

Testing Your Child's Hearing

What are the parts of sound?

Every sound has 2 parts: frequency (or pitch) and intensity (or loudness).

- **Frequency is how high or low a sound is.** A bass drum, thunder, and a man's deep voice are common low-frequency sounds. A high-pitched whistle, squeal, or a child's voice are high-frequency sounds.

Frequency is measured in hertz (Hz) [hurts]. A low-frequency sound is about 500 Hz or lower. A high-frequency sound is about 2,000 Hz and higher.

- **Intensity is how loud or soft a sound is.** If a sound is loud, it has a high intensity. If a sound is soft, it has a low intensity.

Intensity is measured in decibels (dB) [DEH-suh-buls]. A high-intensity (loud) sound has a high decibel level. A low-intensity (soft) sound has a low decibel level. The sound of people talking is usually between 40 and 60 dB. Sounds that are louder than 90 dB are uncomfortable, and sounds louder than 110 dB can be painful.

The chart on page 2 shows how the sounds around us have a wide range of frequencies and intensities.

What can humans hear?

Humans can usually hear frequencies between 32 and 32,000 Hz at intensities of around 10 dB and louder. The most important frequencies for speech and language are between 250 and 8,000 Hz. These are the frequencies typically tested during a hearing evaluation.



How is hearing tested?

These are the most common ways to test hearing:

- **Behavioral testing.** Children and babies 6 months and older can have their hearing tested in a sound booth with headphones or earbuds. During a behavioral hearing test, an audiologist (a hearing care professional) checks to see if your child can hear different frequencies with each ear. The range of hearing tested in the sound booth is usually 250 to 8,000 Hz.

- **Auditory brainstem response (ABR) testing.** When a baby or child cannot do a behavioral hearing test, they may need to have an auditory [AW-di-tor-ee] brainstem response (ABR) test.

During ABR testing, sounds are played in your child's ear. The test measures how the hearing nerve responds to sounds. The range of hearing tested with ABR is 500 to 4,000 Hz.

This test is done while the child is asleep. If needed, medicine can be used to help them stay asleep during the test.

- **Otoacoustic emission (OAE) testing.** Otoacoustic [otto uh-KOO-stik] emission (OAE) testing is a hearing screening tool. For this test, a small probe is placed inside the ear. This is not painful. OAE testing measures how the inner ear responds to sounds.

If an OAE test shows there is a problem, there may be other reasons besides hearing loss, such as a blockage in the ear. This test does not show how much hearing loss your child has. ABR or behavioral testing should always be used when OAE results are abnormal.

