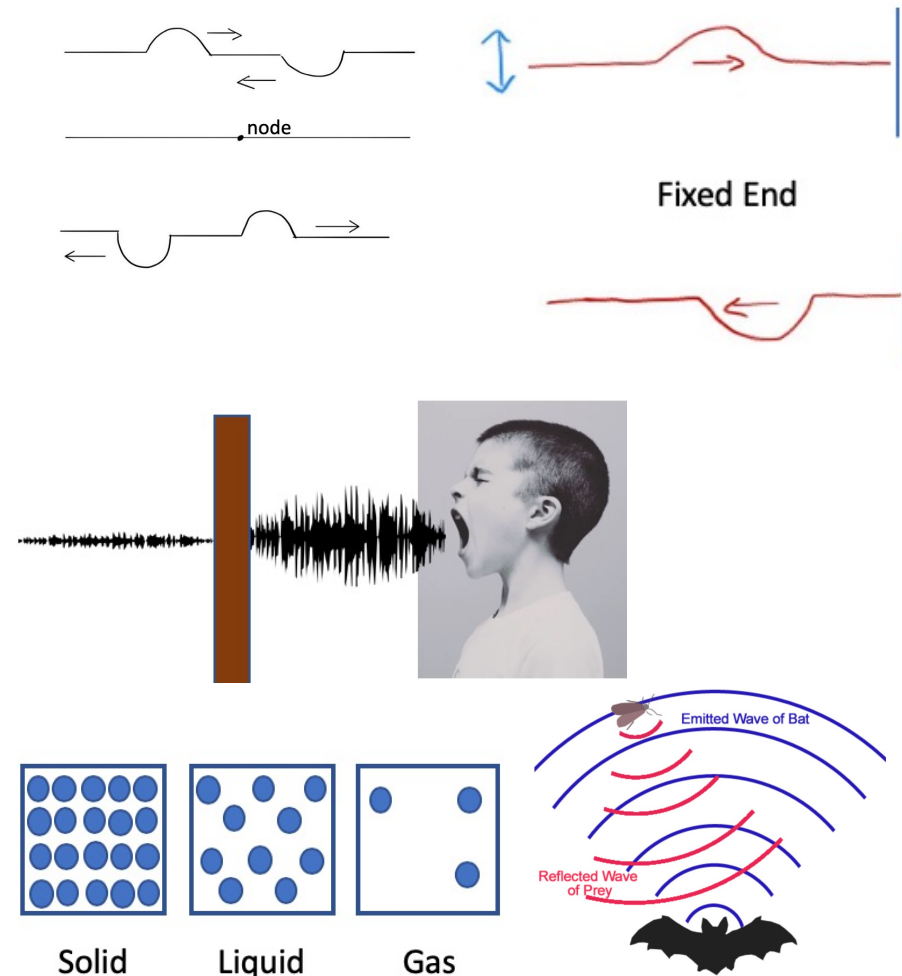


Transmission, Reflection, and Interference

- Wave Behavior
- Sound Behavior in Different Mediums
- Transmission of Sound
- Sound in Space
- Sound Reflection
- Echolocation
- Interference of Waves – Constructive and Destructive



Preview File

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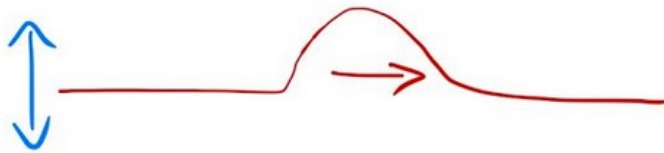
- Some slides appear blank because they have been removed
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- Other slides may have on them, this represents writing that has been removed on this sample

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Wave Behavior

- If the medium the wave travels through stays constant, the waves will travel at a uniform speed
- Waves act differently as they pass through different mediums and encounter various conditions
- _____



