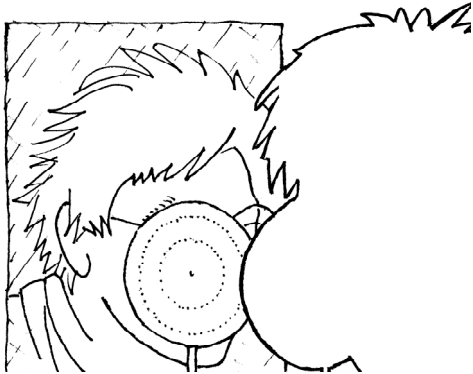


What Do I Do?

1. Rub the glue stick on the back of a paper plate.
2. Center the pattern on the plate. Then press the pattern down, making sure it's firmly attached.
3. Roughly cut away some of the extra paper. Then cut again, using the edge of the circle as your guide.
4. Cut along the sides of all the black marks, bend the marks back, then cut them off.
5. Push the pushpin through the center of your reinforced pattern.
6. Hold the pencil up to the back of your pattern, and push the pushpin into the side of the pencil eraser. Don't push too hard—the pattern should be able to spin freely. You've now made a stroboscope.



- 7.** Stand in front of a wall mirror, or put a hand mirror flat on a table and bend over to face it.



- 8.** Put the back of the stroboscope really close to one eye, and look through one of the slits. Focus on one of the horses reflected in the mirror. Then spin the stroboscope and watch the horse gallop!

Note: You may have to try this a few times before you see the animation. It may help if you close your other eye.

What's Going On?

When the stroboscope is spinning, you see a small area of the pattern's reflection each time a slit passes your eye. Your visual system holds onto the image seen through a slit for about a tenth of a second—long enough for one image to merge into the next one. This phenomenon, called *persistence of vision*, creates the illusion of a galloping horse.

TV and movies rely on the same phenomenon. The images on your TV seem continuous, but in reality, a new image flashes on your screen thirty times a second. It's your eye-brain system that blends these images into a seemingly uninterrupted stream of movement.

Print out this page to use in the Whirling Watcher activity. (You may want to enlarge the image.) You can also use this as a template to make your own drawings.

