



2016-2017

Bonita Vista High School

AP / IB Physics Year 2

Mr. Hiller

elan.hiller@sweetwaterschools.org

Duration: One year

Type of Course: Science D-Level Laboratory Course

Level of Course: Advanced Placement Physics B2 / International Baccalaureate Physics

Prerequisites: Successful completion of one year of physics or by teacher recommendation and permission of the instructor. Students must have successfully completed Algebra I and Geometry.

General Course Description:

AP / IB Physics B2 is year two of a two year college-level course designed to prepare students for the AP / IB Physics examinations. These examinations are given during the 1st and 2nd week in May. Students who score high enough on either of these examinations have the opportunity to receive college credit. The actual college credit awarded for passing scores varies from university to university. AP Physics also meets university entrance requirements for one year of a laboratory science. In addition, this course prepares students for the College Board SAT II Physics subject examination. Approximately one week for the spring intersession break will be required to review for the AP exam. During this time students will take the first of two practice exams and learn how to score them. A schedule for each intersession will be given to assist in planning any vacation time. Plan to be in attendance.

AP / IB Physics B2 is organized into the following six big ideas:

1. **Big Idea 1:** Objects and systems have properties such as mass and charge. Systems may have internal structure
2. **Big Idea 2:** Fields existing in space can be used to explain interactions.
3. **Big Idea 3:** The interactions of an object with other objects can be described by forces.
4. **Big Idea 4:** Interactions between systems can result in changes in those systems.
5. **Big Idea 5:** Changes that occur as a result of interactions are constrained by conservation laws.
6. **Big Idea 6:** Waves can transfer energy and momentum from one location to another without the permanent transfer of mass and serve as a mathematical model for the description of other phenomena.

Course Topics and Timeline:

The following table gives the schedule of general topics and approximate timeline for this year.

Semester 1		Semester 2	
Topic	Time	Topic	Time
Mechanics Review Fluid Statics / Dynamics -Density / Pressure -Buoyancy -Fluid flow rate -Bernoulli's Principle	6 weeks	Electricity -Electrostatics (Charge interaction, fields, potential) -Capacitors DC & RC Circuits -steady state conditions only	5 weeks
Thermodynamics -Heat Transfer -Gas Laws -PV Diagrams -Heat Engine -Zeroth, 1 st Law, 2 nd Law	3 weeks	Magnetism -magnetic field -magnetic/electric field -effects on charge/current carrying wire Electromagnetic Induction	4 weeks
Geometric / Physical Optics -Reflection & Refraction -Interference	5 weeks	Review/1 st Practice Exam	Spring Intersession Break
Atomic & Quantum Physics -Electron energy -Photoelectric Effect Nuclear Physics -Radioactive Decay -Nuclear Reactions	5 weeks	AP / IB Examination	May

Required Materials:

Graph Paper Notebook	All coursework and most lab work will be done on graph paper.	\$5.00
Metric Ruler & Protractor	Recommended & very helpful	\$1.50 & \$1.50
1” 3 Ring Binder	This is used to organize AP multiple choice and free response problems given throughout the year	\$3,lm .00
Calculator	An inexpensive scientific calculator (\approx \$10) is all you need. If you decide to purchase a graphing calculator, the easiest models for beginners to learn to use are the TI-83 (TI-83 Plus) and the TI-84.	\$10-\$15 – Scientific \$90 - \$130 - Graphing
Post-It notes (pack)	These are great for organizing	\$7.00
AP Physics B Test Preparation Book (Available at book stores) – Princeton Review or McGraw Hill 5Steps to a 5	These provide a more detailed explanation of all course concepts as well as having practice AP exams	\$18.00
Pack of colored pencils	These are going to be used to color code various things throughout the year	\$2.00

Rules

1. Be prepared to actively learn each day. This means that you must have all writing materials, books (when requested), and notebooks, and homework in the class daily. This also means that those items that could be distracting in the classroom are to be left home (like CD players, walkmans, IPODs, PSPs, etc). Cellular phones are to be turned off or turned on vibrate during class **and** kept out of sight.
2. Show respect for all people, places, and things here at BVHS. It is not acceptable for a student to talk “out of turn”, or while another student or the teacher is talking.
3. All students will follow the rules set forth in the Bonita Vista High School Handbook.

