

Sound & Noise

A Teacher's Guide and Classroom Resource

Why learn about sound and noise?

- Studies of the NYC sound environment have shown adverse impacts of ***noise*** on public health, both mental and physical.
- ***Noise pollution*** can impede learning, concentration, attention, and comprehension.
- The school environment and everyday city life is affected by sound and noise.



What is the difference between sound and noise?

Sound

- Vibrations transmitted through air or another medium capable of being detected by human organs of hearing



Noise

- A sound that is loud, unpleasant, unexpected, or undesired



What is Onomatopoeia?

Onomatopoeia is a word that comes from a sound.

What are some examples?



How do we measure sound?

- **Sounds** are caused by vibrations and are measured in units called **decibels** (dB).
- Most sound is measured in dBA, which is the decibel level that follows the frequency sensitivity of the human ear at low levels.
 - dBA is good for measuring damage to the ear.
 - Measurements of 85 dBA and higher are defined as harmful sound.
 - Extended exposure to levels over 85 decibels can cause hearing damage as well as mental and emotional stress.
- **Sound meters** range in sensitivity and accuracy. A sound meter phone app (recommended for educational sound measuring) will not be as accurate as the sound meters that DEP noise experts use when they take measurements in response to a noise complaint.

Which sound is louder?

1.



3.



2.

