



AP Physics 1 and AP Physics 2 Frequently Asked Questions

The New AP Physics Courses

Why has the AP Program replaced AP Physics B with two new courses?

An in-depth study by the National Research Council (NRC) concluded that AP Physics B is a very broad course that “encourages cursory treatment of very important topics in physics” rather than cultivating a deeper understanding of key foundational principles. The NRC further concluded that students should experience a full treatment of Newtonian mechanics, including rotational dynamics and angular momentum, topics not covered in AP Physics B. They also emphasized the need for inquiry instruction and in-depth exploration of topics.

To achieve these important goals, and to provide the much-needed time for teachers to accomplish them, the NRC recommended teaching the course material in two years instead of one. After confirming this recommendation through college curriculum studies, higher education validations, state standards reviews, and AP teacher timing trials, the AP Program has replaced AP Physics B with two separate full-year courses: AP Physics 1: Algebra-Based and AP Physics 2: Algebra-Based. The new courses align strongly with college and university expectations; students and teachers will benefit in many ways.

AP will begin offering the new courses in the 2014-15 academic year, and will discontinue the AP Physics B program following the 2013-14 academic year.

How do AP Physics 1 and AP Physics 2 divide content?

AP Physics 1: Algebra-Based is the equivalent of a first-semester college course in algebra-based physics, but it is designed to be taught over a full academic year to enable AP students to develop deep understanding of the content and to focus on applying their knowledge through inquiry labs. The full year also allows time for inclusion of physics content specified by state standards. The course covers Newtonian mechanics (including rotational dynamics and angular momentum); work, energy, and power; and mechanical waves and sound. It also introduces electric circuits.

AP Physics 2: Algebra-Based is the equivalent of a second-semester college course in algebra-based physics, but it is designed to be taught over a full academic year to enable AP students to develop deep understanding of the content and to focus on applying their knowledge through inquiry labs. The full year also allows time for inclusion of physics content specified by your state standards. The course covers fluid mechanics; thermodynamics; electricity and magnetism; optics; and atomic and nuclear physics.

How does the new curriculum framework differ from AP Physics B’s list of learning objectives?

The *AP Physics 1 and AP Physics 2 Curriculum Framework* was developed in close consultation with college and university faculty and master AP teachers nationwide. The new framework differs from the AP Physics B’s list of learning objectives, which



comprises a checklist of topics to cover, in several significant ways. The curriculum framework is now:

- Organized under seven “big ideas” that articulate the foundational principles of introductory physics.
- Focused on a series of learning objectives that clarify what students should know and be able to do to qualify for college credit and placement. Each learning objective combines specific physics content knowledge with one of seven foundational science practices.

How will my students benefit from the changes to AP Physics B?

Teachers and students will have more time to engage in hands-on explorations of physics and inquiry labs. By splitting the AP Physics B course into two separate, full-year courses, teachers and students can achieve much greater depth of understanding.

What are the science practices? How are these practices applied in the new AP Physics 1 and AP Physics 2 courses?

The [science practices](#) describe the knowledge and skills that are essential to the study of science. The ability to develop and use physics knowledge by applying it to the practice of scientific inquiry and reasoning is at the heart of the new physics courses and exams. By applying the principles of scientific inquiry, teachers can promote a more engaging and rigorous experience for AP Physics students.

Do the new courses reflect the knowledge and skills valued by college faculty and department chairs?

College department chairs and faculty across the United States have reviewed each element of the new AP Physics courses and exams. These experts identified the key concepts and skills that students should learn, and confirmed that the new courses can offer students a solid foundation for further science course work in college.

A validation study confirmed that college and university physics faculty believe that the curriculum framework matches the curriculum taught in the corresponding semesters of algebra-based college physics. A large majority of faculty believed that the new AP Physics 1 and AP Physics 2 curricula will prepare students for success in subsequent college physics courses, and they favored granting credit or placement to students.

My students do well on the AP Physics B Exam. Should I teach AP Physics 1 and AP Physics 2 in one year?

The curriculum framework details the requirements for AP Physics 1 and AP Physics 2, which are both full-year courses. For success on the AP Physics 1 Exam and AP Physics 2 Exam, students need to acquire deep conceptual understanding of physics and the skills described in the [science practices](#). To engage students in rigorous inquiry investigations and activities that support the deep conceptual understanding outlined in the learning objectives, it is best to teach the new courses over two academic years. The equivalent of two full years of study will best prepare students who want to take the AP Physics 1 Exam and AP Physics 2 Exam. However, as with all AP subjects, individual schools are ultimately responsible for determining the schedule for their AP courses, as long as the



course is designed to fulfill all requirements delineated by the AP Course Audit.

Can I teach AP Physics 1 and AP Physics 2 in one year?

