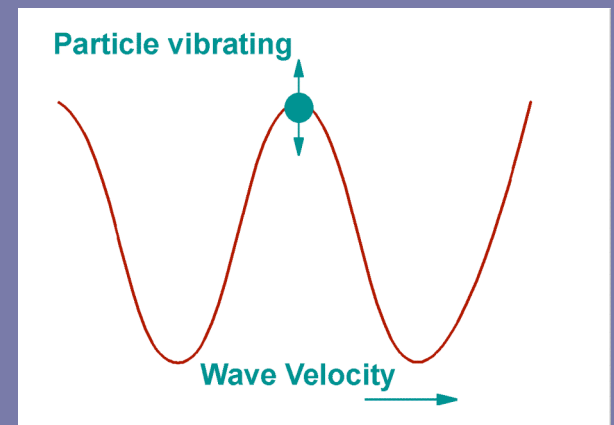
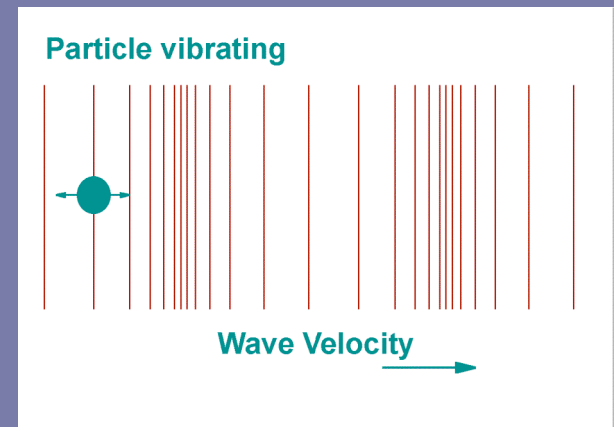


