Sound

Sound is a type of energy that you can hear. Sounds are made by something vibrating.
Vibrate
Vibrate means to quickly move back and forth. Sound changes if an object vibrates faster or slower.
Wavelength is the distance between to crests.

A sound wave with a high frequency looks like this. This is when the sound is moving fast.

A sound wave with a low frequency looks like this. This is when the sound is moving slow.
How Sounds Are Made

Objects that move back and forth don’t always make a sound. A sound is only made if the object moves back and forth quickly. When an object vibrates, it makes nearby air molecules vibrate, too.
How a Guitar Makes Sound

When a string moves, it pushes nearby air molecules. These push against other air molecules next to them. The string pushes out over and over again. This causes the air molecules to move out in waves. You hear sound when these waves move inside your ears.
Diagram of the ear

- Auricle
- Outer Ear Canal
- Eardrum
- Hammer (malleous)
- Anvil (incus)
- Stirrup (stapes)
- Cochlea
- Eustachian Tube
Sound Moves Through Matter

- An object that vibrates in empty space does not make a sound.
- Sound cannot move through empty space.
- Sound only moves through a solid, liquid, or gas.
- Sound moves fastest through solids.
- Sound moves slowest through gases.
The Pitch of Sound

Pitch is how high or low a sound is.

If an object **vibrates fast**, it makes a **high pitch sound**. For example, a small bell.

If an object **vibrates slow**, it makes a **low pitch sound**. For example, a large drum.

https://www.youtube.com/watch?v=QdoTdG_VNV4&feature=youtu.be
Some make sounds by vibrating strings.

- A short string has a high pitch.
- A long string has a low pitch.
- A thin string has a high pitch.
- A thick string has a low pitch.

http://www-tc.pbskids.org/designsquadv/games/string_thing/msg_how_sound_works.swf
Some make sound by air vibrating in a tube.

- Short tube has a high pitch.
- Long tube has a low pitch.
Changing Pitch

Pitch can be changed by changing how fast an object vibrates.

Try This:
Stretch a rubber band tightly, pull it, notice how fast it vibrates, and the high pitch.
Stretch the rubber band less tightly, pull it, notice it vibrates slower, and the pitch is lower.
Pitch ≠ Volume

Pitch is how high or low a sound is.
Volume is how loud or soft a sound is.

Play the game How Loud is Too Loud using this link: [http://www.dangerousdecibels.org/virtualexhibit/3howloudistooloud.html](http://www.dangerousdecibels.org/virtualexhibit/3howloudistooloud.html)

Example:
If you ring a small bell strongly, it has a high volume.
If you ring a small bell gently, it has a low volume.

Important:
The high pitch does not change either way you ring the bell.
Let's Review

1. You stretch a rubber band and pull on one side. The rubber band makes a sound. Your stretch the rubber band more, and pull on it again. It makes a different sound. What changes about the sound?

2. During a rainstorm, you hear thunder. What causes the sound?

3. Sound will travel fastest through __________.

4. Layla bounces a basketball on a floor made of wood. Why does she hear a sound each time the ball hits the ground?
Let’s Try More...

5. A trumpet can make sounds with different pitches. What happens when the sound changes from a low pitch to a high pitch?

6. Adam rings a bell, and the bell makes a sound. When he touches the bell, the sound stops. Why does the sound stop?
What are some sources of sound in nature?

What are some sources of sound made by people?