High School Program Planning

PINE VIEW PROGRAM REQUIREMENTS

The following requirements have been established for Pine View School:

- Students must earn a minimum of 26 credits as approved in Sarasota County School's Student Progression Plan for Pine View. (This includes high school credits earned in middle school.) Credits needed for graduation for transfer students after Grade 9 will be determined at the time of registration.
- All students in Grades 9-12 must be enrolled in at least 6 classes each semester per year.
- Students must complete three consecutive years of the same world language.
- Courses successfully completed (C or higher) may not be repeated through Adult Education or Florida Virtual School.
- Throughout the year, all students in Grades 9-12 must maintain a minimum 2.5 cumulative unweighted GPA for all core classes. Grade point averages are closely monitored to ensure students are eligible for continued placement in a full time gifted magnet program.
- Students are expected to take courses offered at Pine View on campus with a gifted endorsed instructor.
- Students may not drop a course after drop date, even if an Advanced Placement Course.
- Students are encouraged to take the most demanding program of studies for which they are prepared.

STATE ASSESSMENT REQUIREMENTS FOR ALL STUDENTS

- Students must earn passing scores on the Grade 10 ELA FSA and Algebra I EOC.
- The EOC is 30% of final grades for: Algebra I Honors, Geometry Honors, Biology Honors, and US History Honors
- Please note: State Assessment Requirements are subject to change due to legislation.

ADDITIONAL REQUIREMENTS FOR STUDENTS ENTERING HIGH SCHOOL:

- At least one elective must be rigorous: Advanced Placement, Dual Enrollment or result in industry certification.
- Dual Enrollment preregistration is required and needs to be met by completing an application, having a cumulative unweighted GPA of 3.0, and passing the PERT/CLM test at SCF. ACT or SAT scores may also be used in lieu of the PERT/CLM. Test scores must be recent (within the past two years). The deadline date for all requirements to have been met is May 15th, 2019. Applications available in Guidance office.
- Dual enrollment courses are accessed online or off campus at the college or university.
- Please note: Additional Requirements are subject to change due to legislation.

*Course Weighting: Honors classes carry a weight of 1.0. Advanced Placement and Dual Enrollment courses are weighted at 1.5 when calculating a student’s High School GPA.

<table>
<thead>
<tr>
<th>COURSE CREDITS AT A GLANCE</th>
<th>LEGEND</th>
</tr>
</thead>
<tbody>
<tr>
<td>English</td>
<td>Max Credits 1.0</td>
</tr>
<tr>
<td>Mathematics</td>
<td>4</td>
</tr>
<tr>
<td>Science (4 highly recommended)</td>
<td>3</td>
</tr>
<tr>
<td>Social Studies</td>
<td>3</td>
</tr>
<tr>
<td>World Languages</td>
<td>3</td>
</tr>
<tr>
<td>Performing Fine Arts</td>
<td>1</td>
</tr>
<tr>
<td>H.O.P.E./Online Class</td>
<td>1</td>
</tr>
<tr>
<td>Electives</td>
<td>7</td>
</tr>
<tr>
<td><strong>Total Credits:</strong></td>
<td><strong>26</strong></td>
</tr>
</tbody>
</table>

Courses and prerequisites are subject to change based on enrollment.
## AP Course Comparison Table

### Language Arts

<table>
<thead>
<tr>
<th>AP Course Title</th>
<th>Recommended Grade-Level(s)</th>
<th>Recommended PSAT Score</th>
<th>Credit</th>
<th>Typical Assignments/Workload</th>
<th>Avg HW Hrs/Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP Language &amp; Composition</td>
<td>11, 12</td>
<td>R+W ≥ 55</td>
<td>1*</td>
<td>Weekly reading analysis, Weekly LOC, Weekly vocab, Quarterly book projects (350 pages), 6 &quot;Follow the Columnist&quot; summaries, College research essay, Mock</td>
<td>3</td>
</tr>
<tr>
<td>AP Literature &amp; Composition</td>
<td>12</td>
<td>R+W ≥ 60</td>
<td>1*</td>
<td>Nightly reading (10-20 pages), Regular reading checks, Weekly vocab, Quarterly reading projects, Mock</td>
<td>6</td>
</tr>
<tr>
<td>AP Capstone Seminar</td>
<td>11, 12</td>
<td>Teacher Rec</td>
<td>1*</td>
<td>Nightly reading, Weekly Application Exercises and Applications, Ongoing, Assessments and Practice Assessment, Long-Term Performance Task Assessments</td>
<td>5</td>
</tr>
<tr>
<td>AP Capstone Research</td>
<td>12</td>
<td>Teacher Rec</td>
<td>1*</td>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>

