



## Unit 7

## The Senses: Fooling Your Ears

## CONCEPTS

- You have five main senses that help you gather information about the world around you.
- Many times, you use your senses in combination with each other to make sense of the world around you.

## IDEAS &amp; SUGGESTIONS

In this demonstration, the ears are not being fooled at all. Actually, the joke is on your brain. Your ears collect information and send it to the brain via electrical impulses. Each ear collects information from its side of the head. This information helps your brain determine where things are around you. When information from the left side of your body is channeled into the right ear, your brain gets confused. Your brain thinks the information is coming from the right side of your body when, in actuality, it is coming from the left side of your body. Because the person behind you is walking back and forth, it is especially difficult to pin down his/her location. After a while, your brain may be able to adjust to its situation and analyze the information correctly.

During the experiment, be sure that students hold the tubes up close to their ears. Students should NOT put them inside of their ears!

## STUDENT BACKGROUND

Your senses are your guides to the outside world. At any one moment, your brain is receiving hundreds of messages from your sense cells. The brain organizes and analyzes the messages and helps you understand what is going on around you. For example, when you eat lunch, your senses of sight, smell, taste, and touch tell you that you are eating a peanut butter and jelly sandwich. In these experiments, you will be isolating your senses. Your sense of sight is very powerful and in the experiments, you will prevent it from giving you any extra information. This makes your other senses work harder! Sit back, relax, and let your senses do the work.

## TEACHER BACKGROUND

The brain is responsible for collecting information from your senses. All of the sense organs contain receptor cells. These cells collect information in the form of light rays, sound waves, pressure, or even tiny molecules from food floating in the air. The information is turned into electrical impulses by the receptor cells and channeled to the part of the brain called the **cerebrum**. This portion of the brain is where the information from the senses is analyzed and decisions are made. Each sense has a center in the cerebrum where information is processed. The sense organs are only collectors of information. Until the brain interprets the information, you cannot experience it.

## VOCABULARY

cerebrum, olfactory receptors

## Real-World Problem

## Painless Procedures

Modern medicine allows doctors to perform medical procedures without causing patients an extreme amount of pain. How are doctors able to stop nerves from communicating with each other and sending the message to the brain?

(See page 72 for solution.)



## The Senses: Fooling Your Ears

### You Will Need

- 2 pieces of tubing (2 feet each)
- 2 funnels
- masking tape
- two volunteers



### What to Do

- 1 Place a funnel into the end of each piece of tubing and tape the funnels in place.
- 2 Have one volunteer sit with the funnels on his/her lap so that one funnel points to the right and the other one points to the left, as shown.
- 3 This volunteer should hold the tube from the right-facing funnel to the left ear and the tube from the left-facing funnel to the right ear. Then he/she should close his/her eyes.
- 4 Have another volunteer walk back and forth behind the chair, stepping loud enough to be heard through the tubes. While he/she is walking, the listening volunteer should describe which way the classmate is going.
- 5 Repeat the experiment having the classmate walk in front of the chair. This time have the volunteer open his/her eyes.

### Questions to Ask

1. Why was it difficult to tell which direction the person was walking? [The person's ears were "fooled" into thinking the sounds were coming from different directions.]
2. What does this experiment tell you about the way your brain processes information? What adaptations do hearing-impaired people have to make? Why?