Discussion Guide for

WAVES: ENERGY IN MOTION

OBJECTIVES

After viewing this program, students will be able to:

- Draw a wave and label the trough, crest, amplitude and wavelength.
- Contrast compression waves, transverse waves, and standing waves.
- Account for the reason sound does not travel through outer space.
- Discuss reflection, refraction, diffraction. and interference.
- Explain what is meant by natural frequency. List some ways in which organisms use sound. waves other than for hearing.
- Apply the Doppler effect to every day events and scientific observations.

This program is part of the AIMS Interactive Science Essentials Series; This twenty-four part series covers four subject areas. - Earth Science, Biology Physics, and Chemistry There are six programs in each subject area. The individual programs are divided into randomly accessible sections. A glossary provides written definitions of terms used in the program, and in most cases will run a section of the video where the word is used in context.

A script of the narration is accessible, as well as a bulletin board containing a general. introduction to the subject A quiz allows the student to test their knowledge and the results are recorded for you In the teacher's section you can view each student's test responses and edit or create your own quiz and test questions.

OVERVIEW

Waves: Energy in Motion is part two of the Physics Essentials series which examines modern physics. The program clearly illustrates to students through high quality animation how waves transfer energy but not matter, from one point to another. Other important concepts such as reflection, refraction, interference, diffraction, the Doppler effect, wavelength amplitude, and frequency are also thoroughly explained. The program looks at the difference between transverse, compression, and standing waves and concludes by explaining how sound waves are produced by various musical instruments and perceived by the human ear.

TEACHER'S PREPARATION

- Before the student uses the program set up the computer so chat they can easily reach the mouse and the keyboard.
- Load the CD-ROM into the computer so that it is ready for the student to begin using.
- While students are able to work at their own pace, some students may benefit from using the program more than once.

SUGGESTED DISCUSSION QUESTIONS

1. Draw a wave. and label the trough, crest, amplitude and wavelength

2 Compare compression or longitudinal waves with transverse waves.

3. Illustrate the areas of compression and rarefaction in a compression wave.

4. How do standing waves and compression waves differ?

5. Give an example of a. compression wave, a transverse wave and a standing wave.

6. Why does sound not travel through outer space?

7. Relate the Law of Reflection to something in your school.

8. Hypothesize why sound waves travel faster in water than in air.

9. What causes a. wave to be refracted?

10. Describe how diffraction enables us to hear noises around large buildings

11. Explain what happens when waves of the same frequency are in phase and pass a given point at the same time. What happens if this occurs when waves are out of phase?

12. Explain what is meant by "natural frequency."

13. List some ways in which organisms use sound waves other than for hearing.

14. Explain how astronomers use the. Doppler effect to detect the direction in which stars are moving. What causes a sonic boom?

15. Why do musical string instruments require some form of a sounding board?

16. What causes reverberation and why is it a factor in designing auditoriums?

17. Specify what type of units are used to measure sound.

18. Analyze how waves are used in the human ear to detect sound. Why does continual exposure to loud sounds cause hearing loss?

19. True or False? All waves transfer energy?

Discussion Guide for

WAVES: ENERGY IN MOTION

VOCABULARY

amplitude
compression waves
crest
decibel
diffraction
Doppler effect
electromagnetic
frequency
hertz
interference
rarefractions
reflection
refraction
reverberation
seismic waves
spectrum
standing waves
transverse waves
trough
ultrasound
vibration
visible light
wavelength

ADDITIONAL BENEFITS

Students will be able to:

- Relate the frequency of a sound wave to its pitch
- Analyze how reverberation may affect the quality of sound in a room.
- Discuss how waves are used in the human ear to detect sound:

PROGRAMS DETAILS

LENGTH:
25 minutes

SUBJECT AREAS:
Physics

AUDIENCE LEVELS:
Junior/Senior High

ORDER NUMBER:
1-9094SG

CANADIAN LEARNING COMPANY
95 VANSITTART AVENUE
WOODSTOCK, ON N4S 6E3
INFO@CANLEARN.COM
TEL:(800) 267 2977
FAX:(519) 537 1035