

Earsplitters

Earsplitters! presents up-to-the-minute examples of science and technology in action to inspire children to investigate how sounds are produced, how they travel and how they can be changed with direct links to friction and changing sounds. (Sc4, 3e, 3f, 3g)

Key Science Concepts

- **Sounds are made when objects or materials vibrate and the vibrations can travel through different materials, including air.**
- **Some materials can prevent sound vibrations reaching the air.**
- **'Pitch' describes how high or low a sound is. The larger the object is, the lower the pitch of sounds.**
- **'Volume' describes how loud a sound is.**

Background Knowledge

Whenever a sound is produced, a solid, liquid, or gas vibrates. High sounds are produced when something vibrates at high frequency. Low sounds are produced when it vibrates at a low frequency. In general smaller objects or small areas of material vibrate at a higher frequency than large ones. When a material vibrates it makes the air vibrate. Vibrating air makes the eardrum (a membrane in the ear canal) vibrate and this, in turn, causes vibration in the ossicles (small bones in the ear). These bones vibrate against the cochlea (a spiral cone-shaped, fluid-filled tube) sending messages to the brain.

The natural echo of an area such as a room or cave is called 'reverberation'. This is a measure of how well sounds are reflected around the area. Hard, smooth materials reflect sound better than soft, uneven one (soil, curtains, carpets) which absorb sound more than they reflect it, thus decreasing reverberation.

Before the Reading

Have students complete the In Your Own Words definition worksheet.

During the Reading

Have students complete the compare and contrast chart as they read.

After the Reading

Expert Jigsaw Activity:

1. Assign students to groups. Each group will have a section of the text to discuss the main ideas and points.
2. They will become the "expert group" on that section.
3. Then pair expert members from each group with other experts from other groups.
4. Each "expert" explains to that group his/her main ideas and supporting details from their section of the text.

Worksheet Answer Key

1. 20dB, 80dB
2. No one, volumes over 100dB
3. 100dB
4. elephant, 117dB
5. shout 130dB,
6. 200dB,
7. 130dB,
8. howler monkey, 140dB

Challenge Activities

Use sound sensors and data-logging equipment to find the noisiest place in your neighborhood or school. Be sure to check for dangerous levels of sound.

Write a newspaper article on how to listen to music safely through headphones.