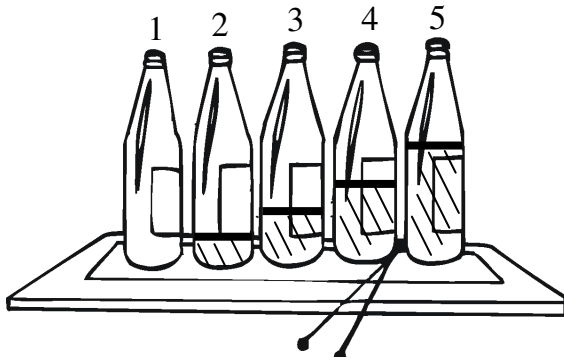


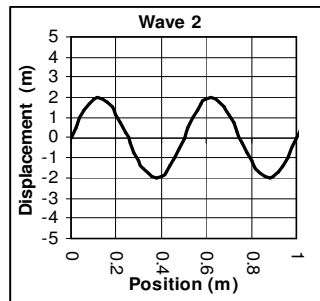
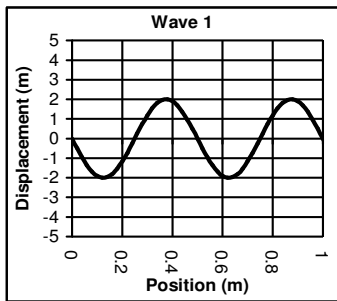
2009 Harmonic Motion 6



- Which bottle will have the lowest note when I blow in it?
 - Which bottle will have the highest note when I hit it?
 - When you blow in the bottle, which has the shortest wavelength?
 - When you hit the bottle, which has the longest wavelength?
 - When you blow in the bottle what is vibrating: air or water?
 - When you hit the bottle, what is vibrating: air or water?
 - When you blow in the bottle, is the opening a node or antinode?
 - When you blow in the bottle, how many wavelengths long is it?

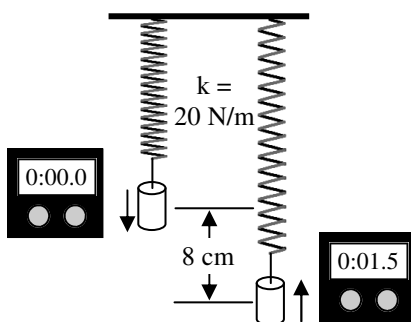
From "Ancillary Sound Topics":

- 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. Find how deep the canyon is. (By the way, this depth is correct. Check it out on the Internet.)



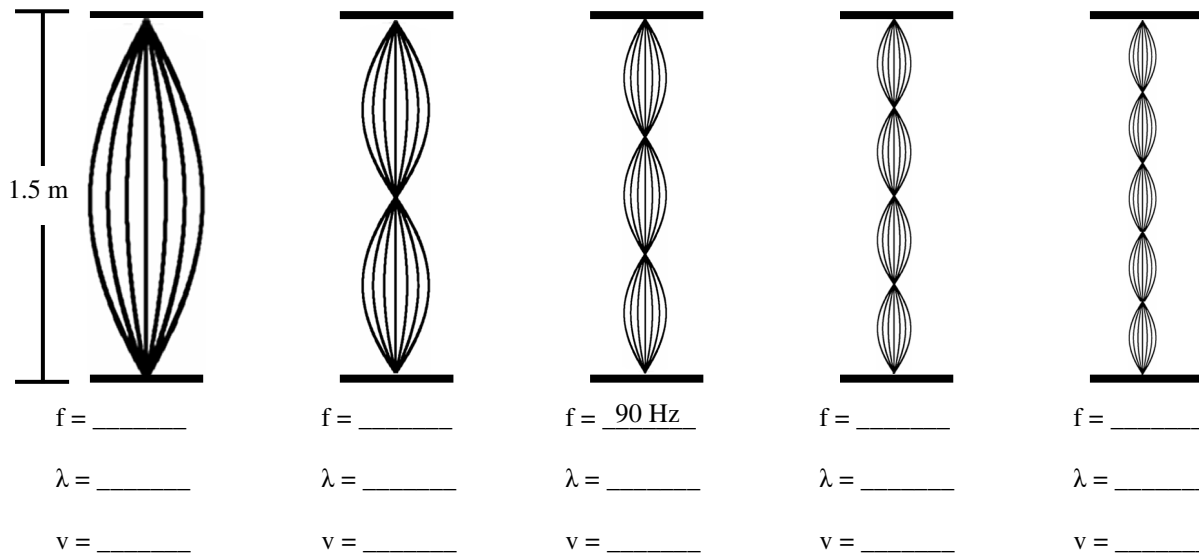
- How many wavelengths are shown on the graph?
 - How long is the graph?
 - Find the wavelength of the wave.
 - If it were a sound wave, find its frequency.

