B-Day: Due Thurs., Feb 1 (Assigned: 1/30)
A-Day: Due Fri., Feb 2 (Assigned: 1/31)

Harmonic Motion 7

Test is coming this week. You MUST go over the homeworks. No review I can give will go thru all the information.

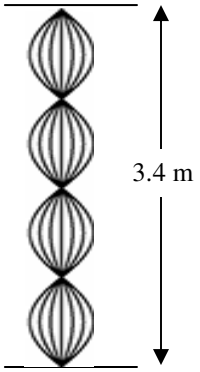
1) If a 32 cm pendulum has a period of 1.2 seconds, find the force of gravity on the pendulum.

2) A Spring has a spring constant of 60 N/m. If it has a mass of 25 kg attached to it, how far will it stretch?
   A) You have two equations that include a spring constant. Write them both:
   B) Were you asked to find period or anything else relating to time?
   C) SO, which equation must do you need to use?
   D) Your equation (known as Hooke's Law) does not have mass in it, so the mass must really be the _____ in the equation.
   E) Solve.

3) If you put a smaller mass on the above spring, how will the equilibrium position change?

4) If a pendulum oscillates (swings back and forth) 36 times in 20 seconds, find its period.

5) If a spring oscillates 40 times in 6 seconds, find its frequency.



320 Hz

6) Use the harmonic at the right to answer the following:
   A) Which harmonic is it?
   B) How many wavelengths is it?
   C) What is this harmonic's wavelength?
   D) Since you have its frequency and wavelength, find the speed of the wave on this string.
   E) If we plucked this string, what frequency would we get?
   F) Would we be able to hear it?
   H) How many antinodes is the fundamental for this space?
   I) Find the wavelength for the fundamental.
   J) If you increased the amplitude, draw how the harmonic would change.

7) Whilst on a trip to Colorado you and your friends stop at Black Canyon of the Gunnison National Park. Your friends ask you just how deep the canyon is. Having been a hot-shot student in Mr. Murray's Physics class, you pull out your trusty stopwatch ("GEEK!"), clap loudly, and record 3.24 seconds for the echo to return.
   A) This 3.24 seconds, is this the time for the sound to go down or down and back?
   B) Find how deep the canyon is. *(By the way, this depth is correct. Check it out on the web.)*

8) How much louder do we perceive a 20 dB difference?

9) If each 10 dB change is 10 times the sound intensity and 2 dB is 100 times the sound intensity, if a sound changes from 70 to 100 dB, how much of a sound intensity change is this?

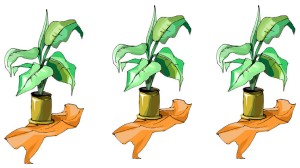
10) When I blew into the bottles, did the frequency (pitch) go up or down as the amount of water increased?
11) When I struck the bottles, did the frequency go up or down as the amount of water increased?
12) Using the above information and what you know about masses on springs, explain all of these in one statement.

13) Why did the bridge "Galloping Gertie" collapse due to the wind? (*And I'm looking for a particular word.)*

14) What do we call a variable that doesn't change in an experiment?

15) What do we call a variable that we change in an experiment?

16) How many variables do we change in a good experiment?
17) Why?



Plant Food A *Plant Food B* *No Plant Food*

Start	10 cm	10.1 cm	9.8 cm
week 1	11.1 cm	12.2 cm	11.8 cm
week 2	12.7 cm	14.5 cm	13.2 cm

18) What is the control setup for this experiment?

19) Which plant food is better?

20) What does the "No plant food" setup tell you about plant food A?

21) So, explain to me why a control setup is important.

22) Explain to me why we rarely have a control setup in physics. (Think back to the pendulum or spring experiment.)

23) What is the basic purpose of the scientific method. (It is very basic.)

24) Why is it so important for scientists to record their procedures.

25) In a few weeks we will be studying electricity. Electric circuits have three quantities: voltage (given by batteries, etc); resistance (light bulbs or other energy using devices); current (the flow of electrons). The amount of current is what you will record by the brightness of the bulbs.
   A) What would be the x-axis or manipulated (independent) variables?
   B) What would be the y-axis or responsive (dependent) variable?
   C) Write a data table below that would be a good experiment to determine how resistance affects current. *(Be sure to use actual electrical devices in your data table to show more or less resistance or voltage [like number of batteries, etc.])*

Experiment Writeup:
1) *Don't waste my time. If you write a 3 page write up I will not read it. It only needs to be a page.*
2) *I don't care if it is typed, but I need to be able to read it.*
3) *You need this format:*
   A) Purpose of the lab: what you wanted to figure out.
   B) Procedures: include your variables, which ones stay the same, what change, etc.
   I might be very happy if I knew how you measure things. (It's a procedures-thing.) :)
   C) Give me your data in 3 tables, labeling them as for what each is designed to study.
   D) Make a definitive conclusion. What affects the period of a spring. Refer to your data to make it beyond any doubt. Convince me!