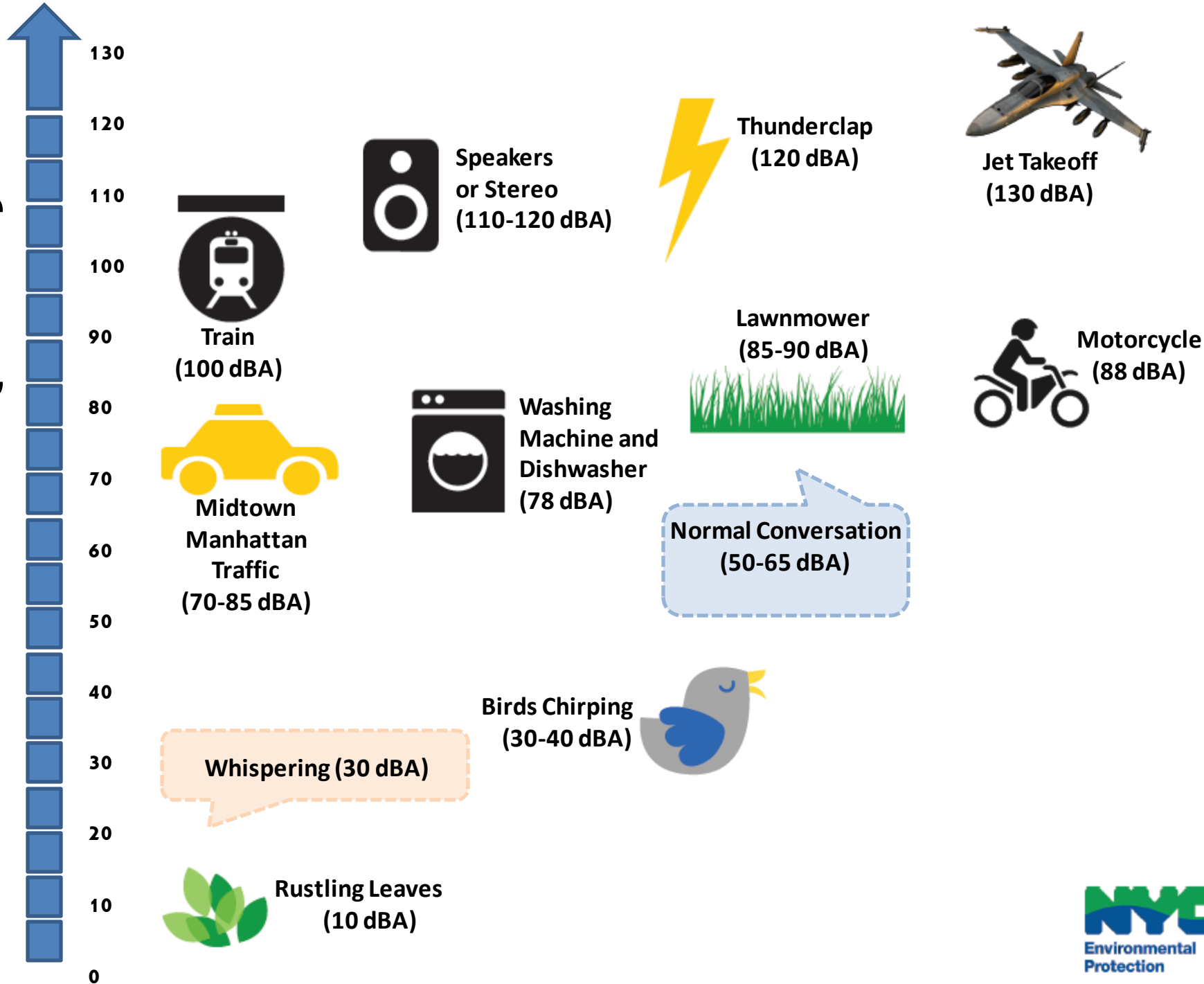


4.



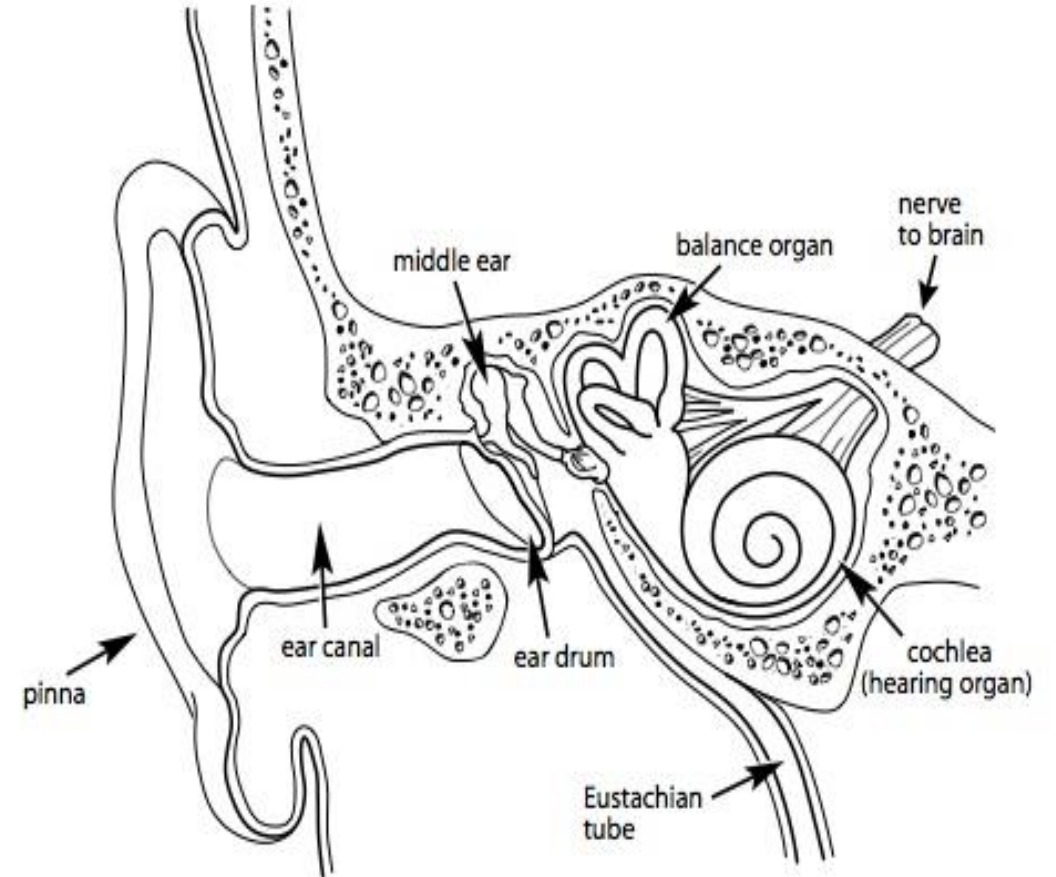
Use the **Loudness Chart** on the next slide to find the correct answers.