Consequences

1. Warning #1- Private/public verbal warning
2. Warning #2- Will be asked to stay after class. You may be given a writing assignment that addresses the uncooperative behavior which must be signed by your parents.
3. Warning #3-Lunch / Nutrition Break detention will be assigned, parents will be notified, and citizenship grade will be lowered one grade.
4. Warning #4-Parent / Teacher / Counselor conference will be arranged. Citizenship grade will be lowered one more letter grade.
5. A.P. Referral

Academic Dishonesty

Academic dishonesty is not part of our culture here at BVHS and will not be tolerated. If the copying of assignments and / or tests is discovered; both parties involved receive a zero for that assignment, your parent/guardian will be notified, your citizenship grade will immediately be lowered to a F, you will lose the AP course designation, and you may be removed from the class overall.

AP Physics guidelines are built on the following premises

1. While AP/IB Physics is a fascinating study encompassing a variety of topics it is also, at times, mathematically and technically challenging. Students who enroll in AP Physics have a sufficient mathematical background to handle this aspect of the course (i.e. a strong foundation in Algebra and knowledge of right triangle trigonometry).
2. Students who enroll in AP Physics understand the importance of regular class attendance and active, constructive participations in class discussions, and laboratory activities. This means they listen and speak at appropriate times, and are not afraid to ask questions.
3. AP/IB Physics students understand the need for firm deadlines on assigned work.
4. AP/IB Physics students understand that regular out of class study (lunch time & after school) is essential for success in this course.
5. AP/IB Physics students understand the importance of attempting all problems assigned.
6. AP/IB Physics students must realize when help/tutoring is required and must have the initiative to seek it.
7. AP/IB Physics students **MUST BE RISK TAKERS!!** Do not be afraid to be wrong with the understanding that you will have the opportunity to learn, improve, and eventually be correct.

Assignments / Test / Quizzes:

A variety of assignments will be given on a regular basis. Assignments are given in bulk and are due 1 to 2 weeks later. This is to help improve time management skills. All homework assignments are to be completed on graph paper. Late work will not be accepted. In most cases on tests, quizzes, class work, and homework, you must show all of your work in a legible, logical manner in order to receive credit for an answer. Credit will be awarded for showing complete effort in the solution of a problem even though your final answer may be incorrect. Short quizzes will be given during each unit. Each unit test will be cumulative in nature by incorporating elements of previous units along with the current unit of study.

Semester Grades:

Since a significant portion of the homework, quizzes, and tests in this class will be at the same level of difficulty as the actual AP Physics Exam, the following grading scale will be used:

% Score	Letter Grade
90 – 100	A
80 – 89.9	B
70 – 79.9	C
65 – 69.9	D
Below 65	F

Item	% of Semester Grade
Exams and Final Project	50 %
Quizzes	20%
<u>Lab Work</u> (includes both participation and lab write up)	20 %
<u>Assignments (HW/Classwork)</u>	10 %

I believe all students have the right to learn in a caring, supportive, and positive learning environment. If your behavior and attitude help to achieve this kind of atmosphere, and you are accepting your responsibility for class work, lab work, homework, participation, and preparation, then you should be earning an 'A' in citizenship. Even though we are trying to reach a goal together, with the right attitude it is easy to see that physics can be "phantastic" and "phun".

Elan Hiller
elan.hiller@sweetwaterschools.org

AP Physics B / IB Physics Contract

Please complete, detach below the dashed line, and return the following form to your teacher.

By printing, signing, and dating this document, I certify that I have read and understand the course description, agree to follow the expectations for AP Physics B / IB Physics Year 2

(Student name – Please print) (Student Signature) Date

(Parent/Guardian name – Please print) (Parent/Guardian Signature) Date

Student Email: _____

Parent / Guardian Email: _____

Parent / Guardian Cell Phone: _____
(if text messaging is a preferred method of communication)