Roar: Sounds and Energy

Grade Levels: 2nd and 3rd

Student Objectives

- Understand how sound works (vibration and waves) and translates to images in our mind
- Understand how sound intensity (volume) varies and recognize its impacts
- Explore sounds of NASCAR
- Measure sounds inside the home and outside

The sounds in our day to day life are vast and varying, and the different types can impact the way we hear. In this activity, students will experience and describe both sounds common in their lives as well as sounds heard within NASCAR.

Materials List

- Sound measuring (decibel) application such as NIOSH Sound Level Meter or Decibel Meter Master
- Computer/laptop/ Smartphone/iPod/iPad (for sounds)
- Pencil(s)

Lesson Plan and Procedures for Adults

1. Ask student(s) what they know about sound.
    - How is sound made? Demonstrate a sound such as clapping your hands loudly and softly to help with discussion.
    - Do we only hear sound - or can we feel sound?
    - How do we feel sound? Discuss the idea of vibration. Great example is to talk and place your hand gently on your throat.
2. Explain what sound is (vibration) and how it works - travelling through the air, entering the ear, going to the brain where it turns it into something we understand.
    - For upper grades, explain sound is energy and varies in tone and pitch. High pitch sounds travel fast with the vibrations close together while low pitch sounds travel slowly with the vibrations spread apart.

3. Play a series of generic sounds like a bell, cow, lion and siren for the student(s) to identify or step outside at various points of the day to hear different sounds in early morning, noon and night. (For additional sounds, see link for website resources.)
4. Have them write down descriptive words for each sound (high pitch, low pitch, loud, soft, chirping, roar, ringing, etc.) or draw what they are hearing.
5. Have the student(s) tell you what words they used to describe the sound.
6. Have the student(s) identify what they think the sound is. Tell them what the sound is.
7. Discuss sounds within NASCAR - talk about what sounds you might hear at a track, during the race, in the stands or in the broadcast booth.
8. Talk about how the sounds are different and what they might tell us:
    - The sounds of a car may tell us the engine is shifting. If possible, take a drive with no other sounds but the car and see if you can hear the engine shifting gears.
    - The sound on the track may tell us the different locations of cars on the track: close vs. far away, faster vs. slower and position on the track.
    - The sounds during a pit stop may tell us a car is being worked on, such as screeching tires, wrenches clicking and talking.
    - The sounds in a garage area may include an engine turning on and off, talking and tools in motion or dropping.
    - The sounds of the fans including cheers, talking and singing.
9. Repeat steps 3 through 5 using sounds from NASCAR videos of a few races, especially when only the sounds from the race are present.
    - Visit nascar.com, YouTube videos, Fox NASCAR, NBC NASCAR or radio clips from MRN/PRN for examples.
10. Explain to the student(s) sounds have different levels and can impact how we hear. Examples include the difference in the engine of a lawn mower to the whisper in your bedroom at night or the sound of your cat's meow as opposed to a dog's barking.
11. Using a decibel reader app, take the student(s) around inside and outside the house to measure the intensity of sound. Have them record the type of sound and the decibel on the recording sheet.
12. Once the student(s) gathers decibel readings from a variety of sounds, use the decibel graphic and have them identify which sounds are within a safe range and which may require hearing protection devices.

Additional Resources

- NASCAR sounds: https://www.youtube.com/watch?v=hdd28Fcz-oI
- Fontana: https://www.youtube.com/watch?v=CRqafZ7pDes