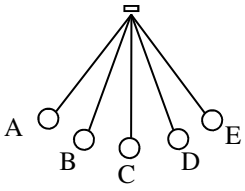
B-Day: Due Mon., Jan 22 (Assigned: 1/18)
A-Day: Due Tues., Jan 23 (Assigned: 1/19)

Harmonic Motion 2

1. Give the variables and units for the following quantities:
   A. Period: _____; B. Amplitude: _____; C. Frequency: _____; D. Wavelength: _____

2. Using Figure 1 at the right answer the following:
   A. If you start at A, when does 1 cycle end?
   B. If you start at E, when does 1 cycle end?
   C. If you start at B going right, when does one cycle end?
   D. If you start at C going to the left, when does one cycle end?
   E. Which letter is the equilibrium position?
   F. In one cycle, how many times does the pendulum pass thru the equilibrium position?
   G. If from A to E is 60°, what is the amplitude of the pendulum?
   H. How many amplitudes does it go thru in one full cycle?
   I. If it takes 0.3 seconds to go from A to E, how long is one period?

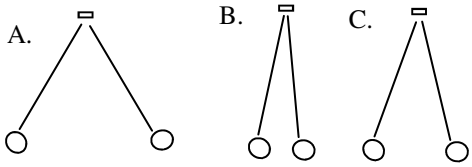
Figure 1



3. If the period of a pendulum is 4 seconds, find the frequency of the pendulum.

4. If the frequency of a wave is 1.35 Hz, find its period.

5. If the frequency of a wave is 0.02 Hz, find its period.



6. If the frequency is bigger, the period is _____.

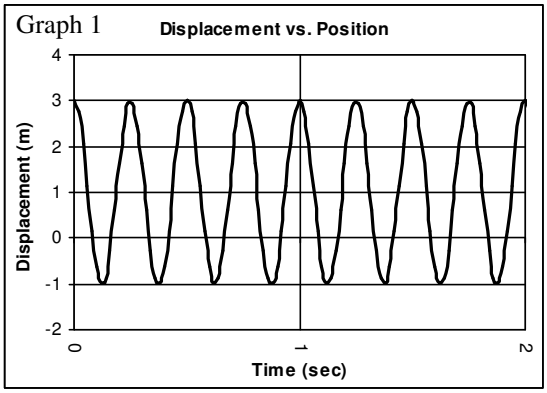
7. Looking at the pendulums at the right, which has the greatest amplitude?
8. Which one of the pendulums has the most energy?
9. Which pendulum has the least energy?
10. So, more amplitude = _____.

11. Use Graph 1 to answer the following:
    A. What is the amplitude of the graph?
    B. How many cycles happen in 1 second?
    C. So, find the frequency shown on Graph 1.

    D. Find the period shown on Graph 1.

    E. Over time, Graph 1 will d_____. Where will it come to rest?

Graph 1



12. Transverse or Longitudinal wave (see notes "Waves")?
    A. ____ A wave is oscillating left and right and moving to the left
    B. ____ A wave is oscillating left and right and moving up.
    C. ____ A wave is oscillating up and down and moving to the left.
    D. ____ A wave is moving up and down and moving up.
    E. ____ Sound. F. ____ Light.

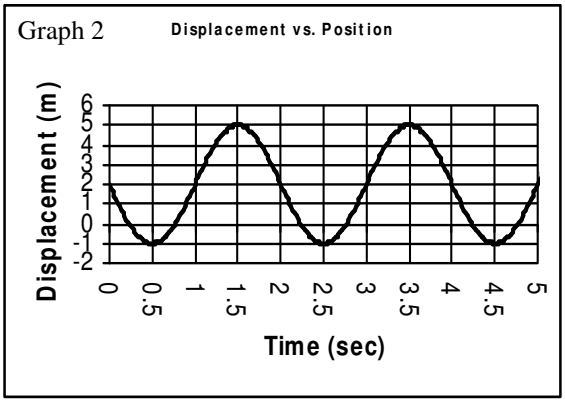
13. Use Graph 2 to answer the following:
    A. Find the amplitude.
    B. Find the period.

    C. Find the frequency.

    D. How many cycles are shown?

    E. What is the equilibrium position?
    F. Mark the crests and troughs?
    G. Mark one cycle starting at 1 second.

Graph 2



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Pendulum equation is on the notes: "Harmonic Basics."

14. If a pendulum is 4 m long, find its period.

15. If a pendulum is 20 cm long, find its period (length must be in meters for the formula to work)

16. Using the equation for the period of a pendulum. Solve for "g". (No numbers, just variables.)

From the Lab:

17. Why did we measure 10 cycles instead of 1 (*be specific and complete in your explanation*)?

18. What is the experimental variable in Table 1?
19. What are the control variables in Table 1?
20. What are you trying to understand in Table 1?

Table 1

Mass	Length	Amplitude	Period
14g	10 cm	10°	.64 sec
14g	15 cm	10°	.79 sec
14g	25 cm	10°	1.1 sec

21. What are you trying to understand in Table 2?

Table 2

Mass	Length	Amplitude	Period
14g	10 cm	10°	.64 sec
20g	15 cm	15°	.79 sec
5g	25 cm	25°	1.1 sec

22. Write your conclusion statement from the Lab below. Remember that a conclusion statement makes a decision about what happens and why. You must make the statement and support it with evidence from the lab. It is legitimate and logical to give data to support your statement.

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