Free End

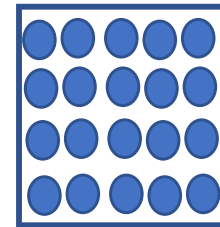


Fixed End

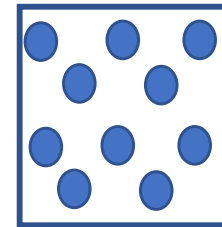


Sound Behavior in Different Mediums

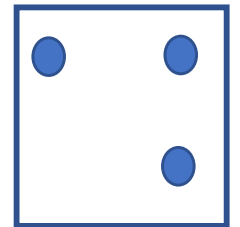
- Sound waves are transmitted from particle to particle through vibrations
- _____
- Therefore, sound travels faster in
 - solids then in liquids
 - liquids compared to gases
 - denser mediums



Solid



Liquid



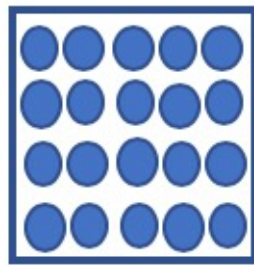
Gas

Medium	Sound Wave Speed
Air (20°C)	343 m/s
Water (20°C)	1,482 m/s
Steel (20°C)	5,960 m/s

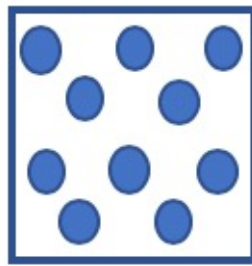
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However

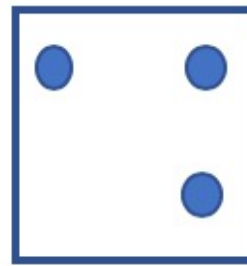
- Since liquids have less energy (and less motion as a result) than gases, _____
- For this reason, a faint sound in air wouldn't be transmitted in water because it wouldn't have enough energy to vibrate the atoms



Solid



Liquid



Gas

In Space

- Space has very few particles all of which are very, very far apart
- Since the particles cannot vibrate against each other, _____



Sound Behavior Under Different Weather Conditions

- _____
- Hot particles (hot air, hot water, etc.) transmit sound waves better than cold particles
 - The particles vibrate quickly and easily

Medium	Sound Wave Speed
Air (0°C)	331 m/s
Air (20°C)	343 m/s
Water (0°C)	1417 m/s
Water (20°C)	1,482 m/s

Partial Reflection at the Boundary

- When a wave is transmitted across the boundary of two different mediums (i.e. a wall), some of the energy goes into the second medium but some is reflected back
- This means that if you're trying to talk through wall, a lot of the sound energy will be _____

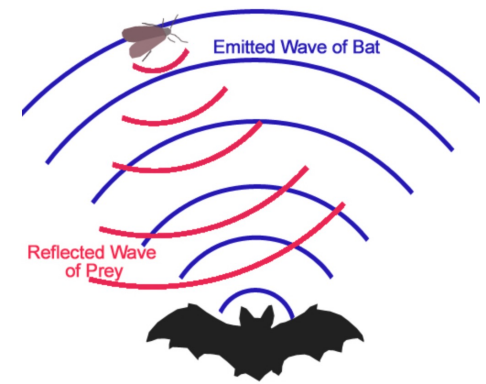


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Wave Reflection Off A Boundary

This reflection is very apparent regarding how sound is perceived and used

- Some animals, ...
- Sound waves are bounced off various objects such as prey, land formations, etc.
- _____

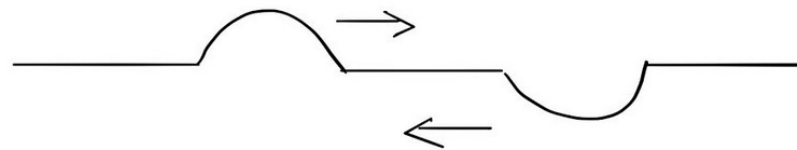


Interference of Waves

- Interference is what occurs when two waves meet
- There are two kinds
 1. Destructive Interference
 2. Constructive Interference

