4th Grade Health
Lesson 1: Sound And The Ear

Our five senses help us experience the world around us.

Who can name all five senses?

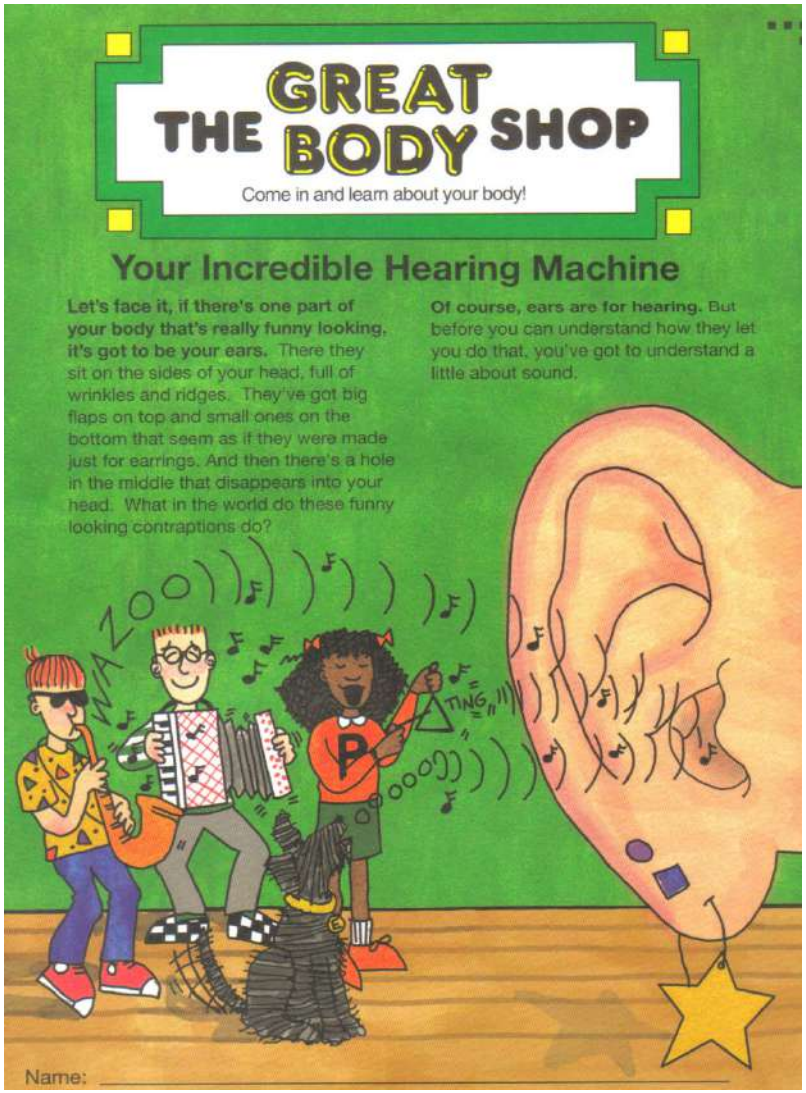
1)Sight
2)Hearing
3)Smell
4)Taste
5)Touch

What body part is used for each sense?

1)Sight	1)Eyes
2)Hearing	2)Ears
3)Smell	3)Nose
4)Taste	4)Tongue
5)Touch	5)Hands/Skin

Today we are going to talk about hearing and your ears…

Let’s start by reading the front page of our Student Issue…



GREAT
THE BODY SHOP

Come in and learn about your body!

