

# Music and Physics

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## INTRODUCTION Laser Music

### SOUND WAVES:

Air Wave Model: Slinky: Longitudinal Waves  
Water Wave Model: Spring: Transverse Waves  
Singing Rod: Which is it?

### HELIUM BALLOONS

Sound affect by medium

### GUITAR: SOUND TO MUSIC

Vibrating String: and spring model

### SINGING TUBE:

Singing Tube Arpeggio  
Vacuum Effect  
Bernoulli Effect w / paper

### TRUMPET:

Harmonic Tone Series  
Model Discrete Frequencies  
Scales and Harmonic Series:  
High & Low notes  
Piccolo & E-flat comparison

### TIMBRE\* OF INSTRUMENTS:

\*Pronounced like timber, but means different  
Harmonic Fingerprint  
Trumpet vs. Clarinet  
Computer Timbres

### INTERFERENCE

Octave, 5th, 4th, 2nd, ...  
Tuning Forks  
Visual Analog: Same or Different?  
Beats, & Computer Beats  
Doppler Effect; how to measure  $\Delta f$

### NAME THAT TUNE:

Bugle Calls  
Wm Tell Overture. Composer? (Not Tonto)  
Star Spangled Banner  
In The Mood  
Woody Woodpecker *or* Malcom Arnold Quintet  
Handel Fireworks *or* Mozart Concerto

### FINALE: Star Wars Tape

### EQUIPMENT:

Laser Setup  
  
Slinky  
Spring or Rope  
Tuning Forks  
Singing Tube  
Singing Rod & Rosin

He Balloons

Cut Paper Holes  
Visual Int. Handout  
Visual Int. Overheads

Mac Disk:  
Sound Demo  
MathReader

Trumpet  
Guitar  
Clarinet

Tape Recorder  
Star Wars Tape