

SOUND ENERGY

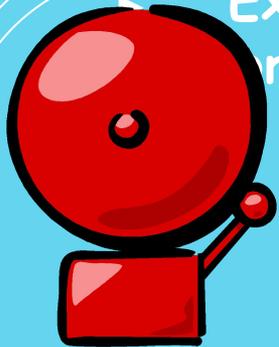
A decorative graphic consisting of several parallel white lines of varying lengths, slanted diagonally from the bottom-left towards the top-right, located in the lower right quadrant of the image.

WHAT IS SOUND?



- ▶ Sound is a form of energy that can be heard and travels in waves.
- ▶ When matter **vibrates** or moves back and forth very quickly, a sound is made.
- ▶ Sound waves can travel through solids, liquids, or gases.

▶ Example: When a school bell rings, parts of the bell will vibrate creating sound.



Sound Waves

- ▶ Sound is a kind of energy that can be heard.
 - ▶ A sound is made when things vibrate.
 - ▶ Sound travels in waves.
 - ▶ Sound must travel through matter to be heard.
 - ▶ The vibrating object makes the air around it vibrate.
 - ▶ Sound vibrations move through the air into your ears and make the eardrums vibrate.
 - ▶ Volume is how loud or soft a sound is.
 - ▶ Pitch is how high or low a sound is.
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SOUND TRAVELS THROUGH MATTER

Gases

Most of the sounds we hear travel through gases, such as air.

Sound waves travel slowly through the air.

For example: Sound from a bell, a horn, or an alarm clock travels through the air.

Liquids

Some sounds that we hear travel through water.

Sound waves travel a faster through water than through the air.

Sonar is the way to use sounds to locate objects under water.

What animals use sonar?

Solids

Some sounds that we hear travel through solids.

Sound waves travel very fast through solids.

For example: When you hit a drum, it vibrates, then the sound travels through the air, to your ears.

PITCH

- ▶ Pitch is the highest or lowest sound an object makes.
- ▶ Objects that vibrate slowly, make a low pitch. Example-drum.
- ▶ Objects that vibrate quickly, make a higher pitch. Example-recorder

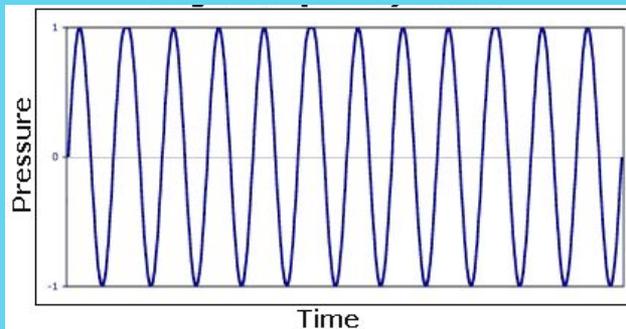
LOUDNESS OR VOLUME

- ▶ **Volume** is the loudness or the softness of a sound.
- ▶ Loud sounds use a lot of energy.
- ▶ Soft sounds use a little energy.
- ▶ Example: The harder a drum is hit, the more the drum will vibrate . The more an object vibrates, the louder the sound it makes.

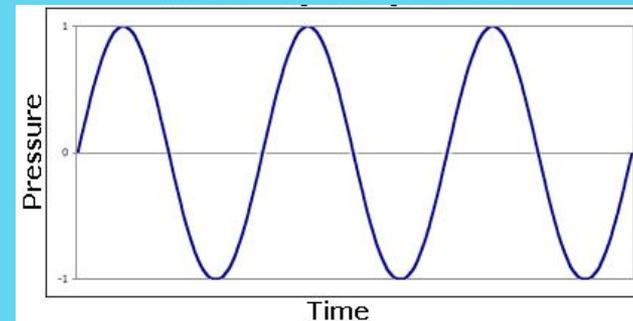


HOW DOES SOUND TRAVEL?

- ▶ Sound passes through the medium as longitudinal waves.
- ▶ When the vibrations are fast you hear a high pitch. When they're slow, you hear a low pitch.



