Your Two Different Pairs of Eyes

by Marcia Clemmitt

A JUMPING SPIDER needs its eight eyes to stalk insects. Some lizards use a third eye in their foreheads to sense how much sunlight their bodies receive. A scallop's two hundred eyespots help it stay away from hungry fish.

And humans have amazing eyes, too. Your eyes have two ways of seeing that are so different, they might easily be called two different pairs of eyes. One kind is for seeing in bright light, and the other is for seeing in the dark.

The difference between your daytime and nighttime eyes starts with your pupils. They're the round black openings in the center of your eyes. In bright light, muscles in the colored iris shrink the pupils to shut out glare. In the dark, another set of muscles widens the pupils to let more light in. If you've ever awakened suddenly in a bright room, you've felt the painful pull of your eye muscles squeezing the pupils shut. The relief you feel when the light goes off is those muscles relaxing.

The pupil lets in light at the front of your eye. Inside, at the back of your eye, is a kind of screen called the retina, which is covered with light-sensitive nerve cells. These light receivers are called rods and cones after their shapes when seen through a microscope.

Cones are for day vision. They signal the brain only when bright light hits them. Rods enable you to see at night. They signal the brain even when very dim light reaches them.

When the right amount of light falls on one of your eye's light receivers, part of the cell changes shape and breaks off. This sends your brain a signal: "light received." Since broken cells can't signal the brain, your eyes are constantly rebuilding light receivers.

Illustrations by Annette LeBlanc Cate