Physics 1-2
Paul Robinson
San Mateo High School
2010-11

Introduction for Students and Parents

Welcome to the wonderful world of *Physics!* Few courses you will ever take will be as relevant to as wide a diversity of topics as this one is intended to be. This course will survey the major principles and concepts, which govern our modern day physical world. While the tools of science have changed dramatically during the past 400 years, the fundamental laws of satellite motion have remained the same as they were during the time of Newton. The difference now, of course, is that the computers, combined with modern-day electronics, have made satellites an essential part of our everyday existence.

Physics is the *basic* science; it is the foundation of chemistry, biology, and all disciplines of science. That's why more and more high schools across the nation are teaching physics earlier in the science sequence rather than a 'terminal' course for seniors. As such, the study of physics becomes part of the educational mainstream for *all* students—and not the select few who are math wizards. Unfortunately, the mathematical language of physics often deters the average non-science student. But when the ideas of physics are presented conceptually and when formulas are seen to be guides to *thinking* rather mere recipes for algebraic manipulations, our discipline is accessible to all students. And for students, who will continue in science, the ideas of physics should be first understood conceptually *before* they are used as a basis for applied mathematics.

This course seeks to build that conceptual base. It is a base for non-science students and science students alike. For the non-science student, it is a base from which to view nature more perceptively. Likewise for the science student, it is a springboard to a greater involvement in physics. A first course that provides a conceptual overview of Newtonian and modern physics for science majors will help to correct a missing essential in physics education: the practice of conceptualizing before *calculating*. For non-science students and science students alike, a conceptual way of looking at physics shapes analytical thinking. Hopefully, you will choose to continue your analytical study of physics by subsequently taking *AP Physics* where you will then compute with comprehension.

Policies, Procedures, & Expectations

• Notebooks

The fundamental organizational tool you will use in physics this year is your three-ringed binder. Keep all of your work and assignments neatly organized in your notebook in an orderly fashion. Keep your class notes for the entire year, as you will need them for comprehensive exams. Your daily class notes should have an entry date in the left-hand margin. They should be *legible* and include all diagrams and illustrations presented on the computer or the board. Keep your notebook in a safe place. You may store a completed unit (packet) of your notebook at home for future study. Do not discard them; they are your "receipt" for your work.

• Tests and Quizzes

Test will cover one or more major topics and will comprise about half your grade. Tests will be announced with at least 2 school days notice and will be graded on either a percentage or curved basis. Tests usually consist of multiple choice and free-response questions. Short quizzes assess the quality of your ongoing study. To discourage last minute cramming for tests, quizzes may or may not be announced. They may include questions from your homework assignments, labs, or what has been discussed in class. "Cheat-Sheets" may be used provided they are hand-written. They must be handed with the exam.

• Labs

Lab work will provide the experiential basis for many of the concepts and ideas you will learn in this course. You learn to swim by getting wet; you learn physics by doing physics. It is time-consuming and requires patience and diligence. This investment of effort pays big dividends in both grades and understanding. When doing a lab you must have a copy of it to record your data and answer the questions.

• Homework

Homework usually consists of one of the following:

- Studying and composing class notes—every day
- Completing worksheets—2 or 3 per unit
- Being able to explain *Review Questions* in the text—assigned at the beginning of a unit
- Writing answers to *Plug and Chug,Think and Explain* and *Think and Solve* questions
- Writing answers to questions from the labs—should be done the same day as the lab
- Studying for tests and quizzes—every day and when announced
- Formulating answers to questions raised in class—when they occur
- Composing and writing a synthesis question including an answer—all unit long; due the day of the exam
- Developing Problem-Solving skills with problems from the Problem Solving Supplement
- Special assignments, extra credit, etc.

• Extra Credit/"CTF" Points

Extra credit is considered to be any supplemental assignment, which is not required. Bonus points can be offered by myself as CTF points (credit towards the final). Possibilities include doing more challenging problems or labs within the topic being covered, or advanced matter in the next sequential topic. In any event, no quarter grade may be raised more than one letter grade by extra credit. Extra credit may include but is not limited to:

- writing answers to more questions than are assigned
- doing optional labs at home
- doing approved scientific research at home or school
  attending "Physics Open House" at a local college or attending other pre-approved lectures
- special research or projects
- Note: If calculators or any other personal effects are stolen or "disappear" from my room all CTF privileges will be revoked, collectively if the effects are not returned by the end of the semester. Any student caught either stealing or cheating or has 4 or more tardies per semester forfeit their CTF privileges. Policy is subject to revision as necessary.
- Student caught cheating will be ineligible to receive extra credit—even if the cheating occurs after the extra credit assignment was completed.

• Late Work/Absences/Tardies

Due dates for all assignments will be announced when assigned. Excused absences may have no more than the same number of days to make-up their work for full credit. Unexcused absences will result in late assignments. No late work will be accepted after that packet for that topic has been graded and returned. Lunchtime/after school detention will be assigned for every tardy and must be served within 48 hours. Students who are tardy more than three times per semester will be referred to the Dean for suspension.

