

Sound Choices™

Hearing Conservation for Children



CLEVELAND
Hearing & Speech
CENTER®

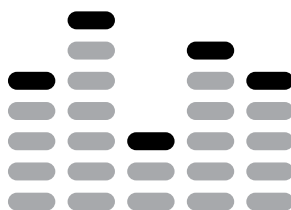
How Loud is too Loud?

DANGER ZONE

160 dB	Jet Airplane
150 dB	Helicopter
140 dB	Rock Concert
130 dB	Ambulance Siren
120 dB	School Dance
110 dB	Power Saw
100 dB	Cement Mixer
90 dB	Lawn Mower

SAFE ZONE

80 dB	City Traffic
70 dB	Small Party
60 dB	Normal Speaking Voice
50 dB	Car Horn
40 dB	Refrigerator Motor
30 dB	Whisper
20 dB	Rustling Leaves
10 dB	Normal Breathing
0 dB	Threshold of Normal Hearing



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Doctor of Audiology



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Did you know
that loud sounds
could damage
your hearing forever ?

Ears never sleep. Your ears and hearing are important every hour of every day and they must last your whole life.

We live in a very noisy world. Doctors and audiologists are seeing permanent hearing problems because of noise exposure. The hearing problems are being detected in more and more children and at earlier ages. This type of hearing loss is called Noise Induced Hearing Loss (NIHL).



The good news is
that hearing problems
caused by loud noise can
be completely prevented !

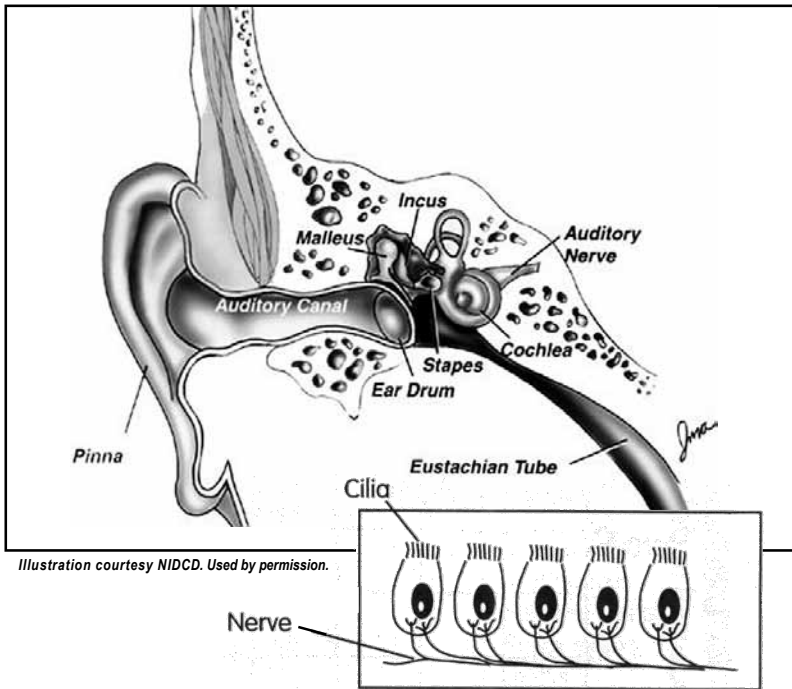
After completing the Sound Choices lessons and learning about noise induced hearing loss, you should know:

- **The basic parts of your ear**
- **How sound is measured**
- **Why loud sound causes permanent damage**
- **When sound is too loud**
- **Good ways to protect your hearing**

I hope you listen well and remember all you are about to learn. Pass it on to your friends, too!

