THE LINK BETWEEN HEARING AND SPEECH:

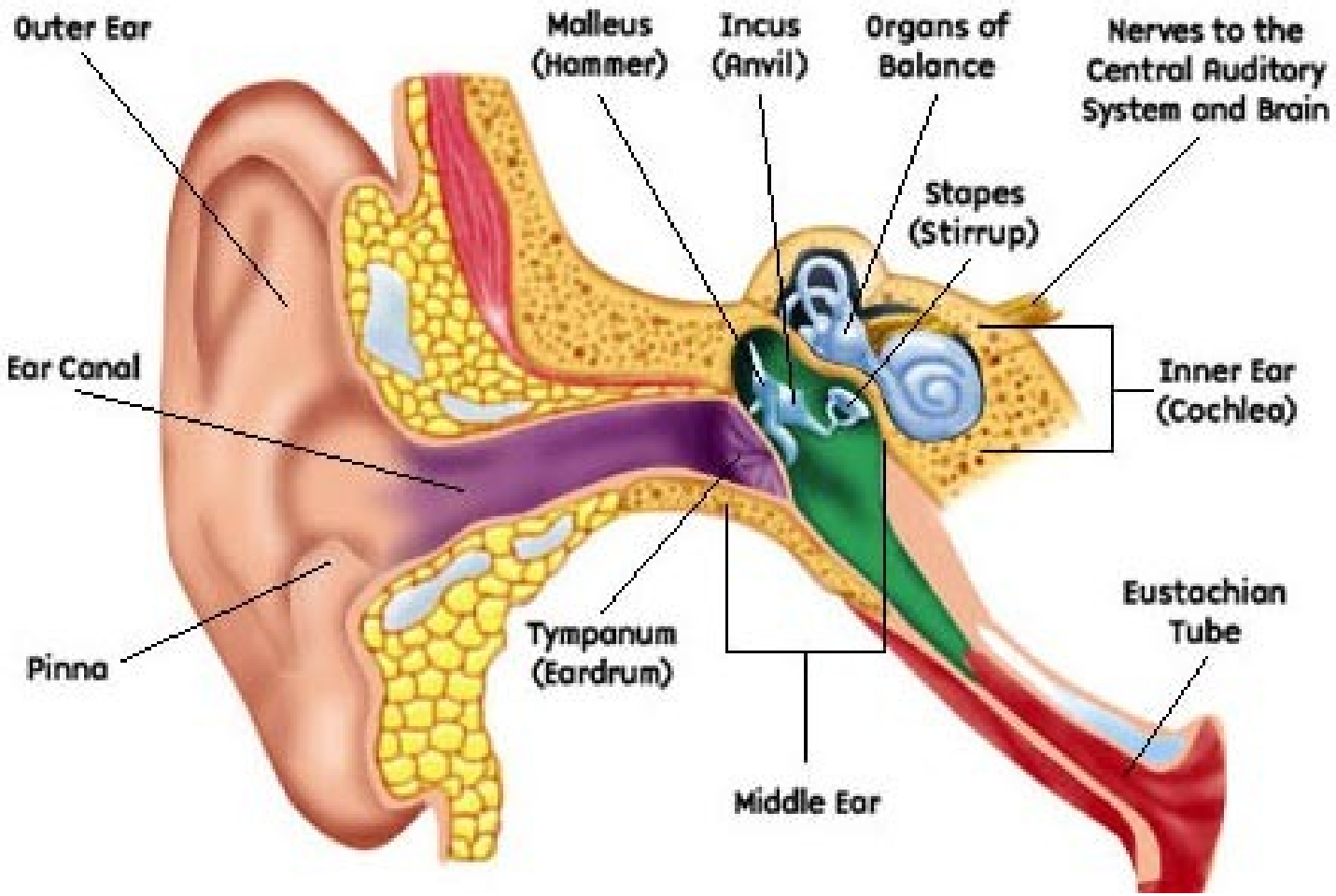
HOW WE REALLY HEAR

Chrissy Morris M.Ed.
Teacher of the Deaf and Hard of Hearing

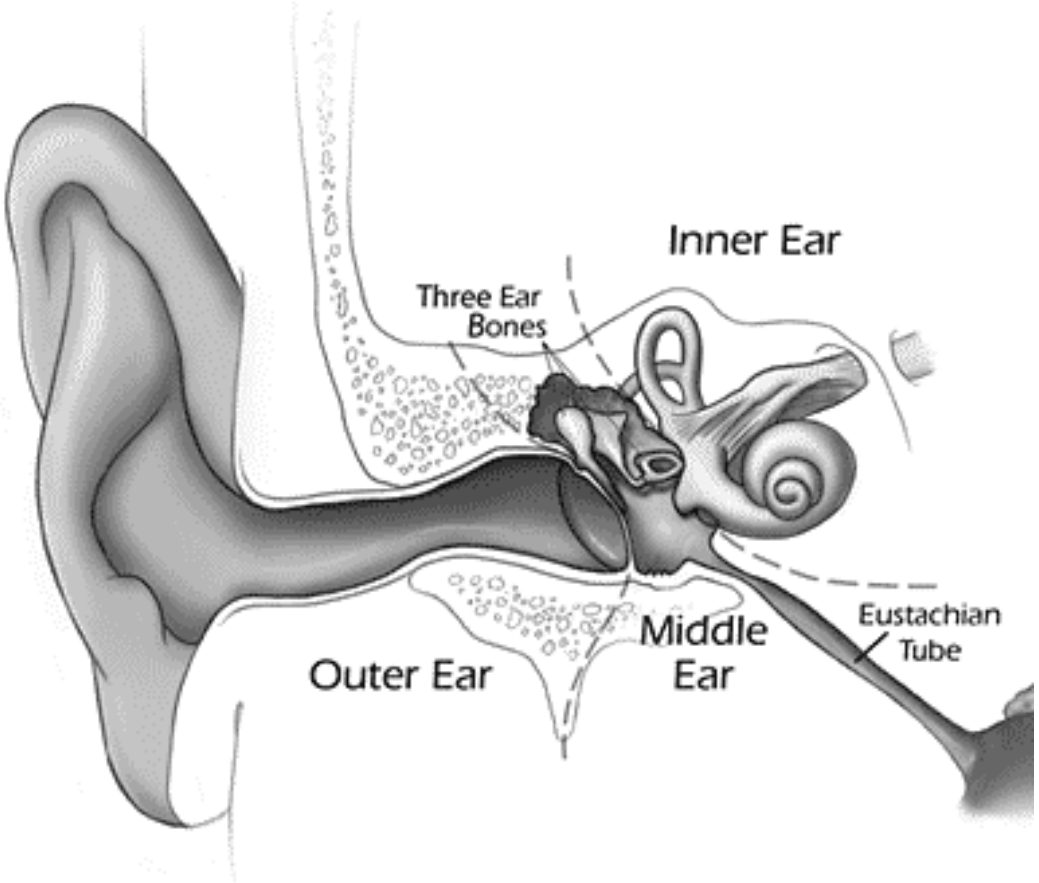
AGENDA

- How We Hear
- The Brain:
  - Access
  - Training
- Questions and Answers

HOW WE HEAR:


Outer Ear
Malleus (Hammer)
Incus (Anvil)
Organs of Balance
Nerves to the Central Auditory System and Brain
Stapes (Stirrup)
Ear Canal
Inner Ear (Cochlea)
Eustachian Tube
Pinna
Tympanum (Eardrum)
Middle Ear