### Math

<table>
<thead>
<tr>
<th>AP Course Title</th>
<th>Recommended Grade-Level(s)</th>
<th>Recommended PSAT Score</th>
<th>Credit</th>
<th>Typical Assignments/Workload</th>
<th>Avg HW Hrs/Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP Calculus AB</td>
<td>11, 12</td>
<td>M ≥ 31.5</td>
<td>1*</td>
<td>Nightly review and practice; Two tests per quarter; Mock</td>
<td>5</td>
</tr>
<tr>
<td>AP Calculus BC</td>
<td>11, 12</td>
<td>M ≥ 31.5</td>
<td>1*</td>
<td>Nightly review and practice; 4 tests per quarter; End-of-year project; Mock</td>
<td>8</td>
</tr>
<tr>
<td>AP Statistics</td>
<td>10 - 12</td>
<td>R+M ≥ 60.5</td>
<td>1*</td>
<td>Nightly practice problems; Monthly tests; Mock</td>
<td>2.5</td>
</tr>
</tbody>
</table>

### Science

<table>
<thead>
<tr>
<th>AP Course Title</th>
<th>Recommended Grade-Level(s)</th>
<th>Recommended PSAT Score</th>
<th>Credit</th>
<th>Typical Assignments/Workload</th>
<th>Avg HW Hrs/Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP Biology</td>
<td>See pre-reqs</td>
<td>R+M ≥ 61.5</td>
<td>1*</td>
<td>Nightly review and reading (1-2 sections/night), End of-year project, Mock</td>
<td>5</td>
</tr>
<tr>
<td>AP Chemistry</td>
<td>See pre-reqs</td>
<td>R+M ≥ 62.5</td>
<td>1*</td>
<td>Nightly review and practice, 4 tests per quarter; End-of-year project, Mock</td>
<td>5</td>
</tr>
<tr>
<td>AP Environmental Science</td>
<td>See pre-reqs</td>
<td>R+M ≥ 59</td>
<td>1*</td>
<td>Vocabulary Study, 30+ pages of reading/week, End of Chapter Preparing for AP Exam questions, 1 Lab per week; 2 tests per quarter (2-4 Chapters each); Midterm and Mock</td>
<td>3</td>
</tr>
<tr>
<td>AP Physics 1</td>
<td>See pre-reqs</td>
<td>R+M ≥ 65.5</td>
<td>1*</td>
<td>Nightly homework (varies)</td>
<td>8</td>
</tr>
<tr>
<td>Course Title</td>
<td>PSI Grades</td>
<td>PSAT Score</td>
<td>Credit</td>
<td>Typical Assignments/Workload</td>
<td></td>
</tr>
<tr>
<td>------------------------------------------------</td>
<td>------------</td>
<td>------------</td>
<td>--------</td>
<td>---------------------------------------------------------------------------------------------</td>
<td></td>
</tr>
<tr>
<td>AP Physics 2</td>
<td></td>
<td>R&amp;M ≥ 65.5</td>
<td>1(\star)</td>
<td>Nightly homework (varies)</td>
<td></td>
</tr>
<tr>
<td>AP Physics C</td>
<td></td>
<td>R&amp;M ≥ 65.5</td>
<td>1(\star)</td>
<td>Nightly review and practice; 4 tests per quarter; End-of-year project; Mock</td>
<td></td>
</tr>
</tbody>
</table>

### Social Studies

<table>
<thead>
<tr>
<th>AP Course Title</th>
<th>Recommended Grade-Level(s)</th>
<th>Recommended PSAT Score</th>
<th>Credit</th>
<th>Typical Assignments/Workload</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP Comparative Government</td>
<td>11, 12</td>
<td>EBRW+M ≥ 1210</td>
<td>0.5(\star)</td>
<td>Nightly textbook reading (15 pages) and notes; Weekly chapter quizzes; Weekly current event article; Bi-weekly tests (MC &amp; FRQ); Semester project; Mock</td>
</tr>
<tr>
<td>AP European History</td>
<td>10 - 12</td>
<td>EBRW+M ≥ 1110</td>
<td>1(\star)</td>
<td>Summer reading, <em>The Prince</em> by Machiavelli; 2-3 units per quarter; Nightly textbook reading (10 pages); Primary source projects each unit; Unit tests</td>
</tr>
<tr>
<td>AP Human Geography</td>
<td>9 - 12</td>
<td>EBRW+M ≥ 1130</td>
<td>1(\star)</td>
<td>Nightly textbook reading (5 pages) &amp; outline notes; Bi-weekly chapter quizzes; Monthly Unit tests (MC &amp; FR); Weekly Current Events Article; Midterm and Mock</td>
</tr>
<tr>
<td>AP Macroeconomics (with Financial Literacy)</td>
<td>12</td>
<td>R+M ≥ 62.5</td>
<td>0.5(\star)</td>
<td>Weekly practice quizzes; Weekly quizzes (MC and FRQ); Quiz corrections as needed; Quarterly project; Quarterly cumulative Midterm and Mock</td>
</tr>
<tr>
<td>AP Microeconomics</td>
<td>11, 12</td>
<td>EBRW+M ≥ 1080</td>
<td>1(\star)</td>
<td>Weekly practice quizzes; Weekly quizzes (MC and FRQ); Quiz corrections as needed; Quarterly project; Quarterly cumulative test/Mock</td>
</tr>
<tr>
<td>AP Psychology</td>
<td>11, 12</td>
<td>EBRW+M ≥ 1210</td>
<td>0.5(\star)</td>
<td>Bi-weekly textbook outline &amp; vocab; Bi-weekly tests (MC and FRQ); Semester project; Mock</td>
</tr>
<tr>
<td>AP U.S. Government and Politics</td>
<td>12</td>
<td>EBRW+M ≥ 1210</td>
<td>0.5(\star)</td>
<td>Summer reading, <em>Peep Show</em>; Weekly current events; Bi-weekly tests (MC)</td>
</tr>
<tr>
<td>AP United States History</td>
<td>11</td>
<td>EBRW+M ≥ 1140</td>
<td>1(\star)</td>
<td>Nightly textbook/article reading (7-10 pages) and notes; 2 tests per quarter; 1 project per quarter</td>
</tr>
<tr>
<td>AP World History</td>
<td>10 - 12</td>
<td>EBRW+M ≥ 1110</td>
<td>1(\star)</td>
<td>Summer Reading, <em>King Leopold’s Ghost</em>; Regular textbook reading (10 pages/week); Weekly writings: DBQ/LEQ/SAQ; Monthly tests; Quarterly projects; Midterm; Mock</td>
</tr>
</tbody>
</table>

