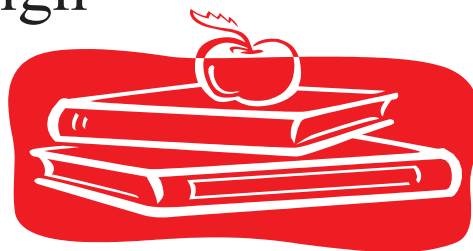


Mackay Junior/Senior High School



COURSE:

Date: 2011-2012

Teacher with contact information:

Mr. McClure

Room: 108

michmcl@mackayschools.org

COURSE DESCRIPTION

Physics is the study of forces and motion. It is a 12th grade class. It is for those college bound students who wish to pursue a career in engineering or the sciences, and there is a strong math component. Prerequisites include a passing grade in Chemistry, plus Advanced Math with Trigonometry or concurrent enrollment.

Topics covered include motion, acceleration, forces, momentum, energy, work, simple machines wave behavior, sound, light and electricity. The lab activities are student-centered, requiring problem solving skills and teamwork.

COMMON CORE / STATE CONTENT STANDARDS/VOCABULARY OBJECTIVES

- Analyze motion graphically and numerically using vectors, graphs and calculations
- Analyze motion in one dimension using time, distance, displacement, velocity
- Analyze motion in two dimensions using angle of trajectory, time, distance, displacement, velocity and acceleration.
- Analyze forces and systems of forces graphically and numerically using vectors, graphs and calculations
- Analyze systems of forces in one dimensions and two dimensions using free body diagrams
- Explain forces using Newton's Laws of Motion as well as the Universal Law of Gravitation.
- Explain the effects of forces including weight, normal, tension and friction on various objects
- Analyze basic forces related to rotation in a circular path
- Analyze the motion of objects involved in completely elastic and completely inelastic collisions by using the principles of conservation of momentum and conservation of energy
- Analyze the motion of objects based on the relationship between momentum and impulse

- Interpret data on work and energy presented graphically and numerically.
- Compare the concepts of potential and kinetic energy and conservation of total mechanical energy in the description of the motion of objects
- Explain the relationship among work, power and energy.
- Analyze how energy is transmitted through waves, using the fundamental characteristics of waves: wavelength, period, frequency, amplitude, and wave velocity.
- Analyze wave behaviors in terms of transmission, reflection, refraction and interference.
- Compare mechanical and electromagnetic waves in terms of wave characteristics and behavior
- Explain Ohm's law in relation to electric circuits
- Differentiate the behavior of moving charges in conductors and insulators.
- Compare the general characteristics of AC and DC systems without calculations
- Analyze electric systems in terms of their energy and power
- Analyze systems with multiple potential differences and resistors connected in series and parallel circuits, both conceptually and mathematically, in terms of voltage, current and resistance.
- Explain qualitatively the fundamental properties of the interactions of charged objects
- Explain the geometries and magnitudes of electric fields
- Explain how Coulomb's law relates to the electrostatic interactions among charged objects.
- Explain the mechanisms for producing electrostatic charges including charging by friction, conduction and induction
- Explain how differences in electrostatic potentials relate to the potential energy of charged objects
- Explain the relationship between magnetic domains and magnetism
- Explain how electric currents produce various magnetic fields
- Explain how transformers and power distributions are applications of electromagnetism

INSTRUCTIONAL MATERIALS

Glencoe Science's *Physics Principles and Problems*

UNITS WITH INSTRUCTIONAL DATES

Week	Lesson	description
1	Chapter 1	
2	Chapter 1	
3	Chapter 2	
4	Chapter 2 and 3	

5	Chapter 3	
6	Chapter 4	
7	Chapter 4 and 5	
8	Chapter 5	
9	Chapter 6	
10	Chapter 6 and 7	
11	Chapter 7	
12	Chapter 8	
13	Chapter 8 and 9	
14	Chapter 9	
15	Chapter 9 and 10	
16	Chapter 10	
17	Chapter 10 and 11	
18	Chapter 11	

ASSESSMENTS / TESTS

The mastery model is employed in Chemistry, in which students who complete all the daily work on time, but who want to improve their test score, may retake tests, which are of equal difficulty to the original version of the test. Tests are multiple choice with a significant problem solving section.

GRADING PROCEDURES

50% tests, 50% homework and labs.

CLASS RULES

Readiness, Respect, Responsibility.

MISCELLANEOUS

Safety first. All students are made aware of chemical spill procedures, and locations of eyewash station, shower and fire extinguisher. Although this is a physics class, it takes place in a general science room, so all the hazards associated with classroom chemicals are present.