Waves & Sound

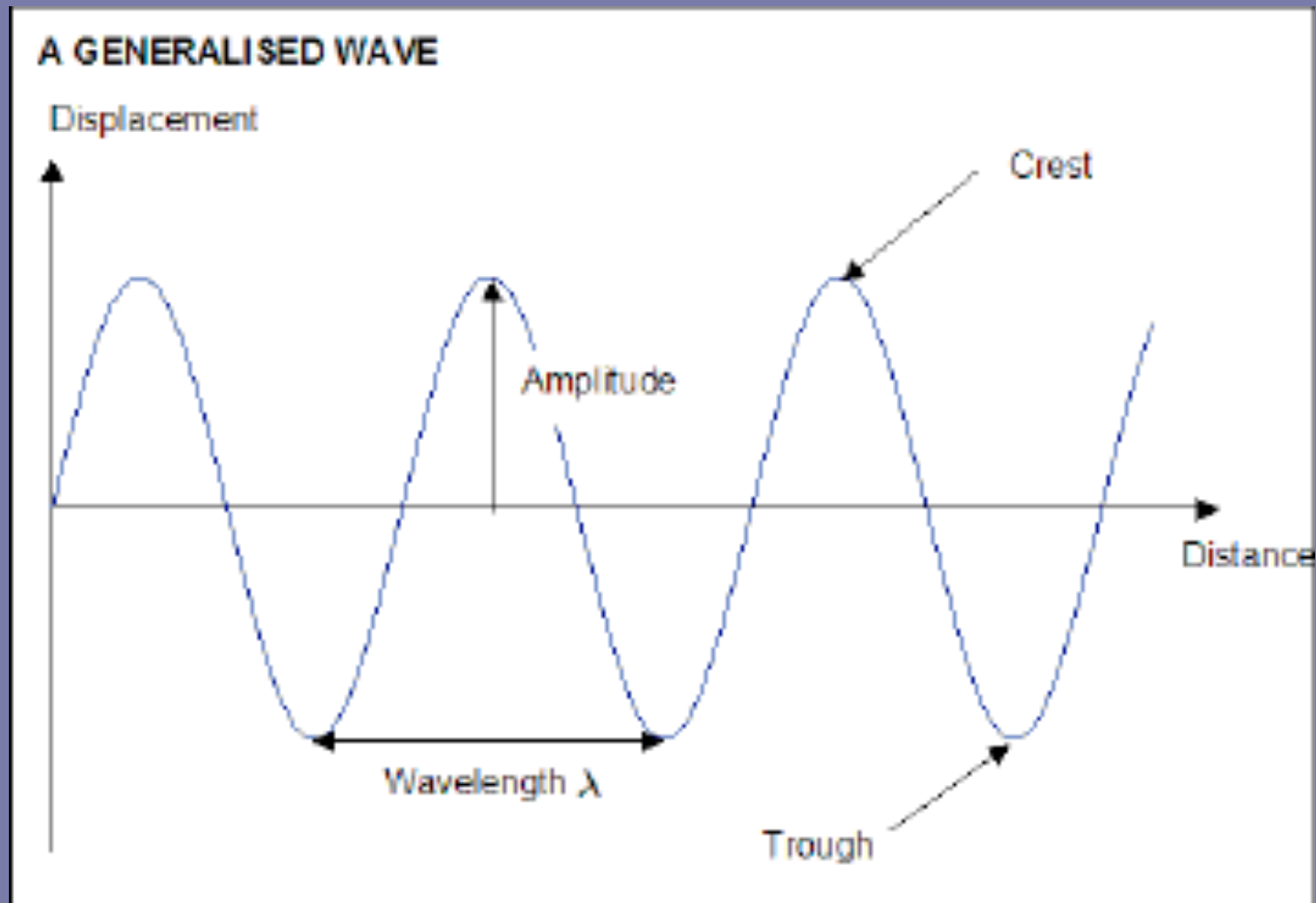
June 21, 2007

What's a wave?

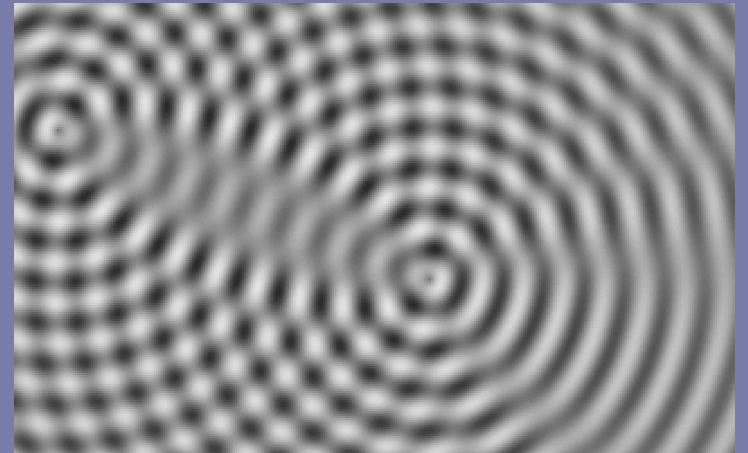
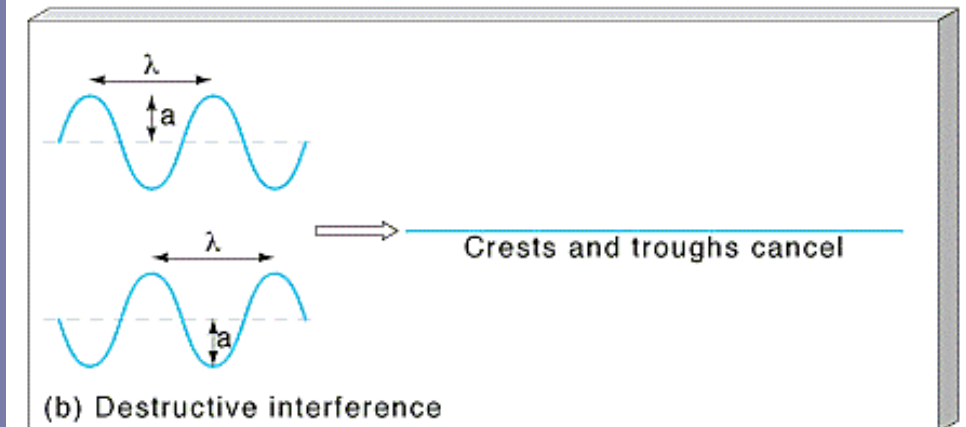
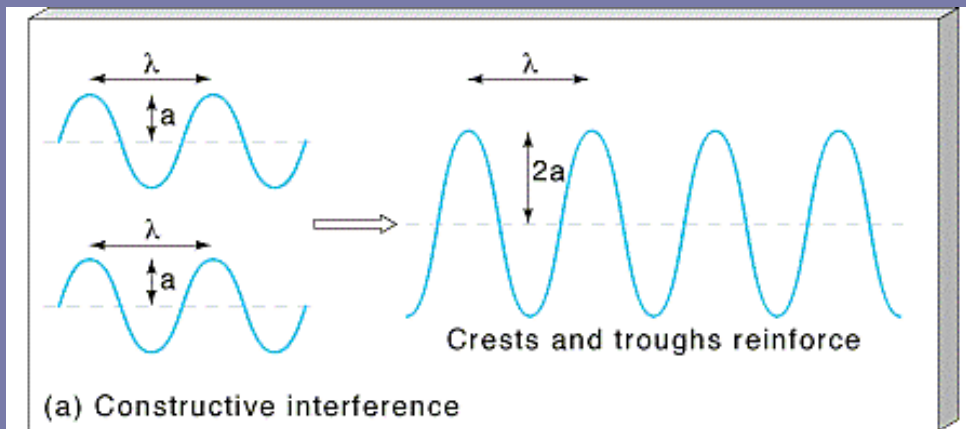
- **Logitudinal** = disturbance is in direction of propagation
- **Transverse** = disturbance is perpendicular to direction of propagation



