On-level Physics
Waves

This unit will allow each student to:

a. gain a better understanding of the behavior and characteristics of wave phenomena
b. continue making proper scientific measurements and calculations
c. define and properly use all vocabulary
d. properly apply all terms and concepts in describing/explaining real world examples
e. continue making and interpreting scientific graphs
f. teach someone else the concepts discussed
g. practice proper laboratory safety

This will be accomplished by each student that is able to:

1. recognize and relate SI and USCS units of period, frequency, wavelength, and wave speed
2. recognize period, frequency, wavelength, and wave speed by the units only
3. describe the periodic motion of a pendulum
4. measure the period and frequency of a pendulum
5. compare a simple oscillation to wave motion
6. draw and label the parts of transverse and longitudinal waves
7. identify wavelength, rest position, crest, trough, and amplitude of a transverse wave
8. identify the wavelength, rest position, compression, rarefaction, and amplitude of a longitudinal wave
9. compare and contrast longitudinal and transverse waves
10. use the relationships of wave speed, frequency, wavelength, and period in calculations
11. describe the behavior of a standing wave and identify the node(s) and anti-node(s)
12. explain wave interference
13. distinguish between constructive and destructive interference
14. compare the natural frequencies of various objects

Textbook Reference – Physics: Principles and Problems

Chapters 14 and 15

Daily Grade: Daily questions/homework/review sheet
/30

Key Terms – *write the definitions of the boldface terms on your own paper, definitions are available at thetetersz one.net*

oscillation, vibration, pendulum**, period, frequency, standing wave,** node, anti-node, **natural frequency, wave, medium,** interference**, transverse wave,** rest position, crest, trough, **wavelength, amplitude,** longitudinal/compressional wave, compression, rarefaction

Waves Review –Answer on a separate sheet of paper;
due prior to the 20Q on Day 5

A. What is the period of a pendulum?
B. If you triple the frequency of a vibrating object, what will happen to its period?
C. Distinguish between the *period* and the *frequency* of a vibration of a pendulum. How do they relate to one another?
D. What factor(s) affect the frequency of a pendulum?
E. Draw and label a transverse wave.
F. Draw and label a longitudinal wave.
G. Compare and contrast transverse and longitudinal waves.
H. Does the medium in which a wave travels move along with the wave itself? Defend your answer with an example.
I. How does the speed of a wave relate to its frequency and wavelength?
J. As the frequency of a wave is increased, does the wavelength increase or decrease? Give a mathematical example.
K. How far, in terms of wavelength, does a wave travel in one period?
L. While watching ocean waves at the dock of the bay, Otis notices that 10 waves pass beneath him in 30 seconds. He also notices that the crests of the waves exactly coincide with the posts of the dock that are 5 meters apart. What are the period, frequency, wavelength, & speed of the ocean waves?
M. Distinguish between *constructive* interference and *destructive* interference.
N. Is interference a property of only some types of waves or of all types of waves?
O. Describe how a standing wave is produced.
P. Where on a standing wave is the node? the anti-node?
Q. Where on a standing wave would you measure the amplitude of the wave?
R. You have two pieces of metal, one has a higher natural frequency when it vibrates. Describe the possible differences in the two pieces of metal that may be the cause of the frequency difference.