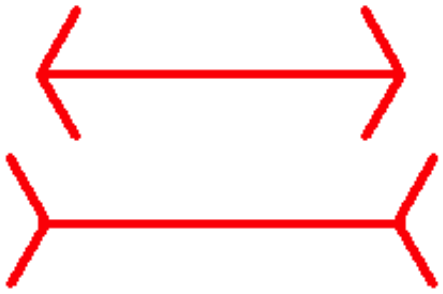
CBC Radio's QUIRKS & QUARKS For KIDS

You must be hearing things



Can you tell which of the centre lines is longer? Click HERE for the answer.

Have you ever seen an optical illusion? They happen when your brain is fooled into thinking one thing, when really something else is going on. Well the same thing can happen with your ears. You can have Auditory Illusions, and you'll think you're hearing things.

Here's an example (your computer needs to have a sound card for this to work):

Sound Example

Did you hear those notes going up or going down? Play them again, and ask someone else to listen. Did they hear the same thing? Here's another example:

Sound Example

Was it going up or down that time?

Well the answer is -- there's no answer. You might have heard them go up, someone else might have heard them go down.

Each note is made of sound waves, like water waves at a beach. Usually If the waves are shorter, it sounds as if the notes are higher. If the waves are longer, the sounds are lower. But musical sounds can be mixture of waves, long and short ones. If you've ever taken piano lessons, think about playing all the C's on a piano, and then playing all the A's. Which sound would be higher? Neither, since each would be a mixture of lower and higher notes.

Here's another illusion based on octaves. Can you name this tune?

Sound Example

Eight Wavelengths

Four Wavelengths

The sound from the wave at the top would be an octave higher than the one below it.

But this sound would sound like both.

That was a song in which the sequence of notes was right, but they were played in octaves different from what we're used to hearing. The result is that it sounds like a jumble of notes.

Here it is played properly. Sound Example

Now try playing the jumbled version again. Sound Example

Can you hear it come together?

These sounds were prepared by Dr Diana Deutsch, a researcher into how the brain interprets sounds. Scientists like her are researching these illusions because they help us understand the way the brain works, and maybe in the future will help us learn ways to hear and see better.

(Audio copyright Dr Diana Deutsch)

There are lots of resources on the Net on optical and auditory illusions.

- You can hear the full Quirks & Quarks interview with Dr Diana Deutsch, from March 29, 1997, at the *Quirks & Quarks* site.
- McGill University in Montreal has a site called Auditory World, with lots of information and examples. It's not very pretty, but it is very interesting.
- Here are two pages of optical illusions to warp your eyes: Page 1, Page 2.
- Illusionworks is a neat multimedia site with optical and auditory illusions.
- And here's information on Dr Diana Deutsch's CD of auditory illusions.