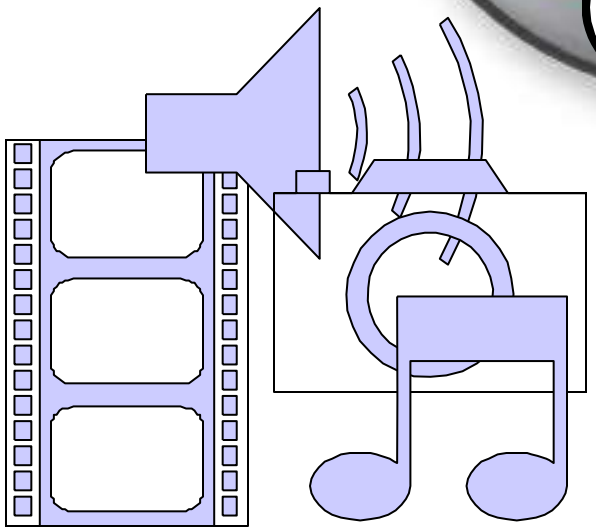
Your Incredible Hearing Machine

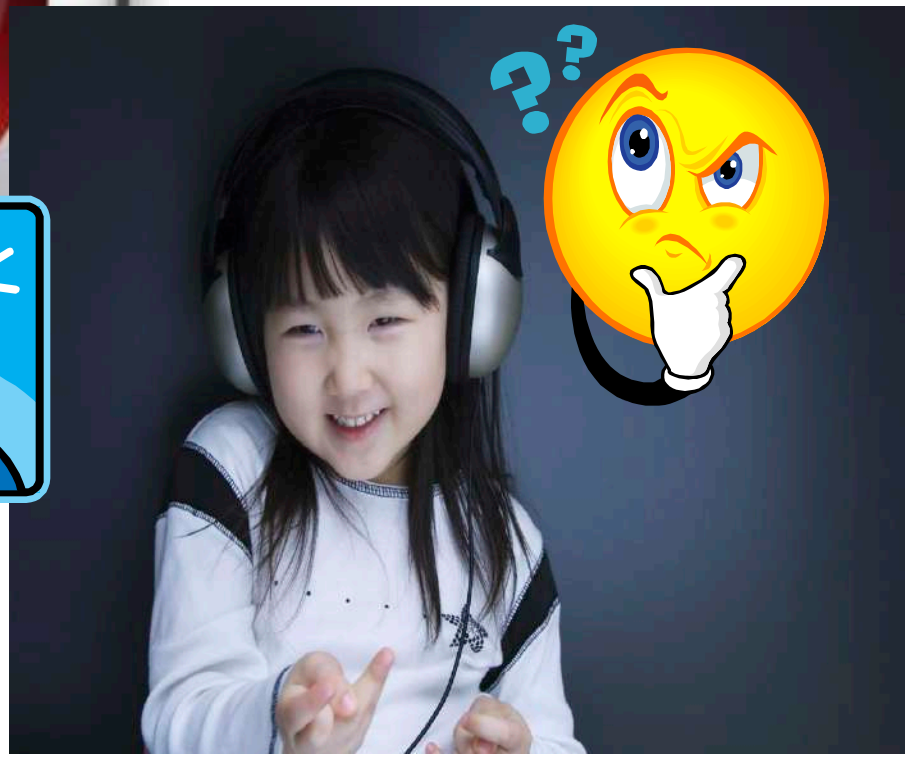
Let's face it, if there's one part of your body that's really funny looking, it's got to be your ears. There they sit on the sides of your head, full of wrinkles and ridges. They've got big flaps on top and small ones on the bottom that seem as if they were made just for earrings. And then there's a hole in the middle that disappears into your head. What in the world do these funny looking contraptions do?

Of course, ears are for hearing. But before you can understand how they let you do that, you've got to understand a little about sound.

