

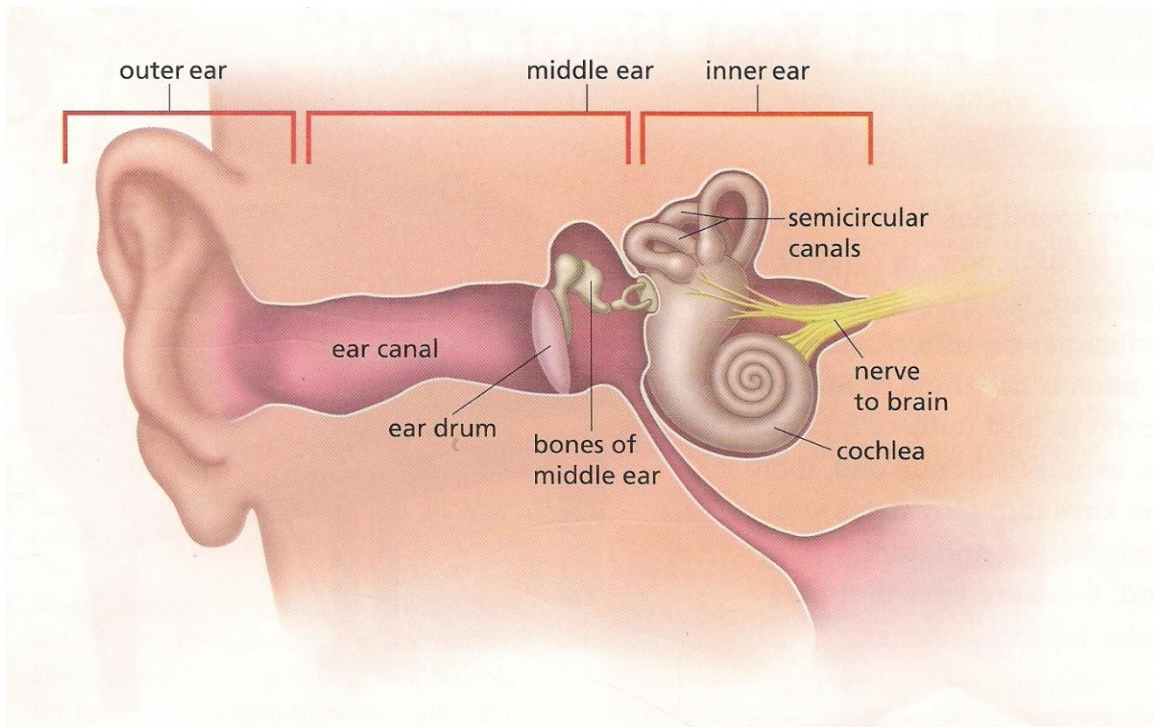
Name: _____

Date: _____

EARS

Now that you know vibrations cause sound and that many things can make vibrations, including movement and our voice, the question is “How do we hear sound?”

Sound is made of vibrations moving through matter, such as air. Your ear needs to pick up those vibrations in order to hear the sound. How does it do that? Think back to when you held the tuning fork near the plastic wrap covering a yogurt container. What happened to the plastic wrap? It moved up and down, or vibrated. The **eardrum** in your **middle ear** picks up vibrations in the same way. When sound waves hit your eardrum, your eardrum vibrates.



When sound waves travel through the air, your **outer ear** catches them. It directs the sound waves into your head through the **ear canal**. The sound waves push against your eardrum and make your eardrum vibrate, just like the tuning fork made the plastic vibrate.

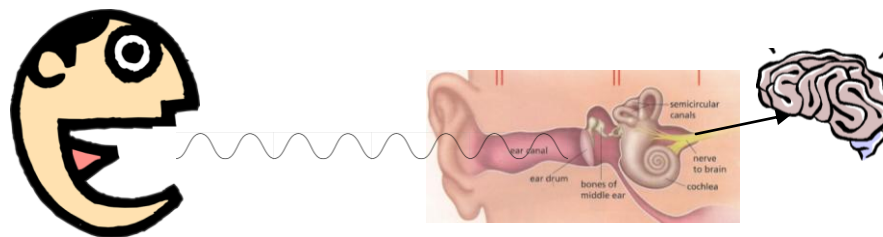
As your eardrum vibrates, it makes the three tiny bones in the middle ear move. These bones send the vibrations to the shell-shaped part of the **inner ear** called the **cochlea**. This area is filled with liquid and lined with thousands of tiny hairs. The sound vibrations make the liquid move and this makes the hairs wave back and forth. The hairs are joined to **nerves** that send a signal to your **brain**. Your

brain then lets you know what you are hearing. Believe it or not, all this happens in less than a second!

Your eardrum is very delicate. So it is a good thing it is tucked inside your head where it is protected from sharp objects that could damage it. That is why you should never stick objects in your ear! They could damage your eardrum. You also have another safety feature that protects your ears – earwax. It collects dust that gets into your ear canal so that it doesn't block the vibrations of your eardrum.

1. Explain how you hear the sound of another person's voice. Draw a picture to show your explanation.

When someone speaks they cause the air to vibrate. These vibrations travel through the air and enter someone else's outer ear. From there they travel through the ear canal to that person's ear drum. When the vibrations hit the ear drum it causes the ear drum to vibrate. This vibration is transferred to the small bones in the inner ear. As the bones vibrate they send signals to the brain through nerves attached to them. The brain interprets these signals as a human voice.



2. How does your body try to protect your ears and hearing?

The ear drum is tucked far inside the head so that it does not get damaged.
Ear wax is designed to collect dust that gets into the ear canal so that the dust cannot block or affect the vibrations.

3. What part of your ear is like the plastic wrap that covered the yogurt containers? How is it similar?

The ear drum. It is a thin layer of skin that can vibrate up and down, just like the plastic wrap.