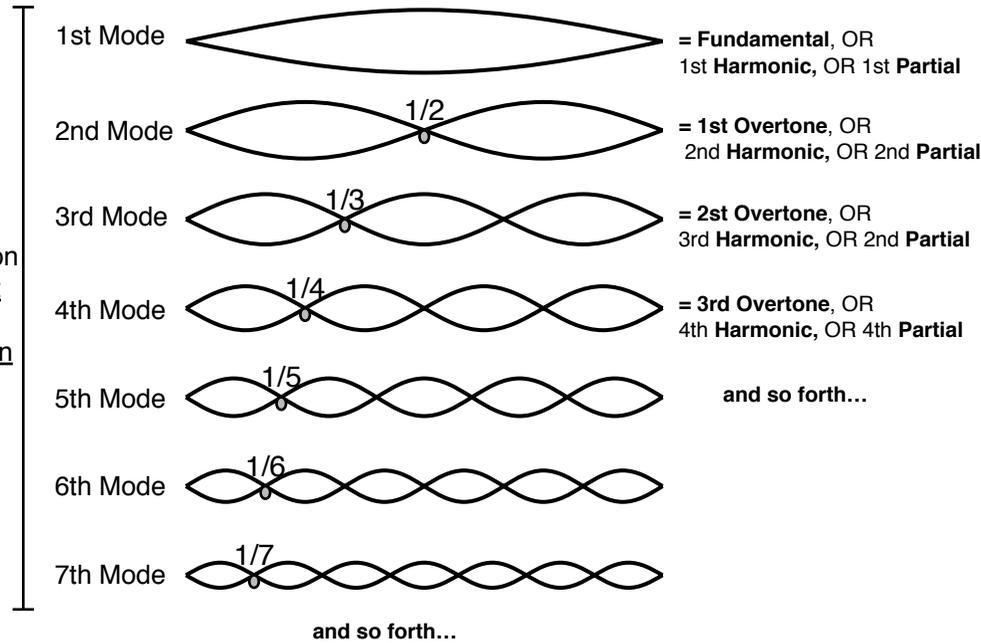


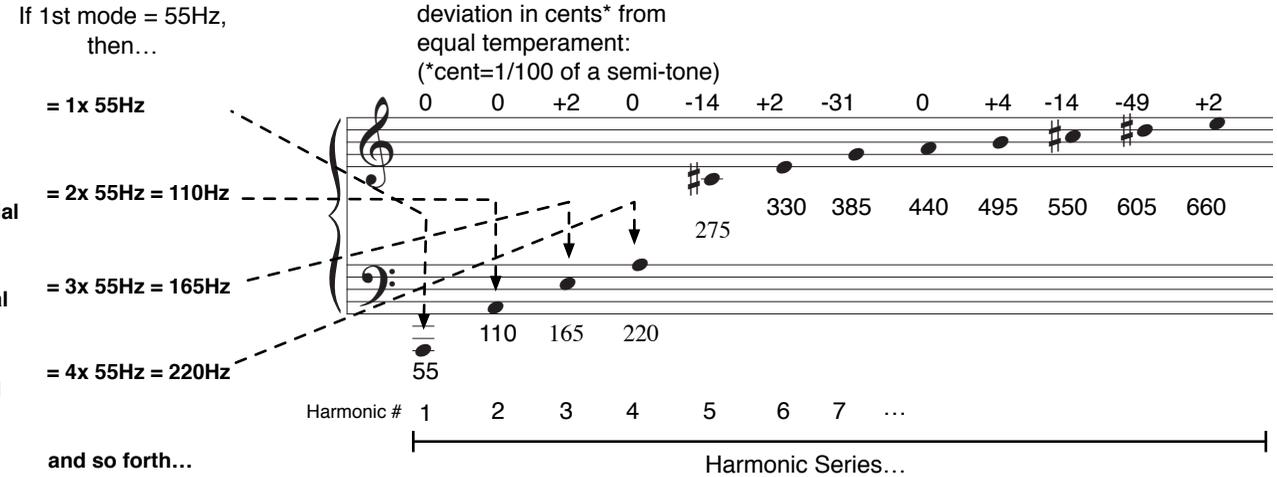
# Harmonic Series Primer

## Modes of Vibration of a String

**IMPORTANT:**  
On an actual string, all these modes of vibration are happening **at the same time** (see animation on class website, week 4)



## Musical Equivalent to Modes of Vibration



### NOTES:

Each mode of vibration produces a simple tone (called a **sine tone**).

The frequencies of each mode of vibration, of each sine tone, is an **Integer** (i.e., whole number) **multiple of the fundamental**

When our brain receives a series of tones related by integer multiple of the fundamental, it automatically groups them together and perceives all the sine tones as *one* tone (i.e., a complex tone) with a specific tone color. The process is called **spectral fusion**.

The perceived pitch of a complex tone tends to be the frequency of the fundamental.