WHEN THE EAR ISN'T WORKING



Conductive Loss

Sensorineural Loss

Mixed Loss

Frequency/ Hertz

125 250 500 1000 2000 4000 8000

Loudness

0 10 20 30 40 50 60 70 80 90 100 110 120

Normal 0-15dB

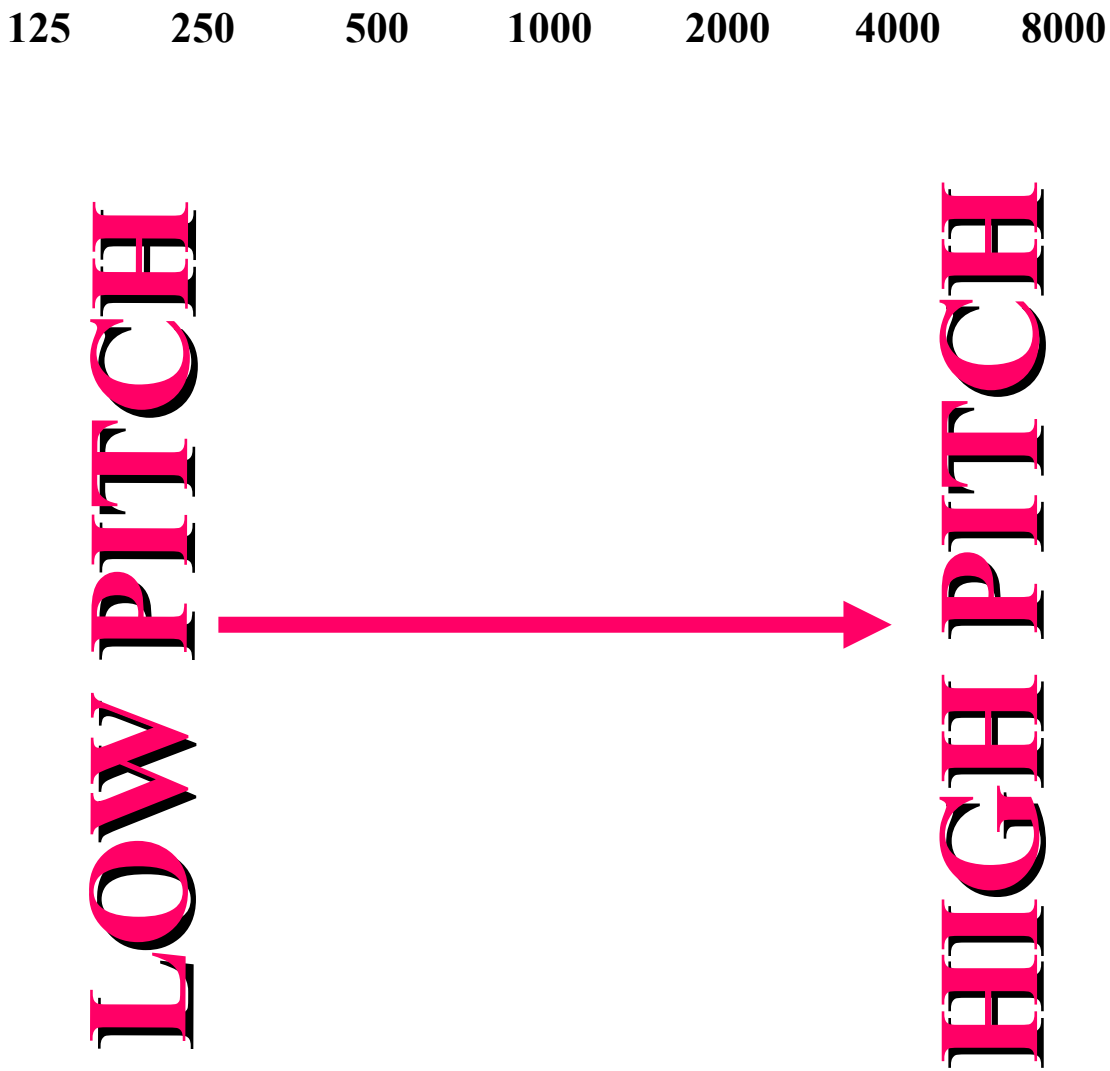
Mild 16-40 dB

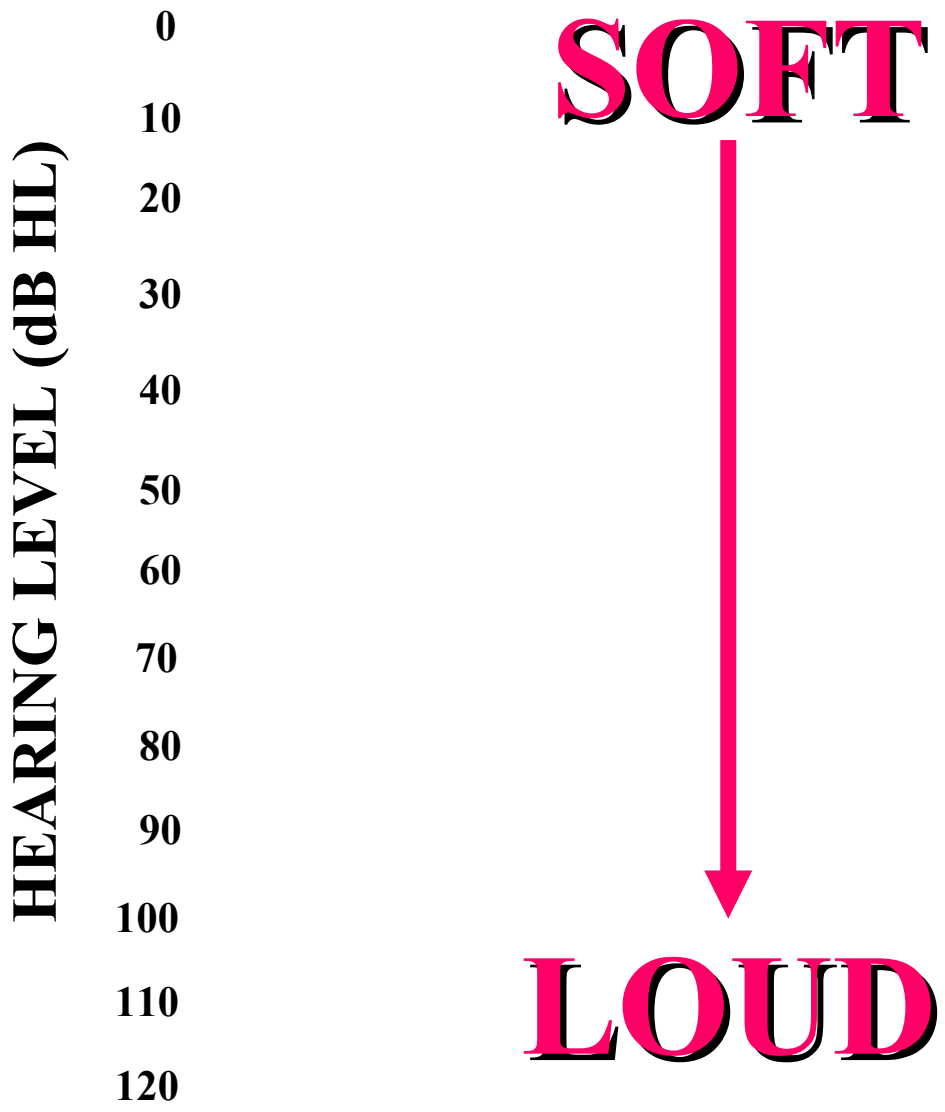
Moderate 41-55 dB

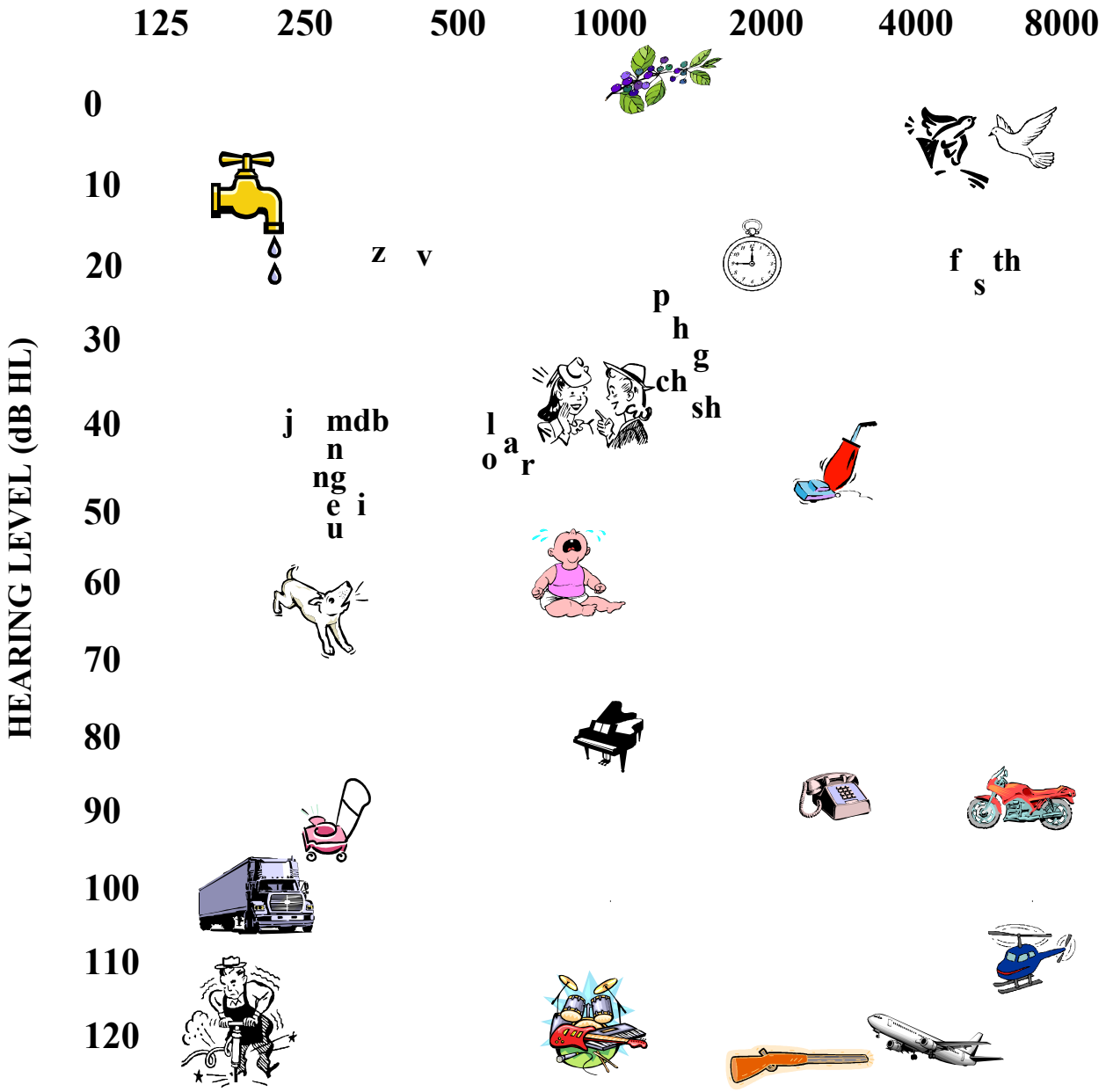
Moderately Severe 56-70 dB

Severe 71-90 dB

Profound 90+ dB


125
250
500
1000
2000
4000
8000
LOW PITCH
HIGH PITCH
FREQUENCY IN CYCLES PER SECOND (HZ)

