**AP® Physics 1 Syllabus**

## Mr. Conn Cedar Creek HS

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| **Curricular Requirements** | | **Page(s)** |
| CR1 | Students and teachers have access to college-level resources including college-level textbooks and reference materials in print or electronic format. | 1 |
| 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. | 1 |
| 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. | 1 |
| 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. | 2 |
| 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. | 2 |
| 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. | 2 |
| 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. | 2 |
| 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. | 2 |
| 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. | 2 |
| 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. | 2 |
| CR2j | The course design provides opportunities for students to develop understanding of the foundational principles of mechanical waves in the context of the big ideas that organize the curriculum framework. | 2 |
| CR3 | Students have opportunities to apply AP Physics 1 learning objectives connecting across enduring understandings as described in the curriculum framework. These opportunities must occur in addition to those within laboratory investigations. | 6 |
| CR4 | The course provides students with opportunities to apply their knowledge of physics principles to real world questions or scenarios (including societal issues or technological innovations) to help them become scientifically literate citizens. | 7 |
| CR5 | Students are provided with the opportunity to spend a minimum of 25 percent of instructional time engaging in hands-on laboratory work with an emphasis on inquiry-based investigations. | 2 |
| CR6a | The laboratory work used throughout the course includes investigations that support the foundational AP Physics 1 principles. | 3 |
| CR6b | The laboratory work used throughout the course includes guided-inquiry laboratory investigations allowing students to apply all seven science practices. | 3, 4, 5, 6 |
| CR7 | The course provides opportunities for students to develop their communication skills by recording evidence of their research of literature or scientific investigations through verbal, written, and graphic presentations. | 2 |
| CR8 | The course provides opportunities for students to develop written and oral scientific argumentation skills. | 6, 7 |



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# Instructor:

Thomas Conn

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# About this course:

The AP Physics 1 course will meet for 50 minutes every day. Lab work is integral to the understanding of the concepts in this course. 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.

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.

Grades will be determined by taking the number of points a student has earned and

dividing it by the total number of points that the student could have achieved. This decimal is multiplied by 100, and that will be the student’s grade.

# Textbook:

Giancoli, Douglas C. *Physics: Principles with Applications.* 7th Edition. New York: Pearson Prentice Hall, Inc., 2014. **[CR1]**

# Topics Covered:

1. Kinematics (Big Idea 3) **[CR2a]**
   1. Vectors/Scalars
   2. One Dimensional Motion (including graphing position, velocity, and acceleration)
   3. Two Dimensional Motion
2. Dynamics (Big Ideas 1, 2, 3, and 4) **[CR2b]**
   1. Newton’s Laws of Motion and Forces
3. Universal Law of Gravitation (Big Ideas 1, 2, 3, and 4) **[CR2c]**
   1. Circular Motion
4. Simple Harmonic Motion (Big Ideas 3 and 5) **[CR2d]**
   1. Simple Pendulums
   2. Mass-Spring Oscillators
5. Momentum (Big Ideas 3, 4, and 5) **[CR2e]**
   1. Impulse and Momentum
   2. The Law of Conservation of Momentum
6. Energy (Big Ideas 3, 4, and 5) **[CR2f]**
   1. Work
   2. Energy
   3. Conservation of Energy
   4. Power
7. Rotation (Big Ideas 3, 4, and 5) **[CR2g]**
   1. Rotational Kinematics
   2. Rotational Energy
   3. Torque and Rotational Dynamics
   4. Angular Momentum
   5. Conservation of Angular Momentum
8. Electrostatics (Big Ideas 1, 3, and 5) **[CR2h]**
   1. Electric Charge
   2. The Law of Conservation of Electric Charge
   3. Electrostatic Forces
9. Circuits (Big Ideas 1 and 5) **[CR2i]**
   1. Ohm’s Law
   2. Kirchhoff’s Laws
   3. Simple DC Circuits
10. Mechanical Waves and Sound (Big Idea 6) **[CR2j]**

# Laboratory Activities:

At least twenty 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 physics notebook where they will take notes, write formulas and 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.

**Classroom Norms**

**Tutoring**:

Monday and Wednesday mornings 8:05- 8:35 am

Tuesday and Thursday afternoons 4:15- 4:45 pm

\*additional tutoring available upon request

**Class Schedule and Conference Time**:

AP Physics 2 Room C213 1st Period 8:40-9:30

AP Physics 1 Room C213 2st Period 9:35-10:30

Intervention Room C213 Eagle Time 10:35-11:05

Conference Room C213 3nd Period 11:10-12:00

Lunch A Lunch 12:00-12:30

AP Physics 1 Room C213 4th Period 12:35-1:25

AP Physics 1Room C213 5th Period 1:30-2:20

AP Physics 2 Room C213 6th Period 2:25-3:15

AP Physics 1 Room C213 7th Period 3:20-4:10

**Expectations**:

In order to meet the high standards established by Cedar Creek HS and to provide an opportunity for ALL students to learn, the following expectations will be implemented in class.

* + Be present and on time.
  + Be prepared and engaged in learning.
  + Be respectful of yourself and others.
  + Follow all CCHS rules paying close attention to safety guidelines.

**Supplies**:

Composition Notebook (graph type if possible) for notes, lab exercises, practice, and reflection

3-Ring binder with 5 dividers for portfolio TI-83 or higher model graphing calculator for problem solving (class calculators are available if needed) Pencil/Ruler/Protractor

**Grading**:

Major Grades (60%)- includes tests, formal labs, performance assessments, and projects

Daily Grades (40%)- includes homework, practice, lab exercises, and quizzes

**Policies**:

* **Make-up work**
  1. If you miss class because of an absence, you will get one extra day to turn in any assignment for each day that you are absent. Test and Labs must be made up within three days.
  2. The student is responsible for investigating and obtaining all missing assignments, notes, and due dates.
  3. Late work is accepted for partial credit three days after due. The total grade on the assignment will be a maximum of 60%. Students are responsible for coordinating the reworking of assignments, laboratories and tests for a maximum of a 70%.
  4. If you know of an absence ahead of time, inform the teacher and collect assignments.

1. **Beginning of Class**
   1. You are encouraged to be to class on time and prepared when the bell rings.
   2. At the bell you will be required to show homework previously assigned and complete an introductory assignment. Homework and intro assignment will result in a cumulative participation grade factored into your daily grades.
   3. Tardies will be addressed per CCHS policy.
2. **End of Class**
   1. We will need every moment of class to fully explore the content.
   2. At the end of class you will be given a reflection assignment to self-assess your understanding of the day’s activities and concepts. If additional time is needed, you may complete for homework.
3. **Academic Integrity**
   1. I have very high expectations for students at Cedar Creek HS. You are expected to show your best effort on all assignments and assessments.
   2. Cheating or plagiarism will not be tolerated. Committing either offense could result in loss of credit for the assignment or assessment in question.

5. **Cell Phones / MP3 Players**

a. There is a time and place for everything. Absolutely NO Cell Phone / MP3 usage without being directed to do so.

b. This class is based on collaboration and the isolation caused by a phone or MP3 player is not consistent with the class objectives.