KEEP IN BINDER ALL YEAR!

Name _____ Date _____
AP Physics Course Information Sheet
Period _____ Mrs. Nadworny

AP Physics 1 & 2

http://www.MrsNadworny.weebly.com

Welcome to Advanced Placement Physics! This course information sheet is designed to give you an understanding of what to expect from this course, as well as what I expect of each student.

Contact Information

- You may contact me in one of the following ways:
  - Email – denise.nadworny@northport.k12.ny.us
  - Science Department telephone # - (631) 262-6704
  - Classroom L-213 or Science Resource S-114

Required Text

- College Physics by Etkina, Gentile, and Van Heuvelen
  - *This textbook will be used for reading assignments and homework. You are not required to bring the text to class; therefore you will be able to leave it at home.*

Supplies

- It is recommended that you get **two 3-ring binders** (1" or thicker). One binder may be used to organize the MANY handouts through out the course of the year. It is also recommended that you keep a **large** 3-ring binder at home to store materials from previous units.
- **Pens** and **pencils** are required for taking notes and completing laboratory experiments.
- **Loose-leaf** should also be included in your binder for completing homework.
- Graph paper may be required occasionally. It is recommended students print 5 sheets of graph paper from an online source to keep in their binder.
- It is suggested that each student get **dividers** to insert into their binders. They are great for organizing the material into specific categories. (Notes, Labs, Homework, Tests, and Supplies)
- A basic **scientific calculator** will be needed in almost every class period. If purchasing one is a problem, you should sign out one from the Math Department as soon as possible.
- You will need a **metric ruler** and a **protractor** and should bring these with you to class everyday.

Grades

- Your grade for each quarter will be based upon the following criteria:

- TESTS (60%)
- ASSIGNMENTS (Labs and Homework) (40%)

Tests

- Tests will be given at the end of each unit to assess your learning.
  - Tests are modeled and graded on actual AP exams to give you practice in the types of questions and timing required of you on the AP exam.
- If you missed an exam in college you would not receive credit. Therefore, it is expected that you be present for EVERY exam.
- In the case that you are absent with an excused reason during the day of a test you are expected to make-up the test during the first Physics period you return. For extended absences, you are expected to make up the exam within **3 days or less of your returning to school, or a grade of zero will be given.** You may opt to take the test on your own time (free period, lunch, before or after school).
- Test corrections may be submitted to raise your test grade by up to one full "letter grade" depending on the quality of your corrections. Students are strongly encouraged to take advantage of this opportunity to clear up any confusion they may have and become more confident with the material.
- **THE AP EXAMS:** Students will be prepared to take both the AP Physics 1 and AP Physics 2 exams at the end of the year. They are separate three hour exams, with separate fees. Taking the AP Physics exam in May is a requirement for all students in this course. Students for whom this poses a problem should see their guidance counselor or me as soon as the conflict becomes apparent. There will be a fee charged by the College Board for taking the tests. Fee reductions are possible in some cases. See me as soon as possible if this fee is a problem.
- **FINAL PROJECT:** All students will be assigned with the task of constructing a Rube-Goldberg Machine in addition to writing about and presenting the physics concepts associated with their machine. This project will count as the final exam grade worth 20% of the course average.

Homework

- Homework will be assigned for each unit on a nightly basis and will include readings, worksheets, problems from the text, or other appropriate activities.
- Homework will normally be reviewed at the beginning of the class in which it is due. All homework should be kept in your binder for study and for use in writing up your Homework Set.
- Homework will be submitted to the online Mastering Physics system. Additionally, at the end of each unit, the written work for the homework problems need to be turned in as a Homework Set. The Homework Set should consist of an orderly copy of the assigned problems, with corrections where necessary, not just a collection of the daily homework papers. A complete Homework Set should include full solutions, including all work shown and appropriate diagrams. It will usually be submitted the day after the test. A penalty of 10% per day will be assessed for late homework sets. Mastering Physics problems are the major component of your homework grade and should be done carefully.

Labs

- The College Board requires that this course includes a hands-on laboratory component comparable to college-level physics laboratories, with a minimum of 25% of time spent on student-conducted laboratory investigations representing a variety of topics covered in the course. Each student should complete a lab notebook or portfolio of lab reports to guarantee acceptance of credits at a college institution.
- All A.P. labs need to be written up according to the format described on the handout entitled "AP Lab Write-up Information." Refer to it for more details.
    - **All lab write-ups must be typed.** Graphs and diagrams should be attached in their proper location.
    - All lab activities must be neatly handwritten in a pen or pencil.
- Labs are to be handed in at the beginning of class on the day they are due. If labs are not handed in at this time they are subject to a 10% deduction for each day they are late.
- If you miss a lab period due to an excused absence, you will be provided with an appropriate makeup assignment. The makeup assignment is due three days after your return to school.

NORTHPORT HIGH SCHOOL LAB POLICY

1. All labs are to be handed in at a time as specified by the instructor.
2. Students who do not hand in their labs on or before the due date will face a 10% (one letter grade) deduction per day to be reflected in the final grade of the lab. This penalty is applied when calculating the quarter average.
3. Each instructor will determine whether or not a lab report is suitable enough to satisfy the Regents requirement. It is the responsibility of the student to take direction from the instructor and perform the necessary work to rectify the situation and meet the Regents requirement.
4. The absolute deadline for the resubmission of those labs considered to be unsuitable for Regents standards is two weeks before the end of the quarter.
5. Students who miss a lab due to a legal absence are to see their instructor immediately upon their return and arrange a make-up session. If the missed lab experience involves the use of supplies that are no longer available, the instructor will provide a suitable alternative.
6. A quarterly review of each student's lab folder will be made by the instructor. Letters will be sent to the home of any student who is deficient in labs for that quarter. This letter is to be signed and returned to the instructor, or a parent conference will be arranged.