Destructive Interference

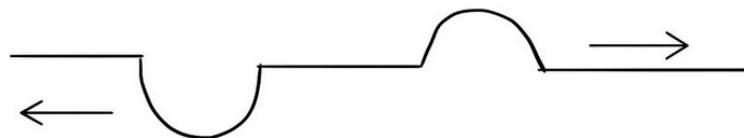
- Occurs when a crest meets a trough
 - Occurs at the node
- _____
- Once the waves pass, they resume their original amplitude



Before interference



Destructive interference



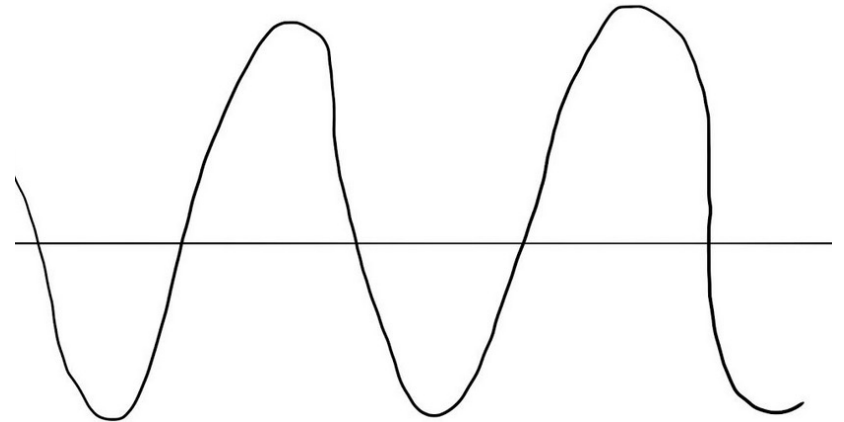
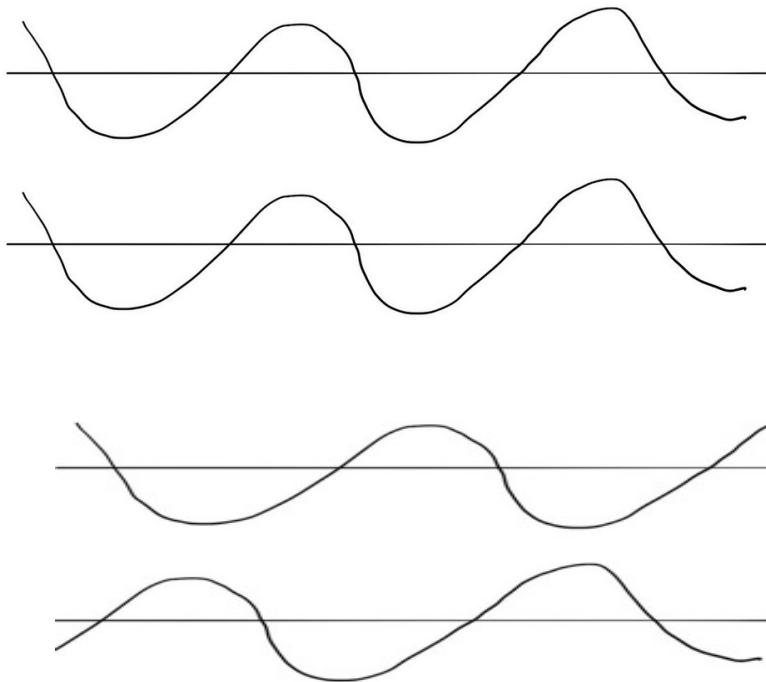
After interference

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Interference

- _____

- If the waves are continuous, the interference will continue



Check Your Understanding

Being as accurate as you can, draw what occurs when

a) a crest of +1 meets a crest of +1

b) a trough of -2 meets a crest of +3

c) a crest of +2 meets a crest of +1