Waves Lab (Student Sheet)
Demonstration Lab
PSI Physics

Name:_____ **Period:**_____ **Date:**_____

This is a demonstration lab. Your teacher will perform the lab and give you the necessary information. Record all of your own calculations, as well as the data given to you by your teacher in the charts below.

Purpose: The purpose of this demonstration is to:
- Illustrate the various parts of a wave
- Calculate the velocity of the waves on a string

Calculations Chart:
Record all of your calculations in the chart below.

Trial	Mass per unit length of string μ	Frequency f	Wavelength λ	Hanging Mass m	Tension $F_T = mg$	Velocity v
1		Hz	m	kg	N	m/s
2	Kg / m	Hz	m	kg	N	m/s

Calculate trial 1 velocity here:

$$v = \lambda f \qquad\qquad\qquad v = \sqrt{\frac{F_T}{\mu}}$$

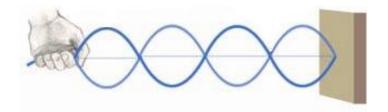Calculate trial 2 velocity here:

$$v = \lambda f \qquad\qquad\qquad v = \sqrt{\frac{F_T}{\mu}}$$

Conclusion Questions:

1. Identify each of the following parts and values on the wave diagram below: node, antinode, crest, trough, wavelength, and amplitude.

2. Suppose you are asked to repeat this experiment. You are given a 200 g mass, a string with $\mu = 3.85 * 10^{-3}\ kg/m$, as well as the rest of the apparatus.
   a. Calculate the speed of sound from the mass density (μ) and the weight of the hanging mass.

   b. When you run the experiment you get a standing wave with:

Frequency	Wavelength
20 Hz	0.92 m

   Calculate the velocity of the waves from this data.

3. A variety of attributes could cause the two velocities recorded during the demonstration to be slightly different from each other. Suggest two.