

HARMONICS

Name _____

Part C: Standing Waves and Harmonics

Two Types of Waves

Travelling Wave

A wave that moves across long distances. (like a wave on the ocean)

Standing Wave

A wave that stays in place. It is often between two points.

For each wave described, say it if is traveling or standing:

C.1 a wave on the ocean

C.2 a sound wave made by shouting across an open field

C.3 a wave on a string made by the wave machine (if you have done the wave machine lab already)

C.4 a sound wave made inside of an wind instrument
(where the wave of the perfect frequency remains inside of the instrument.)

Parts of a Standing Wave:

Node

A point at which the string does not move.

Antinode:

A point at which the string moves the maximum amount.

Harmonic:

A pattern of nodes and antinodes, created at the correct frequencies.
For this string, they should have *nodes* at the two ends.

Natural Frequencies:

Frequencies at which the harmonics are created.

Oscillation

When something moves back and forth.
Standing waves *oscillate* between two positions.

A point at which a wave moves the maximum amount is called a _____.

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When a standing wave forms a pattern of nodes and antinodes, it is called a _____.

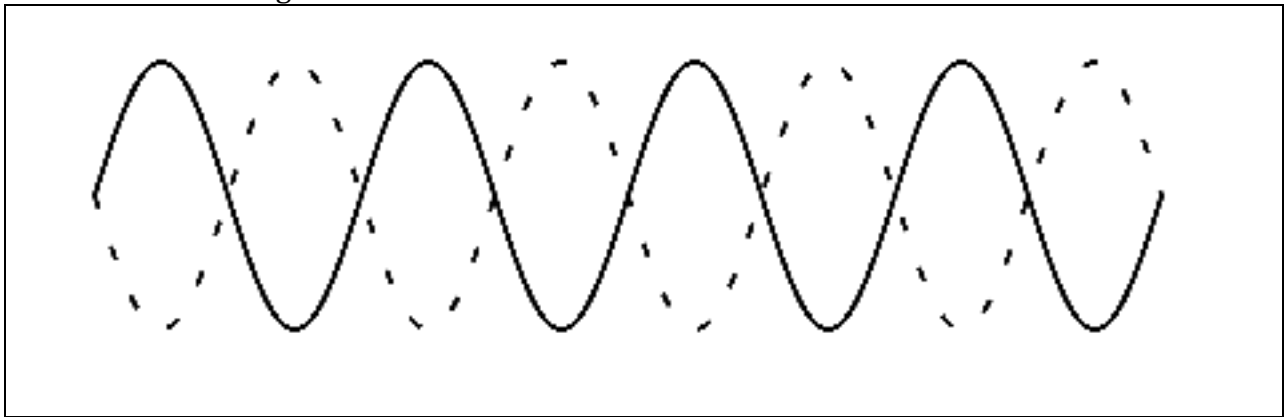
A point at which a wave does not move at all is called a _____.

Whenever something moves back and forth in a pattern, it is called _____.

Harmonics always occur at certain frequencies called the _____.

Diagram of a Standing Wave:

We draw a standing wave like this:



The wave *oscillates* between two forms: the solid line and the dotted line.

The points where they cross are the *nodes*, at which the wave does not move.

The points where they are farthest apart are the *antinodes*.

1. Draw a *dot* at the nodes.

2. Draw a *cross* at the anti-nodes.

3. Look at the solid-line wave. It looks exactly like the simpler waves you drew in the packet called WAVELENGTHS. On this wave, please draw a wavelength on the diagram.