### Technology

<table>
<thead>
<tr>
<th>AP Course Title</th>
<th>Grade-Level(s)</th>
<th>Recommended PSI Score</th>
<th>Credit</th>
<th>Typical Assignments/Workload</th>
<th>(\star)Avg HW Hrs/Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP Computer Science A</td>
<td>10 - 12</td>
<td>R+M ≥ 61.5</td>
<td>1(\star)</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>AP Computer Science Principles</td>
<td>9 - 12</td>
<td>Teacher Rec</td>
<td>1(\star)</td>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>
## World Languages

<table>
<thead>
<tr>
<th>AP Course Title</th>
<th>Recommended Grade-Level(s)</th>
<th>Recommended PSAT Score</th>
<th>Credit</th>
<th>Typical Assignments/Workload</th>
<th>Avg HW Hrs/Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP Chinese Language</td>
<td>11, 12</td>
<td>Teacher Rec</td>
<td>1&lt;sup&gt;E&lt;/sup&gt;</td>
<td>TBD</td>
<td>TBD</td>
</tr>
<tr>
<td>AP French Language &amp; Culture</td>
<td>11, 12</td>
<td>Teacher Rec</td>
<td>1&lt;sup&gt;E&lt;/sup&gt;</td>
<td>Mock; bi-weekly vocabulary &amp; grammar quizzes; 1-2 essays per quarter</td>
<td>3</td>
</tr>
<tr>
<td>AP Spanish Language &amp; Culture</td>
<td>11, 12</td>
<td>Teacher Rec</td>
<td>1&lt;sup&gt;E&lt;/sup&gt;</td>
<td>bi-weekly readings and writing analysis; bi-weekly tests</td>
<td>TBD</td>
</tr>
<tr>
<td>AP Spanish Literature &amp; Culture</td>
<td>11, 12</td>
<td>Teacher Rec</td>
<td>1&lt;sup&gt;E&lt;/sup&gt;</td>
<td>TBD</td>
<td>TBD</td>
</tr>
</tbody>
</table>

## Art / Music

<table>
<thead>
<tr>
<th>AP Course Title</th>
<th>Recommended Grade-Level(s)</th>
<th>Recommended PSAT Score</th>
<th>Credit</th>
<th>Typical Assignments/Workload</th>
<th>Avg HW Hrs/Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>AP Art History</td>
<td>10 - 12</td>
<td>R+W ≥ 60</td>
<td>1&lt;sup&gt;E&lt;/sup&gt;</td>
<td>nightly textbook reading and video notes; bi-weekly tests; mock</td>
<td>3</td>
</tr>
<tr>
<td>AP Drawing</td>
<td>10 - 12</td>
<td>Teacher Rec</td>
<td>1&lt;sup&gt;E&lt;/sup&gt;</td>
<td>12 concentration pieces; 12 breadth pieces</td>
<td>6</td>
</tr>
<tr>
<td>AP Music Theory</td>
<td>10 - 12</td>
<td>M+W ≥ 59.5</td>
<td>1&lt;sup&gt;E&lt;/sup&gt;</td>
<td>weekly worksheets; weekly dictation tests; mock exam</td>
<td>2</td>
</tr>
<tr>
<td>AP Studio Art 2D</td>
<td>11, 12</td>
<td>Teacher Rec</td>
<td>1&lt;sup&gt;E&lt;/sup&gt;</td>
<td>12 concentration pieces; 12 breadth pieces</td>
<td>3</td>
</tr>
<tr>
<td>AP Studio Art 3D</td>
<td>11, 12</td>
<td>Teacher Rec</td>
<td>1&lt;sup&gt;E&lt;/sup&gt;</td>
<td>12 concentration pieces; 8 breadth pieces</td>
<td>1</td>
</tr>
</tbody>
</table>

This document should be used in conjunction with guidance staff and parents while making final scheduling decisions.

