

FUNNELS OF SOUND

Activity Pack



- Description: **Explore how sound travels using ear defenders and funnels to create giant ears**
- Duration of Activity: **No fixed duration**
- Age: **5yrs+**
- Topic: **Neurosciences and Mental Health**
- Key words: **Hearing, Sound, Acoustics, Ears, Cochlea, Noise**
- Resources:
- **Instructions and Equipment List**
 - **Activity Worksheet**
 - **Activity Evaluation Poster - Children**
- Related Activities: **Playing with Sound**

With thanks to [MRC Institute of Hearing Research](#)

Funnels of Sound Instructions and Equipment List

Key messages

- » Along with touch, sight, taste and smell, hearing helps both people and animals to make sense of their environment.
- » Hearing involves more than your ears, when you listen you use your eyes and move your head to help 'see' where sounds are coming from.
- » Your brain interprets sounds so that you can respond to them.
- » The outside part of your ear sticking out from your head helps to funnel sound in.
- » Sometimes people have problems with their hearing or have sore ears.

What MRC Scientists do?

- » 8-10 Million people in the UK are affected by hearing loss.
- » Research looks at everything from the brain mechanisms of hearing to how an individual's quality of life is affected by hearing loss.
- » Seeking new ways to support those with hearing impairments.

Activity overview

Explore how sound travels to the ears using ear defenders and funnels to create giant ears.

Steps

1. Encourage the participants to whisper or talk very quietly or talk in normal voices into the tubes.
2. Offer each participant the chance to listen and talk into the funnel earphones
3. Those wearing the earphones should be instructed to close or cover their eyes and point in the direction of the sound
4. Swapping or crossing the funnels over will cause the participant to point in the wrong direction
5. Doppler effect can be obtained by making a constant noise while passing the two funnels side by side in front - this gives the illusion of movement to the listener.

Important notes

- » Do not allow anyone to shout down the funnels this can hurt the listener.
- » Remember all ages can be affected by hearing loss or problems.

Suggested Script and background information

Introduce the idea that by wearing the specially adapted ear defenders with funnels you have extra large / powerful ears.

These ear extensions catch sounds and send them down the pipe right into your ear. The part of the ear that is on the outside of your head isn't all that different to the funnel.

Sound travels through the air in waves and the shape of your ear helps to catch the waves and channel them into the part of the ear that is inside your head.

Your ear has three parts, called the outer, middle and inner ear.

The bit you can see is the outer ear.

In the middle ear sound bounces against the ear drum, the drum passes these vibrations on to the three ear bones and they pass it on to a spiral structure called the cochlea in the inner ear.

From the inner ear the signal travels along the hearing nerve into the brain.

The brain then interprets the sounds so you can hear music, talking and laughter.

You have an ear on each side of your head to help your brain figure out where sounds are coming from.

If a dog barks on your left hand side, the sound will get to your left ear first and then quickly afterwards it will reach your right ear. This tiny time difference tells your brain that the dog is on your left-hand side even if you can't see it. The dog's bark is also louder in your left ear because your head gets in the way and blocks a bit of the sound from your right ear.

Sometimes people have problems with their hearing or have sore ears. There are lots of different causes of hearing loss and scientists at the Medical Research Council are trying to find ways to prevent hearing loss and to improve people's hearing.

Lots of children experience an infection called glue ear. The infection causes fluid to build up in the middle ear. It can make it difficult to hear too. If glue ear is really bad, it can be fixed with grommets – these are little tubes that a doctor can put in your ear drum to let the fluid out.

For further information visit [MRC Research](#)

Funnels of Sound Equipment List

Staging

This activity is best conducted in an open space to allow participants to move about.

Required

- » Modified Ear defenders with Tubes and Funnel attached
- » Each ear defender is drilled and the 1-1.5cm hole sealed completed by one end of a piece of approx. 1m tubing. A large wide funnel is attached and sealed onto the open end of the tubing. The apparatus requires all joints to be sealed to work correctly.

Optional

- » Worksheet - one per participant
- » Lab coat - one per participant
- » Activity evaluation poster - children

FUNNELS OF SOUND

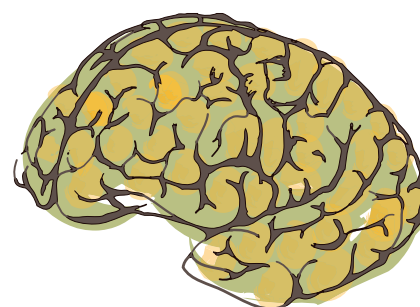
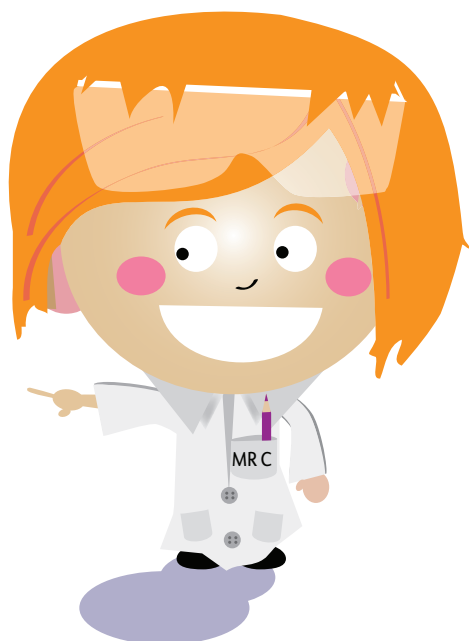
Worksheet

Along with touch, sight, taste and smell, hearing helps both people and animals to make sense of their environment. Hearing involves more than your ears, when you listen you use your eyes and move your head to help see where sounds are coming from. Your brain interprets sounds so that you can respond to them.

Today we are going to use funnels and headphones to show you how sound travels into your ears.

1. **Put the headphones on and close your eyes.**
2. **The Scientist demonstrator will talk into the funnel - your job is to point to where the sound is coming from.**
3. **The demonstrator will move the tubes about, which ear do you hear the sound in first?**

When you are wearing the headphones the funnels turn into huge ear-extensions. They catch sounds and send them down the pipe right into your ear. The part of the ear that is on the outside of your head isn't all that different to the funnel. Sound travels through the air in waves and the shape of your ear helps to catch the waves and channel them into the part of the ear that is inside your head.



Your brain looks a bit like this

Your ear has three parts, called the outer, middle and inner ear. The bit you can see is the outer ear. In the middle ear sound bounces against the ear drum, the drum passes these vibrations on to the three ear bones and they pass it on to a spiral structure called the cochlea in the inner ear. From the inner ear the signal travels along the hearing nerve into the brain. The brain then interprets the sounds so you can hear music, talking and laughter.

You have an ear on each side of your head to help your brain figure out where sounds are coming from. If a dog barks on your left-hand side, the sound will get to your left ear first and then quickly afterwards it will reach your right ear. This tiny time difference tells your brain that the dog is on your left-hand side even if you can't see it. The dog's bark is also louder in your left ear because your head gets in the way and blocks a bit of the sound from your right ear.

Sometimes people have problems with their hearing or have sore ears. There are lots of different causes of hearing loss and scientists at the Medical Research Council try to find ways to prevent hearing loss and to help people hear better.

Lots of children experience an infection called glue ear. The infection causes fluid to build up in the middle ear. It can make it difficult to hear too. If glue ear is really bad, it can be fixed with grommets - these are little tubes that a doctor can put in your ear drum to let the fluid out.