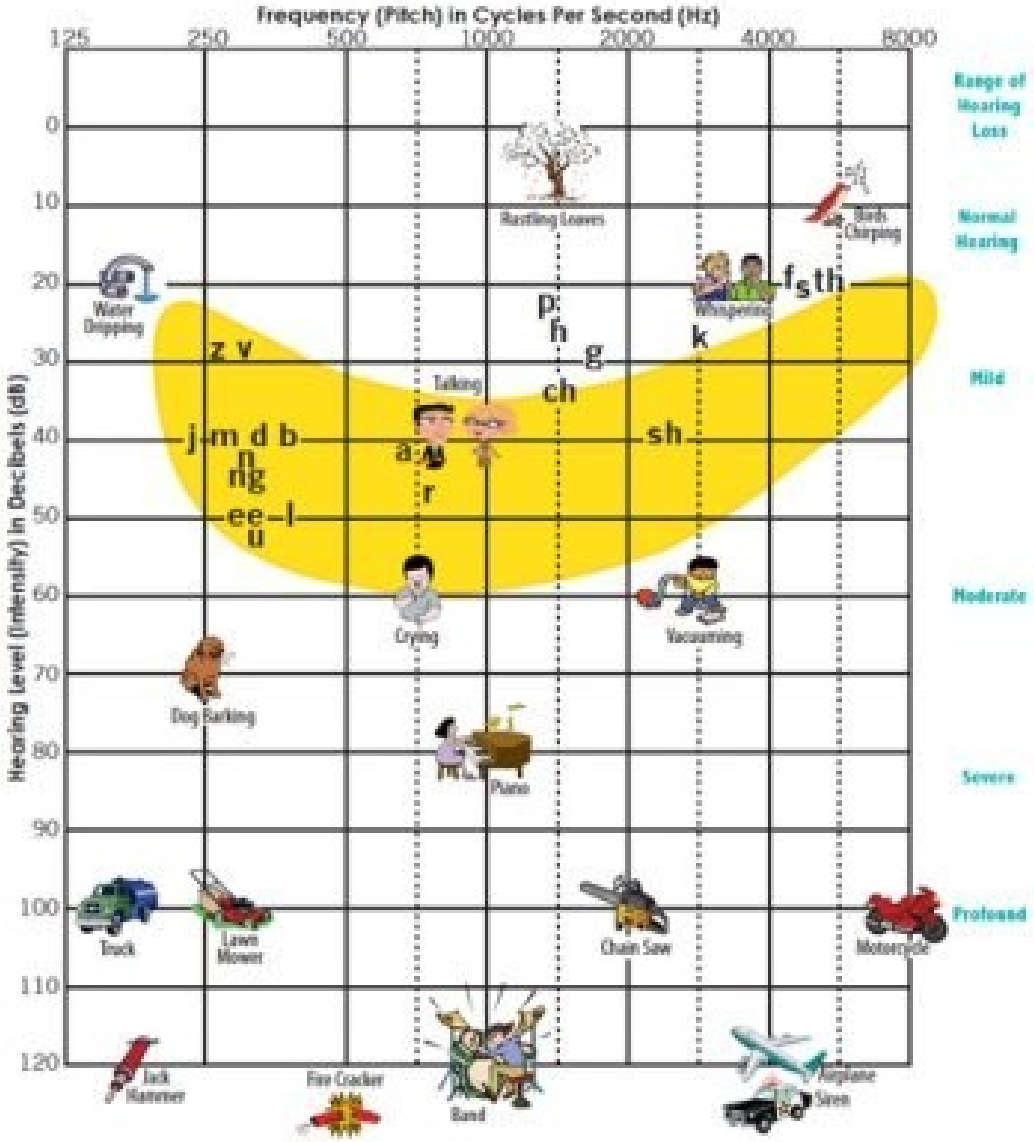

HEARING LEVEL (dB HL)
0
10
20
30
40
50
60
70
80
90
100
110
120
SOFT
LOUD



AUDIOGRAM OF FAMILIAR SOUNDS

FREQUENCY IN CYCLES PER SECOND (HZ)

Audiogram of Familiar Sounds



Adapted from: American Academy of Audiology, www.audiology.org and Northern, J. & Downs, M. (2002). Audiograms of familiar sounds; and Ling, D. & Ling, A. (1978). Aural Habilitation.

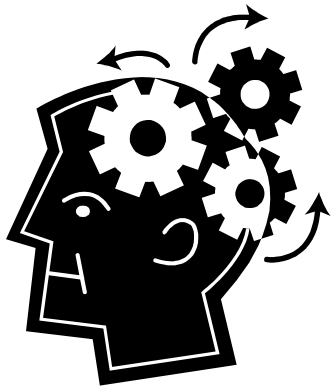
EFFECTS OF HEARING LOSS

- Depending on the level of loss
  - Certain sounds of speech are not audible to child
  - Child receives an incomplete message from a speaker
  - Child's own auditory feedback loop is affected

HOW WE REALLY HEAR:

"The problem with hearing loss is it keeps **sounds** from reaching the **brain**. Hearing loss is not about the ears; it's about the **brain**."

