

# Brandeis High School AP Physics 1 Syllabus and Lab Safety Contract

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## Course Introduction

### Textbook:

College Physics: A Strategic Approach AP, 3rd Ed. by Knight, Jones and Field. Pearson 2015

### About this course:

The AP Physics 1 course will meet for 50 minutes every day. The AP Physics 1 Course has been designed by the College Board as a course equivalent to the algebra-based college-level physics class. At the end of the course, students will take the AP Physics 1 Exam, which will test their knowledge of both the concepts taught in the classroom and their use of the correct formulas.

CR1—Students and teachers have access to college-level resources including college-level textbooks and reference materials in print or electronic format.

The content for the course is based on six big ideas:

Big Idea 1 – Objects and systems have properties such as mass and charge. Systems may have internal structure.

Big Idea 2 – Fields existing in space can be used to explain interactions.

Big Idea 3 – The interactions of an object with other objects can be described by forces.

Big Idea 4 – Interactions between systems can result in changes in those systems.

Big Idea 5 – Changes that occur as a result of interactions are constrained by conservation laws.

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.

### Evaluation:

Students will get grades on homework, quizzes, laboratory work, projects, and exams. Exams are typically worth 100 points and will consist of questions similar to ones students will see on the AP Exam. Homework assignments and quizzes will consist of problems from the textbook, supplements, and old AP Exams. Projects are long-term, and typically will involve groups of students developing a plan, collecting data and/or research, and presenting conclusions in a meaningful way. Laboratory work is student centered and inquiry based and is discussed below.

Exams- 60%

Quizzes/Labs- 30%

Homework-10%

One of the homework supplements will be Pearson's Mastering Physics online homework program. Students will be required to sign up and complete assignments online. Computer and internet access provided on campus.

CR2a—The course design provides opportunities for students to develop understanding of the foundational principles of kinematics in the context of the big ideas that organize the curriculum framework.

### Topics Covered:

1. Kinematics (Big Idea 3) [CR2a]
  - a. Vectors/Scalars
  - b. One Dimensional Motion (including graphing position, velocity, and acceleration)
  - c. Two Dimensional Motion
2. Dynamics (Big Ideas 1, 2, 3, and 4) [CR2b]

CR2b—The course design provides opportunities for students to develop understanding of the foundational principles of dynamics in the context of the big ideas that organize the curriculum framework.

- a. Newton's Laws of Motion and Forces
3. Universal Law of Gravitation (Big Ideas 1, 2, 3, and 4) [CR2c]
  - a. Circular Motion
4. Simple Harmonic Motion (Big Ideas 3 and 5) [CR2d]
  - a. Simple Pendulums
  - b. Mass-Spring Oscillators
5. Momentum (Big Ideas 3, 4, and 5) [CR2e]
  - a. Impulse and Momentum
  - b. The Law of Conservation of Momentum
6. Energy (Big Ideas 3, 4, and 5) [CR2f]
  - a. Work
  - b. Energy
  - c. Conservation of Energy
  - d. Power
7. Rotation (Big Ideas 3, 4, and 5) [CR2g]
  - a. Rotational Kinematics
  - b. Rotational Energy
  - c. Torque and Rotational Dynamics
  - d. Angular Momentum
  - e. Conservation of Angular Momentum
8. Electrostatics (Big Ideas 1, 3, and 5) [CR2h]
  - a. Electric Charge
  - b. The Law of Conservation of Electric Charge
  - c. Electrostatic Forces
9. Circuits (Big Ideas 1 and 5) [CR2i]
  - a. Ohm's Law
  - b. Kirchhoff's Laws
  - c. Simple DC Circuits
10. Mechanical Waves and Sound (Big Idea 6) [CR2j]

CR2c—The course design provides opportunities for students to develop understanding of the foundational principles of gravitation and circular motion in the context of the big ideas that organize the curriculum framework.

CR2d—The course design provides opportunities for students to develop understanding of the foundational principles of simple harmonic motion in the context of the big ideas that organize the curriculum framework.

CR2e—The course design provides opportunities for students to develop understanding of the foundational principles of linear momentum in the context of the big ideas that organize the curriculum framework.

CR2f—The course design provides opportunities for students to develop understanding of the foundational principle of energy in the context of the big ideas that organize the curriculum framework.

CR2g—The course design provides opportunities for students to develop understanding of the foundational principles of rotational motion in the context of the big ideas that organize the curriculum framework.