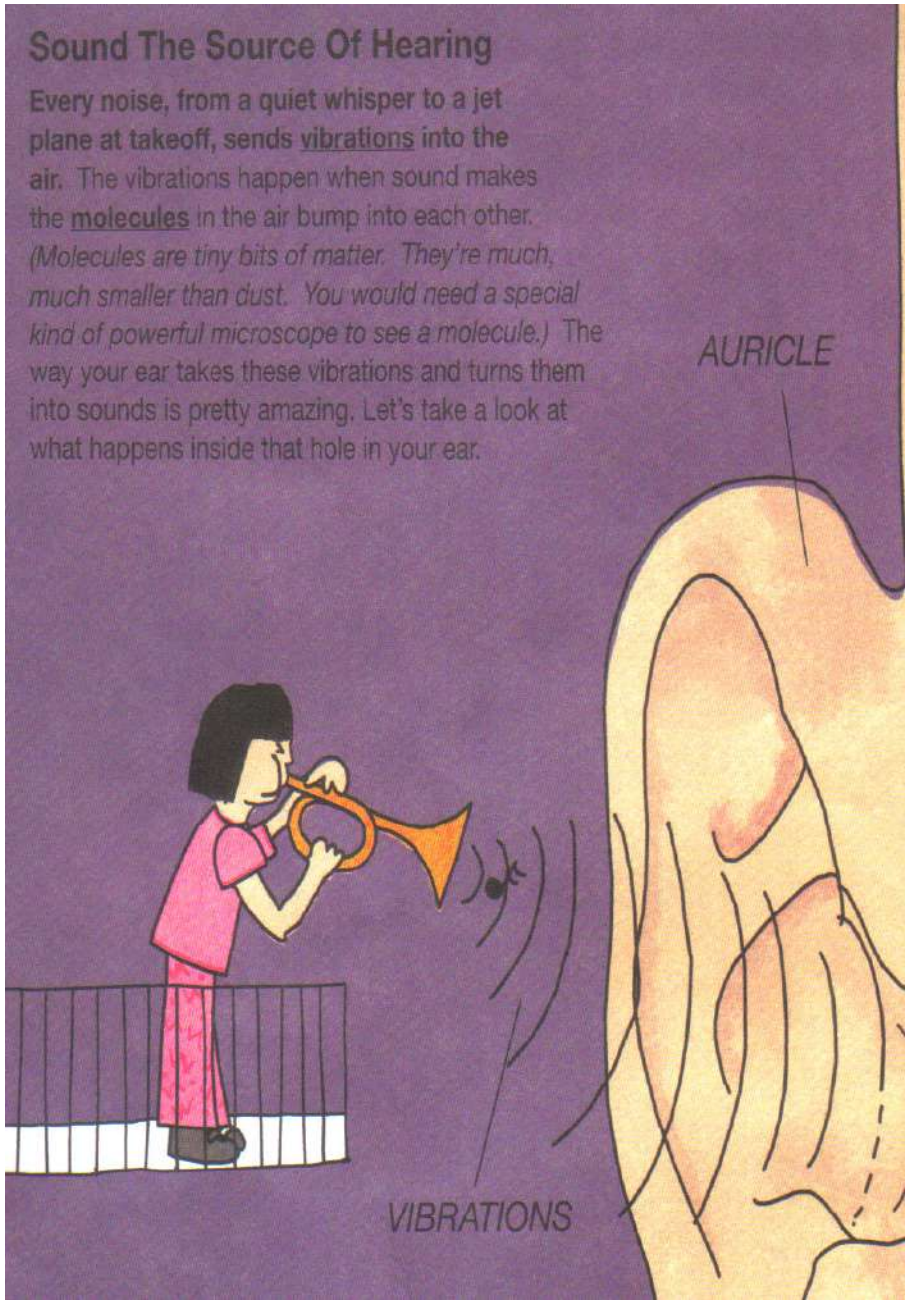
Name: _____

Can anyone tell me what sound is?





Let's check our answers. Please turn to page 2 in our Student Issues and read aloud "Sound: the Source Of Hearing"



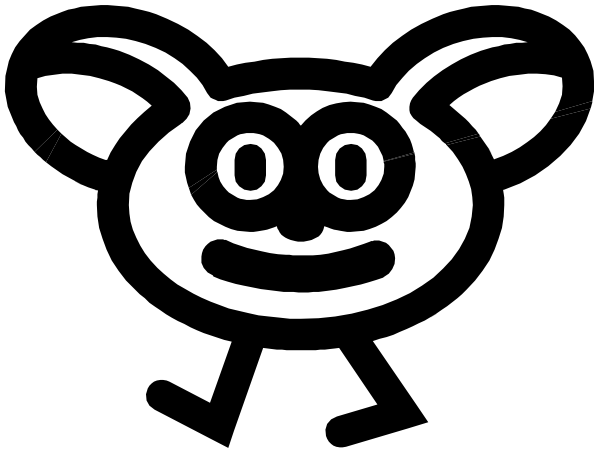
Sound vibrations travel through air at the speed of 1,116 feet per second, or about one mile every five seconds

