Norwood Public Schools

College Physics Curriculum Overview

Description:

The College Physics course explores the fundamental laws that govern the universe. The conceptual laboratory and mathematical approach is used to study mechanics, forces, momentum, energy, waves, and electromagnetism. Lab investigations provide reinforcement of the conceptual and computational components of the course.
Prerequisite: passed Chemistry and passed or concurrently taking Algebra 2.

Learning Experiences:

- Students make observations, raise questions and formulate hypotheses.
- Students use algebra and basic trigonometry skills to solve scientific problems.
- Students write informative essays in concordance with the mission statement expectations on energy conservation, and electric circuits.
- Students communicate scientific ideas through writing and graphing.
- Students conduct hands-on and virtual laboratory experiments.
- Students gather and take notes from science textbook and other sources.
- Students keep an organized, chronological binder of all notes, handouts, laboratories, and assessments.
- Students complete projects on the physics of car safety, energy conservation of roller coasters, and the physics of sports.

Content Outline:

Term 1
Scientific Skills: measurement techniques, unit conversions, scientific problem solving
Motion: frames of reference, scalars and vectors, calculating motion

Term 2
Forces: Newton's laws, free-body diagrams, friction, gravity, momentum
Energy: forms of energy, law of conservation of energy, energy-mass relationship

Term 3
Thermal Energy: movement of heat, temperature, kinetic theory of matter, laws of thermodynamics
Waves: mechanical waves, sound, light and optics

Term 4
Electricity: static electricity, electric circuits, Ohm's law
Magnetism: principles of electromagnetism, motors, generators,

Resources Used:

- Physics: Principles and Problems. Glencoe. 2005.
- Hewitt, P. Conceptual Physics. Pearson. 2009.
- Glencoe Physics Online: http://www.physicspp.com
- E-Instruction Student Response Systems
- Vernier Data Collection Laboratory Systems and Probeware

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