<sup>*Co-rec, can be taken concurrently</sup>  
<sup>*Fulfills Grad Requirement</sup>  
<sup>E Elective</sup>  
<sup>Avg HW Hours/Week: some weeks will demand more time outside of class than others, so this number is an estimate; some students may need to spend more/less time on certain courses, as each learner is different; the number of hours listed reflects the general consensus from students and teachers as to the amount of time most, but not all, students should expect to spend outside of class to master content and complete assignments on time.</sup>

Recommended PSAT scores predict that a student with that score has a 60% chance of earning a 3 or higher on the AP exam for that course. The link to the AP Course Expectancy Tables with recommended PSAT scores in this course catalog can be found using the following link. [https://apppotential.collegeboard.org/app/welcome.do](https://apppotential.collegeboard.org/app/welcome.do)

M = Math test score  
R+M = Reading + Math test scores  
R+W&L = Reading + Writing test scores  
M + W & L = Math + Writing and Language test scores  
EBRW + M = Evidence-Based Reading and Writing + Math section scores

"Bi-weekly" means "once every two weeks"

Please note that the recommended PSAT score is used as a guideline through the CollegeBoard AP Potential and is intended to help students make informed course selections. It is not intended to discourage a motivated student from registering for an AP course.

<sup>*Grade Levels presented are recommended. Scheduling priority will be given to the stated Grade Level. Additional seats may be filled by underclassmen if they meet the requirements.</sup>
LANGUAGE ARTS
Course Flow Chart

**KEY**
- Course is a prerequisite; must be passed before enrolling in next course.
- Course may be taken as a co-requisite; enrolled in the same year.

**Electives Choices (10th-12th Grades)**
- AP Research (12th Grade only)
- AP Seminar
- Creative Writing I, II, III

**Electives Choices (9th - 12th Grades)**
- Journalism 4
- Speech 2
- Journalism 3
- Speech 1
- Journalism 2
- Theatre 1
- Journalism 1
About the Advanced Placement Program® (AP®)

The Advanced Placement Program® has enabled millions of students to take college-level courses and earn college credit, advanced placement, or both, while still in high school. AP Exams are given each year in May. Students who earn a qualifying score on an AP Exam are typically eligible to receive college credit and/or placement into advanced courses in college. Every aspect of AP course and exam development is the result of collaboration between AP teachers and college faculty. They work together to develop AP courses and exams, set scoring standards, and score the exams. College faculty review every AP teacher’s course syllabus.

AP English Program

The AP Program offers two courses in English studies, each designed to provide high school students the opportunity to engage with a typical introductory-level college English curriculum.

The AP English Language and Composition course focuses on the development and revision of evidence-based analytic and argumentative writing and the rhetorical analysis of nonfiction texts. The AP English Literature and Composition course focuses on reading, analyzing, and writing about imaginative literature (fiction, poetry, drama) from various periods.

There is no prescribed sequence of study, and a school may offer one or both courses.

AP English Language and Composition Course Overview

The AP English Language and Composition course aligns to an introductory college-level rhetoric and writing curriculum, which requires students to develop evidence-based analytic and argumentative essays that proceed through several stages or drafts. Students evaluate, synthesize, and cite research to support their arguments. Throughout the course, students develop a personal style by making appropriate grammatical choices. Additionally, students read and analyze the rhetorical elements and their effects in non-fiction texts, including graphic images as forms of text, from many disciplines and historical periods.

PREREQUISITE

There are no prerequisite courses for AP English Language and Composition.

Students should be able to read and comprehend college-level texts and apply the conventions of Standard Written English in their writing.

AP English Language and Composition Course Content

The AP English Language and Composition course is designed to help students become skilled readers and writers through engagement with the following course requirements:

- Composing in several forms (e.g., narrative, expository, analytical, and argumentative) about a variety of subjects
- Writing that proceeds through several stages or drafts, with revision aided by teacher and peers
- Writing informally (e.g., imitation exercises, journal keeping, collaborative writing), which helps students become aware of themselves as writers and the techniques employed by other writers
- Writing expository, analytical, and argumentative compositions based on readings representing a variety of prose styles and genres
- Reading nonfiction (e.g., essays, journalism, science writing, autobiographies, criticism) selected to give students opportunities to identify and explain an author’s use of rhetorical strategies and techniques
- Analyzing graphics and visual images both in relation to written texts and as alternative forms of text themselves
- Developing research skills and the ability to evaluate, use, and cite primary and secondary sources
- Conducting research and writing argument papers in which students present an argument of their own that includes the analysis and synthesis of ideas from an array of sources
- Citing sources using a recognized editorial style (e.g., Modern Language Association, The Chicago Manual of Style)
- Revising their work to develop
  - A wide-ranging vocabulary used appropriately and effectively;
  - A variety of sentence structures, including appropriate use of subordination and coordination;
  - Logical organization, enhanced by techniques such as repetition, transitions, and emphasis;
  - A balance of generalization and specific, illustrative detail; and
  - An effective use of rhetoric, including tone, voice, diction, and sentence structure.

