

Waves and Sound Unit

- **Covers: Properties of Waves, Types of Waves, Sound Waves, Frequency, Period, and Amplitude, and the Universal Wave Equation**
- **Lesson & Engaging Activities**
- **Daily Teaching Schedule**



Waves and Sound



Unit - Solutions and Mixtures

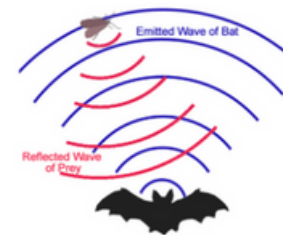
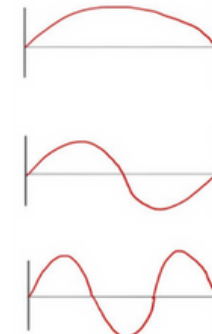
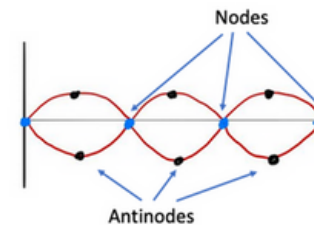
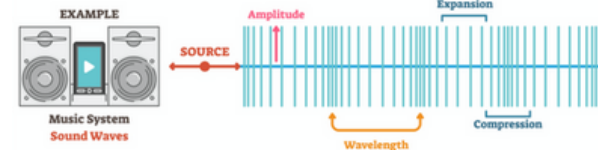
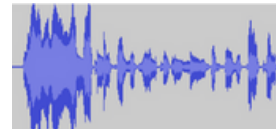
- 4 Lessons
- 5 Activities

Properties of Waves

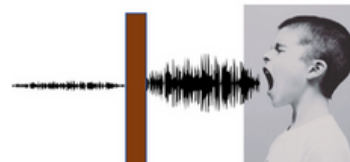
Types of Waves and Wave Behaviors

Sound Waves and their Properties

- Waves
- Water and Seismic Waves
- Transverse and Longitudinal Waves
- Frequency, Period, and Amplitude
- Crests, Troughs, and Wavelength
- Universal Wave Equation
- Waves in different mediums
- Partial wave reflection
- Free and Fixed ends
- Destructive and Constructive Interference
- Standing Waves, Nodes, and Antinodes
- Harmonics
- Creating Sound
- Moving Sound
- Noise Cancelling Headphones
- The Speed of Sound



$$v = f\lambda$$



Lesson Includes Teacher and Student Versions - Videos Embedded in Lessons

Waves Introduction

- What Waves Are
- Types of Waves
- Transverse vs. Longitudinal Waves
- Frequency, Hertz, Period
- Amplitude
- Crests, Troughs, and Wavelength
- Universal Wave Equation

$f = \frac{1}{T}$ $T = \frac{1}{f}$ $v = f\lambda$

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This digital presentation includes both Google and Office resources and is Google Classroom Ready

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

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Standing Waves

- Wave Reflection
- Interference
- Standing Waves
- Nodes and Antinodes
- Scientific and Musical Names

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Sound, Sound Energy and Speed

- Hearing Sound
- Creating Sound
- Moving Sound
- The Speed of Sound
- Practice

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Sound

- Hearing: Humans can generally hear sound waves with frequencies between 20 Hz and 20,000 Hz (20 kHz)
- Energy: Sound is simply the transfer of energy (caused by vibrations) between particles within and across mediums

Videos embedded directly into the slides. One-click access.

Standing Waves - A Special Case of Interference

- When waves of equal amplitude and shape, traveling in opposite directions meet, it is possible for them to form standing waves
- Due to constructive and destructive interference,

Student and Teacher versions of the presentations

Engaging Activities

Speed Quizzing

The time required for one full cycle is the _____

period

What is amplitude?

The distance from rest position to maximum displacement.



A fast-moving review activity where students quiz each other, swap cards, then move on to someone new.

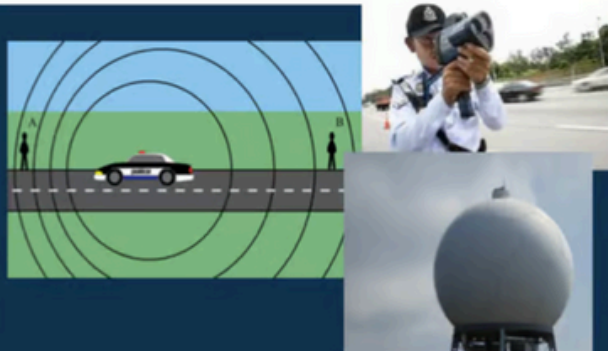
Waves and Sound Unit

The Silencer ... Shhhhhh



SOUND STEM CHALLENGE

The Doppler Effect Lab Station Activity



7 Lab Station Activities to get your kids out of their seats and engaged in their learning

Sound, Sound Energy and Speed Lab Station Activity



7 Lab Station Activities to get your kids out of their seats and engaged in their learning

Tinnitus Ringing in the Ears

Scientific Reading Comprehension
Article and Extension Activity



Improve your students' **Literacy** and **Analysis Skills**, use as an **Emergency Substitute Plan**, or create **Applicability** in your classroom