Loudness (dBA)



Parts of the Ear

- **Ear** – the sense organ that detects sounds.
- **Outer Ear (Pinna)** – acts as a funnel on the outside of the ear that directs sound into the ear.
- **Ear Canal** – a tube running from the outer ear to the inner ear to transmit sound.
- **Inner Ear (Cochlea)** – a hollow tube in the inner ear of higher vertebrates, usually coiled like a snail shell where sound waves are transformed into electrical impulses which are sent on to the brain.



What effects can loud sounds and noise have on the ear?

Loud sounds can cause physical damage to different parts of the ear and may lead to hearing loss.



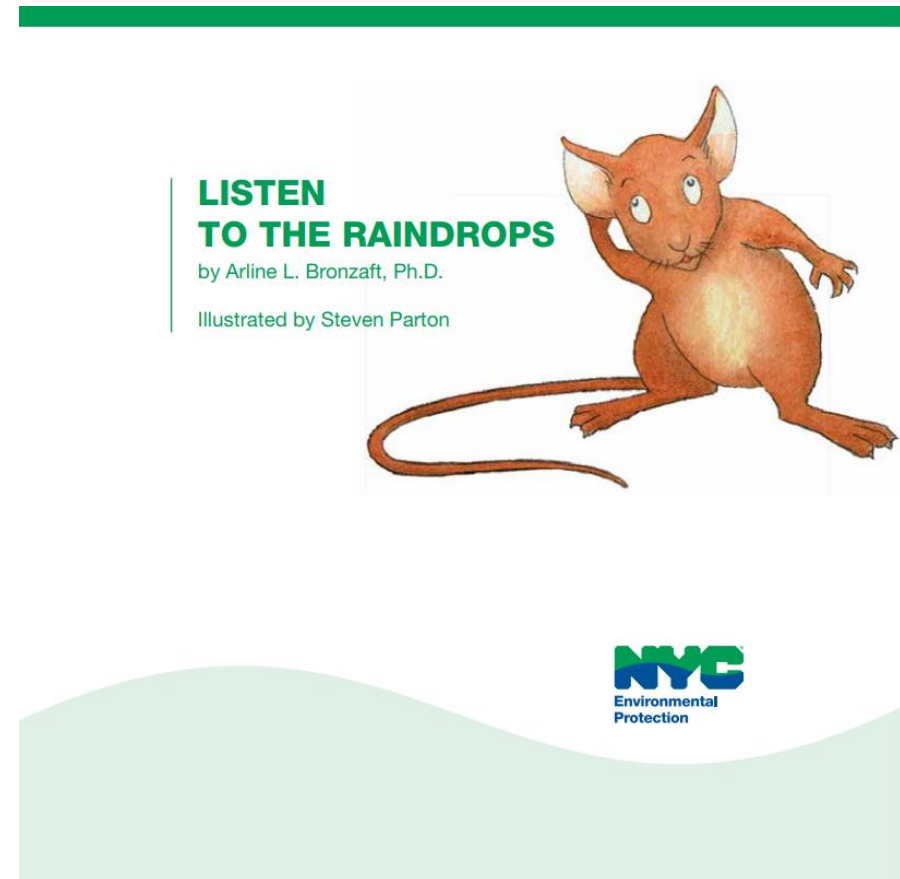
Even little things can make big sounds.
Have you read "Horton hears a Who"?

Noise Expert and Advocate

Dr. Arline Bronzaft is an environmental psychologist.

In 1975, she published an unprecedented study about the effects of noise on an elementary school in Inwood, Manhattan.

The study concluded that students in the classrooms facing the train tracks performed less well than students in quieter classrooms.



