Good Vibrations



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Good Vibrations







Main Ideas:

- Sounds are made when something vibrates
- Sounds can be loud or soft and high or low
- We use sound to communicate
- Sound is a type of energy



Introduce Science with Literature



This exuberant celebration of creativity tells the fascinating story of Wassily Kandinsky, one of the very first painters of abstract art.

Throughout his life, Kandinsky experienced colors as sounds, and sounds as colors--and bold, groundbreaking works burst forth from his noisy paint box.





Start with what they know



What do you know about sound?

What do things that make sound have in common?





Go on a listening walk

What sounds can we hear in our school?

What do you think we will hear on our listening walk?

• Use those on the grid, or make one in advance.

Students work in pairs to color a square when they hear the sound.

The Listening Walk

Listen carefully for each of these sounds. Color a square for each of the sounds you hear.

cough	singing	footsteps
loud speaker	talking	paper shuffling
door shutting	sneeze	shouting
pencil sharpener	phone ringing	laughing





Understanding Sound



How are sounds made? How does sound get from the source (say, the teacher's mouth) to your ears?











Something has to be moving for sound to be made.



Introduce Science with Literature





Sound moves by making vibrations, or back and forth movements.

The vibrations that produce sounds are invisible to the eye.





Visualizing Vibrations





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Making Vibrations



Tuning fork

Bells

Screaming balloon

Musical cup





Tuning Forks

Strike the tuning fork and look closely at its motion.



Can you see any movement of air molecules?

Bring the tuning fork close to your ear and listen for the sound produced.

As gently as possible, touch the tuning fork to your lip. Can you feel the vibration?





Vibrations are waves

- Vibrations cause sounds.
- We can hear when sound waves travel through the air to our ears and cause our eardrums to vibrate.
- Sound can also travel through other forms of matter, such as liquids and solids.







Vibrations are waves



Sound waves move when the air molecules are pushed into other air molecules.







Energy is the ability to do work. Moving something against a force is work, so some types of energy (like sound) are created by movement.





Telephones use sound to communicate.

The first telephone call was on March 10, 1876. Alexander Graham Bell called his assistant, Thomas Watson. He said:

"Mr. Watson--come here--I want to see you."

What would you have said?







Making a Telephone

- The old "two cans and a string" technique (or better yet, "two paper cups and a string") really does work.
- The key is to make sure that the string is tight between the two cups, and this normally means that the distance is limited, and the two people must be connected to each other by a straight line.





Making a Telephone

- 1. First cut a long piece of string.
- 2. Make a hole at the center of the bottom of both cups.
- 3. Thread the string through the holes in both cups and anchor with paper clips.
 - --Tie string to paper clip inside each cup.
- 4. Stretch out the phone, but be careful not to pull the string through the hole.
- 5. The string must be tight and not touching anything else.
- 6. One person holds cup to ear and listens to the other person whisper into the other cup.
- 7. Try letting the sting go slack. Can you hear the other person now?







Think About It



Would the can telephone in this Progresso soup commercial actually work?

What is wrong with it?





- The artist Wassily Kandinksy once said, "The sound of colors is so definite that it would be hard to find anyone who would express bright yellow with base notes, or a dark lake with the treble."
- He made paintings to show how sound looked to him when he listened to music. What do you think he was hearing when he painted these?
- Do these paintings make you think of music?









Composition VIII (1923)

- When you listen to music, do you ever visualize images of real objects in your head? Do different songs make you think of different things?
- In this activity, you will see that sounds from music are representations of energy. Sound energy can make things move.
- This is easy to hear, but it is very hard to see.





Materials needed for this lesson:

- Cardstock (index cards work well)
- Wireless speaker that is flat on top
- Music source to connect via Bluetooth to wireless speaker, such as a mobile phone (<u>Need help?</u>)
- Craft paint (water it down)
- Tap water
- Small cups to distribute paint
- Tape









Visualizing Sound Procedure

- Dilute craft paint in a small cup by mixing it with water. One-part paint to one-part water is a good ratio.
- 2. Use two or three colors of paint.
- 3. Place a dry index card on top of the speaker.
- 4. Dip a crumpled tape into one color of paint and place it on your index card canvas.







Visualizing Sound Procedure

- 5. Dip another piece of crumpled tape into another color of paint and place it on your index card canvas. Repeat with a third color if desired.
- 6. Make sure the wireless speaker is on and connected to a device with music (like a mobile phone) via Bluetooth.
- 7. Choose a song to play.









Ready to try it yourself?











Visualizing Sound: Going Further



https://www.wonderopolis.org/wonder/whatmakes-sounds-louder

MYSTERY science

https://mysteryscience.com/waves/sound-wavescommunication



https://www.pbs.org/video/curious-crew-soundvibrations

Contact Information



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