

UNORGANIZED NOISE: TEACHER GUIDE

Subject: Physical Science
Grade Level: Middle School
Last Updated: June 05, 2011

Case Summary

Atlanta residents are complaining about the noise from Hartsfield-Jackson International Airport and traffic. The article indicates that Mayor Kasim Reed and Entertainer T.I. are campaigning to find ways to eliminate noise pollution.

Credits

Tell us who wrote the case, their position, institution, and location. You may include contact info if desired. This case was written by Deirdre Mitchell (math/science teacher, McNair Middle School, Decatur, GA), Malissa Summers (math/science teacher, McNair Middle School, Decatur, GA), and Laurisa London (PhD. Student, Polymer Chemistry, Clark Atlanta University, Atlanta, GA) Authors may be contacted at mjillete@emory.edu.

Learning Objectives

1. Identify the characteristics of electromagnetic and mechanical waves.
2. Describe how the behavior of light waves is manipulated causing reflection, refraction diffraction, and absorption.
3. Explain how the human eye sees objects and colors in terms of wavelengths.
4. Describe how the behavior of waves is affected by medium (such as air, water, solids).
5. Relate the properties of sound to everyday experiences.

Georgia Performance Standards

S8P4. Students will explore the wave nature of sound and electromagnetic radiation.

Assessment

Box Chart
Vocabulary foldable
Assignment – question response
Mechanical Waves diagram (Poster board project labeled appropriately with scientific terms; Rubric will be used as a grading tool)
Electromagnetic Spectrum Illustration (Poster board project labeled appropriately with scientific terms; Rubric will be used as a grading tool)
Electromagnetic waves Quiz
Waves Concept map
A rap, poem, or literary expression about electromagnetic waves

Implementation Strategy

Before the reading of scene one, play traffic or airplane sounds to get the students' attention. The dialogue can be read by the teacher, graduate student, or volunteer students depending on the dynamics of the classroom. The students should complete a box chart following the completion of scene once. Teacher and graduate student should facilitate the process of identifying facts and learning issues. The students should then conduct research of the learning issues followed by a class or group discussion to confirm understanding and obtain answers to new questions. Students should then be given a specified time to complete the scene one assignment. This assignment will have the students to research mechanical waves further if needed. Following the assignment, use the media player's oscilloscope feature to provide a visual of sound waves to the students. Ask the student to describe what they see using the terms that were learned in their research. Have the to complete a mechanical wave diagram with the appropriate labels for homework or class work if time permits

Day 1 (90 minutes)

Scene 1: Skit performed by teachers/grad students and student volunteers as other students read along (10 minutes)

Box Chart – Facts, learning issues, action plan (10 minutes)

Research/Discussion (30 minutes)

Assignment – question and response (30 minutes)

Oscilloscope demonstration of sound waves (10 minutes)

Mechanical wave diagram (Class work or homework)

Day 2 (90 minutes)

Electromagnetic waves video (10 minutes)

Scene 2: Skit performed by teachers/grad students and student volunteers as other students read along (10 minutes)

Electromagnetic waves video (10 minutes)

Box Chart – Facts, learning issues, action plan (10 minutes)

Research/Discussion (30 minutes)

Electromagnetic spectrum diagram (group project)

Case Notes

What worked: The concept worked well with middle school students. They were very interested in how sound waves affected them as it pertained to their daily use of electronics and appliances. The students were very successful working in groups to complete their posters and diagrams. Shared responsibility of the of the assignment task worked well for completion. Group presentations were ideal when considering the time. Students were also responsible for individual reflections in which some required assistance from peers or teachers. Showing a video of or a demonstration of an Oscilloscope peaked students' interest and encouraged the research.

What didn't work: Students required more time than expected for research and demonstrations. Some students needed assistance with the write up and individual reflections. Allowing students to complete write ups and reflections for homework didn't work because many of the assignments weren't returned.

How did students respond: The students responded very well. The students engaged well and most worked to expectation when completing the task.

How can the case be improved or altered? Increasing time for research and task completion if necessary could increase productivity. Eliminating some of the task could reduce time required. Also, adding another day to complete all task to increase productivity.

Resources

Tejeez (2007). YouTube. *Youscope* [video]. Retrieved June 4, 2011 from <http://www.youtube.com/watch?v=s1eNjUgaB-g>.