1. The College Board does not mandate any particular authors or reading list, but representative authors are cited in the AP English Course Description.
AP English Language and Composition Exam Structure

AP ENGLISH LANGUAGE AND COMPOSITION EXAM:
3 HOURS 15 MINUTES

Assessment Overview
The AP English Language and Composition Exam employs multiple-choice questions to test students' skills in rhetorical analysis of prose passages. Students are also required to write three essays that demonstrate their skill in rhetorical analysis, argumentation, and synthesis of information from multiple sources to support the student's argument. Although the skills tested on the exam remain essentially the same from year to year, there may be some variation in format of the free-response (essay) questions.

Format of Assessment

Section I: Multiple Choice: 62-55 Questions | 1 Hour | 45% of Exam Score
- Includes excerpts from several non-fiction texts
- Each excerpt is accompanied by several multiple-choice questions

Section II: Free Response: 3 Prompts | 2 Hours, 15 Minutes | 55% of Exam Score
- 15 minutes for reading source materials for the synthesis prompt (in the free-response section)
- 2 hours to write essay responses to the three free-response prompts

Prompts Types
Synthesis: Students read several texts about a topic and create an argument that synthesizes at least three of the sources to support their thesis.
Rhetorical Analysis: Students read a non-fiction text and analyze how the writer's language choices contribute to his or her purpose and intended meaning for the text.
Argument: Students create an evidence-based argument that responds to a given topic.

Sample Multiple-Choice Question
Students are given a passage of writing and asked to respond to a set of prompts and questions based on the passage. Below is one example.

The primary rhetorical function of lines 14–22 is to

(A) provide support for a thesis supplied in lines 1–2
(B) provide evidence to contrast with that supplied in the first paragraph
(C) present a thesis that will be challenged in paragraph three
(D) introduce a series of generalizations that are supported in the last two paragraphs
(E) anticipate objections raised by the ideas presented in lines 12–14

Sample Free-Response Question
The following passage is from Rights of Man, a book written by the pamphleteer Thomas Paine in 1791. Born in England, Paine was an intellectual, a revolutionary, and a supporter of American independence from England. Read the passage carefully. Then write an essay that examines the extent to which Paine's characterization of America holds true today. Use appropriate evidence to support your argument.

If there is a country in the world, where concord, according to common calculation, would be least expected, it is America. Made up, as it is, of people from different nations, accustomed to different forms and habits of government, speaking different languages, and more different in their modes of worship, it would appear that the union of such a people was impracticable; but by the simple operation of constructing government on the principles of society and the rights of man, every difficulty retires, and all the parts are brought into cordial union. There, the poor are not oppressed, the rich are not privileged... Their taxes are few, because their government is just, and as there is nothing to render them wretched, there is nothing to engender riots and tumults.
AP® ENGLISH LITERATURE AND COMPOSITION

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The AP English Literature and Composition course focuses on reading, analyzing, and writing about imaginative literature (fiction, poetry, drama) from various periods.

There is no prescribed sequence of study, and a school may offer one or both courses.

AP English Literature and Composition Course Overview

The AP English Literature and Composition course aligns to an introductory college-level literary analysis course. The course engages students in the close reading and critical analysis of imaginative literature to deepen their understanding of the ways writers use language to provide both meaning and pleasure. As they read, students consider a work’s structure, style, and themes, as well as its use of figurative language, imagery, symbolism, and tone. Writing assignments include expository, analytical, and argumentative essays that require students to analyze and interpret literary works.

PREREQUISITE

There are no prerequisite courses for AP English Literature and Composition.

Students should be able to read and comprehend college-level texts and apply the conventions of Standard Written English in their writing.

AP English Literature and Composition Course Content

The course is designed to help students become skilled readers and writers through engagement with the following course requirements:

- Reading complex imaginative literature (fiction, drama, and poetry) appropriate for college-level study
- Writing an interpretation of a piece of literature that is based on a careful observation of textual details, considering the work’s structure, style, and themes; the social and historical values it reflects and embodies; and such elements as the use of figurative language, imagery, symbolism, and tone
- Composing in several forms (e.g., narrative, expository, analytical, and argumentative essays) based on students’ analyses of literary texts
- Writing that proceeds through several stages or drafts, with revision aided by teacher and peers
- Writing informally (e.g., response journals, textual annotations, collaborative writing), which helps students better understand the texts they are reading
- Revising their work to develop
  - A wide-ranging vocabulary used appropriately and effectively;
  - A variety of sentence structures, including appropriate use of subordination and coordination;
  - Logical organization, enhanced by techniques such as repetition, transitions, and emphasis;
  - A balance of generalization and specific, illustrative detail; and
  - An effective use of rhetoric, including tone, voice, diction, and sentence structure.

1. The selection of literature for the course should consider texts used in students’ previous high school ELA courses, so that by the time students finish the AP course, they will have read texts from 16th- to 21st-century American and British literature, along with other literature written in or translated to English. The College Board does not mandate the use of any particular authors or reading list, but representative authors are cited in the AP English Course Description.
AP ENGLISH LITERATURE AND COMPOSITION EXAM: 3 HOURS

Assessment Overview
The AP English Literature and Composition Exam employs multiple-choice questions and free-response prompts to test students' skills in literary analysis of passages from prose and poetry texts.

