NIH SEPA Environmental Health Investigators
Measuring Skills and Tools 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 and health.

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

Activities

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

Lecture: Lead the lecture by discussing what noise pollution is and how it affects the environment and human health. Pass out the “How Loud is It?” sheets and have students 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 together to further explain how we use decibels to measure sound. Be sure to include the negative health effects on the eardrum and hearing from long term sound pollution exposure. (10 minutes)

Activity: Have students form small groups and pass out the digital sound meters. Explain how the basic functions of the sound meters work. Have students go to at least 5 locations around the inside of the school and record 10 sound data readings at each location (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 each group collected and how different locations and activities contribute to sound pollution. (15 minutes)

Resources

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 sound 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 bB_____
Just audible sound ____0 dB_____
Conversation in a restaurant___60 bD_____
Racetrack ____140 dB_____
Airport _____80 dB_____
Airstrip with planes taking off____150 dB_____
Raking leaves _____20 dB_____

ENVIRONMENTAL HEALTH INVESTIGATORS

Group Names:_____

_____

_____

Sound Data Collection

Location	Sound in dB

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