Sound Travels even faster through water

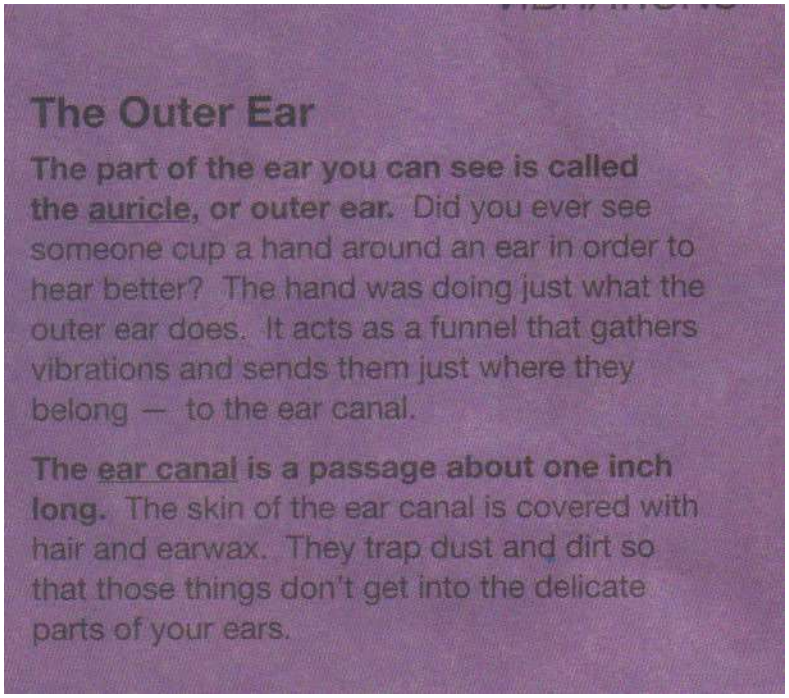
It Can also travel through other materials such as glass, brick, steel, and the earth on which we live!

✓ Our ears are the organs that enable us to hear sound

✓ The ear is made up of three different parts – let's learn about each part!



Let's read our Student Issues, "The Outer Ear" on page 2.

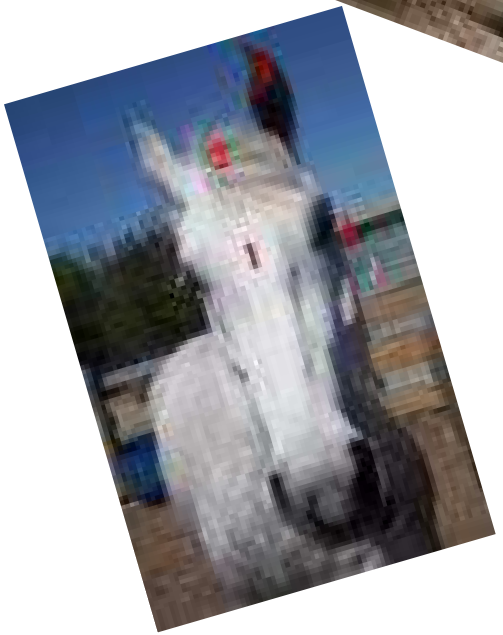


The Outer Ear

The part of the ear you can see is called the auricle, or outer ear. Did you ever see someone cup a hand around an ear in order to hear better? The hand was doing just what the outer ear does. It acts as a funnel that gathers vibrations and sends them just where they belong — to the ear canal.

The ear canal is a passage about one inch long. The skin of the ear canal is covered with hair and earwax. They trap dust and dirt so that those things don't get into the delicate parts of your ears.

✓ The outer ears of animals are different from the ears of humans
✓ Some animals such as seals, are able to close their ears when diving so that water does not get into them
✓ In other animals the outer ear is controlled by muscles which help the animal move its ears up or around in order to collect more sound vibrations



Human ears are connected to the head with muscles also, but those muscles don't allow us to move our ears to pick up sounds. The most that some people can do with those muscles is wiggle their ears!

Have you ever seen a pet dog or cat move its ears in the direction of a sound? Can anyone in class wiggle his or her ears? Would you like to show us?

Let's talk about the middle ear. Open your Student Issues to the green box and let's read "Middle Ear".

