



Protect Your Hearing!

**One person's music is another person's
noise.**

What is noise?

- Loud sounds if they are over 85 dB can be damaging.
- How do I know if I am listening to levels above 85dB?
- It is invisible, tasteless, odorless, and **IGNORED** as a form of pollution.

NOISE LEVELS

for Everyday Sounds



dB
140

PAINFUL

- firecrackers - 140
- jackhammer - 130
- jet plane takeoff - 120



130
120
110

EXTREMELY LOUD

- rock concert - 110
- snowmobile, chain saw - 100
- lawn mower, motorcycle - 90



100
90
80
70

VERY LOUD

- alarm clock - 80
- busy traffic, vacuum cleaner - 70



60
50
40

MODERATE

- normal conversation - 60
- moderate rainfall - 50
- quiet room - 40



30

FAINT

- whisper - 30

Noise levels can vary depending on closeness to the sound.



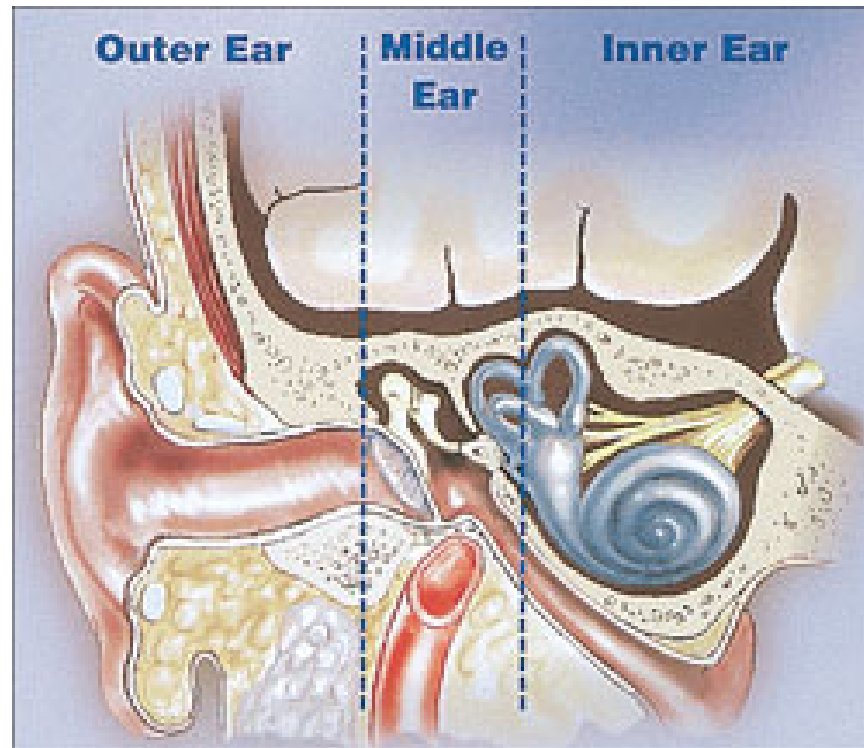
Limit your exposure time to noisy activities and wear adequate hearing protection. For more information, call 1-800-438-8295 or visit www.asha.org



DID YOU KNOW?

- Noise-induced hearing loss is 100% preventable.
- Approximately 5.2 million children and adolescents aged 6–19 years have noise-induced hearing loss (CDC, retrieved 2013).
- 26 million adults aged 20–69 years have suffered permanent damage to their hearing from excessive exposure to noise (CDC, retrieved 2013).
- An MP3 player at maximum volume is roughly 105 decibels.
- Noise-induced hearing loss is:
 - cumulative
 - invisible
 - permanent

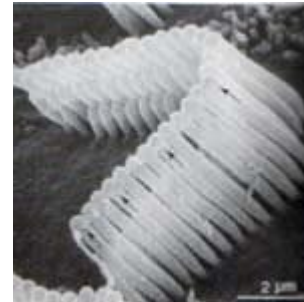
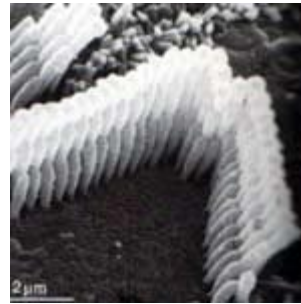
How we hear...



