Honors Physics

Main Topics
(What main ideas/concepts are covered):

- Laboratory Procedures
- The Science of Physics
- Linear and Rotational Motion
- Forces
- Work and Energy
- Sound and Light
- Electricity and Magnetism

Rationale
(Why a student should take this course):

Through this course, students will better understand how the world works by examining the science of matter in motion. In addition, physics encourages critical thinking and problem-solving skills that can be applied to any other subject of study.

Description of Average Weekly Outside Requirements (may vary by teacher)

Reading
(Text, document, etc.):

- Students may read from the textbook, approximately 5-10 pages at a time per week.
- Students may be responsible for short readings (2-3 pages) on current issues in science once per week.

Written
(Terms, questions, outlines, free response, etc.):

- Students will solve 4-5 problems between 2-3 times per week
- Students will show calculations and organize data in tables and graphs to support their laboratory results
- Students will write laboratory reports and answer 1-2 free response questions 1-2 times per week

Grade Composition
(How grades are determined):

- Tests
- Quizzes
- Laboratory Reports
- Classwork
- Homework
- Projects

Required Skills

- Reading/Comprehension
- Work Ethic
- Strong Math Skills – Algebra 2
- Basic Writing

Skill Development
(Skills developed in this course and how):

Critical Thinking – Students will apply their knowledge of physics to observe, analyze, and explain a variety of situations presented through word problems, laboratory experiments and demonstrations

Problem Solving – Students will understand how to identify a problem, determine the relevant information, and apply physics concepts and equations to solve the problem

Sample Textbook Excerpt:

"In the absence of friction, the total mechanical energy remains the same. This principle is called *conservation of mechanical energy.* Although the amount of mechanical energy is constant, mechanical energy itself can change form. For instance, consider the forms of energy for a falling egg, as shown in **Table 1.** As the egg falls, the potential energy is continuously converted into kinetic energy. If the egg were thrown up in the air, kinetic energy would be converted into gravitational potential energy. In either case, mechanical energy is conserved. The conservation of mechanical energy can be written symbolically as follows:

Conservation of Mechanical Energy

$$ME_i = ME_f$$

Initial mechanical energy = final mechanical energy

(in the absence of friction)