Listen to the Raindrops is the first published children's story about soundscapes

Noise Mitigation in Your Community

- There are many ways to reduce loud sounds in homes, schools, and businesses.
 - Double-glazed windows
 - Sound dampening wall panels
 - Just turn down the volume on your TV, radio, or cellphone!
- Check out the [New York City Noise Code commercial guidelines](#) on noise mitigation.



What is New York City doing to reduce noise?

- The New York City Department of Environmental Protection (DEP) regulates noise in respect to *businesses, construction, and stationary vehicles*.
 - Call 311 to report a noise code violation
- DEP created and implemented the **NYC Noise Code**, the regulating document for loud sounds in NYC.
- Personal noise and noises on the move are regulated by NYC police.
- Transit noise, such as subways and airplanes, are regulated by the [MTA](#) and the [FAA](#) respectively.



The New York City Noise Code

New York City classifies noise into eight categories:

1. Construction Noises
2. Animal Noises
3. Food Vending Vehicles
4. Air Conditioners and Circulation Devices
5. Music from Bars and Restaurants
6. Refuse Collection Vehicles
7. Motor Vehicles and Motorcycles
8. Common Courtesy



NYC Noise Complaint Trends

NYC OpenData

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311 Service Requests from 2010 to Present

Based on [311 Service Requests from 2010 to Present](#)

Please note: Due to pandemic call handling modifications, the 'Open Data Channel Type' values may not accurately indicate the

Created Date	Closed Date	Agency	Agency Name	Complaint Type	Descriptor
08/14/2022 10:44:00 PM		DEP	Department of Environmental Protec...	Noise	Noise, Barking Dog (NR5)
08/14/2022 10:32:00 PM		DEP	Department of Environmental Protec...	Noise	Noise, Ice Cream Truck (NR4)
08/14/2022 10:28:00 PM		DEP	Department of Environmental Protec...	Noise	Noise: air condition/ventilation eq...
08/14/2022 10:01:00 PM		DEP	Department of Environmental Protec...	Noise	Noise, Barking Dog (NR5)
08/14/2022 09:49:00 PM		DEP	Department of Environmental Protec...	Noise	Noise: Boat(Engine,Music,Etc) (NR10)
08/14/2022 09:36:00 PM		DEP	Department of Environmental Protec...	Noise	Noise: Alarms (NR3)
08/14/2022 09:35:00 PM		DEP	Department of Environmental Protec...	Noise	Noise, Barking Dog (NR5)
08/14/2022 09:32:00 PM		DEP	Department of Environmental Protec...	Noise	Noise: Boat(Engine,Music,Etc) (NR10)
08/14/2022 09:29:00 PM		DEP	Department of Environmental Protec...	Noise	Noise, Barking Dog (NR5)
08/14/2022 09:26:00 PM		DEP	Department of Environmental Protec...	Noise	Noise, Barking Dog (NR5)
08/14/2022 09:05:00 PM		DEP	Department of Environmental Protec...	Noise	Noise: Construction Before/After H...
08/14/2022 08:50:00 PM		DEP	Department of Environmental Protec...	Noise	Noise: Boat(Engine,Music,Etc) (NR10)
08/14/2022 07:52:00 PM		DEP	Department of Environmental Protec...	Noise	Noise, Barking Dog (NR5)
08/14/2022 07:36:00 PM		DEP	Department of Environmental Protec...	Noise	Noise, Barking Dog (NR5)
08/14/2022 07:30:00 PM		DEP	Department of Environmental Protec...	Noise	Noise: Boat(Engine,Music,Etc) (NR10)
08/14/2022 07:27:00 PM		DEP	Department of Environmental Protec...	Noise	Noise: Alarms (NR3)
08/14/2022 07:27:00 PM		DEP	Department of Environmental Protec...	Noise	Noise, Barking Dog (NR5)

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Showing 311 Service Requests 1 to

Noise complaints to 311, NYC's information hotline, have increased.

Use [NYC Open Data](#) to investigate noise complaints and other quality of life data.

Thank You!

For more information about sound and noise, visit: www.nyc.gov/dep.

For more education resources, contact: educationoffice@dep.nyc.gov.