Format of Assessment

Section I: Multiple Choice | 1 Hour | 55 Questions | 45% of Exam Score
- Includes excerpts from several published works of drama, poetry, or prose fiction
- Each excerpt is accompanied by several multiple-choice questions or prompts

Section II: Free Response | 2 Hours | 3 Questions | 55% of Exam Score
- Students have 2 hours to write essay responses to three free-response prompts from the following categories:
  - A literary analysis of a given poem
  - A literary analysis of a given passage of prose fiction (this may include drama)
  - An analysis that examines a specific concept, issue, or element in a work of literary merit selected by the student

AP ENGLISH LITERATURE AND COMPOSITION SAMPLE EXAM QUESTIONS

Sample Multiple-Choice Question
Students are given a passage of writing and asked to respond to a set of prompts and questions based on the passage. Below is one example:

The chief effect of the first paragraph is to
(A) foreshadow the outcome of Papa's meeting
(B) signal that change in the family's life is overdue
(C) convey the women's attachment to the house
(D) emphasize the deteriorating condition of the house
(E) echo the fragmented conversation of the three women

Sample Free-Response Prompt
Read carefully the following poem by the colonial American poet, Anne Bradstreet. Then write a well-organized essay in which you discuss how the poem's controlling metaphor expresses the complex attitude of the speaker.

"The Author to Her Book"
Thou ill-formed offspring of my feeble brain,
Who after birth didst by my side remain,
Till snatched from thence by friends, less wise than true,
Who thee abroad exposed to public view;
Made thee in rags, halting, to the press to trudge,
Where errors were not lessened, all may judge.
At thy return my blushing was not small,
My rambling brat (in print) should mother call,
I cast thee by as one unfit for light,
Thy visage was so irksome in my sight;
Yet being mine own, at length affection would
Thy blamishes amend, if so I could.

I washed thy face, but more defects I saw,
And rubbing off a spot, still made a flaw,
I stretched thy joints to make thee even feet,
Yet still thou run'st more hobbling than is meet:
In better dress to trim thee was my mind,
But nought save homespun cloth in the house I find.
In this array, 'mongst vulgars may'st thou roam;
In critics' hands beware thou dost not come;
And take thy way where yet thou are not known.
If for thy Father asked, say thou hadst none;
And for thy Mother, she alas is poor.
Which caused her thus to send thee out of door.
(1678)
The Advanced Placement Program® has enabled millions of students to take college-level courses and earn college credit, advanced placement, or both, while still in high school. AP Exams are given each year in May. Students who earn a qualifying score on an AP Exam are typically eligible, in college, to receive credit, placement into advanced courses, or both. Every aspect of AP course and exam development is the result of collaboration between AP teachers and college faculty. They work together to develop AP courses and exams, set scoring standards, and score the exams. College faculty review every AP teacher's course syllabus.

AP Capstone™ Program

AP Capstone™ is an innovative diploma program from the College Board that equips students with the independent research, collaborative teamwork, and communication skills that are increasingly valued by colleges. AP Capstone is built on the foundation of two AP courses — AP Seminar and AP Research — and is designed to complement and enhance the in-depth, discipline-specific study experienced in other AP courses.

In AP Seminar, students investigate real-world issues from multiple perspectives, gathering and analyzing information from various sources in order to develop credible and valid evidence-based arguments.

In AP Research, students cultivate the skills and discipline necessary to conduct independent research in order to produce and defend a scholarly academic thesis.

Students who earn scores of 3 or higher in AP Seminar and AP Research and on four additional AP Exams of their choosing will receive the AP Capstone Diploma. Students who earn scores of 3 or higher in AP Seminar and AP Research but not on four additional AP Exams will receive the AP Seminar and Research Certificate. AP Seminar may also be taken as a stand-alone option.

AP Seminar Course Content

Students engage in conversations about complex academic and real-world issues through a variety of lenses, considering multiple points of view. Teachers have the flexibility to choose one or more appropriate themes that allow for deep interdisciplinary exploration based on:

- Concepts or issues from other AP courses
- Student interests
- Local or civic issues
- Academic problems or questions
- Global or international topics

Exploring different points of view and making connections across disciplines are fundamental components of the AP Seminar experience. Students consider each topic through a variety of lenses and from multiple perspectives, many of which are divergent or competing. Analyzing topics through multiple lenses aids in interdisciplinary understanding and helps students gain a rich appreciation for the complexity of important issues. Teachers should encourage students to explore a topic through several of the following lenses:

- Cultural and social
- Artistic and philosophical
- Political and historical
- Environmental
- Economic
- Scientific
- Futuristic
- Ethical

Pedagogical Framework

Throughout the program, students consider and evaluate multiple points of view to develop their own perspectives on complex issues and topics through inquiry and investigation. The AP Capstone program provides students with a framework that allows them to develop, practice, and hone their critical and creative thinking skills as they make connections between various issues and their own lives.

Students use the following framework as they explore issues and topics:

- Question and Explore
- Understand and Analyze Arguments
- Evaluate Multiple Perspectives
- Synthesize Ideas
- Team, Transform, and Transmit
Students are assessed with two through-course performance assessment tasks and one end-of-course exam. All three assessments are summative and will be used to calculate a final AP score (using the 1–5 scale) for AP Seminar.