We recommend that schools with an introductory or honors physics course consider adapting it to cover the AP Physics 1 college-level curriculum, beginning in fall 2013, and offering AP Physics 2 in the subsequent year. As an alternative, after taking AP Physics 1, students can take either of the AP Physics C courses or other AP science courses, as AP Physics 1 provides excellent preparation for future science course work.

AP Physics 1 does not cover all my state standards. Will I have time to cover them during the year?

Teacher-timing trials of the AP Physics 1 curriculum revealed that teachers will have the time needed to cover their state standards. Therefore, teachers who supplement the course with additional material will not jeopardize students' success in taking either the AP Exams or state standardized tests.

The AP Physics Exams

Are there separate exams for AP Physics 1 and AP Physics 2?

There are two new exams, one for AP Physics 1 and one for AP Physics 2. Each exam takes three hours to complete.

Can my students take both exams in the same year?

Students can take both exams in the same year. The new exams will be administered for the first time in May 2015.

How do the new exams differ from the current exam?

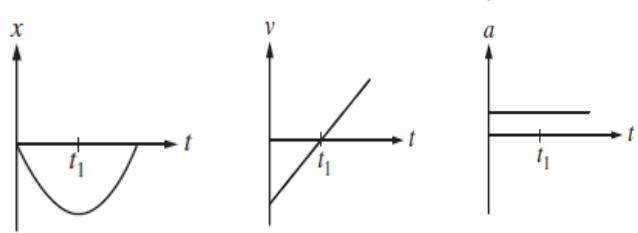
Like the AP Physics B Exam, the AP Physics 1 Exam and AP Physics 2 Exam feature multiple-choice and free-response questions. However, the new exams place more emphasis on assessing students' conceptual understanding of physics. As a result, students need to show that they understand physics content by applying the [science practices](#) — which requires more writing on the free-response section than in the past. All questions are tied directly to the learning objectives described in the curriculum framework, each of which combines physics content and the foundational science practices.

The new AP Physics 1 and AP Physics 2 exams:

- **Feature fewer multiple-choice questions**, which were designed to emphasize the ability to apply reasoning skills. Having fewer questions to answer gives students the time they need to respond.
- **Contain fewer free-response questions**. The new questions emphasize qualitative and quantitative explanations, reasoning, and justifications of answers. To allow students the time they need to respond, the free-response sections of the exams also contain fewer questions.
- **Include an experimental-design question** that asks students to indicate how they would design an experiment, collect data, and discover sources of uncertainty.
- **Ask students to show evidence of deep, conceptual understanding** of physics principles and of the ability to develop and interpret conceptual models. The

exams now place less emphasis on questions that involve using *only* mathematic routines to solve problems. Students will continue to solve problems mathematically, but the exams emphasize the use of symbolic and proportional reasoning and the ability to translate among multiple representations.

Sample Question



The graphs above represent the position (x), velocity (v), and acceleration (a) as a function of time (t) for a marble moving in one dimension. Which of the following could describe the motion of the marble?

(A) Rolling along the floor and then bouncing off a wall
 (B) Rolling down one side of a bowl and then rolling up the other side
 (C) Rolling up a ramp and then rolling back down
 (D) Falling and then bouncing elastically off a hard floor

Answer: C

Targeted Learning Objective:

Learning Objective (3.A.1.1): The student is able to express the motion of an object using narrative, mathematical, and graphical representations. [See Science Practices 1.5 and 2.1]

Exam Format

Below is a comparison of the AP Physics B Exam and the AP Physics 1 and AP Physics 2 Exams.

Subject	Section 1: 90 minutes/ 50 percent	Section 2: 90 minutes/50 percent
AP Physics B	70 multiple-choice questions	6 to 7 free-response questions
AP Physics 1	50 multiple-choice questions	5 free-response questions <ul style="list-style-type: none"> • experimental design • qualitative/quantitative translation • short answer (3)
AP Physics 2	50 multiple-choice questions	4 free-response questions <ul style="list-style-type: none"> • experimental design • qualitative/quantitative translation • short answer (2)



The Lab Component

What are the lab requirements for the two new courses?

In the new courses, instructional time devoted to laboratory investigations has increased from 20 to 25 percent. The investigations now emphasize student-centered inquiry instruction and learning. Inquiry investigations foster student engagement in the practices of science through experimenting, analyzing, making conjectures and arguments, and solving problems in a collaborative setting, where students direct and monitor their progress.

Scheduling and Operational Issues

I'm interested in teaching AP Physics 1 and AP Physics 2. What does my administration need to know?

AP Physics 1 and AP Physics 2 are designed to be independent full-year courses. Schools will not need to purchase new lab equipment to accommodate either course. In most cases, teachers can use the textbook authorized for AP Physics B to teach the new courses.

Is there a prerequisite for AP Physics 1?

Unlike AP Physics B, which recommends a prior high school physics course, no prior course work in physics is necessary for students to enroll in AP Physics 1. Students should have completed geometry and be concurrently taking Algebra II or an equivalent course. Although the Physics 1 course includes basic use of trigonometric functions, this understanding can be gained either in the concurrent math course or in the AP Physics 1 course itself.

Is there a prerequisite for AP Physics 2?

Students entering AP Physics 2 need to have developed mastery of the learning objectives described in the AP Physics 1 curriculum framework to be prepared for AP Physics 2. Taking the AP Physics 1 course or a comparable introductory course in physics will satisfy this prerequisite. Students should also have taken or be concurrently taking precalculus or an equivalent course.

What are a student's options after taking AP Physics 1?

Students have the following options:

- They can take AP Physics 2 (recommended for students considering pre-med or life science majors).
- They can go on to either AP Physics C: Electricity and/or Magnetism or AP Physics C: Mechanics (recommended for students considering physics or engineering majors).
- They can choose to take other AP science courses.

Can we start teaching the AP Physics 1 content in 2013-14 instead of 2014-15?

Although the AP Course Audit will not accept AP Physics 1 syllabi until March 2014, schools can adapt their current introductory or honors course to include AP Physics 1 college curriculum for the 2013-14 year. The school can then offer AP Physics 2 in fall 2014, and students can take both exams in May 2015.



College Policies

Will colleges award credit for completion of AP Physics 1 alone?

AP recommends that colleges and universities grant one semester of credit for a score of 3 or higher on the AP Physics 1 Exam and one semester of credit for a score of 3 or higher on the AP Physics 2 Exam. However, colleges and universities set their own policies for granting credit and/or placement for AP scores. Students should contact colleges of interest directly to learn more about specific AP credit policies and requirements.

The AP Course Audit

When can I submit my AP Physics 1 and AP Physics 2 syllabus to the AP Course Audit?

The AP Course Audit will accept submissions of AP Physics 1 and AP Physics 2 syllabi from March 2014 through January 31, 2015.

If I have an authorized syllabus for AP Physics B, will I need to submit a new one for the 2014-15 school year?

The AP Course Audit process is designed to ensure that teachers have a thorough understanding of the AP Physics 1 and AP Physics 2 course requirements, and that they receive the support needed to create a syllabus for each course. To ensure that the authorization process is as stress-free as possible, teachers have two options for submitting a syllabus for AP Physics 1 and/or AP Physics 2:

- **Option 1:** Design and submit a syllabus aligned with the new curricular requirements, guided by the resources that will become available on the AP Course Audit website in March 2014.
- **Option 2:** Submit one of the Annotated Sample Syllabi (available in March 2014 on the AP Course Audit website) and use it as an approach to teaching the course.

The AP Course Audit will begin accepting syllabi for review in March 2014.

Are resources available to support course authorization?

AP will create (and post online) numerous resources to help teachers plan for the 2014-15 year, including practice exam questions, syllabus development guides, sample syllabi, and more.

- The **Syllabus Development Guide** provides a detailed explanation of each curricular requirement, including scoring components, evaluation guidelines, definitions of key terms, and samples of evidence that highlight the level of detail reviewers expect to see in a college syllabus.
- The **Annotated Sample Syllabi** demonstrate a variety of ways teachers can fulfill the curricular requirements within the context of a syllabus.

Please visit [AP Course Audit Information](#) for details.



If I start teaching the AP Physics 1 content in fall 2013, can I have my course audited during that year?

The AP Course Audit will not accept AP Physics 1 syllabi until the 2014-15 school year, when the new AP courses and exams become operational. You can begin to incorporate the AP Physics 1 curriculum into your course in fall 2013, and you may use the AP designation following syllabus authorization in 2014-15. Schools should continue to use locally designated course titles until that time.

Can I use the physics textbook that was approved for AP Physics B?

Teachers can use the college textbook approved for AP Physics B in compliance with AP Course Audit requirements.

Professional Development

What resources are available to help me teach the new courses?

Starting in summer of 2013, [AP Summer Institutes](#) will devote 20 percent of each session to previewing the new courses and exams. In 2013-14, [AP workshops](#) will feature a similar structure. We also offer one-day, face-to-face workshops devoted to addressing critical aspects of the new courses.

During the 2014-15 year, [AP Summer Institutes](#) and [AP workshops](#) will focus entirely on familiarizing educators with the new courses and exams and offering guidance and strategies to support success.

We will publish several Course Planning and Pacing Guides for each course. These online resources will contain various approaches to planning and pacing the curriculum across one school year. They will also contain a host of ideas for teaching the courses, along with activities, resources, and assessments.

Teachers can join the [AP Physics Teacher Community](#), an online forum moderated by fellow educators where AP teachers can connect with colleagues, share classroom materials, and exchange ideas.