Middle Ear

Sound vibrations zip through the ear canal until they get to the eardrum. The eardrum is just a piece of very thin skin that covers one end of the ear canal. As sound vibrations hit the eardrum, they make it shake, just like the top of a drum shakes when you hit it with a drumstick.

Now, here's where things get really interesting! On the other side of the eardrum are three tiny bones. They are called the **hammer**, the **anvil** and the **stirrup** *(look for them in the middle ear in the diagram below)*. These three bones are very tiny. All of them could fit on the nail of your pinky! The shaking from the eardrum makes these bones move.

- ✓ The eardrum separates the outer ear from the middle ear.
- ✓ It is very sensitive and can be moved by even the smallest vibrations.
- ✓ The eardrum then passes these vibrations on to the three bones of the middle ear.
- ✓ From there sound moves to the inner ear.

Look closely at the bones of the middle ear. Why do you think they are called the hammer, the anvil, and the stirrup?

The inner ear… Let's read the section entitled "The Inner Ear"

The Inner Ear

The last tiny bone — the stirrup — fits into a hole. Because of its shape, this hole is called the **oval window**. The oval window is the entrance to the inner ear.

What's on the other side of the oval window? It is the **cochlea**, which looks a lot like a snail's shell. The inner ear also contains three canals that look like loops. You'll probably never guess what these are for! *(Look on page 5 for a hint.)*

Let's take a look at the cochlea. Inside, it is lined with twenty thousand very stiff hairs, and filled with fluid. When vibrations from the three bones pass through the oval window and get into the cochlea, they make the hairs wave back and forth. They also make the fluid ripple through the cochlea.

Inside the cochlea is an area called the organ of Corti. It is also covered with thousands of hairs. Every single one of these hairs is connected to a nerve. As the vibrations in the cochlea make the hairs move, they send messages along the nerves to your brain. At this point, the vibrations change into tiny electrical charges.

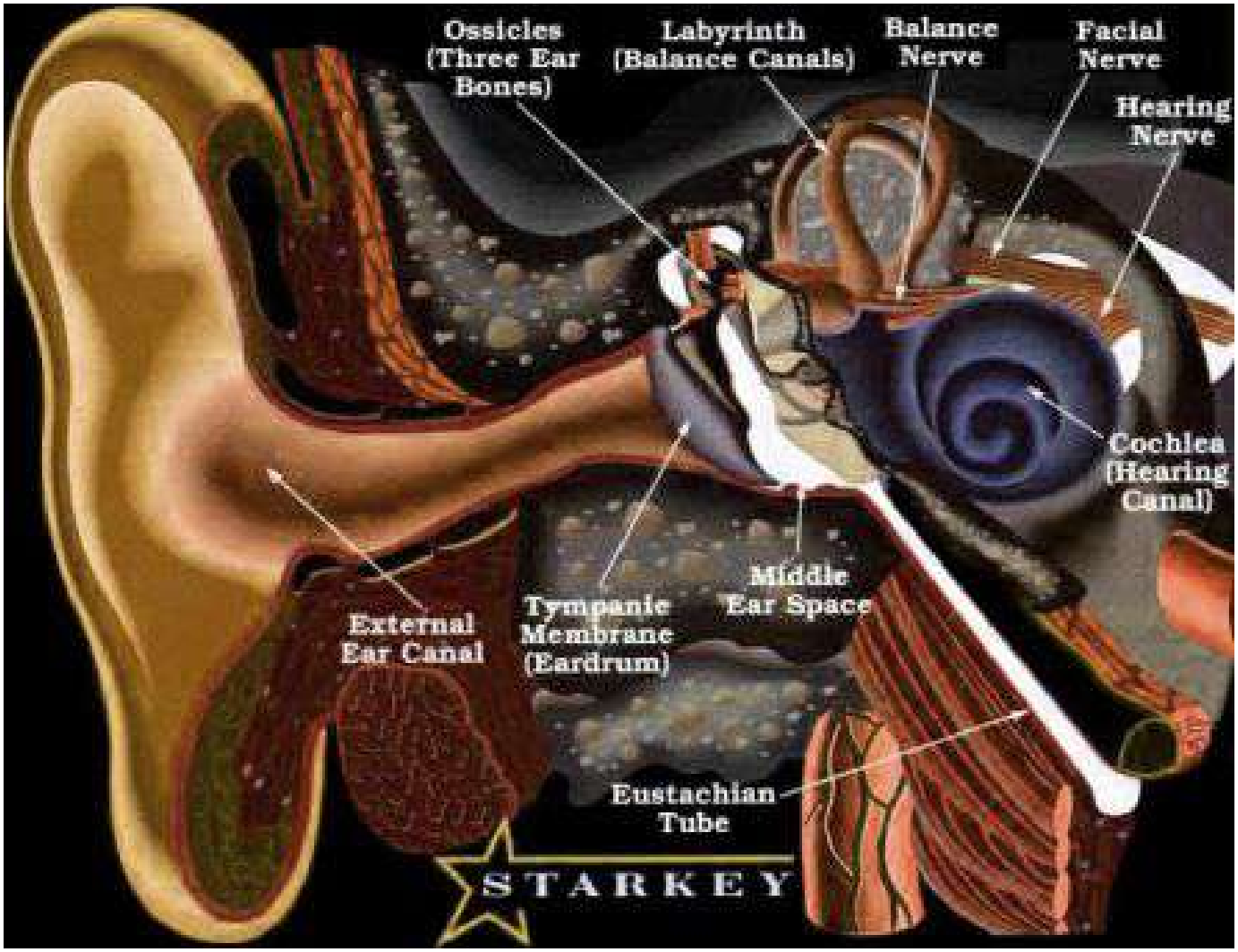
As you might guess, loud noises cause the hairs to move a lot. In fact, loud noise can cause hearing loss or deafness. Be kind to your inner ear, and keep the volume down when listening to music.

