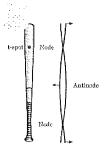
D) Standing Waves

standing wave- a wave pattern that results when two identical waves travel in
opposite directions and interfere (waves that reflect and bounce back)
Sketch of a standing wave:
node- a point on a standing wave that has very little movement
antinode- a point on a standing wave where the MAXIMUM Why of the occurs

Answer the following questions from the ESPN Sports Figures 10-minute video.



1. Explain why baseball bats have a "sweet spot."
but vibrates and sets off standing wave
* bull hit at node-won't vibrate * lose energy vibrations waste energy-won't go as fur

2. Bats break not because the players are hitting so hard but because of <u>excessive</u>!

3. Will a baseball generally travel further with a wooden bat or an aluminum bat? Explain your answer in physics terms.

your answer in physics terms.

Aluminum Shiffer than word - less vibration - more energy into ball -> hit farthet

Quote from Justin Morneau after hitting a homerun: "It feels almost effortless. You don't have that resistance; it just hits the sweet spot, as they call it, and it feels like it just jumps off of there. It doesn't have any vibration or anything. It just feels good."

Electromagnetic Spectrum:

Why can't we see radio waves?



Radio Microwaves Infrared visible Ultraviol wavelength frequency Radio Waves: Produced by combining an Audio wave wavelength of the speed of light, so v = 3x/108 m/s EX: Find the wavelength for K102.1 FM. (2.94 m) In frequency wavelength or K102.1 FM. (2.94 m) wavelength of the wavelength for K102.1 FM. (2.94 m)	x-ray gamma wavelength frequency
Find the wavelength for K102.1 FM. (2.94 m) Frequency	1
Radio Waves: Produced by combining an Audio wave wave and average sound converted to electrical currents. Carrier wave = steady, high frequency wave that changes when combining an Audio wave = steady, high frequency wave that changes when combining are measured in Megat Hertz (MHz) 1 M KDWB 101.3 = 101.3 × 106 HZ Wave looks like: AM stands for Amplitude Medulation AM stations are measured in Kailo Hertz (kHz) 1 kH AM 1500 = 1500×103 HZ ov 1500 UOD Wave looks like: Radio waves travel at the speed of light, so v = 3×108 m/s EX: Find the wavelength for K102.1 FM. (2.94 m) = 102.1×106 HZ 3×108 = (102.1×10	frequency
Audio wave = sound converted to electrical currents Carrier wave = steady, high frequency wave that changes when co M stands for Meyery Mulation FM stations are measured in Megat Hertz (MHz) 1 M KDWB 101.3 = 101.3×10.4 Hz Wave looks like: MM stands for Mulation AM stations are measured in Malation AM stations are measured in Malation AM stations are measured in Malation AM 1500 = 1500×103 Hz or 1500 U00 Wave looks like: Radio waves travel at the speed of light, so v = 3×108 m/s EX: Find the wavelength for K102.1 FM. (2.94 m) FM 500×104 Hz 3×108 m/s AM 1500 = 100.1×10	
M stands for frequency FM stations are measured in Megal Hertz (MHz) 1 M KDWB 101.3 = 101.3×106 HZ Wave looks like: M stands for Amplitude Medulation AM stations are measured in Kilo Hertz (kHz) 1 kH AM 1500 = 1500×103 HZ or 1500 U07 Wave looks like: AM 1500 = 1500×103 HZ or 1500 U07 Wave looks like:	Ţ
FM stations are measured in Megat Hertz (MHz) 1 M KDWB 101.3 = 101.3×10° HZ Available of Megat Hertz (MHz) 1 M KDWB 101.3 = 101.3×10° HZ Am stands for Amplitude Medulation— AM stations are measured in Aio Hertz (kHz) 1 kH AM 1500 = 1500×10³ HZ or 1500 UOO Available of light, so v = 3×10° M/s EX: Find the wavelength for K102.1 FM. (2.94 m) EX: Find the wavelength for K102.1 FM. (2.94 m) EX: Find the wavelength for K102.1 FM. (2.94 m)	Holined with dodlo wave
Wave looks like: What stands for amplitude modulation AM stations are measured in kilo Hertz (kHz) 1 kH AM 1500 = 1500×10^3 Hz or 1500×10^3 Vave looks like: Addio waves travel at the speed of light, so $v = 3 \times 10^8$ m/s EX: Find the wavelength for K102.1 FM. (2.94 m) $3 \times 10^8 = (103.1 \times 10^8)$	Hz = 10 ⁶ Hz)
AM stands for <u>amplitude</u> <u>medulation</u> AM stations are measured in <u>kilo</u> Hertz (kHz) 1 kH AM 1500 = 1500×10^3 Hz or 1500×10^3 Vave looks like: Acadio waves travel at the speed of light, so $v = 3 \times 10^8$ m/s EX: Find the wavelength for K102.1 FM. (2.94 m) $3 \times 10^8 = (103.1 \times 10^8)$	-
AM stands for <u>Amplitude</u> <u>Madulation</u> AM stations are measured in <u>Kaio</u> Hertz (kHz) 1 kH AM 1500 = 1500×10^3 Hz or 1500×10^3 Wave looks like: Radio waves travel at the speed of light, so $v = 3 \times 10^8$ m/s EX: Find the wavelength for K102.1 FM. (2.94 m) $3 \times 10^8 = (102.1 \times 10^8)$	frequency of wo
Nave looks like: Radio waves travel at the speed of light, so $v = 3x/0^8 m/s$ EX: Find the wavelength for K102.1 FM. (2.94 m) $3x/0^8 = (103.1 \times 10^8)$	frequency of wo changes
Nave looks like: Radio waves travel at the speed of light, so $v = 3x/0^8 m/s$ EX: Find the wavelength for K102.1 FM. (2.94 m) $3x/0^8 = (103.1 \times 10^8)$	
Nave looks like: Radio waves travel at the speed of light, so $v = 3x/0^8 m/s$ EX: Find the wavelength for K102.1 FM. (2.94 m) $3x/0^8 = (103.1 \times 10^8)$	= 1000 Hz)
Radio waves travel at the speed of light, so $v = \frac{3x/0^8 m/s}{3x/0^8 = (103.1 \times 10^8 + 103.1 \times 10^8 = (103.1 \times 10^8 = (103.$	HZ
EX: Find the wavelength for K102.1 FM. (2.94 m) $3 \times 10^8 = (102.1 \times 10^8)$	amplitude Cheio changes
EX: Find the wavelength for K102.1 FM. (2.94 m) $3 \times 10^8 = (102.1 \times 10^8)$	changes
=102.1×106 HZ 3×108=(102.1×10	
3×108=(102.1×10	
5 . N .	6))
· 3×10 ⁸ m/s	94m
X: Find the wavelength for AM 1500. (200 m)	777N
= 1500×10 ³ Hz 3×108= (1500×10	λ
•	00m × covers lon distance
Do you think AM or FM works better for music? WHY?	with alsiand

frequencies are not ones that our eyes are receptive to visible light = 400-750nm 4