

Slide 1.1 Introduce yourself

Slide 1.2 Today we will be talking about hearing loss prevention.

Slide 2.1 In today's lesson we will cover; how the ear works, how to measure sound, what a hair cell is and why they are important, how hearing loss impacts your life and ways that we can prevent it.

Slide 3.1 (Ear video) To get started we will have a short video that explains how the ear works. It is important to know that there are many tiny parts in your ear, and they can easily become damaged.

Slide 4.1 (Telephone game) *<Here you will whisper the phrase "Preston pierced his ear with a purple pin" to the first student in the "telephone line" and have them each repeat it to the next student in line. The final student says out loud what they heard.>*

Lesson: Students should notice that the message gets skewed and that all hear it differently. The way things are said, the vocabulary used, the distance from your ear can all contribute to it being messed up.

Next, we will talk about how we measure noises.

Slide 5.1 Sound is measured in decibels. This is abbreviated as "dB" {Pronounced "dee Bee"}. The louder the noise the higher the number. There are apps and tools designated for measuring how loud noises are. Any noises over 80 dB can be harmful to your ears. As you can see this includes hairdryers, helicopters and planes, sirens on police cars and other emergency vehicles and fireworks too.

Question to the class: Why would something that we could use every day like the hairdryer be particularly dangerous for your hearing?

Answers could be: How close it is to your ears. How long it is held close to your ears.

Note: The vehicles, planes, helicopters all over sudden bursts of noise that fade. They are still damaging but the exposure is not as often as daily use items.

Question: Can you think of any noises that you hear every day that are loud in short bursts? Long bursts?

Answers could be: short- school bell, screaming on the playground, hallways between classes

Long: truck with no exhaust, band practice

Slide 6 Now that we have talked about how there are loud noises around us all the time, even when we may not want them, it is important to talk about those hair cells mentioned in the video.

These hair cells, or Stereocilia, are surrounded by fluid that acts like waves. The waves can break the hair cells down. The longer you are exposed to loud noises, the harder it is for those hair cells to recover from that vigorous movement and stand up straight again. This is how hearing damage occurs. The unfortunate part is that when they are repeatedly damaged, they do not go back to normal and cannot be fixed.

The number of adults in the United States that report some trouble with hearing is over 37 million people.

Slide 7 Short bursts of a really loud noise can also result in noise-related hearing loss. This can be instant or take longer to develop. In the case of a gunshot or loud explosion it can lead to temporary or permanent hearing loss. All of which contribute to the long-term deterioration of your hearing.

Question: How many of you like to listen to your music loudly?

Answer: Show of hands

Question: How many of you have been to a concert and left when your ears felt like they were ringing? This is a type of temporary hearing loss. (For rural populations substitute concert with truck or tractor pulls or demolition derby)

So loudly is subjective, meaning that based on where your hearing is already at, it is louder than your normal. It is important to know that listening to your music too loud will deteriorate your hearing faster than normal. Hearing damage may occur over years of exposure, which is why hearing loss is most often detected as you get older. Older people with many years of exposure to loud noise may have a harder time hearing you speak compared to someone at the same age who wasn't working in loud environments. Because hearing loss happens many, many years after we started being exposed, it is important to learn about how to protect your hearing early and take steps to prevent hearing loss throughout your lifetime. In the next slide we will talk about some ways you can spot hearing loss without having a hearing test done.

(Refer to the noise scale on slide 4 if needed)

Slide 8 One thing you might notice is that you have trouble hearing when in public places when there are background noises - these noises become distracting. Conversations could start to sound mumbled. Another sign might be that higher pitched voices become harder and harder to understand. For example, if grandpa asks you or one of your female friends to repeat something but does not need to ask your dad to repeat himself. That is an example of how you can see hearing loss limit your ability to discern high pitches.

In some cases, particularly with damage caused by loud bursts of noise, like with fireworks, there can be ringing in your ears.

Here's a chance to experience a simulation of what music sounds like with various stages of hearing loss (Click on play button – youtube video of singer with band – just over one minute long)

Slide 9

I'm guessing you don't want your music to sound like that – I know I don't! There are three ways to prevent noise-induced hearing loss:

1. **Lower the volume** – this decreases or eliminates the exposure to loud sounds. But we know this is not possible for all sounds...
2. **Move away from the noise** – The less distance between the SOUND and the EAR, the easier the sound is to hear. Sound follows the “distance doubling” rule: when you **half** the distance to the noise source, you **double** the sound level.
3. **Wear hearing protection**- muffles the loud noise and reduces long term exposure to unsafe noises. Many adults who work in factories, on farms, and in the sports industry are exposed to loud noises daily. Most workplaces have procedures in place for where they need hearing protection and where they do not.

Consider this scenario: you are mowing the lawn for your parents. What safety precautions can you take to prevent hearing loss?

(Come to a conclusion with the students)

1. *you cannot lower the volume on a lawn mower*
2. *you must push the lawn mower and therefore cannot move away*
3. *You can wear ear plugs or earmuffs (headphones do not work because they are adding to the noise.)*

Slide 10 Today we covered; how the ear works, how to measure sound, what a hair cells are and why they are important, how hearing loss impacts your life, and ways that we can prevent it.

Slide 11 Keep in mind that 40% of people under 18 are around dangerously loud noises, and by acting sooner rather than later, you can prolong your hearing. This wraps up the power point lesson are there any questions before we move on to our next activity?