- Cole & Flexer



COCHLEAR IMPLANTS: TRUE OF FALSE

FALSE

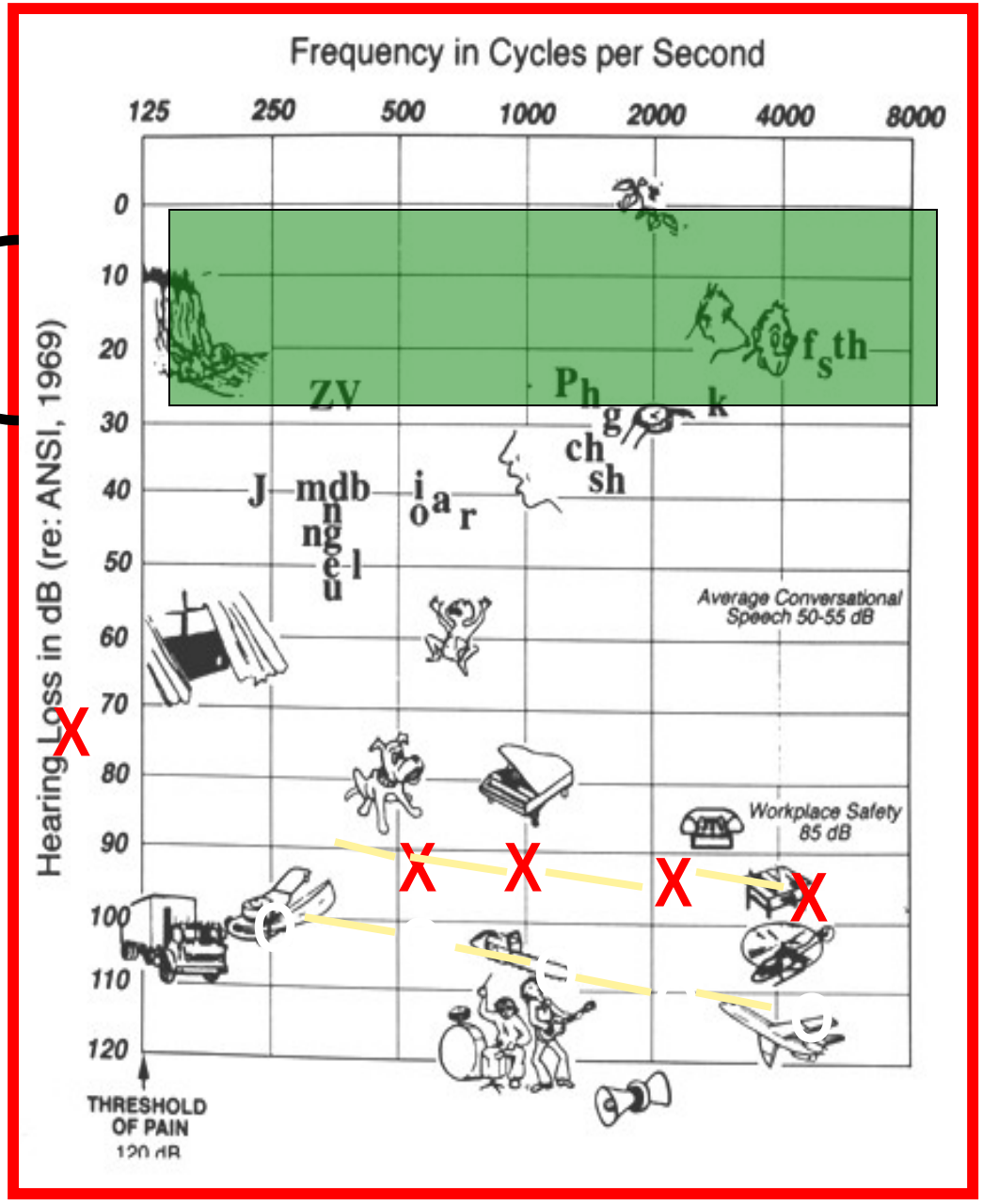
Cochlear implants are always better than hearing aids.

FALSE

Cochlear implants cure deafness.

