Standing Waves:

Standing waves are a special case of interference.

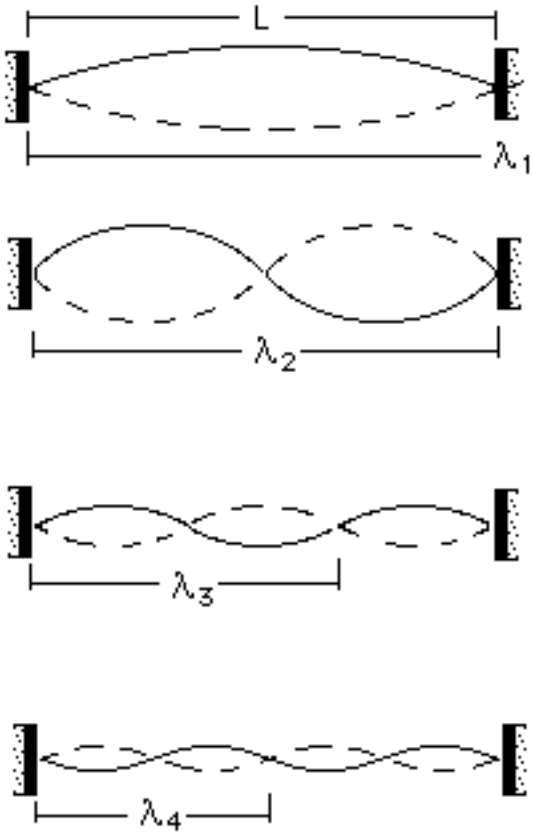
When two waves with the same frequency travelling in the same mediu meet, this standing wave pattern will be created.

It is very difficult to generate two waves of exactly the same frequency, this is usually observed when an incident wave meets its reflection. When this occurs, there are areas of constructive interference called **antinodes** and areas of total destructive interference called**nodes.**

Demo the slinky ...

http://zonalandeducation.com/mstm/physics/waves/standingWaves/standingWaves1/StandingW1.html

Standing waves...fixed on 2 ends



Fundamental

1st Harmonic

$L=1/2\lambda$

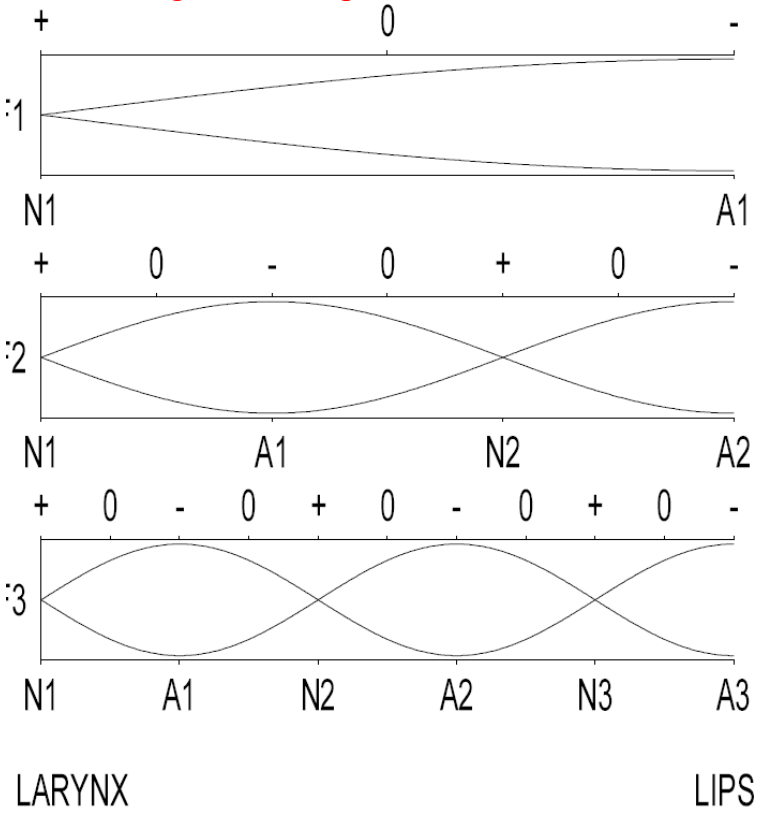
1st Overtone

2nd Harmonic

Ex.1A guitar string is 60.0cm long. What is the wavelength of the fundamer
and the first overtone?

If the temperature is 22C, calculate the frequency of each sound.

Standing waves... open on 1 end, closed on 1 end



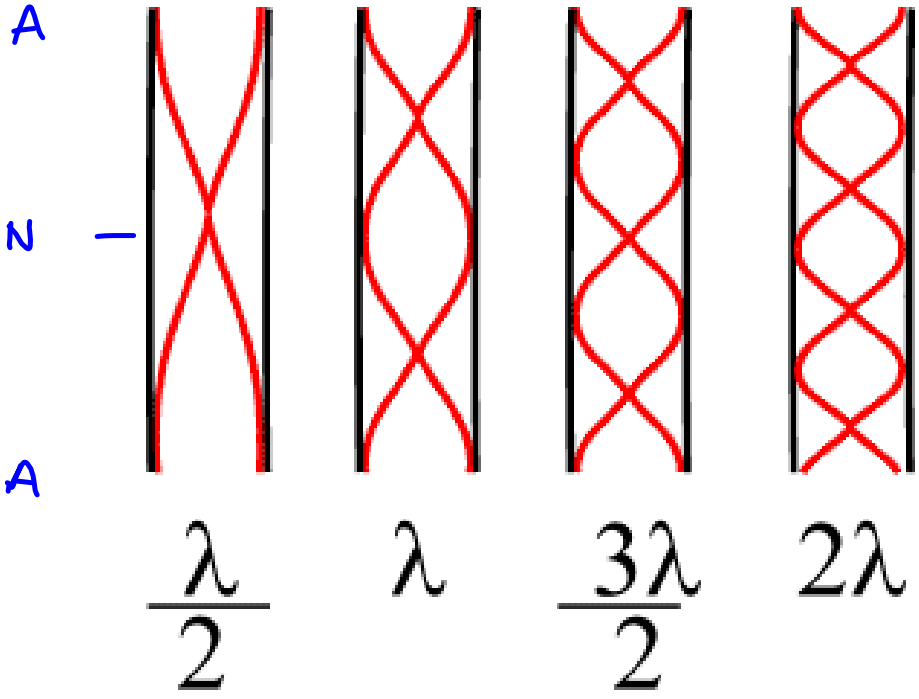
Fundamental

1st Harmonic

$L=1/4\lambda$

Ex.2 If you blow into a Pepsi bottle that is 20.0cm tall, what is the fundamental frequency? (v_{sound} = 340 m/s)

Standing waves... open on 2 ends



Fundamental

1st Harmonic

Ex.3 An organ pipe (open on 2 ends) is 3.00m long. Find the wavelength and the frequency of the fundamental, first and third overtone. The temperature in the room is 20.0°C.

worksheet

lab

STSE