



Y-CITYSCI: A Youth-Led Citizen Science Network for Community Environmental Assessment

Environmental Assessment Curriculum: Lesson 2

Grade Level: Middle school

Duration: 1 hour

Introduction to Noise Pollution

Next Generation Science Standards

Disciplinary Core Ideas:

ESS3.C: Human impacts on Earth systems

Science and Engineering Practice 3:

Planning and Carrying Out Investigation

Objectives

1. Students will operate digital sound meters to measure noise.
2. Students will discuss how noise pollution affects their environment.

Materials

- Digital sound meters (1 per group)
- “How Loud Is It?” worksheet (1 per student)
- “Sound Data Collection” sheet (1 per student)
- Clipboards (1 per student)
- Projector/smartboard
- Sound clip: (<https://m.youtube.com/watch?v=EfE76wKY31Q>)

Activities

Bell Ringer: Play a sound clip of a popular song out loud and discuss the various types of soft and loud sounds the students hear each day. (5 minutes)

Lecture: Lead the lecture with a discussion about what noise pollution is and how it affects the environment. Pass out the “How Loud is Too Loud” sheets and have students try to fill out the first section on their own. Then, as a class, go through the correct ranking and discuss how sound is measured in decibels. Go through the second section on the sheet as a group to further explain how decibels measure sound. Be sure





to include the negative health effects on the eardrum and hearing from long term sound pollution exposure. (10 minutes)

Activity: Put students in small groups and pass out digital sound meters. Explain how to use the basic functions of the sound meters. Have students go to at least 5 locations around the inside of the school and record 10 sound data readings (about 1 per second) on their “Sound Data Collection” sheets. Tell groups to meet back in the classroom at a designated time. (30 minutes)

Discussion: Come back together and discuss the data that was collected and how different locations and activities contribute to sound pollution. (15 minutes)

Resources

A background on noise pollution can be found on the Encyclopedia Britannica website:
<https://www.britannica.com/science/noise-pollution>.

Dr. Rick Neitzel from University of Michigan School of Public Health shares his research on the association between noise and health effects on this video:
<https://www.youtube.com/watch?v=KAhX0sv6Hcw>.

The article Environmental Noise Pollution in the United States: Developing an Effective Public Health Response describes some of the most serious effects associated with noise pollution and discusses ways to reduce noise:
<https://www.ncbi.nlm.nih.gov/pmc/articles/PMC3915267>



Name: _____

How Loud is It?

Individually: Rank the following sounds from 1 to 8. 1 being the one you think is the quietest and 8 being the loudest.

Chain Saw _____
Breathing _____
Just audible sound _____
Conversation in a restaurant _____
Racetrack _____
Airport _____
Airstrip with planes taking off _____
Raking leaves _____

With Class: After discussing each sound, write in how many decibels each sound measures.

Chain Saw _____
Breathing _____
Just audible sound _____
Conversation in a restaurant _____
Racetrack _____
Airport _____
Airstrip with planes taking off _____
Raking leaves _____



Name: Answer Key

How Loud is It?

Individually: Rank the following sounds from 1 to 8. 1 being the one you think is the quietest and 8 being the loudest.

Chain Saw 6
Breathing 2
Just audible sound 1
Conversation in a restaurant 4
Racetrack 7
Airport 5
Airstrip with planes taking off 8
Raking leaves 3

With Class: After discussing each sound, write in how many decibels each sound measures.

Chain Saw 115 dB
Breathing 10 dB
Just audible sound 0 dB
Conversation in a restaurant 60 dB
Racetrack 140 dB
Airport 80 dB
Airstrip with planes taking off 150 dB
Raking leaves 20 dB



Group Names: _____

Sound Data Collection

Location	Sound in dB