Q: What is the entrance to the inner ear called?

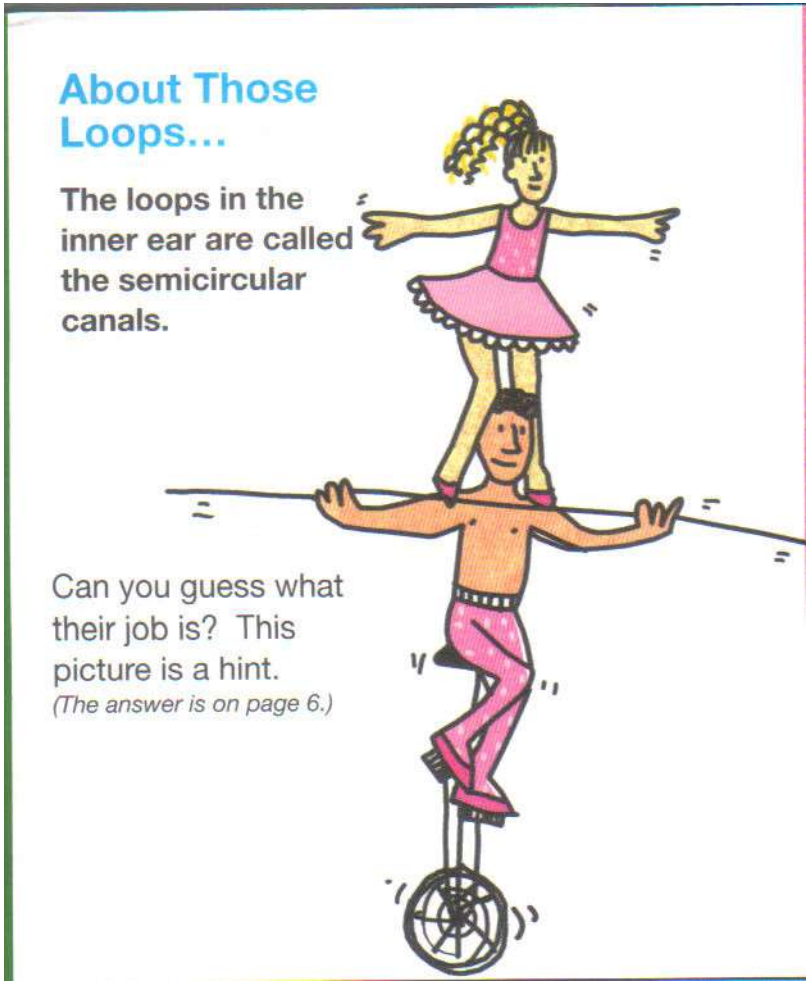
A: The Oval Window?