- A transverse wave is moving to the left. Which way is could it NOT be vibrating?
- Give two examples of diffraction from class.
- What is the period of a pendulum that is 65 cm long?



- The picture shows a mass-spring system oscillating (vibrating). The left picture shows the top of the spring's motion; the right is at the bottom.

 - What is the amplitude of its motion?
 - What is its period?
 - Calculate its frequency.
 - As its amplitude d_____, how will its frequency change?
 - Calculate the mass hanging on the spring.



8. The above diagram shows THE SAME STRING vibrating at different frequencies. The frequency of one of the harmonics is given. Use the given information to fill in all of the remaining blanks.
9. What did you learn about the speed of the wave for each harmonic?

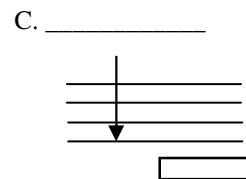
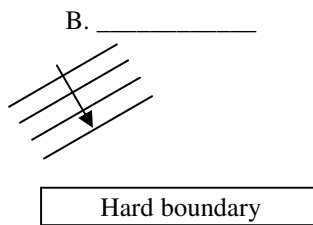
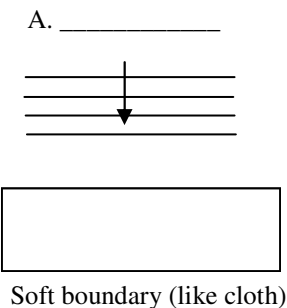
10. Which of the following will change the speed of a wave?

- A. Change the harmonic?
 B. Change the length of the space?
 C. Grab a harmonic at one of the nodes?
 D. Tighten the string?
 E. Change the string's mass or thickness?
 F. Disturbing the string farther (more amplitude)?
 G. Change the temperature of the medium?

11. Fill in the table at the right.

	Variable	Units
Period		
Spring Constant		
Frequency		
Mass		
Length		
Speed		
Time		

12. Draw what will happen to these waves at the following boundaries. And name which interaction is shown for each.

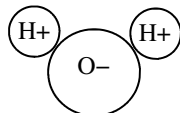


TAKS on next page.

TAKS PREP

13. The equation $Ag + H_2S \rightarrow Ag_2S + H_2$ represents the changes that occur when silver tarnishes. From left to right, the coefficients needed to balance the equation are
- 1, 1, 1, 1
 - 1, 2, 1, 2
 - 2, 1, 2, 1
 - 2, 1, 1, 1

14. The diagram shows a water molecule. The changes on either end of the molecule indicate that water is
- A polar molecule
 - A non-polar molecule
 - An ionic compound
 - An ion



15. Replication (R), Transcription (TS), or Translation (TL)?
- ___ When DNA turns into mRNA.
 - ___ When DNA makes more DNA.
 - ___ Done before the code goes to the ribosome.
 - ___ Occurs inside the ribosome.
 - ___ When mRNA becomes tRNA.
 - ___ Occurs in the nucleus of the cell.
 - ___ Builds a protein chain of amino acids.

16. Fill in the following sequences.

DNA	RNA	DNA	DNA
U		T	
G		A	
G		G	
A		C	
C		T	

17. Frequency in Hz means #cycles/1 second. For waves 1 cycle = 1 wavelength. So, for waves 1 Hz means how many λ per second. A radio wave from space has a frequency of 25,000 hertz (Hz). How many wavelengths pass a point in space during a 2.5 second time period
- 625,000
 - 62,500
 - 6,250
 - 625
18. A book sits on a desk that is 1 meter (m) high. The book's gravitational potential energy is 10 joules (J). If the book falls from the desk, what is the sum, in joules, of its gravitational potential energy and kinetic energy when the book is 0.5 m from the ground?

19. Earth receives energy from the sun by:
- Convection
 - Conduction
 - Radiation
 - Temperature