Parts of a wave



Wave Interference



How fast does a wave move?

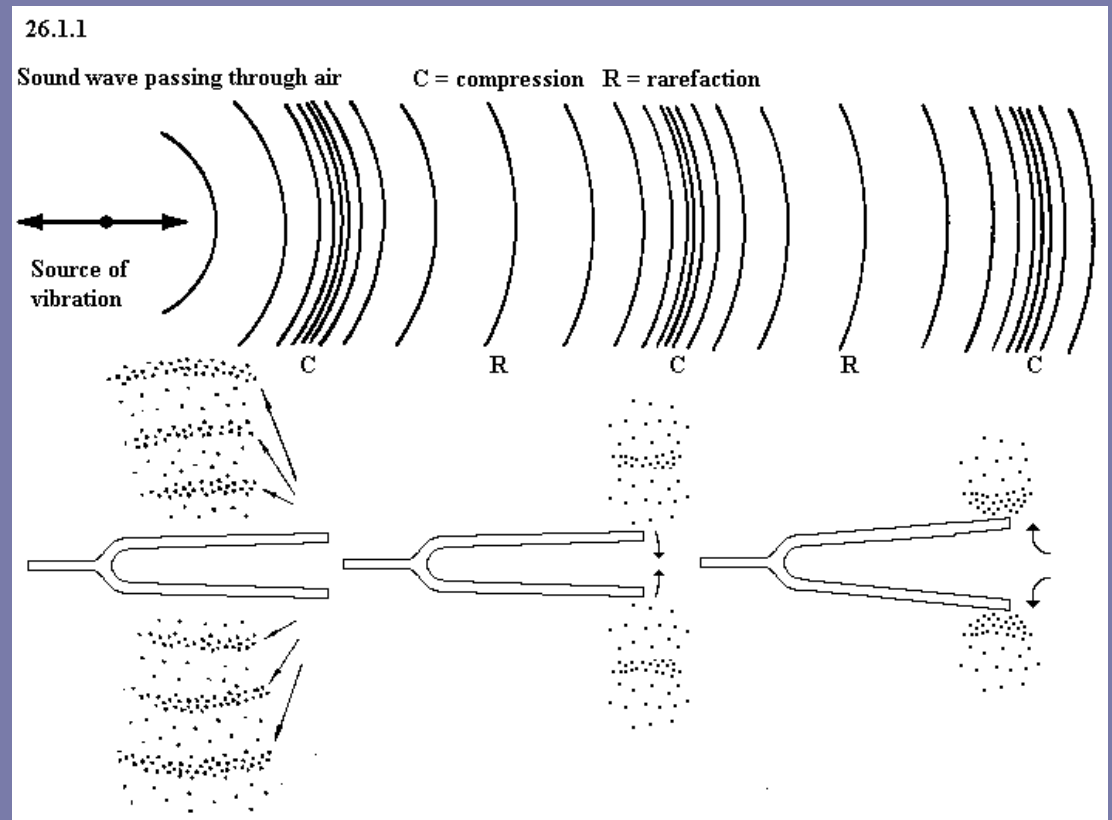
Velocity = frequency * wavelength

$$v = \nu \lambda$$

Wave speed depends on the medium.

How is sound a wave?