What is noise-induced hearing loss?

Damage to the hearing system can be caused by a one-time exposure to an intense “impulse” sound, such as an explosion, or by continuous exposure to loud sounds or noise over an extended period of time.

These are pictures of normal healthy hair cells.



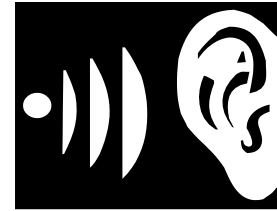
These are pictures of hair cells that have been exposed to very loud noise. Notice how they are bent over.



Retrieved from Dangerous Decibels, 2013

Listen to the warnings from your ears....

How loud is too loud?



- You have to raise your voice to be understood by someone standing nearby.
- The noise hurts your ears.
- You develop a buzzing or ringing sound in your ears, even temporarily.
- You don't hear as well as you normally do until several hours after you get away from the noise.

How do you protect your hearing?

Block the noise (use earplugs)
Avoid the noise
Turn down the sound



CAUTION

**HEARING
PROTECTION
REQUIRED**

Ways to protect your hearing

- Know which noises cause damage (at or above 85 decibels).
- Avoid hazardous sound environments.
- Wear hearing protection.
- Move away from the sound source.
- Make family, friends, and colleagues aware of the hazards of noise.
- Have your hearing tested if you suspect hearing loss or notice sudden changes in your hearing.

How does hearing protection work?

- Hearing protectors work by reducing the level of sound that reaches our inner ear.
- All hearing protectors have a Noise Reduction Rating, or NRR.
- If a hearing protector has an NRR of 25, it can reduce a potentially harmful noise by 25 decibels.
 - *A 100-decibel noise will be reduced to a safe level of 75 decibels ($100 - 25 = 75$).*

Types of hearing protection

- Ear plugs



- Custom made ear plugs



- Ear muffs





Help educate your children about safe listening.

1. Start early
2. Learn together about the ear
3. Discuss the fact that hearing loss can occur when we listen to loud sounds for long periods of time.
4. Model good behaviors
5. Be sure that everyone in the family is wearing hearing protection when attending noisy events.

Tips on using personal audio devices safely

- 1) Turn down the volume to a reasonable level.
- 2) Limit listening time to an hour before taking a long break.
- 3) Talk to your kids about noise and hearing loss.
- 4) If your child cannot hear you talking when you are standing an arm's length away, then tell him or her to turn down the volume.
- 5) If the device has volume-limiting software, use it!
- 6) Use sound-isolating or noise-cancelling earphones when listening in a noisy environment.
- 7) Teach your kids to start with the volume low and turn it up only loud enough to hear the music comfortably.

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Lesson Plans & Classroom Activities

How Your Brain Understands What Your Ear Hears
National Institute on Deafness and Other Communication Disorders
 Curriculum supplement for grades 7-8. Lessons are designed to help students understand the interrelationship of hearing, language, and human communication, as well as to develop the healthy hearing habits necessary to avoid Noise-Induced Hearing Loss.

I Love What I Hear!
National Institute on Deafness and Other Communication Disorders
 Classroom activities about hearing for grades 3-6. The activities are designed to: help students build awareness of the importance of hearing conservation and the problem of Noise-Induced Hearing Loss; introduce and reinforce scientific understanding of hearing and the science of sound; and provide opportunities for children to influence the awareness and understanding of others.

Noise-Induced Hearing Loss Teacher Resource Guide
Dangerous Decibels
 A K-8 curriculum supplement with hands-on science activities about the anatomy and physiology of hearing, the physics of sound, and health-related behaviors for prevention of Noise-Induced Hearing Loss.


Questions and Answers About Hearing
National Institute on Deafness and Other Communication Disorders
 Interactive quiz with factoids about hearing and hearing loss.

Operation BANG: Be Aware of Noise Generation
Military Audiology Association
 Three-day (1 hour per day) hearing loss prevention campaign for 5th graders. The curriculum focuses on teaching children about noise and hearing loss and also tries to enhance students' appreciation of good hearing and motivate them to protect it.

Know Noise
Sight and Hearing Association
 Comprehensive education program for grades 3-6.

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Visit www.listentoyourbuds.org for additional information on noise-induced hearing loss, activities for kids, and lesson plans for teachers.

www.asha.org



Concerned about hearing?

We're here to help. For more information
contact:

American Speech-Language Hearing Association
2200 Research Boulevard
Rockville, MD 20850

E-mail: audiology@asha.org

Website: www.asha.org

Protect Your Hearing

Presentation Notes

Slide 1

No commentary

Slide 2

Just as the presentation opens: one person's music is another person's noise. No matter what the sound source is...if the loudness of the sound is over 85dB there is potential danger for NIHL.

Slide 3

Children and young adults frequently participate in activities involving potentially damaging noise levels: playing with noisy toys, band instruments, and video games; listening to personal music players and stereos at high volumes; attending concerts and movies; operating lawn mowers, leaf blowers, and power tools; and riding off-road vehicles and snowmobiles.

The loudness of sound is measured in decibels (dB). Noise-induced hearing loss can be caused by prolonged exposure to any loud noise over 85 (dB).

Slide 4

It's cumulative because the damage can start when we are young and get worse over time. It's invisible because it can happen without our even noticing it, until it's too late. And it's permanent because, unlike a broken arm that gets better over time, we can't "heal" our hearing. Once it's damaged, it's damaged for good.

<http://www.cdc.gov/healthyyouth/noise/>

Slide 5

The ear can be divided into three parts leading up to the brain—the outer ear, the middle ear, and the inner ear.

- The outer ear consists of the ear canal and eardrum. Sound travels down the ear canal, striking the eardrum and causing it to move or vibrate.
- The middle ear is a space behind the eardrum that contains three small bones called ossicles. This chain of tiny bones is connected to the eardrum at one end and to an opening to the inner ear at the other end. Vibrations from the eardrum cause the ossicles to vibrate, which, in turn, creates movement of the fluid in the inner ear.
- Movement of the fluid in the inner ear, or cochlea, causes changes in tiny structures called hair cells. This movement of the hair cells sends electrical signals from the inner ear up the auditory nerve (also known as the hearing nerve) to the brain.

The brain then interprets these electrical signals as sound.

Slide 6

The loud sound is collected by the ear as sound waves.

The sound travels down the ear canal to the eardrum. The loud sound passes through the middle ear into the inner ear, also known as the cochlea. The tiny hair cells lining the fluid-filled cochlea can be damaged by loud sound.

Only healthy hair cells can send complete electric signals to the brain for interpretation and understanding. If the hair cells are damaged by loud noise, the signals cannot be correctly interpreted by the brain.

Once hair cells are damaged, there is no current treatment to repair them. The resulting hearing loss is permanent.

Slide 7

If you think it is too loud, you are probably right!

Slide 8

No commentary

Slide 9

No commentary

Slide 10

(Refer back to the noise level poster.)

Hazardous sound environments are typically work related and usually workers in a loud noisy environment will be given hearing protection by the employer. Non-work related noisy environments can be loud clubs and concerts, hunting, auto races, etc.

Slide 11

They do not block out all noise, but just make all noises sound softer.

The higher the NRR, the more protection they offer.

Slide 12

- Formable or foam ear plugs will expand to fill the ear canal and seal against the walls. They come in various pre-made shapes and sizes.
- Custom made ear plugs are made to fit individual ears and offer increased comfort for longer wearing time. They come in many different colors.
- Ear muffs fit completely over both ears. They must fit tightly so that sound is blocked from entering the ears.

- YouTube video on how to correctly insert foam ear plugs:
www.youtube.com/watch?v=5QZ7o9KAH4I

Slide 13

1. Have conversations with your kids about the importance of maintaining good hearing.
2. Learn how the ear works and what happens when it is damaged.
4. Model behaviors such as wearing earplugs when you are blow-drying your hair or mowing the lawn.
5. Auto races, football games

Slide 14

The risk of hearing loss from personal audio devices is based on the volume of the sound and the time spent listening.

1. A good rule of thumb for young children is about 60%.
3. Discuss the fact that hearing loss can occur when we listen to loud sounds for long periods of time.
4. Long listening times can still be risky.
5. When the surrounding environment is loud, we tend to turn audio devices up to compensate.

Slide 15

Search term to get to this page: Lesson plans & classroom activities

Slide 16

No commentary