



Noise Pollution (Episode #103)

Strand: Pollution

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Common Core

Language Arts & Literacy in History/
Social Studies, Science and Technical Subjects:

RI.K.1, RI.1.1, RI.2.1, RI.K.2, RI.1.2,
RI.1.2, RI.2.2, RI.K.4, RI.1.4, W.K.2

National Science Standards

Unifying Concepts and Processes

- Evidence, models, and explanation
Science in personal and social perspectives
- Changes in Environments
Content Standard B: Properties of objects and materials



Episode Content Connection

Most students do not realize that noise can be a form of pollution. Sound is measured in a unit called a decibel. Exposure to sounds as loud as 85 decibels can do damage to hearing. The longer the exposure to intense sound the more likely hearing damage can occur. It has been observed that many young people today are suffering from hearing sensitivity decrease do to excessively amplified music placed close to the ear canal by ear-buds.

The activity demonstration titled “Hear Here” is for you to show how the energy of sound can travel from one place to another and to explain how our eardrum vibrates and sends that vibration information to our brains. When something makes a noise, it sends vibrations, or sound waves, through the air.

The human eardrum is a stretched membrane, like the skin of a drum. When the sound waves hit your eardrum, it vibrates and the brain interprets these vibrations as sound.





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After the vibrations hit your eardrum, a chain reaction is set off. Your eardrum, which is smaller and thinner than the nail on your pinky finger, sends the vibrations to the three smallest bones in your body: the hammer, then the anvil, and finally, the stirrup. The stirrup passes those vibrations along a coiled tub in the inner ear called the cochlea.

Inside the cochlea there are thousands of hair-like nerve endings, cilia. When the Cochlea vibrates, the cilia move. Your brain is sent these messages (translated from vibrations by the cilia) through the auditory nerve.

Your brain then translates all that and tells you what you are hearing.

Neurologists don't yet fully understand how we process raw sound data once it enters the cerebral cortex in the brain.

After watching an episode have the student(s) reflect on the following questions.

- What types of things can cause noise pollution?
- What can you do to prevent noise pollution?
- How can noise pollution hurt you?
- What is your favorite sound in nature?
- Do you think that after watching the "Rae Rae Adventure to the Rube Station" electric/solar powered cars might a good way to reduce noise pollution?

"Rae Rae Adventure" (location)

Rube Station

With all the noise in the world it is refreshing to find a place like the Rube Station in Eustis, FL. The Rube Station is a place where solar powered vehicles can recharge in the middle of a town. This futuristic glimpse into the world of renewable and very QUIET transportation is one you don't want to miss. Join Rae Rae and our new friends Max and





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Bill at the Rube station as they show the kids at home what they might be driving in the future, and what the so-called “gas stations” of tomorrow might be like! It is a pleasantly quiet adventure.

“Enviro-Songs”

It’s too Loud!
Peace and Quiet

“Enviro Do-And Show”

Enviro-Communicator

Rae Rae guides kids through a timeless project that kids have enjoyed for years. The viewers at home will love both the simplicity and satisfaction of building their own communication device and challenging their friends to see if they can guess the words being whispered on the other end of the line. Kids will also acquire an understanding of how sound waves are transmitted across a string and understand how a plastic cup and how their own eardrums are similar.

“Critter Connection”

Keeping with our emphasis on sound and ears, the nice people at the Central Florida Zoo introduce their big eared Rabbit friends Hippo and Chocolate to the kids at home.

Terms to Preview

Eardrum: The eardrum is a very thin layer of tissue that is deep inside the ear. It works just like a drum head (or diaphragm) stretched very tightly across the ear canal. The Eardrum vibrates when noise enters the outer ear the eardrum vibrates the hearing bones. These hearing bones transmit energy to the brain and we hear it as a sound.

Sound Waves: Sound waves are patterns of disturbances to the surrounding air. These waves travel away from the source of sound like a ringing telephone. For example: when a person speaks he disturbs the air around him and this disturbance or waves travel until



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they completely fade away or dissipate, just like when a pebble is dropped into water. The water sends out waves in all directions away from the place the pebble (the center) was dropped.

Percussion Instrument: A Percussion instrument is an instrument that creates a sound when it is beating, shaken or rubbed. Examples of a percussion instrument is a drum, marimba, bells, xylophone, cymbals etc...

Sign Language: Sign language is a language that uses hand patterns instead of sounds to communicate with.

Noise Pollution: Noise pollution is the excessive and annoying and displeasing noise that disrupts the normal sounds of nature. Some examples of noise pollution are: machinery noise, airplane noise, train noise, construction noise etc...

Hearing Protection: Hearing protection are devices that keep hazardous noise from reaching the naked ear such as gun shots, machinery noise, engine noise, etc. Two types of hearing protection are earplugs and ear muffs.

Decibel: The decibel is a unit of measurement of the intensity of sound.

Fun Facts

- Children have more sensitive ears than adults. They can hear a larger variety of sounds.
- Noise pollution is classified into two categories either interior or exterior.
- Some examples of outdoor pollution are: airplanes, trains, lawnmowers, sirens, construction sites and loud music from cars.
- Most noise pollution comes from outdoor sources.





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- If you are around loud noises you should wear hearing protection so you don't damage your fragile ears.
- Noise pollution can cause damage to physical property as well as people and animals.
- Loud abrupt sounds can do damage to the eardrum.
- Lower but sustained sounds can cause damage to the inner ear.
- Your ears aren't just good for helping you hear. They help you keep your balance as well.
- Near the top of the cochlea are three loops called the semi-circular canals. These canals are full of fluid that moves when you move your head. It pushes up against the cilia and sends messages to your brain that tells it how your body is moving. You know that feeling of dizziness after you have been spinning around? Well, the fluid in your ears spun as well. That makes the cilia move in all different directions and confused your brain.
- Some examples of indoor noise pollution are: vacuum cleaners, dishwashers, loud stereos, washing machines, and people yelling.