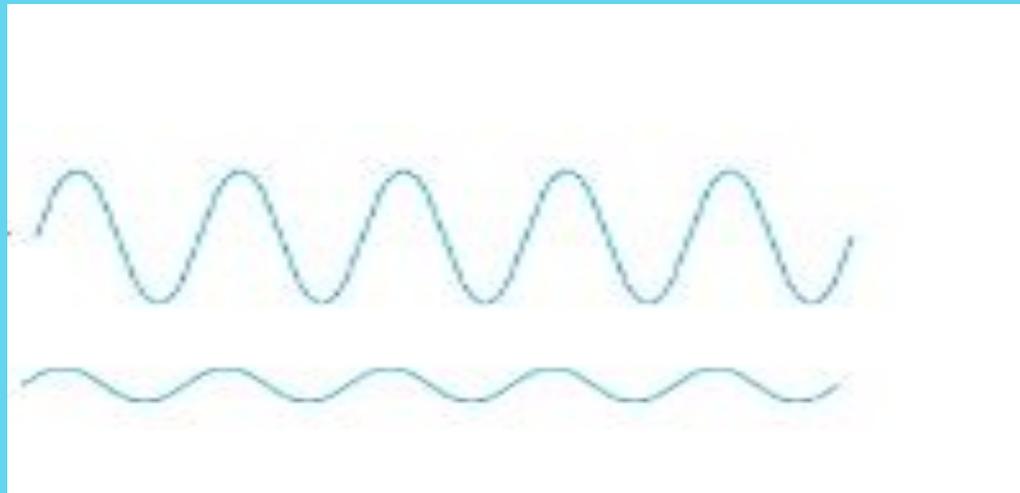
High Pitch



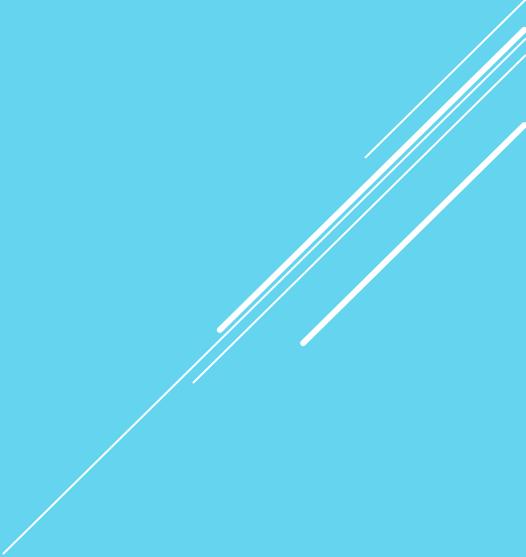
Low Pitch

HOW ELSE CAN WE CHANGE SOUND?

- ▶ We can make it louder or softer by changing the **amplitude** of the height of the wave.
- ▶ The higher the amplitude, the louder the sound. The lower the amplitude the softer the sound.

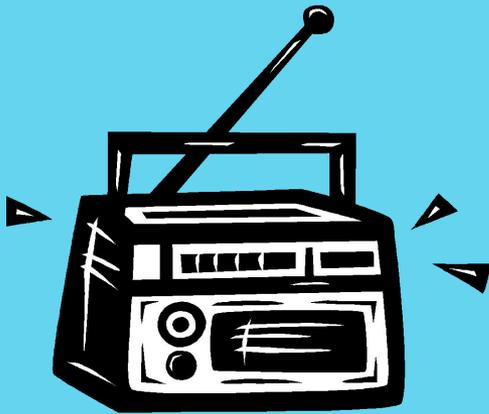


HOW YOU MAKE SOUNDS

- ▶ We use our vocal cords to make sounds in our throat.
 - ▶ When we speak, our vocal cords vibrate.
 - ▶ Place your hand on your throat when you talk, and you can feel the vocal cords vibrate.
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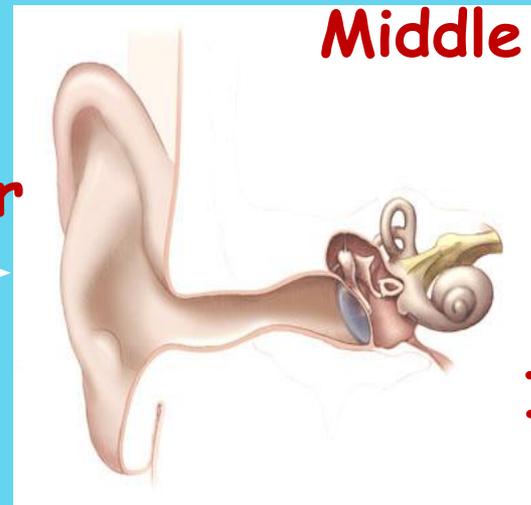
How does the ear work?

- Sound waves are sent.
- The outer ear “catches the sound waves”.
- The middle ear takes the sound waves and “vibrates” the eardrum.
- The inner ear sends the messages to the brain.



Sound Waves

Outer Ear



Middle Ear

Inner Ear

- The brain puts it together and hooray! You hear your favorite song on the radio.

DID YOU KNOW?

- ▶ Sound travels 4 times faster through water than through air.
- ▶ There is no sound in space.
- ▶ Geologists use their knowledge of how sound travels through rocks to help them find oil fields.

