

Physics 140 Discovery Room #8

9.1 pendulum; 9.2 standing waves, string and wind instruments; 10.1 electric charge, static cling

Name _____

Date/Time _____

Harmonic Oscillators

Mass on spring: Measure the period of oscillation for a mass on the end of a spring using a stopwatch (a useful trick is to measure the time for 10 periods, and then divide your result by 10). Now change the mass on the spring and again measure the period.

1. Does the period depend upon the mass? Why or why not?

Now change the amplitude of oscillation and measure the period again.

2. Does the period depend upon the amplitude? Why or why not?

Use the same mass and a different spring and again measure the period of oscillation.

3. Does the period depend upon the spring constant? Why or why not?

Adjustable Pendulum: Use a stopwatch to measure the period of oscillation for the pendulum. Add some clay to the pendulum bob and measure the oscillation period.

1. Does the period depend upon the mass? Why or why not?

Change the length of the pendulum and measure the period of oscillation.

2. Does the period depend upon the length of the pendulum? How?

Standing Wave with String and Weight

Attach the 100 g weight to the string and vary the driving frequency to produce standing waves.

1. What are the frequencies of the 1st and 2nd harmonics? Identify the nodes and anti-nodes.

2. Now switch out the 100 g for a 200 g weight. How did the frequency of the 1st harmonic change? Why did this happen?

Adjustable Organ Pipe with air and Helium

Listen to the frequency as you change the length of the pipe.

1. How and why does the frequency change with the length for a closed-ended pipe?

2. How and why does the frequency change when you go from a closed-ended pipe to an open-ended pipe?

3. How and why does the frequency change when the air is replaced by Helium?

Fun Fly Stick

1. Use the Fun Fly Stick to float a piece of mylar. Why do you have to touch the end of the stick to the mylar before it will be repelled?

2. Have someone else touch the mylar while it is floating. What happens? Why?

Using the margins of this sheet of paper, write down a question regarding a topic, concept, or example you do not understand from this week in PHYS140.