CR2h—The course design provides opportunities for students to develop understanding of the foundational principles of electrostatics in the context of the big ideas that organize the curriculum framework.

CR2i—The course design provides opportunities for students to develop understanding of the foundational principles of electric circuits in the context of the big ideas that organize the curriculum framework.

### Laboratory Activities:

Twenty five percent of the course will be lab work. [CR5] Labs may take several in-class days to finish, and students may have to do work outside of class as well.

Students are expected to keep a lab notebook where they will maintain a record of their laboratory work. Lab reports will consist of the following components: [CR7]

- Title
- Objective/Problem
- Design (if applicable): If the lab has no set procedure, what is to be done? Why are you doing it this way?
- Data: All data gathered in the lab will go here
- Calculations/Graphs: Calculations are done here. Any graphs that need to be made go here.
- Conclusion: Data analysis occurs here, and a statement can be made about what was learned in the lab. Error analysis also occurs here. Evaluation of the lab occurs here as well.

## **AP Physics 1 Classroom Policies**

1. No late homework accepted
2. All assignments are due at the beginning of class or will be counted as 1 day late
3. Late labs suffer a -15 point deduction per school date late
4. Quizzes can and should be corrected for half points back

## **Grade Distribution**

Tests-60%

Labs/Quizzes-30%

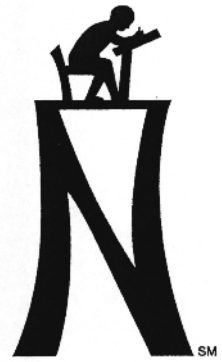
Homework/daily- 10%

- Test are graded based on an AP scoring curve and based on the following gradebook equivalency
  - o AP score 5 = 100 gradebook score
  - o AP score 4 = 90 gradebook score
  - o AP score 3 = 80 gradebook score
  - o AP score 2 = 70 gradebook score
  - o AP score 1 = 60 gradebook score

This course is college level algebra based physics. This course is not for students who want the easy path. Those who are serious about learning and critical thinking will thrive. Detractors from a positive learning environment will not be tolerated and asked to leave. Challenge is evidence of growth. If you do not feel challenged by your academics you are likely not growing in any measurable way. Athletes, musicians and artist will all agree to get better at something you must practice a lot. Academics at the college level are no different.

Please sign the electronic syllabus form at <http://wilsonphysics.weebly.com/ap-1-syllabus.html>

**LABORATORY SAFETY CONTRACT**  
**Northside ISD**



**I AGREE TO**

- Act in a responsible manner at all times in the laboratory.
  - Follow all written and oral instructions given by the teacher.
  - Use good housekeeping practices in the lab.
  - Wear safety goggles and aprons at all times.
  - Know the location and proper use of all safety equipment.
  - Never taste laboratory materials. **GUM, FOOD, OR DRINKS SHOULD NOT BE BROUGHT INTO THE LABORATORY.** Consider all chemicals toxic.
  - Immediately report any accident or injury, no matter how minor, to your teacher.
  - Tie back long hair, remove dangling jewelry, wear shoes with closed toes, and do not wear long, loose sleeves in the laboratory.
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- In case of a chemical spill on the skin or clothing, rinse the affected area with copious amounts of water. If the eyes are affected, water-washing must begin immediately and continue for 10 to 15 minutes or until professional assistance is obtained.
  - Never remove ANY chemicals from the laboratory.
  - Cosmetics should not be applied in the laboratory.
  - Contact lenses – please be aware that there is added risk with the wearing of contact lenses. The lenses can trap foreign materials against the cornea or may absorb and retain chemical vapors. In addition to wearing safety goggles, be sure to rinse and clean contact lenses appropriately.
  - If in doubt, ask!

**LABORATORY SAFETY CONTRACT**  
**Northside ISD**

I, \_\_\_\_\_, have read and understand my teacher's safety rules and I agree to abide by the safety regulations and any additional instructions, written or verbal, provided by the district and/or my teacher.

1. Do you wear contact lenses? \_\_\_\_\_

2. Do you have any serious allergies or other medical condition? (If so, name them.) \_\_\_\_\_

3. Have you been prescribed any emergency medicine, such as an asthma inhaler, insulin, or EpiPen? (If so, name them.) \_\_\_\_\_

Student signature \_\_\_\_\_

Date \_\_\_\_\_

Parent signature \_\_\_\_\_

Date \_\_\_\_\_