Q: What is on the other side of the oval window?

A: the cochlea, three canals

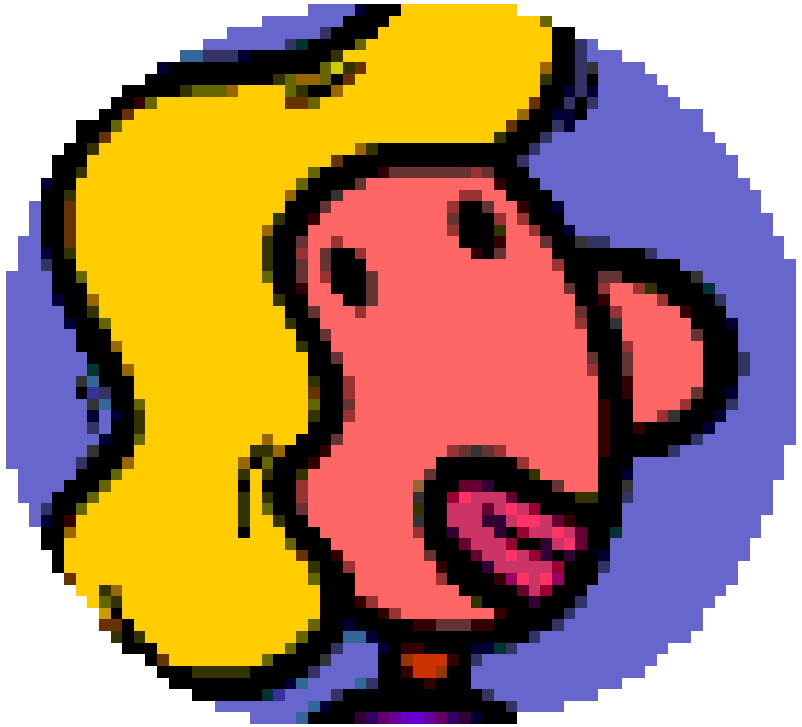

Ossicles (Three Ear Bones)
Labyrinth (Balance Canals)
Balance Nerve
Facial Nerve
Hearing Nerve
Cochlea (Hearing Canal)
External Ear Canal
Tympanic Membrane (Eardrum)
Middle Ear Space
Eustachian Tube
STARKEY

Look at page 5, the section “About Those Lops…”

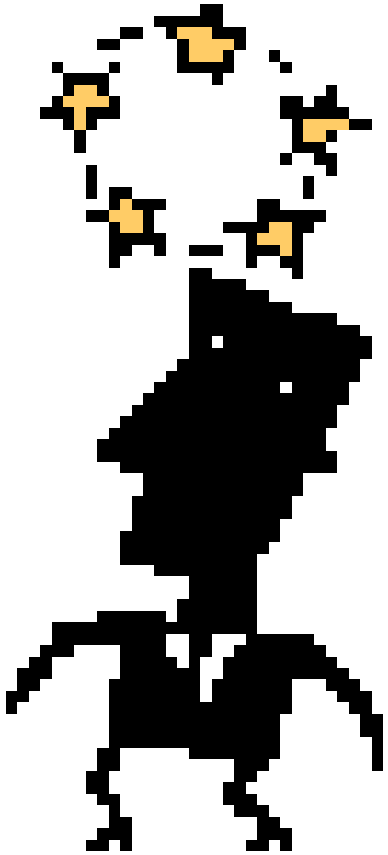


Make a prediction… What do you think is the function of the semicircular canals in the ear?

The semicircular canals help us keep our balance.



- Let’s do an experiment
- In a safe place spin around about 10 times
- Is the classroom still spinning?
- This is because the fluid in the semicircular canals is still moving and the messages sent to the brain are confused.



- This movement of the fluid in the semicircular canals is the reason why people get seasick or carsick. When a person is in a boat, the boat is constantly rocking. Even though the person gets used to the rocking, the fluid in the ears keep moving. This movement “confuses” the brain, resulting in temporary dizziness.