Ear Tricks

Overview: Think of your ears as "sound antennas." There's a reason you have TWO of these – and that's what this experiment is all about.

What to Learn: Sound is made by vibrating objects and can be described by its pitch and volume.

Materials

- noisemaker
- partner
- blindfold
- earplugs

Lab Time

1. Sit or stand in the middle of a room.
2. Close your eyes or put on the blindfold.
3. Have your partner walk to another part of the room as quietly as possible.
4. Have your partner move the sound maker around the room, but also make sure your partner makes the sound directly in front of you, behind you and over your head as well.
5. With your eyes still closed, point to where you think the sound came from.
6. Try it several times and then let your partner have a turn.

Did you get fooled this time? This works sometimes, but not always. What I hope happened was when the noisemaker was above your head, directly in front of you or directly behind you, you had trouble determining where the sound was coming from. Can you guess why this might have happened? Your ears are placed directly across from one another. If a noise happens directly in front of you, it hits your both ears at the exact same time. Your brain has no clues as to where the sound is coming from if the sound hits both ears at the same time so it makes its best guess. In this case, its best guess may be wrong. Let's try one more thing here.

7. Close your eyes or put on the blindfold.
8. Put an ear plug in one of your ears. If you don't have one, use your finger to cover your ear. Be very careful not to put your finger into your ear. Just use your finger to cover the hole in your ear.
9. Have your partner walk to another part of the room as quietly as possible.
10. Have your partner make the noisemaker make a noise. This will work best if the noise is not too loud.
11. With your eyes still closed, point to where you think the sound came from.
12. Try it several times and then let your partner try to find the sound.

How did you do with just one ear? Did you get fooled a little more often this time? Your brain has fewer clues to work with so it does the best it can with what it has.

Reading

Your ears are very good at determining where sounds are coming from. The reason your ears are so good at detecting the direction of a sound is due to the fact that sound hits one ear slightly before it hits the other ear. You

brain does an amazing bit of quick math to make its best guess as to where the sound is coming from and how far away it is. Let's do a little more with this.

Exercises Answer the questions below:

1. How do your two ears work together to determine the location of a sound?

2. Does it matter what frequency (how high or low) the sound is? Are some frequencies easier to detect than others with only one ear?

Answers to Exercises: Ear Tricks

1. How do your two ears work together to determine the location of a sound? (Sound hits one ear slightly before it hits the other ear, and your brain makes a guess as to where the sound is coming from and how far away it is based on your experience.)
2. Does it matter what frequency (how high or low) the sound is? Are some frequencies easier to detect than others with only one ear? (answers will vary)