



Finding Sounds

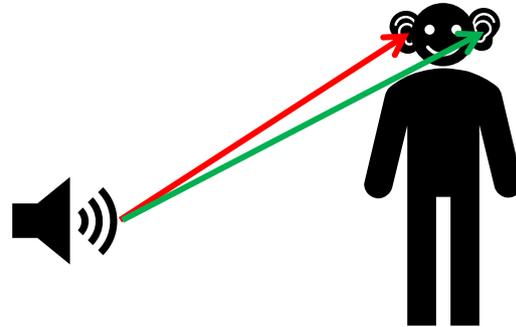
During this activity, you will discover how good you are at working out where a sound is coming from. Scientists call this 'sound localisation'.

How to

- 1) Choose which one of you will be the 'sound seeker' and which will be the 'experimenter'- the experimenter should follow the rest of these instructions.
- 2) Stand the sound seeker in the middle of an open space.
- 3) Tie a blindfold over the sound seeker's eyes and ask them to stand still- we don't want them falling over!
- 4) Quietly (try taking any shoes off!) walk around the sound seeker, about a metre away. At some point, stop and clap.
- 5) Ask the sound seeker to point to where you were when you clapped.
- 6) After a few goes, ask the sound seeker to hold their hand over one of their ears. Does this change how good they are at the game?
- 7) Now ask the sound seeker to sit on the floor. This time you should clap either above their head, in front of their face (not too close!), directly behind them or anywhere in between these positions. How good are they at localising the sound now? Does covering one ear make a difference?
- 8) Don't forget to swap around so both people can have a go at being the sound seeker!
- 9) Why not try a different sound, like ringing a bell, or shaking a container with some rice or dried beans in it. Is it easier or harder to work out where the sound is coming from with certain sounds?

The Science

When we want to work out where a sound is coming from, we compare the time difference between the sound reaching our left and right ears. Sounds on our left reach our left ear first, then travel around our head to our right ear- our brain uses this delay to work out that the sound is on our left. With one ear covered, you can't do this calculation, so it is much harder to work out where a sound is coming from.



But have you worked out the problem with this method yet? It only works for sounds on our left or right. If it comes from directly in front of us, behind us, above or below us, a sound reaches both ears at the same time- because of this, we are much worse at localising sounds in these directions. Our brain tries to work out where the sound comes from by looking at subtle differences caused by how the sound bounces around in our funny-shaped ears, but this is much harder. Or, we tilt our head, to change the distance the sound has to travel to reach each ear. Did you notice the sound seeker doing this during the experiment?

Compared to lots of animals, humans are quite bad at sound localisation- we tend to use sounds to know what direction to look in, then work out what made the sound using vision. Many other mammals, like dogs, can move their ears around, helping them work out the precise direction a sound is coming from. Barn owls are even better at it, and can hear exactly where a mouse is from a distance, in the dark, so they can swoop down and catch it- pretty amazing!