

FALL SEMESTER STUDY GUIDE 2013.14

For all units, go over the study guides made for each unit.

- a. what was the main concept covered in each lab
- b. go over warmups and wrapups

WAVES UNIT:

1. Transverse and Longitudinal Waves
2. Anatomy of Waves: amplitude, wavelength, frequency, period speed
3. Relationship between frequency and wavelength
4. What is meant by inverse and direct relationships? Give an example
5. The importance of the MEDIUM
6. Mechanical and EM (electromagnetic) wave properties
7. Be able to solve problems about frequency, wavelength and speed
8. Speed $(v) = \text{frequency}(f) \times \text{wavelength}$
9. Resonance
10. Speed of Sound depends on what factors?
11. What must sound travel through?
12. WAVES: be able to compare/contrast transmittance, reflection, scatter, absorption, refraction, diffraction,
13. Doppler Effect
14. What causes light?
15. What is bright line spectra? How is this related to Blue and red shift? What can we tell about stars from spectra?

MOTION UNIT

1. Parallelogram Rule
2. How do you measure speed?
3. Know how to use vectors, add vectors and calculate resultant vectors.
4. Constructing Particle Models and Interpreting them
5. Be able to interpret and construct PT graphs and VT graphs. Convert from Pt to VT graphs
6. Inertia, velocity, acceleration

FORCES UNIT

1. Know Newton's three laws of physics and be able to give examples.
2. What causes friction? What are the types of friction.
3. Free body diagrams for motion and be able to calculate forces including μ
4. Be able to understand and create free body diagrams:
 - a. speeding up, slowing down, constant velocity, no motion

5. Understand free fall and be able to calculations on the worksheets
6. Elevator lab
7. Hang Time Lab
8. What is terminal velocity?
9. Does mass affect velocity during free fall? Explain
10. What is projectile motion? How does this compare with free fall?
11. Nerf Gun Lab

MOMENTUM AND ENERGY : $KE = \frac{1}{2} mv^2$ and $GPE = mgh$

- a. Look over Momentum quiz
2. Look over labs and be able to explain the main concept learned in each lab:
3. [Momentum and Football video](#)
4. [Collisions and Conservation of Momentum Activity](#) uses this [Collision website](#)
5. [Momentum Practice Problems](#)
6. [Myth Busters: Car Collision](#) and [teacher notes](#).
7. [Momentum Bashing Lab](#)
8. [Momentum Lecture Guide](#) and [teacher notes](#)
9. [answers](#) for [Conservation of Momentum and Collision Worksheet](#)
10. [Momentum of Colliding Objects Lab](#)
11. [Understanding Car Crashes](#) watch the [video](#): ([Teacher answers](#))
12. [Conceptual Physics: Momentum](#) and [Teacher answers](#)
13. [Pendulum Lab](#) and [Teacher Notes](#)
14. Be able to calculate period, momentum, Impulse, KE, PE
15. Conservation of Momentum
16. Relationship Between PE and KE

SCIENCE AS A PROCESS:

1. be able to identify Independent and dependent variables,
2. graph appropriately,
3. make data tables,
4. measure with a ruler,
5. average data,
6. create a hypothesis (If... then/...because)
7. design an experiment
8. make a CLAIM (CLEVER: Claim, evidence and reasoning)

