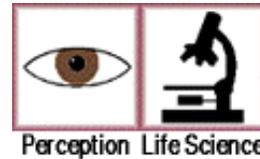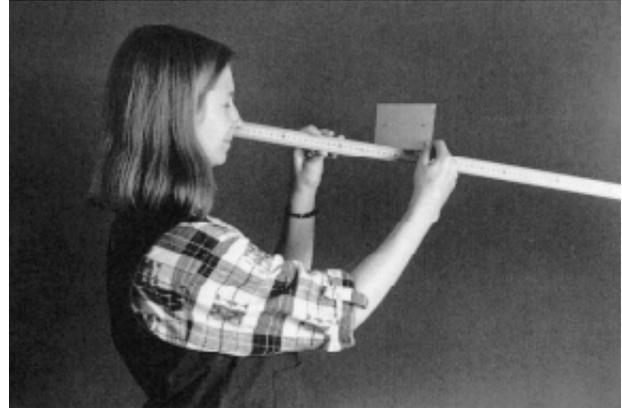# Blind Spot

To see, or not to see

The eye's retina receives and reacts to incoming light and sends signals to the brain, allowing you to see. There is, however, a part of the retina that doesn't give you visual information. This is your eye's blind spot.

materials

- **One 3 X 5 inch (8 x 13 cm) card** or other stiff paper
- **A meterstick**

assembly

(5 minutes or less) Mark a dot and a cross on a card as shown.

Perception Life Science

to do and notice

(5 minutes or more)

Hold the card at eye level about an arm's length away. Make sure that the cross is on the right.

Close your right eye and look directly at the cross with your left eye. Notice that you can also see the dot. Focus on the cross but be aware of the dot as you slowly bring the card toward your face. The dot will disappear, and then reappear, as you bring the card toward your face.

Now close your left eye and look directly at the dot with your right eye. This time the cross will disappear and reappear as you bring the card slowly toward your face.

Try the activity again, this time rotating the card so that the dot and cross are not directly across from each other. Are the results the same?

what's going on?

The optic nerve carries messages from your eye to your brain. This bundle of nerve fibers passes through one spot on the light sensitive lining, or retina, of your eye. In this spot, your eye's retina has no light receptors. When you hold the card so that the light from the dot falls on this spot, you cannot see the dot.

As a variation on this blind spot activity, draw a straight line across the card, from one edge to the other, through the center of the cross and the dot. Notice that when the dot disappears, the line appears to be

continuous, without a gap where the dot used to be. Your brain automatically "fills in" the blind spot with a simple extrapolation of the image surrounding the blind spot. This is why you do not notice the blind spot in your day-to-day observations of the world.

etcetera ──────────────

Using a simple model for the eye, you can find the approximate size of the blind spot on the retina.

Mark a cross on the left edge of a 3 x 5 inch (8 x 13 cm) card. Hold the card 9.75 inches (25 cm) from your eye. (You will need to measure this distance; your distance from the card is important in determining the size of your blind spot.)

Close your left eye and look directly at the cross with your right eye. Move a pen on the card until the

point of the pen disappears in your blind spot. Mark the places where the penpoint disappears. Use the pen to trace the shape and size of your blind spot on the card. Measure the diameter of the blind spot on the card.

In our simple model, we are assuming that the eye behaves like a pinhole camera, with the pupil as the pinhole. In such a model, the pupil is 0.78 inches (2 cm) from the retina. Light travels in a straight line through the pupil to the retina. Similar triangles can then be used to calculate the size of the blind spot on your retina. The simple equation for this calculation is $s/2 = d/D$, where s is the diameter of the blind spot on your retina, d is the size of the blind spot on the card, and D is the distance from your eye to the card (in this case, 9.75 inches [25 cm]).