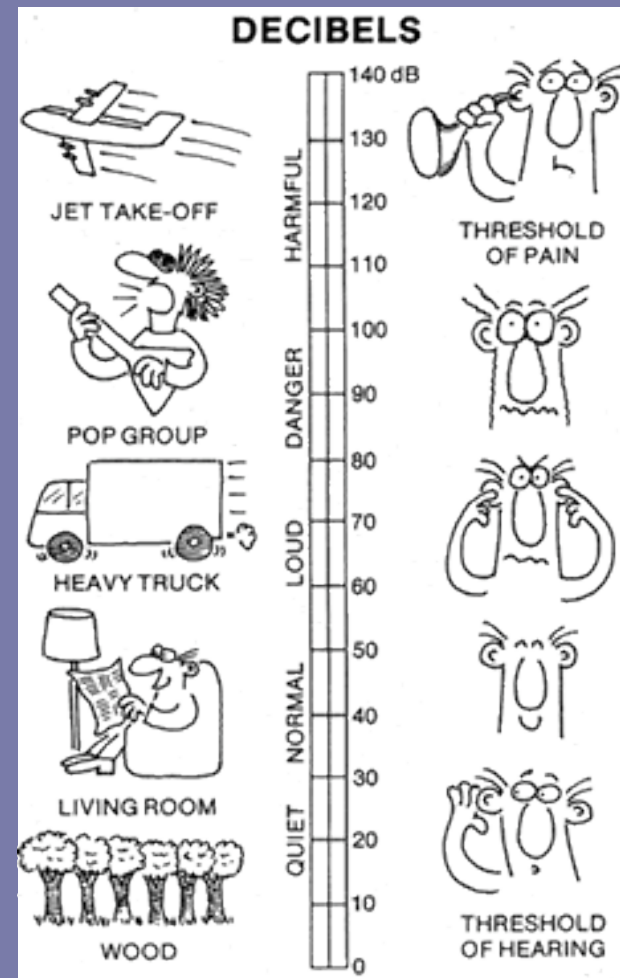
- Sound waves are **vibrations**.
- Longitudinal or transverse?



How loud is that sound?

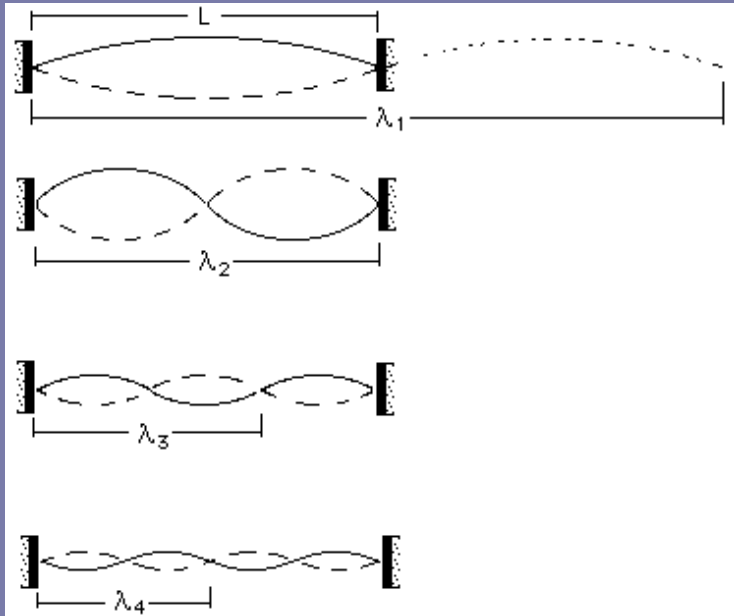
- Decibel scale
 - Logarithmic scale

$$\beta = 10 \log \left(\frac{I}{I_0} \right)$$

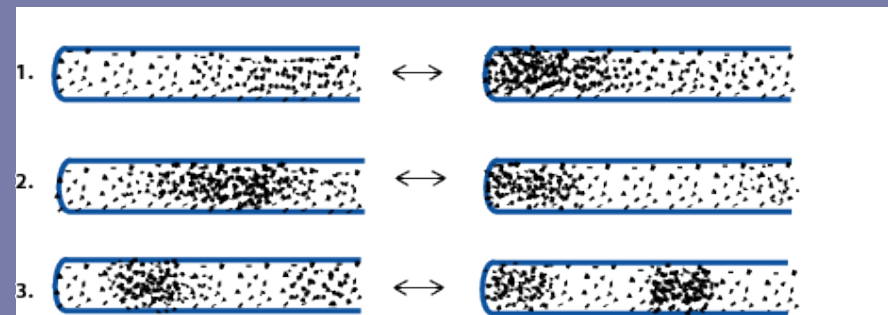
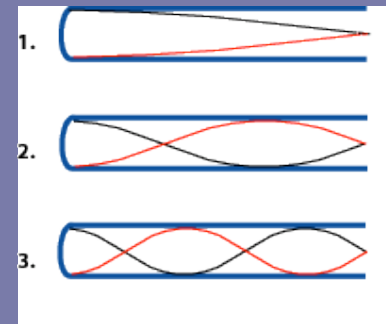