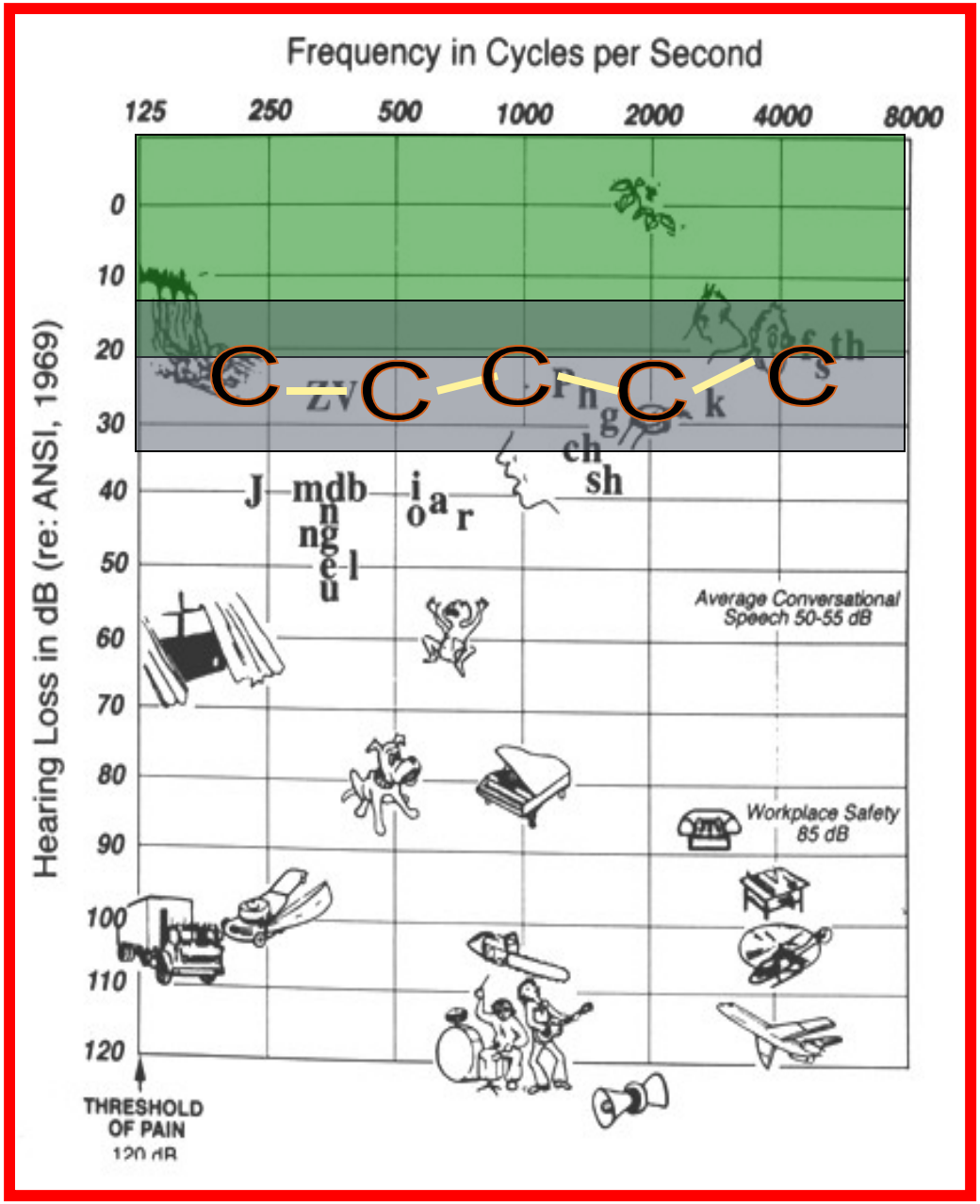
Normal range of hearing

BEFORE



Normal range of hearing

AFTER CI



TRUE

In order to benefit from
a cochlear implant,
a child must learn to listen.

Learning to Listen

Implants take work.
We must train the
BRAIN

"I'm really serious about exercising. Last year I only went to the gym twice, once to join and once to renew."

LEARNING TO LISTEN

- Intervention needs to be:

EARLY & Intense

- "Neuroplasticity is greatest during the first 3 ½ years of life; the younger the infant, the great the neuroplasticity."
  – Cole & Flexer

PARENTS ARE THE KEY

- Primary model for spoken language and development
- Help your child integrate listening into his/her personality
- Use natural communication

ROUTINE & MEANINGFUL ACTIVITIES

- ROUTINE: Integrate speech, language, listening, and communication into everyday life
- Developing language through daily activities

FOLLOW TYPICAL DEVELOPMENT

- Activation = Day 1 of listening

- Follow typical development of:
  - SPEECH
  - LANGUAGE
  - AUDITION

"A developmental model allows for synchrony of intervention and development, promoting large rapid gains." – Cole and Flexer

AUDITORY FUNCTION

- Awareness
- Discrimination
- Identification/Recognition
- Comprehension

TEAM WORK

- Team Members
  - Parents
  - Teachers/care givers
  - Support/ visiting teachers
  - Speech & Language Therapist
  - AVTs

SPECIAL THANKS TO:

Essie Goldsmith M.Ed. & Karen Noble, M.Ed. LDT/C

Ashley Garber

Understanding The Educational Needs of Students With Hearing Issues

(click the above line, to access the powerpoint file)

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Impact of Hearing Loss: