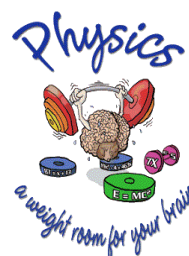




# AP Physics 1 Syllabus

Mr. Webber

Webbert1@duvalschools.org  
www.physics-is-phun.org/home



## Course Description

You can't play a game if you don't know the rules, and the more you know the rules the more you enjoy the game. Physics is the study of nature's "rules" – the rules and laws governing the universe in which you are a part. So, to learn physics is to learn about ourselves and the arena of physical and natural laws that govern all aspects of our lives, from the atoms within our cells to the motions of galaxies and the energies in distant quasars!

AP Physics 1 examines, in depth, topics in Classical Mechanics to prepare you for the AP Physics 1 test in May of 2025. My goal is not to teach to the test; rather, it is to teach the subject and cognitive skills that go along with it. When striving for that goal, testing becomes secondary and a natural extension of the learning process.

This course will also teach you to become critical thinkers and develop analytical reasoning that will give you problem-solving skills that apply across all disciplines. To that end, an inquiry-based instructional environment is utilized, one in which the traditional practice of "I do-we do-you do" is reversed. There will be many practice problems, assessments, and homework assignments – it is imperative that you complete all work to the best of your ability. Physics is learned by doing, not by watching, and memorization will not work.

## Expectations

According to the College Board AND based on my experience, students are to give a minimum of one hour of study to AP Physics every night. This time should be used to organize class notes, rework proofs and derivations, and work on assessments. Tests and exams will require additional time, as will final preparation for the AP Exam.

This course also has Saturday sessions, often formatted according to NMSI (National Math and Science Initiative). These sessions help you understand basic concepts and prepare you for the AP exam and also serve as recitations – a forum to ask questions and go over problems. You are expected and highly encouraged to attend the Saturday sessions. Dates will be discussed throughout the course.

## Major Units of Study

**Semester 1:** Kinematics; Dynamics and Mechanics; Circular Motion; Work, Power, and Energy.

**Semester 2:** Linear Momentum and Collisions; Simple Harmonic Motion; Torque and Rotational Dynamics; Fluid Dynamics (new to the 2024-2025 academic year).

*Note: As of 2022, Mechanical Waves and Sound; Electrostatics; and Circuits have been moved to AP Physics 2.*

## Materials -- Textbooks

### **Required**

1. "College Physics for AP Courses" by Irina Lyublinskaya (Principle Author). Open Stax. 2017. Found on the course website.
2. "Quantitative Skills in the AP Sciences" published by the College Board. 2018. Found on the course website.

### **Optional**

3. "College Physics, 8<sup>th</sup> ed." by Raymond Serway, Chris Vuille, and Jerry S. Faughn. Brooks/Cole. 2010.
4. "College Physics" by Eugenia Etkina, Michael Gentile, and Alan Van Heuvelen. Pearson. 2014.

### **Recommended**

There are publications through Barrons, Princeton, and McGraw Hill designed to be a supplement to AP courses. These are fairly inexpensive and can be found both new and used online. We will discuss these more in class.

## Materials – Student Supply Information

Notebook and binder, pencil (mechanical serves best), calculator (scientific)

## **Grading**

The class is based on a points earned system; that is, the possible points available per assessment depends on its length. Problems are worth 10 points each with a scoring rubric based on the College Board's expectations. Assessments will fall into one of two categories:

Formative Assessments: 40%

Summative Assessments: 60%

Note: Summative assessments are closed notes and no equation sheet is permitted. The physics and concepts are to be learned as we work through the course!

## **Late Work and Missed Test Policies**

- Work is expected to be turned in on the due date. In the case of an excused absence, assignments are due the day you return. Late work is subject to a 25% penalty.
- No late work, regardless of penalty, will be accepted after the unit summative assessment has been given.
- If you miss a laboratory exercise with an excused absence, you may be exempted from the work (to be determined by the instructor).
- If you miss a summative assessment (test or exam) and have an excused absence, you have one week to make up that test. Make-up time is by appointment only and will not happen during class time.

