



**Day 5 – Grade
4 - Science**



*Investigating Sound
(Review and Assessment)*

Performance Indicator: 4.P.4B.3: Define problems related to the communication of information over a distance and design devices or solutions that use sound to solve the problem.



Essential Question(s):

How does sound travel through matter?

How is sound created and sensed, and how does it transfer energy?



I-Can Statements:

- I can explain the relationship between pitch, volume, and frequency.
- I can explain how sound travels through different states of matter.



Engage Activity



How do these objects solve problems with sound?

How do these objects solve problems with sound?

Exploration Time

Pitch is a measure of how high or low something sounds and is related to the speed of the vibrations that produce the sound.

Volume is a measure of how loud or soft something sounds and is related to the strength of the vibrations.

Sound is caused by vibrations (back and forth movements that occur very quickly)

Sound vibrations can be transferred from one material to another.

Frequency measures how fast sound waves are vibrating.



Exploration Time

Sound waves are mechanical waves that transfer energy via the propagation of vibrations through matter.

Big Ideas

Sound waves cannot move through empty space (vacuum) where there is no matter to vibrate and pass the energy along.

When sound waves move through matter, the matter undergoes compression (the molecules get closer to each other), followed by expansion (molecules move apart).

Sound waves can move through gases, liquids, and solids.

Exploration Time



Directions: Read all questions and answer choices carefully. Based on what you have learned about sound, choose the best possible answer.

Use the following scenario to answer this question.

As part of a class project, students are trying to design a way to communicate from their classroom to another classroom down the hall using sound.

4.P.4B.3: What is one of the problems the students will need to solve in order to effectively communicate from one closed classroom to another?

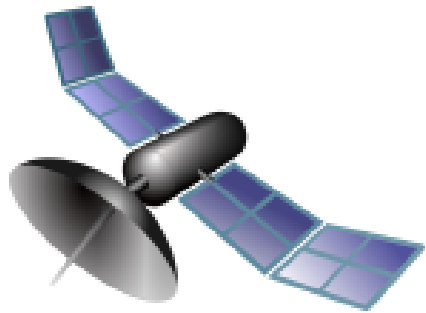
- a. The clarity of the sound decreases with distance.
- b. Other people in the hall will be able to hear the sound.
- c. The wall between the rooms will absorb all of the sound.
- d. There will be too many sounds in the room to hear clearly.

Exploration Time

Directions: Read all questions and answer choices carefully. Based on what you have learned about sound, choose the best possible answer.



Use the following pictures to answer this question.



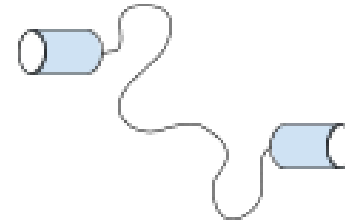
Satellite



Cell Phone



Telephone



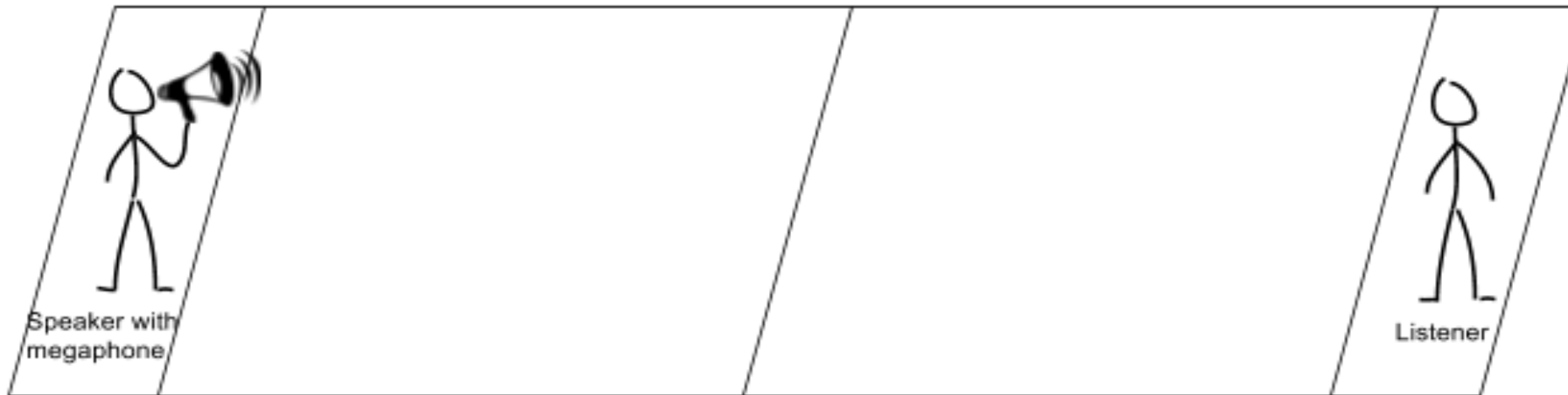
String phone

4.P.4B.3: What problem are all of these devices designed to solve?

- a. Seeing images that are too far away.
- b. Communicating sound over a distance.
- c. Sending computer signals through the internet.
- d. Sending top secret messages across the world.

Use the following picture and scenario to answer this question.

Students in a class are testing to see how well a megaphone can solve the problem of communicating sound from one side of a football field to the other. To test this solution, one student is going to speak into the megaphone on one side of the field while another student is going to be listening from the other side of the field.



4.P.4B.3: What is one way the students can test how effective the megaphone is at solving this problem?

- a. They can measure the wind speed on both sides of the field.
- b. They can measure the pitch of the sound in the middle of the field.
- c. They can measure the volume of the sound by the speaker and by the listener.
- d. They can measure the distance between the megaphone and the other side of the field.



Exploration Time

Directions: Read all questions and answer choices carefully. Based on what you have learned about sound, choose the best possible answer.

What are some uses of sound energy? Describe three uses that you have observed or have studied in the following areas.

Sound energy at school:



Sound energy at home:



What role does energy play in sound?

- Sound waves have nothing to do with energy.
- Sounds waves carry energy.
- Energy is present in loud sounds only.
- Energy is present in high-pitched sounds but not in low-pitched sounds.



What sort of frequency do high-pitched sounds have?

- high
- low
- medium
- no frequency



What does volume measure?

- the speed of a sound
- the frequency of a sound
- the highness or lowness of a sound
- the loudness or softness of a sound



Which two aspects of sound go together?

pitch and frequency

decibels and pitch

pitch and volume

amplitude and pitch



Congratulations !!!