Standing Waves

On Strings



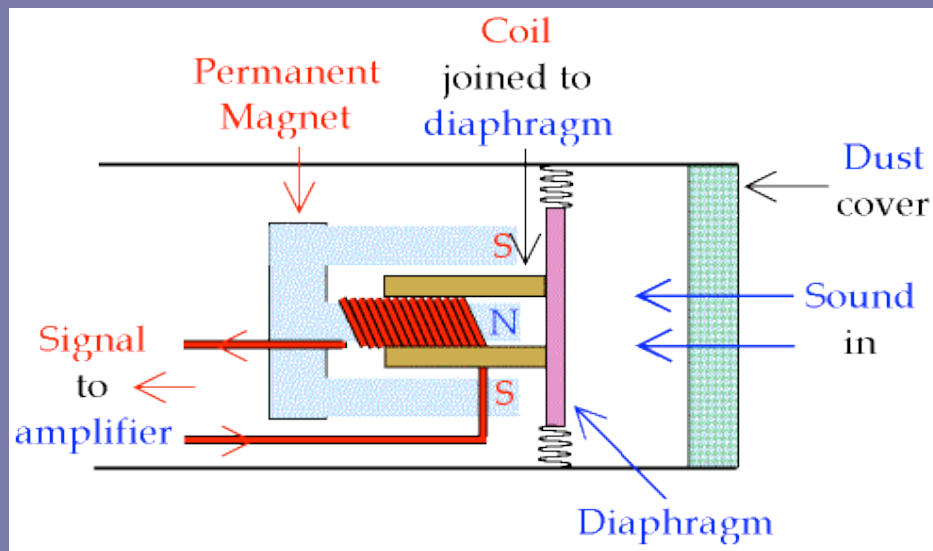
In Pipes



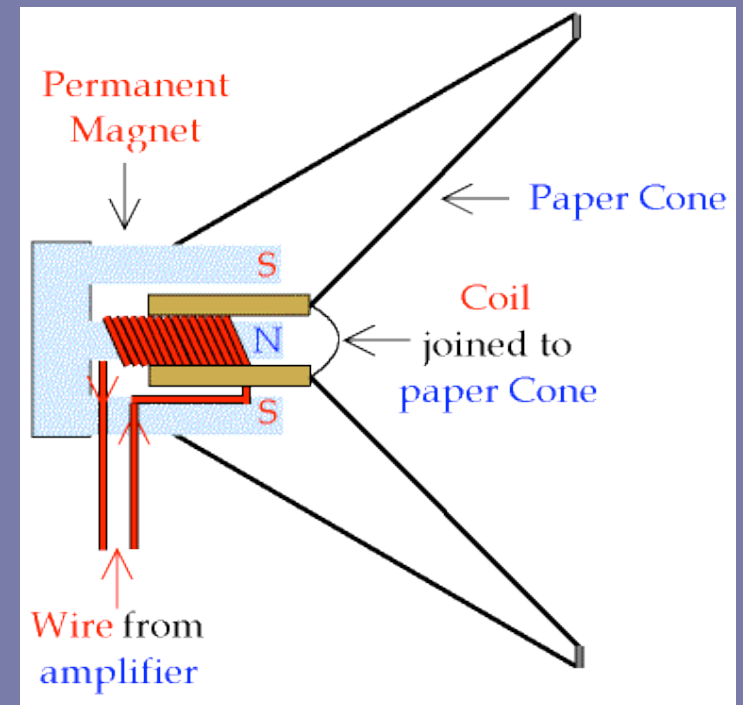
Time to play...

- Find the standing waves
 - String Instruments
 - Pipes
- Oscilloscope Waveforms

How does a microphone work?



Microphone



Speaker

Energy revisited

- What energy transformations have we seen today?