## **Website**

The course has a website, which you may access at [www.physics-is-phun.org](http://www.physics-is-phun.org) and then select AP Physics 1 from the main menu. Assessments, textbooks, classroom materials (such as Goals and Scales), a calendar, and other tools are there for you to utilize. A password is required to enter the AP Physics 1 section, which will be provided.

## **General Classroom Guidelines**

- We practice and expect respect at all times – to our teacher, our classmates, our school, and ourselves.
- We come to class prepared and excited to learn.
- We appreciate the value of education.
- We work to maintain a positive learning environment.
- We strive to do our best.
- We believe in academic integrity.
- We will keep our classroom and supplies neat.

## **General Classroom Procedures**

- We arrive to class on time, enter in a respectful way, and begin any bell work.
- We raise our hands to be recognized.
- We do not leave our seats unless given permission.
- We do not leave our trash on the floor. Trash is to be thrown out at the end of class.
- We do not eat, drink, or chew gum in this classroom.

## **General Classroom Policies**

- Work is to be turned in on the due date. Late work may be subject to a 25% penalty.
- No work will be accepted after the unit test.
- A missed test with an excused absence must be made up within one week – not during class. If the absence is excused, full credit may be earned; if unexcused, a maximum score of 75% may be earned.
- You are responsible for work from any absence
- Any act of cheating results in a grade of 0.
- Do not arrive late for class.
- Behavior that is not compliant with the student handbook will be addressed by the procedures outlined in the handbook.

## **Cell Phone Policy**

No cell phones, tablets, or earbuds are allowed on your person – keep them quiet and put away! Anyone caught using a cell phone will face the discipline, as outlined in the School Code of Conduct. This includes confiscation of the device(s).

## Course Outline:

### Quarter 1

Kinematics  
Kinematics in one dimension  
Vectors and scalars  
Kinematics in two dimensions  
Projectile motion  
Dynamics 1  
Forces  
Newton's Laws of Motion  
Friction  
Simple machines: Pulleys

### Quarter 2

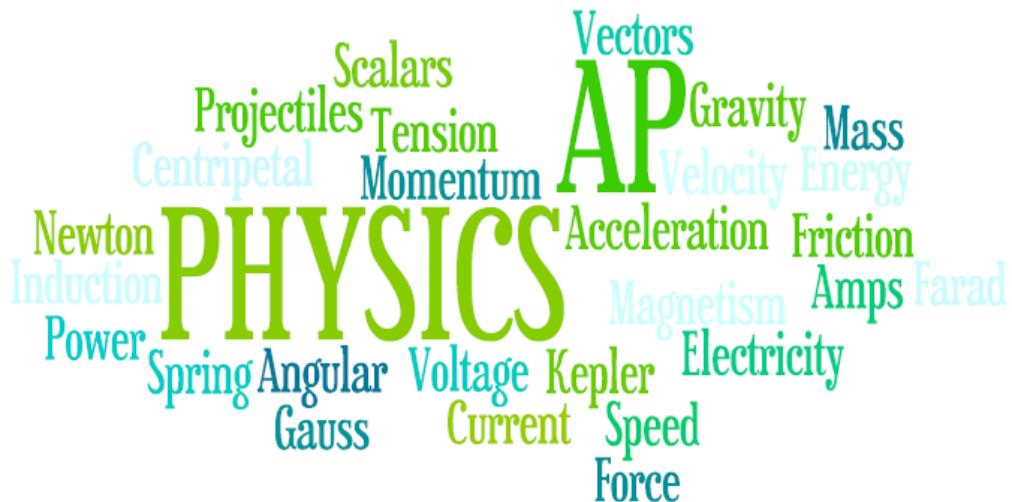
Dynamics 2  
Uniform circular motion  
Dynamic circular motion  
Gravitation  
Energy  
Work  
Power  
Kinetic energy  
Gravitational potential energy  
Elastic potential energy  
Conservation of energy

