Day 5 Resonance Sound Wave interference Demo Harmonics Motor on String Demo

1. **Last day to pay for Great America**
2. **Video Tacoma Narrows Bridge**
3. **Nationalities in this classroom summary German 24 Polish 15 Irish 8 English/Norwegian 7 French/Hmong 5 Italian 4**
4. **Phet interference of sound waves and demo**
5. **Wine glass resonance**
6. **Vibrating motor on a string harmonics**

Resonance

- It was an innocent experiment. Tesla had attached a small vibrator to an iron column in his New York City laboratory and started it vibrating. At certain frequencies specific pieces of equipment in the room would jiggle. Change the frequency and the jiggle would move to another part of the room. Unfortunately, he hadn't accounted for the fact that the column ran downward into the foundation beneath the building. His vibrations were being transmitted all over Manhattan.
- For Tesla, the first hint of trouble came when the walls and floor began to heave (ref 1). He stopped the experiment just as the police crashed through the door. It seems he'd started a small earthquake in his neighborhood smashing windows, swayed buildings, and sending panicked neighbors rushing into the streets. The police had frequently responded to complaints about Tesla's unusual activities.

- http://www.intuitor.com/resonance/index.php

Resonance

- In physics, **resonance** is the tendency of a system to oscillate at a greater amplitude at some frequencies than at others. These are known as the system's **resonant frequencies** (or *resonance frequencies*). At these frequencies, even small periodic driving forces can produce large amplitude oscillations, because the system stores vibrational energy.

Day 5 Resonance

- http://phet.colorado.edu/en/simulation/sound

SOUND DEMO WITH WHOLE CLASS PARTICIPATING

Now Rows 1 and 2 stand and walk slowly trying to line yourself up at one spot that sounds louder as you move you head back/forth at that spot. Now rows 3,4, and 5 try

Note higher frequency has shorter wavelengths

- https://www.youtube.com/watch?v=oXV45t6wlWU

Day 5 Resonance

- http://www.physics.ucla.edu/demoweb/demomanual/acoustics/effects_of_sound/breaking_glass_with_sound.html

- Breaking wine glass with sound above
- http://www.ccmr.cornell.edu/education/ask/index.html?quid=1143
- Why the wine glass makes a noise above

Day 5 Resonance

- http://www.phys.unsw.edu.au/jw/strings.html#modes
- Harmonics above
- Fundamental 1st harmonic
- 2nd harmonic etc.
- How many wavelengths.