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| **Today:** | **16** Waves & Sound 1st 1/3 | | HW2 |
| **Wednesday:** | **16** Waves & Sound 2nd 1/3 | HW1 redo, | HW3 |
| **Lab:** | **Lab1**: Harmonic Motion | | |

**10.1 Energy and Simple Harmonic Motion**
**10.2 Damped Harmonic Motion**
- **Over, Under, and Critically Damped**

**10.3 Driven Harmonic Motion and Resonance**
- **Resonance**

**Ch 16 Waves and Sound**
**Intro.**
**Transverse waves**
- **Waves terminology**
  - **Medium**
  - **Front**
  - **Wave / Front speed**

- **How does the Wave Speed depend upon the properties of the medium?**
  - **Qualitative relationship**
    - **Force**
    - **Mass**
  - **Quantitative Relationship**

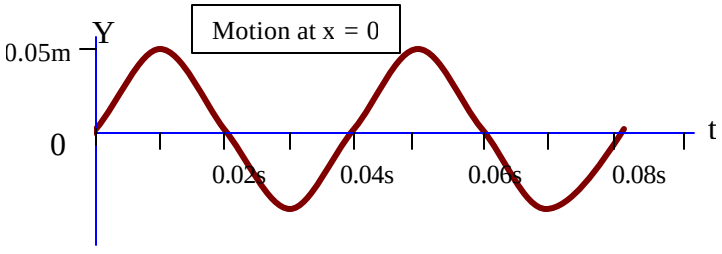
**Example 1 :Guitar string.** I have a guitar string stretched about 0.6 m & that stretch of it has a mass of about 2 g. I hang 4 kg from the end over the pulley. At what speed would a pluck travel up the string?

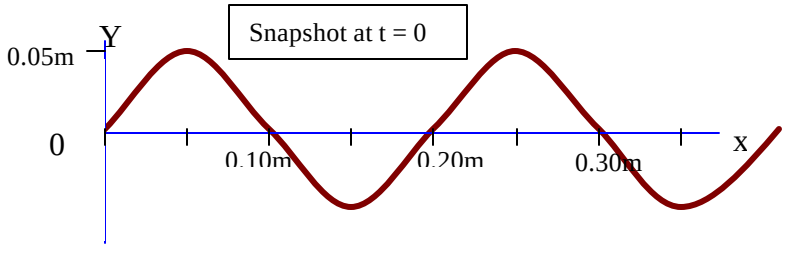
  - **Waves**
    - **Wavelength**
    - **Wave speed: How do the two periodicities relate to each other?**

**Example2:** Light waves travel through empty space at about $3.00 \times 10^8$ m/s. We perceive light with a wavelength of 650 nm = $6.50 \times 10^{-9}$m as red. What is its period?

**16.1 The mathematical description of a wave**
- **Intro**

**Example3:** The two plots represent a wave traveling down my favorite wave-demo (the series of long beams). Write the Y position as a function of x and t. In other words, write the basic form of the equation and fill in values for all the constants.



**HW 3**

6. A person lying on an air mattress in the ocean rises and falls through one complete cycle every five seconds. The crests of the wave causing the motin are 20.0 m apart. Determine (a) the frequency and (b) the speed of the wave.

17. Consult Interactive Solution 16.17 at www.wiley.com/college/cutnell (6th edition) in order to review a model for solving this problem. To measure the acceleration due to gravity on a distant planet, an astronaut hands a 0.055-kg ball from the end of a wire. The wire has a length of 0.95 m and a linear density of 1.2×10-4kg/m. Using electronici equipment, the astronaut measures the time for a transverse pulse to travel the length of the the wire and obtains a value of 0.016 s. The mass of the wire is negligible compared to the mass of the ball. Determine the acceleration due to gravity.

24. The drawing shows two graphs that represent a transverse wave on a strong. The wave is moving in the +x direction. Using the information contained in these graphs, write the mathematical expression (similar to those in the text) for the wave.