• Packets

Packets consist of all the assignment and notes for a particular unit and comprise about half your grade. You will be given assignments sheets for each unit. You are to put this in your notebook and keep it up to date. If the work is complete, you will get full credit. If the work is incomplete, I will write "INC" at the top and initial the paper. If the work is completed, it can be re-submitted for partial credit.

The only time I will actually grade and record your work is when I collect your packet. You will complete and attach the coversheet and turn in the unit's work. At that time I will record in my gradebook the number of points you have earned. I will not record each and every assignment. You are to keep track your papers and work. If you lose it before the packet is due, you will receive no credit. On the day the packet is due, you are to:

a) assemble the assignments in *proper* order
b) complete the coversheet
c) each assignment is to be labeled
d) staple the packet together neatly in the upper left corner

Packets with assignments out of order may receive 50% credit. Packets without a completed coversheet will not be graded. Packets with forged initials (cheating) will receive no credit. Packets that are late will receive 50% credit unless it is due to an excused absence. Packets that are messy and have sloppy handwriting will be marked down 10 to 25%. *Packets are due the day of the unit exam.* Students not eligible to take the test for a unit until they have completed and turned in their packet.

• Grades

Grades will be calculated according to the following weighted percentage basis:

Weighted Category—Percentages

Packets - 40%
Tests - 35%
Quizzes - 10%
Final - 15%

A = 90 - 100
B = 75 - 89
C = 65 - 74
D = 50 - 64
F = 49 - 0

This means that grades are *not* calculated by dividing the number of points earned by the number of points possible (simple percentage). My grade book program calculates grades using the following formula:

Grade = **0.40** (average of packets) + **0.35** (average of tests) + **0.10** (average of quizzes) + **0.15** (final)

• Supplies

Always bring your notebook stocked with lined paper, pencil, and pen to class. Other miscellaneous items needed include a 6" plastic rule and protractor. You will do as much of your graphing as possible using a computer and a graphing calculator. However, occasionally you will need graph paper when making vector diagrams. Graph paper is available from me at cost.

• Care of the Classroom and Laboratory Equipment

Lab equipment is very expensive requiring care and respect. Students whose attitude and behavior and respect do not reflect laboratory equipment and furniture will not be tolerated.

• Technology

Our lab is currently outfitted with Apple iMacs computers with PowerPoint and MS Office as well as graphing software. Students are not allowed access the internet without permission. We will also use probeware from Pasco. Students are *never* allowed to use my computer.

• Physics Club—Field Trips

Our *Physics Club* will consider going field trips to great places like the Exploratorium, The Bay Model, SLAC, and Lick Observatory. We will also visit famous engineering landmarks like the Golden Gate and Third Street Bridge. Participation is optional, but greatly encouraged! All trips require supplemental funding.

• Books

You will be issued a copy of *Conceptual Physics* by renowned author Paul Hewitt for your use at home. These books are expensive and should be covered. You will be charged for damaged texts or lost texts. You must pay for a lost/damaged text before a new another text will be issued to you.

• Plagiarism and Cheating

Students are encouraged to work together cooperatively. This teamwork model is typically how they will operate in today's work force. Dialoguing with fellow students about physics is encouraged; *plagiarism* is not. Students working together in class may arrive at an answer, but all students are expected to participate, write-out their own answers, and be able to orally defend their answers. Plagiarism is immoral and will not be tolerated. Swapping computer disks/files makes this very easy. Any verified act of copying assignments and/or tests will be met with an automatic zero for *both* parties and immediate parent contact and discussion of possible classroom suspension. Students are not eligible for extra credit.

• Extra Help

Students who require extra help are encouraged to do so by making an appointment with me during lunch hour, during my prep (6th period) or after school. The lab is normally open during this time. Other times can be arranged by individual appointment. You are welcome to email brief questions to me at "pablo@laserpablo.com"

Your education is the reason you are here. Maximize your experience by going over these "Policies, Procedures, and Expectations" with your parents. Sign and return this sheet to me by Friday, August 29th. If you have any questions, please ask immediately.

• **Phone/Email Messages**
The best way to reach me for messages or to make requests for homework due to absence is via email: "pablo@laserpablo.com". Parents and students may leave a message for me on my cell phone, 400-9425.

Your signature signifies that you have read and understand the "Policies, Procedures, and Expectations".

Student_____Date_____

Parent/Guardian_____Date_____

Parent/Guardian_____Date_____

Student Information

Phone(s)_____

Career Goal_____

Educational Goal_____

Email Address_____

Previous Science Courses—

Previous Math Course—

Hobbies and Special Interests—

Favorite Movie

Book last read—

Parent(s) Information (optional)

Occupation(s)_____

Address_____

Day/Evening Phones_____