Daily Teaching Schedule

UNIT – Waves and Sound **10 DAYS TOTAL**

Properties of Waves 10 days			
Types of Waves and Wave Behaviors			
Sound Waves and their Properties			
Number of Day(s)	Course Content	Teaching Resources	NGSS
1	- Waves - Water and Seismic Waves - Transverse Waves - Longitudinal Waves - Frequency, Period, and Amplitude - Crests, Troughs, and Wavelength - Universal Wave Equation	Waves - An Introduction - Lesson	HS-PS4-1 HS-PS4-2 HS-PS4-3 HS-PS4-4 HS-PS4-5 HS-ESS2-2
1	- Wave behavior - Waves in different mediums - Sound waves in space - The effect of weather - Partial wave reflection - Free and Fixed ends - Interference of waves - Destructive and Constructive Interference - Interference addition	Waves - Transmission, Reflection, and Interference - Lesson	
1	- What we already know - Standing Waves - Nodes and Antinodes - Check Your Understanding - Harmonics	Standing Waves - Lesson	
1	- Sound - Creating Sound - Moving Sound - Inquiry - Noise Cancelling Headphones - The Speed of Sound	Sound, Sound Energy and Speed - Lesson	
1	Hands-on review activity	Sound, Sound Energy, and Speed - Lab Station Activity	
1	Hands-on review activity	The Doppler Effect - Lab Station Activity	
1	Review activity	Tinnitus – Ringing in the Ears - Science Reading Article	
2	Hands-on review activity	Sound Transfer STEM Activity - The Silencer	
1	Review activity	Waves and Sound Unit - Speed Quizzing	
Assessments	There are multiple assessments included throughout this unit portion. UNIT TEST		

The Following Resources are Included

Forms of energy and energy transformations

- [Energy And Its Forms - Lesson](#)
- [Energy and Its Forms - Lab Station Activity](#)
- [Energy and Energy Production - Science Comprehension Article Bundle](#)
- [Energy Forms and Transformations Word Search and Scramble Activity](#)
- [Science Story Prompt - Energy - The Energy Explorers and the Temple of Tante](#)

Renewable and Nonrenewable forms of energy

- [Nuclear Energy - Fission and Fusion Lesson](#)
- [Nuclear Energy - Fission and Fusion - Lab Station Activity](#)
- [Nuclear Energy: Fission and Fusion - A Science Reading Comprehension Resource](#)
- [Fission vs Fusion Infographic Assignment](#)
- [Fossil Fuel and Nuclear Energy Production – A Digital Scavenger Hunt Activity](#)
- [Renewable Energy - Lesson](#)
- [Renewable Energy - Lab Station Activity](#)
- [Renewable Energy Production – Digital Scavenger Hunt Activity](#)

Heat transfer methods and specific heat capacity

- [Thermal Energy, Temperature and Heat - Lesson](#)
- [The Insulator – Thermal Insulator Challenge](#)

Who's It For?

- High School Physical Science Teachers
- Teachers using NGSS
- Teachers who want to increase their student's engagement and retention
- Teachers not looking to reinvent the wheel

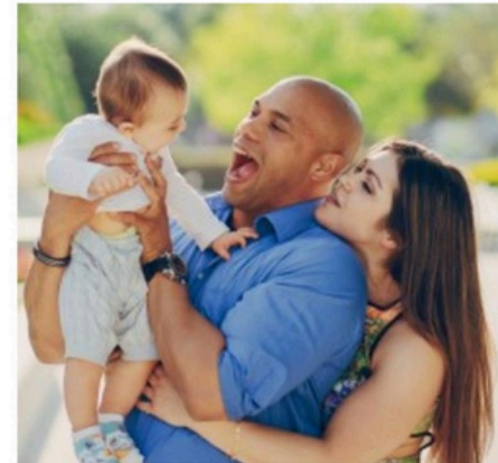


Save yourself the **STRESS AND TIME**



TWF

Spend your time WISELY



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