Use of Electronic Devices

- Scientific & graphing calculators as well as any other equipment designated in a student's IEP are the only electronic devices approved for use in class.

- Any other electronic devices being used without authorization are subject to confiscation. Confiscated devices will be returned to the students as per the guidelines listed in the student handbook.

Attendance

- **Lateness**
  - It is expected that you be on time to every class. In the case of a lateness you are required to submit a pass.
  - The third unexcused lateness or any significant lateness may result in detention.
- **Absences**
  - If you are absent, it is your responsibility to make up any missed work.
  - If you are absent for class, but are present in school during any other periods, it is your responsibility to turn in assignments due that day and inquire about any work assigned during the class period.
  - **Field Trips**
    - If you will miss class due to a field trip, you must obtain any work that will be missed BEFORE leaving for the trip. Any work due that day should be submitted before leaving (when possible). Work assigned on that day will be due upon your return.
  - **Music Lessons**
    - If you will miss class because of music lessons, it is your responsibility to inform me PRIOR to the lesson that you will be out and hand in any work due during the period of your lesson. Any work assigned on that day will be due the next day.
    - It is not acceptable to miss a test for a music lesson. In the case that you have a conflict, it is expected that you make every attempt to reschedule your lesson or take the test prior to being absent.
- **Cutting**
  - Any graded work that is missed due to a cut or illegal absence will receive a grade of zero.

Academic Dishonesty

- Any forms of academic dishonesty such as cheating or plagiarism will not be tolerated and will result in penalty.

AP Physics Curriculum

1. **Methods and Tools of Physics** (0.5 week)
   a) Review of necessary mathematical tools – vectors, unit conversions, significant digits
   b) Review of graphical analysis of data – uncertainty estimates, utilizing mathematical models, identification of independent, dependent, and control variables, straightening graphs, error analysis
2. **Kinematics in One and Two Dimensions** (1.5 weeks)
   a) Kinematics in one dimension: horizontal motion, free fall
   b) Kinematics in two dimensions: projectile motion
3. **Forces and Newton's Laws of Motion** (2 weeks)
   a) Static equilibrium: forces, free body diagrams, friction, inclined planes, Newton's first and third laws
   b) Acceleration: Newton's second law
4. **Circles and Gravity** (1.5 weeks)
   a) Uniform circular motion: horizontal and vertical circles, banked curves
   b) Gravity: universal gravitation, satellites
   c) Rotational motion: torque, rotational equilibrium
5. **Energy and Momentum** (2 weeks)
   a) Work and power: work, power, efficiency
   b) Energy: conservative/non-conservative forces, derivation of potential energies, conservation of energy
   c) Momentum: momentum, impulse, conservation of momentum, angular momentum
6. **Rotational Motion** (1.5 weeks)
   a) Angular momentum, center of mass, moment of inertia
   b) Rotational mechanics, rotational work, rotational energy
7. **Fluids** (2 weeks)
   a) Statics: density, pressure, buoyancy, Pascal's principle
   b) Dynamics: fluid flow continuity, Bernoulli's principle and equation
8. **Thermal Physics** (2 weeks)
   a) Thermal energy: heat transfer, thermal expansion
   b) Gases: kinetic theory, ideal gases, internal energy
   c) Thermodynamics: first law (including thermal processes, pV diagrams, and cycles), second law (including heat engines and pumps)
9. **Electrostatics** (2.5 weeks)
   a) Forces and fields: charge, Coulomb's law, electric fields, capacitors, conductors, point charges
   b) Potential and energy: electric potential, work, electric potential energy, equipotential surfaces
10. **Electric Circuits** (2.5 weeks)
    a) Simple circuits: current, resistance, voltage, power, DC/AC
    b) Compound circuits: series, parallel, combinations, capacitors & lightbulbs in circuits, internal resistance, emf
11. **Electromagnetism** (2 weeks)
    a) Magnetism: cause, properties, magnetic flux
    b) Fields: around magnets, around wires, solenoids
    c) Forces: on a charged particle, on a wire, between two wires, mass spectrometer
    d) Induction: motional emf, Faraday's law, Lenz's law
12. **Simple Harmonic Motion and Waves** (2.5 weeks)
    a) Simple harmonic motion: dynamics, energy, pendulum, mass on spring
    b) Waves: traveling waves, properties, sound, Doppler effect, superposition, EM spectrum
    c) Standing waves: strings, open pipes, closed pipes
    d) Diffraction and interference: single slit, double slit, multiple slit (diffraction grating), thin films
13. **Optics** (2 weeks)
    a) Reflection: plane mirrors, curved mirrors
    b) Refraction: Snell's law, dispersion, total internal reflection, lenses, aberrations
14. **Quantum, Atomic, and Nuclear Physics** (2.5 weeks)
    a) Photons: photoelectric effect, momentum, Compton scattering, X-ray production, duality
    b) Models of atom: Bohr model, atomic spectra, Schrödinger model, Heisenberg uncertainty principle, matter waves
    c) Nuclear: stability, binding energy, mass-energy equivalence, fission/fusion, radioactive decay
15. **Review for AP Exam** (2 weeks)
16. **Final Project** (3.5 weeks)