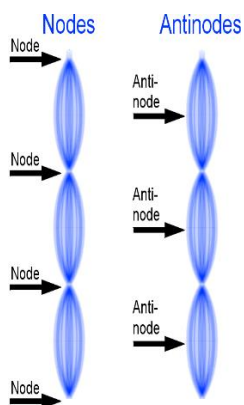


Name _____ Date _____ Block _____

Objectives

- Create standing waves on a vibrating string
- Determine the relationship between wavelength and frequency
- Learn about resonance

The frequency at which objects vibrate is called the natural frequency. Almost everything has a natural frequency, and most things have more than one. We use natural frequency to create all kinds of waves, from microwaves to the musical sounds from a guitar. In this Investigation you will explore the connection between frequency of a wave and its wavelength.



Common Uses of Waves

- Ultrasound uses very high frequency sound waves to make images of the inside of the body
- Light is a wave that has different frequencies we call colors
- Seismic waves are the waves of energy caused by the sudden breaking of rock within the earth or an explosion. Earthquakes!

Part 1

Change the Frequency

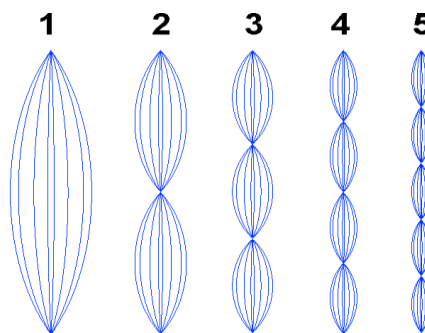
1. **Observe the string as you change the frequency**
2. **Describe What Happens**

Part 2

You need to collect data for 1 – 10 Harmonics [1 – 10 “bumps”]

Complete the following data table as you find the various harmonics.

Each Harmonic has a different frequency and wavelength. Turn the dial to find the different harmonics



The first five harmonics of the vibrating string

FREQUENCY, WAVELENGTH, & SPEED

WIGGLER LAB

Data Collection

Harmonic #	Frequency (Hz)	Wavelength (m)	Wave's Speed (m/sec)
1			
2			
3			
4			
5			
6			
7			
8			
Can you get anymore harmonics? What was the highest number of harmonics you were able to get?			

Part 3

Graph: _____

Part 4

Conclusion

1. What is the relationship between wavelength and frequency?
2. What do you notice about the speeds you calculated? Look at all of them.