**Percent of Assessment**

<table>
<thead>
<tr>
<th>Team Project and Presentation</th>
<th>20% of AP Score</th>
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<td>Individual Research Report</td>
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<table>
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<th>Individual Research-Based Essay and Presentation</th>
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**End-of-Course Exam (2 Hours) | 45% of AP Score**

- Understanding and analyzing an argument (3 short-answer questions); suggested time 30 minutes
- Synthesizing information to develop an evidence-based argument (evidence-based argument essay); suggested time 90 minutes

**Overview of Assessment Tasks**

**Team Project and Presentation**

In this project, three to five students collaborate as a team to identify a problem or issue. Team members work together to develop a research question; then they identify approaches, perspectives, or lenses for examining the question and divide responsibilities among themselves for individual research.

Individually, students investigate their assigned approach, perspective, or lens on the issue or topic of the team research question. Each student presents his or her findings and analysis to the group in a well-written individual report that:

- identifies the area of investigation and its relationship to the overall problem or issue;
- summarizes, explains, analyzes, and evaluates the main ideas and reasoning in the chosen sources;
- identifies, compares, and interprets a range of perspectives about the problem or issue; and
- cites all sources used and includes a list of works cited or bibliography.

Working collaboratively, the team considers all the research and analyses from individual team members for the purpose of proposing one or more solutions or resolutions. The team:

- collaboratively synthesizes and evaluates individual findings and perspectives to create a collective understanding of different approaches to the problem or issue;
- considers potential solutions or resolutions and conducts additional research in order to evaluate different solutions within the context of the problem; and
- proposes one or more solutions or resolutions and prepares an argument to support their proposal.

The team develops an 8–10 minute presentation that presents a convincing argument for the proposed solutions or recommendations. The team should ensure the claims made are supported by evidence and that they have considered different perspectives and the limitations and implications of their proposed solutions or recommendations. The presentation and the media used to enhance the presentation should consider audience, context, and purpose. Following the presentation, the team will defend its argument, with each student responding to a question posed by the teacher. Each team member should be prepared to answer questions about any part of the presentation.

**Individual Research-Based Essay and Presentation**

On or around Jan. 2 of each year, the College Board will release academic, cross-curricular source material (texts) focused on a theme representing a range of perspectives from each of the following domains:

- Natural Sciences, Technology, Mathematics, Environment
- Social Sciences, Politics, Economics, Psychology
- Arts (Visual Arts, Music, Dance, Theater)
- Culture, Languages, Linguistics
- History
- Literature, Philosophy, Critical Theory/Criticalism

The following will be represented in the texts: visual text and/or multimedia and quantitative data.

Students read and analyze the provided stimulus materials to identify thematic connections among the sources and possible areas for inquiry. They compose a research question prompted by their analysis of the stimulus material. They then gather additional information through research; analyze, evaluate, and select evidence; and develop a logical, well-reasoned argument of 2,000 words. The final paper must refer to and incorporate at least one of the sources provided.

Students must avoid plagiarism by acknowledging, attributing and/or citing sources throughout the paper and including a bibliography (see AP Capstone Policy on Plagiarism and Falsification or Fabrication of Information).

Students each develop a 6–8 minute presentation using appropriate media and present it to an audience of their peers. This presentation is an opportunity for students to present their conclusions by building arguments that convey their perspectives. The presentations should use the evidence to support students' own arguments and situate their perspectives in their larger contexts rather than merely summarizing student research. Finally, students defend their research process, use of evidence, and conclusion through oral responses to two questions asked by the teacher.

**End-of-Course Exam**

During the AP Exam administration window, students will take the AP Seminar End-of-Course Exam. The exam consists of four items (three short-answer and one essay question). The three short-answer questions assess analysis of an argument in a single source or document. The essay question assesses students' skills in synthesizing and creating an evidence-based argument.
About the Advanced Placement Program® (AP®)

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In AP Seminar, students investigate real-world issues from multiple perspectives, gathering and analyzing information from various sources in order to develop credible and valid evidence-based arguments.

In AP Research, students cultivate the skills and discipline necessary to conduct independent research in order to produce and defend a scholarly academic paper.

Students who earn scores of 3 or higher in AP Seminar and AP Research and on four additional AP Exams of their choosing will receive the AP Capstone Diploma. Students who earn scores of 3 or higher in AP Seminar and AP Research but not on four additional AP Exams will receive the AP Seminar and Research Certificate. AP Seminar may also be taken as a stand-alone option.

AP Research Course Overview

AP Research allows students to deeply explore an academic topic, problem, or issue of individual interest. Through this exploration, students design, plan, and conduct a year-long research based investigation to address a research question.

In the AP Research course, students further their skills acquired in the AP Seminar course by understanding research methodology; employing ethical research practices; and accessing, analyzing, and synthesizing information as they address a research question. Students explore their skill development, document their processes, and curate the artifacts of the development of their scholarly work in a portfolio. The course culminates in an academic paper of 4000–5000 words (accompanied by a performance or exhibition of product where applicable) and a presentation with an oral defense.

AP Capstone Research Course Content

Although the topic of each research study will vary, the course requires students to plan and conduct a study or investigation.