### Quarter 3

Dynamics 3  
Impulse and momentum  
Conservation of momentum  
Elastic and inelastic collisions  
Dynamics 4  
Linear restoring force and simple harmonic motion  
Simple harmonic motion graphs  
The simple pendulum  
Mass-spring systems  
Dynamics 5  
Rotational motion  
Torque  
Center of mass  
Rotational kinematics and inertia  
Rotational energy  
Angular momentum  
Conservation of angular momentum

### Quarter 4

Dynamics 5 -- Continued  
Dynamics 6 – Fluid dynamics  
Practice Tests and Review



# AP PHYSICS 1

## COURSE CHANGES FOR THE 2024-2025 SCHOOL YEAR

In response to a changing educational environment, the College Board (and Mr. Webber!) have made the following changes to AP Physics 1 for the 2024-2025 academic year.

### Course Changes – College Board

- 8 units—an increase from 7.
  - Fluids (previously Unit 1 of AP Physics 2) is now Unit 8 of AP Physics 1.
- Adding connections between rotational and translational motion.
- Adding specific learning objectives referencing power.
- Adding equations of motion for objects in simple harmonic motion.
- Uncoupling specific science practices from specific learning objectives. In the revised course framework, any learning objective can be tested with any science practice, which allows a greater range of questions to be written to the new framework.

### Exam Changes – College Board

- Digital testing (Hybrid – Bluebook and paper free-response).
- 40 multiple-choice questions (MCQs)—a decrease from 50 MCQs.
- Removal of multiselect questions – all multiple-choice questions will have a single answer.
- Decreasing Section I (MCQs) time from 90 to 80 minutes.
- 4 free-response questions (FRQs)—a decrease from 5 FRQs.
- All 4 FRQs are new question types:
  - Mathematical routines
  - Translation between representations
  - Experimental design and analysis
  - Qualitative/quantitative translation
- Increasing Section II (FRQs) time from 90 to 100 minutes.

### Course Changes – Mr. Webber

- Assessment problems will be done in class. You are still expected to commit to one hour after school every day, as per the AP Contract, to organize your notes and to study.
- The learning pace will be increased to incorporate the additional section (Fluids) and class time lost to problems.

## **NOTES**

## Beginning of Class To-Do List

- AP Central College Board Account Created.
  - [apcentral.collegeboard.org](http://apcentral.collegeboard.org)
  - Join Code: 3AVPYX
  
- Access to [www.physics-is-phun.org](http://www.physics-is-phun.org) verified.
  
- Class supplies obtained and organized.
  
- Learning and understanding the operation of my scientific calculator.
  
- Syllabus Acknowledgement signed and returned.
  
- AP College Board Contract signed and returned.
  
- Lab Safety Contract signed and returned.



And now your adventure  
in physics is ready to  
begin!

## Acknowledgements

Please read and fill out this acknowledgement page and return it to Mr. Webber. Keep the syllabus in your notebook for reference.

I, \_\_\_\_\_, have read the syllabus for AP Physics 1. I  
Name of Student  
understand Mr. Webber's Guidelines, Procedures, and Policies, including the use of cell phones and tablets, and the expectations of me, including the time and work expected outside of class. I also understand the discipline and academic consequences for not living up to those expectations. I recognize that the science of physics is very demanding and rigorous and that it will require discipline, planning, and studying on my part.

\_\_\_\_\_  
Signature of Student

\_\_\_\_\_  
Date

As the parent(s)/guardian(s) of the above named student, I/we also understand the Guidelines, Procedures, and Policies of Mr. Webber's class. In addition, I/we understand the academic demands of the course and will provide support to our student, Mr. Webber, and the class as a whole.

\_\_\_\_\_  
Signature of Parent/Guardian

\_\_\_\_\_  
Date

\_\_\_\_\_  
Parent/Guardian Email

\_\_\_\_\_  
Phone