Audiogram

Pitch

Low

Medium

High

frequency in hertz - Hz

250

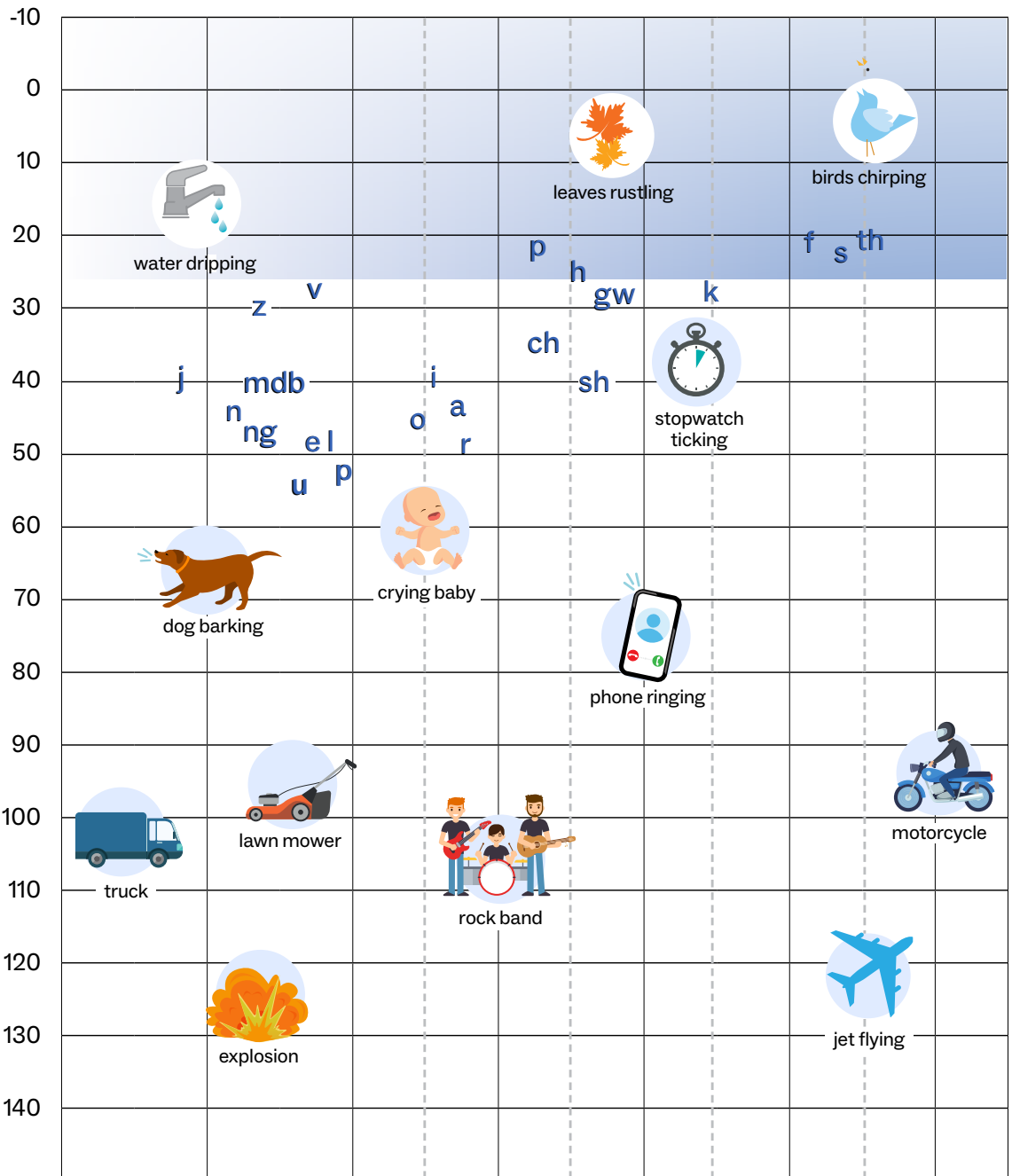
500

1000

2000

4000

8000



Loudness

Whisper

Conversation

Discomfort

Pain

increments in decibals - dB

How is hearing loss described?

Hearing loss is described by the **severity** (how much loss there is) and the **type** (where the loss is occurring in the ear).

- **Severity:** Hearing loss severity can range from mild to profound. Someone with mild hearing loss may be able to hear speech sounds, but not clearly. Speech will also sound very soft to someone with mild hearing loss. Someone with more severe or profound hearing loss may not be able to hear speech sounds at all.
- **Type:**
 - **Sensorineural** [sen-suh-ree-NUR-al] hearing loss is a permanent hearing loss that happens in the nerve of the inner ear.
 - **Conductive** hearing loss happens when there is a problem with sound getting to the inner ear organ. Some conductive hearing losses are not permanent.
 - **Mixed** hearing loss is when there is both a sensorineural and a conductive hearing loss occurring at the same time.

Where do I start?

You are the most important advocate for your child, and you will have a team of people to help you along the way. Your team may include the following people:

- Audiologist
- Early intervention specialist
- Teacher
- Speech and language therapist
- Doctor (otolaryngologist/neurotologist)
- Genetics Counselor

Your team can help answer your questions and create a plan, support your child's language learning, and help you find information to make the best decision for your child.

How do I choose a communication option for my child?

When your child has hearing loss, there are many ways to communicate with them. You will need to decide which option is best for your family. You can talk with your doctor and other parents to help you make your decision.

Notes