Dr. Laura Brady
Pediatric Audiologist

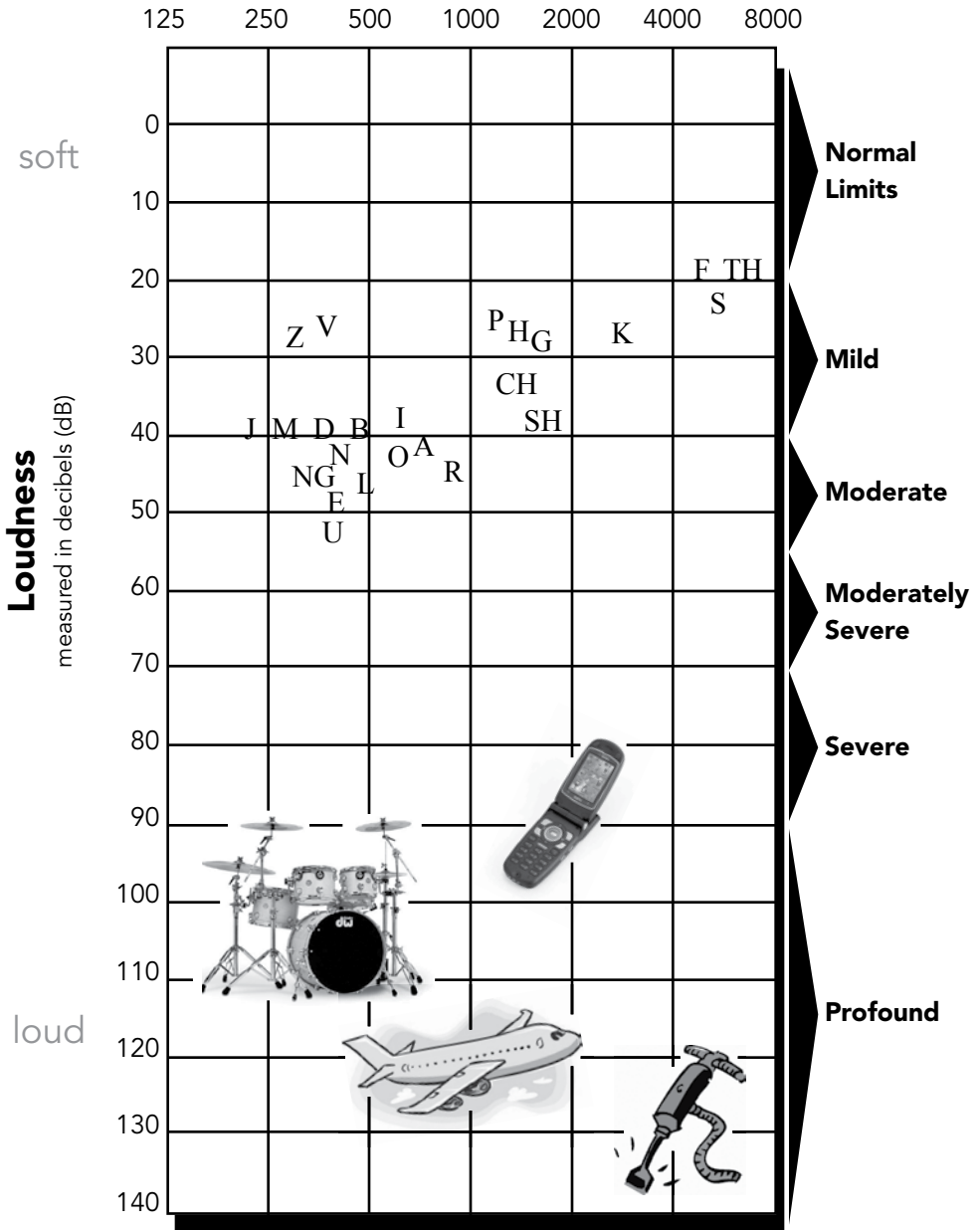
How do we hear?



Sound waves enter the outer ear and travel down the **ear canal** (auditory canal) where they bump into the **ear drum**. The ear drum begins to vibrate and this vibration moves the **three middle ear bones** (malleus, incus, stapes). The three bones are in an air filled cavity and the last bone is connected to the window (membrane) of the **cochlea**. The cochlea is filled with fluid and when the last middle ear bone pushes on the membrane of the cochlea, the fluid inside the cochlea begins to move. There are also thousands of small **hair cells** (cila) in the cochlea and when the fluid moves, it stimulates the hair cells, making them move the way wind blows tall grass. The movement of the hair cells sends a signal to the **hearing nerve** (auditory nerve), which takes sound to the **brain**. This is how we hear all the sounds around us!

Familiar Sounds Audiogram

low  Pitch  high
measured in Hertz (Hz)



Noisy Toys and Machines

There is noise all around us. Many of the games, toys, and machines we use everyday make noise that puts your hearing at risk. How many of these machines do you or your family members use or encounter in your life?



When you are hanging out

- mp3 players
- Televisions and video games
- Amplified musical instruments
- Radio

At Home

- Vacuum
- Power saw
- Leaf blower
- Lawn mower
- Chain saw
- Blow dryer
- Blender/Mixer



At Work

- Jackhammer
- Farm equipment
- Factory equipment

On the Move

- Airplane
- Motorcycle
- Subway train
- Emergency Sirens
- Honking horn
- Boat motor



KIDS,

Keep your Hearing Safe



1. Turn it Down

If you are wearing earbuds/headphones and someone can hear your music from arms reach away (about 3 feet), it is too loud.

2. Use Noise Cancelling Earphones

These will allow you to set the listening level at a lower volume if you are in a noisy place and still hear what you want to hear.

3. Limit Listening Time

The louder the sound, the less time it takes to damage your hearing. The next steps will help you limit exposure to loud sounds.

4. Move Away

Move away from the source of the loud sound. It's one of the easiest things to do! Also, do not use noisy equipment in small enclosed spaces.

5. Use Earplugs

Earplugs are inexpensive and easy to find at most drugstores, sporting goods stores, and hardware stores. Keep them at home, in your backpack, or in the car so you have them when you need them.

6. Cover Your Ears

Use your hands or use one finger to push the little flap in front of your ear backwards to seal off the ear canal.

7. Block the Sound

Close the door, close the window!

Safe Hearing

Hints for Adults

1. Install Carpet and Drapes

Fabrics and acoustical tile help absorb sound that would otherwise reverberate and bounce off bare floors, walls, and ceilings. Using rugs/drapery helps make a noisy environment quieter.

2. Place Rubber Mats

When used under noisy or vibrating appliances, rubber mats reduce the noise you hear.

3. Enclose Noisy Machines

Use materials that absorb sound. Many commercial products are available.

4. Maintain Equipment

Oil the equipment as recommended and keep loose parts from creating noise.

5. Choose Quieter Models

When replacing food blenders, dishwashers, heating and cooling systems, choose those that are quieter.

6. Plant Leafy Shrubs

Putting plants around houses and buildings at window height can absorb traffic noise.

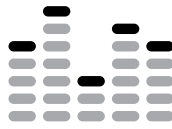


Quiet Please!

There are lots of fun things to do that do not involve loud noises.
How many can you name?

For more Information

www.dangerousdecibels.org
www.nidcd.nih.gov/health/wise
www.noisyplanet.nidcd.nih.gov/
www.listentoyourbuds.org
www.chcheating.org/noise-center



Sound Choices™

GLOSSARY

Audiogram – Chart used to record results of a hearing test. Shows loudness from top to bottom and pitch from left to right.

Auditory Canal – Part of the outer ear and is also known as the **ear canal**. Sound travels through the tube-like ear canal and then makes the eardrum vibrate.

Auditory Nerve – A bundle of specialized hearing cells that connect the ear to the brain.

Cochlea – The organ of hearing. Part of the inner ear that is shaped like a snail shell and is about the size of a pea. Inside the cochlea there are sensory cells (hair cells, called cilia) that convert mechanical energy to electrical energy that travels along the auditory nerve to the brain.

Decibels (dB) – The unit used to measure the volume or loudness of sound. Named after Alexander Graham Bell.

Ear Drum – Also known as the tympanic membrane. It is a very thin membrane that marks the end of the outer ear and the beginning of the middle ear. When sound waves strike this membrane, it moves and causes the bones of the middle ear to move, creating mechanical energy.

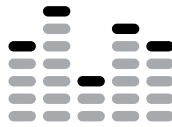
Eustachian Tube – The tube that connects the middle ear to the space behind the nose.

Hertz (Hz) – The unit used to measure the frequency or pitch of sound.

Middle Ear Bones – The three smallest bones in your body! They are the Malleus, Incus, and Stapes. Due to the shape of the bone, each has another name. They are sometimes called the “hammer,” “anvil,” and the “stirrup.”

Noise Induced Hearing Loss (NIHL) – Hearing problems caused by loud sounds/noises as opposed to other causes. NIHL is permanent and cannot be fixed, but it can be prevented.

Pinna – This is the outer part of your ear that everyone can see; also called the **auricle**. It helps to ‘collect’ sound waves and funnels them into the ear canal.

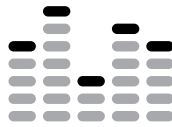


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WORD SEARCH

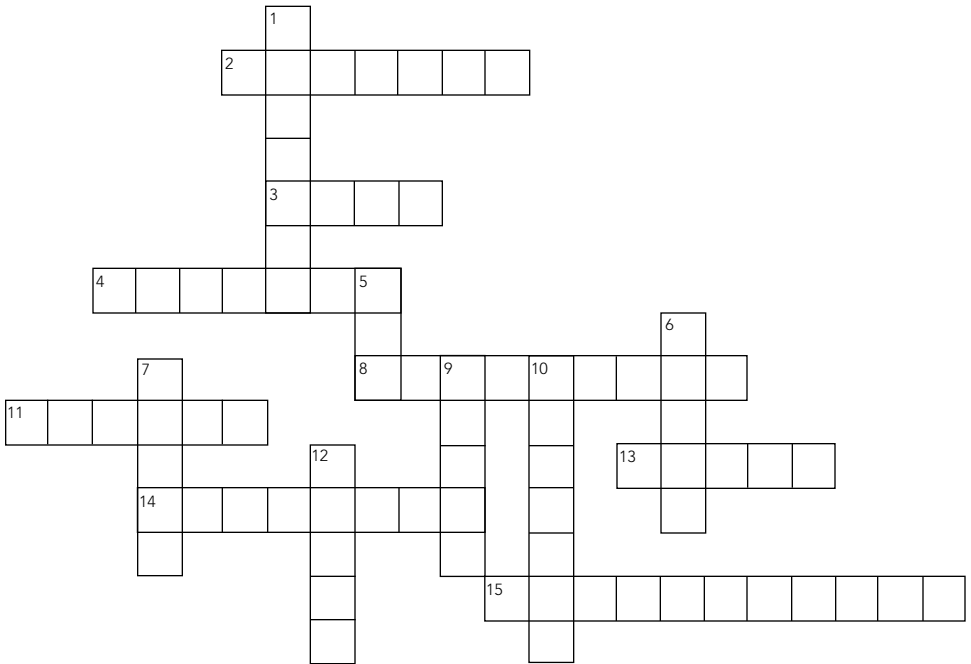
S J L M P O L C T K R G G K N
F O D O I E O E B Y A N T C G
F H U N N C R Y B L V I J L N
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S W E S T A P E S N W E W D N
K A M U R D R A E E E H D N Z
C U M U L A T I V E S N Y E A
E F A S C L L C H U Q I T S D
L V P J U P T R E Z F R P S F
S X Y I K B E L H U R M N B Z
H B D G M Y L I E D L H N A T
Y H W W O A P R R Q D P T M O
R R H M M X G I T P K R I U K
G D Z D A F B H Z S T T O F U

COCHLEA	LOUDNESS
CUMULATIVE	MALLEUS
DECIBEL	PERMANENT
EARDRUM	SAFE
HEARING	SOUND
HERTZ	STAPES
INCUS	



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CROSSWORD

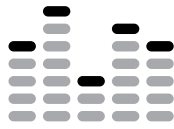


Across

2. One of our senses
3. Inventor of the telephone
4. Shell shaped organ of hearing
8. Sound over 85 dB
11. Why some sounds need to be loud
13. Another name for the outer ear
14. Ringing in the ears
15. Hearing doctor

Down

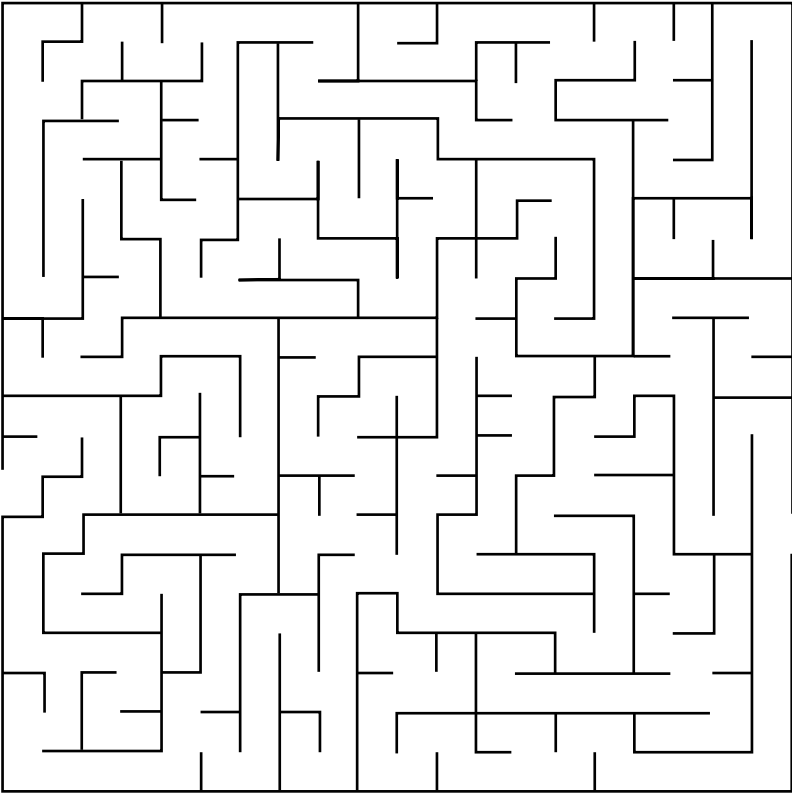
1. Unit used to measure loudness
5. Electronic device used to assist hearing
6. Any type can damage hearing
7. Unit used to measure pitch
9. Unwanted sound
10. Located at the end of the ear canal
12. Tiny hair cells in the cochlea

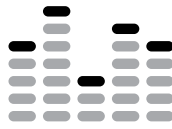


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MAZE

Help sound reach the cochlea safely!

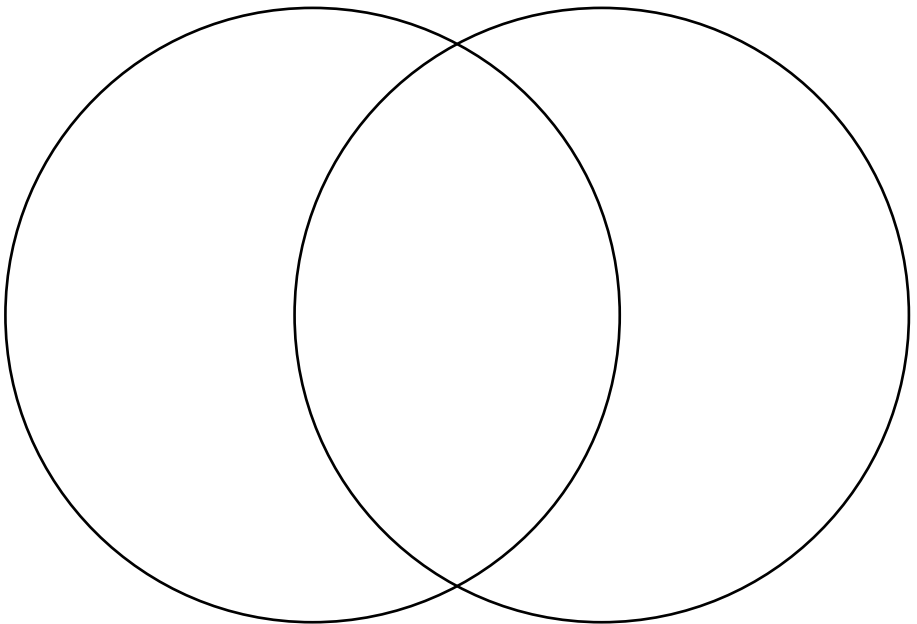




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Venn Diagram

- 1). Using the list below, write the names of the sounds that can **hurt** your hearing, in the left circle.
- 2). In the right circle, write the names of the sounds that are **usually safe**.
- 3). In the overlapping circle, write the names of the sounds that **could damage** your hearing.



Airplane engine

Friend whispering

Music player

Jackhammer

School lunchroom

Television

Video game

Leaf blower

Reading

Riding your bike

Roller skating

Crickets

Listening Activity

**Listen for all the sounds around you
and write them down.**

Sounds in school

Sounds outside

Sounds at home



UNIVERSITY CIRCLE

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Cleveland, OH 44106
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(216) 231-7141 Fax

SOUTH EUCLID

4257 Mayfield Road
South Euclid, OH 44121
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(216) 382-4990 Fax

BROADVIEW HEIGHTS

7000 Town Centre Drive #200
Broadview Heights, OH 44147
(216) 325-7520
(216) 325-7620 Fax

LORAIN

1913 North Ridge Road East
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