The course provides opportunities (activities/assignments) for students to

- Understand principles of discipline-specific research methods (e.g., qualitative, quantitative, mixed).
- Employ appropriate disciplinary research methods to develop, manage, and conduct an in-depth study or investigation in an area of student’s own interest, culminating in a 4000–5000 word paper (accompanied by an additional piece of scholarly work — where applicable — to be performed or exhibited).
- Present (using appropriate media) and defend the research design, approach, and findings to a panel.
- Document their processes and curate the artifacts of the development of their scholarly work in a portfolio.

Pedagogical Framework

Throughout the program, students consider and evaluate multiple points of view to develop their own perspectives on complex issues and topics through inquiry and investigation. The AP Capstone program provides students with a framework that allows them to develop, practice, and hone their critical and creative thinking skills as they make connections between various issues and their own lives.

Students use the following framework as they explore issues and topics:

- Question and Explore
- Understand and Analyze
- Evaluate Multiple Perspectives
- Synthesize Ideas
- Team, Transform, and Transmit

RECOMMENDED PREREQUISITES

Students must have successfully completed the AP Seminar course.
Students are assessed on the academic paper and presentation and oral defense of research. The academic paper is 4,000–6,000 words, and the presentation and defense take approximately 15–20 minutes.

**Assessment Overview**
- Academic Paper — 75% of score
- Presentation and Oral Defense — 25% of score

**Format of Assessment**

- **Academic Paper**
  - Introduces and contextualizes the research question and initial student assumptions and/or hypotheses
  - Reviews previous work in the field to synthesize information and a range of perspectives related to the research question (e.g., Literature Review)
  - Identifies the gap in the current field of knowledge to be addressed
  - Explains and provides justification for the chosen method, process, or approach
  - Presents the findings, evidence, results, or product
  - Interprets the significance of the findings, results, or product; explores connections to original research question
  - Discusses the Implications and limitations of the research or creative work
  - Reflects on the process and how this project could impact the field
  - Discusses possible next steps and/or future directions
  - Provides a complete list of sources cited and consulted in the appropriate disciplinary style

- **Presentation and Oral Defense**
  - All students will develop a 15 to 20-minute presentation (using appropriate media) and deliver it to an oral defense panel. Students may choose any appropriate format for their presentation, as long as the presentation reflects the depth of their research. Prior to the presentation, students whose academic paper was accompanied by an additional piece of scholarly work (e.g., performance, exhibit, product) will arrange for the teacher and panelists to view the scholarly work.
  - The defense will include three to four questions from a panel consisting of the AP Research teacher and two additional panel members (chosen at the discretion of the AP Research teacher).
MATH
Recommended Course Flow

Statistics 2
(Probability & Statistics w/Applications Honors)

AP Calculus AB

AP Calculus BC

Multivariable Calculus
& Differential Equations
(Calculus Honors)

AP Statistics

Precalculus Honors

Algebra 2 Honors

Geometry Honors

Algebra 1 Honors

may be taken concurrently
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**AP Calculus Program**

AP Calculus AB and AP Calculus BC focus on students’ understanding of calculus concepts and provide experience with methods and applications. Although computational competence is an important outcome, the main emphasis is on a multirepresentational approach to calculus, with concepts, results, and problems being expressed graphically, numerically, analytically, and verbally. The connections among these representations are important.

Teachers and students should regularly use technology to reinforce relationships among functions, to confirm written work, to implement experimentation, and to assist in interpreting results. Through the use of the unifying themes of calculus (e.g., derivatives, integrals, limits, approximation, and applications and modeling) the courses become cohesive rather than a collection of unrelated topics.

**AP Calculus AB Course Overview**

AP Calculus AB is roughly equivalent to a first-semester college calculus course devoted to topics in differential and integral calculus. The AP course covers topics in these areas, including concepts and skills of limits, derivatives, definite integrals, and the Fundamental Theorem of Calculus. The course teaches students to approach calculus concepts and problems when they are represented graphically, numerically, analytically, and verbally, and to make connections among these representations.

Students learn how to use technology to help solve problems, experiment, interpret results, and support conclusions.

**Recommended Prerequisites**

Before studying calculus, all students should complete the equivalent of four years of secondary mathematics designed for college-bound students: courses which should prepare them with a strong foundation in reasoning with algebraic symbols and working with algebraic structures. Prospective calculus students should take courses in which they study algebra, geometry, trigonometry, analytic geometry, and elementary functions. These functions include linear, polynomial, rational, exponential, logarithmic, trigonometric, inverse trigonometric, and piecewise-defined functions. In particular, before studying calculus, students must be familiar with the properties of functions, the composition of functions, the algebra of functions, and the graphs of functions. Students must also understand the language of functions (domain and range, odd and even, periodic, symmetry, zeros, intercepts, and descriptors such as increasing and decreasing). Students should also know how the sine and cosine functions are defined from the unit circle and know the values of the trigonometric functions at the numbers 0, π/6, π/4, π/3, π/2, and their multiples. Students who take AP Calculus BC should have basic familiarity with sequences and series, as well as some exposure to polar equations.

**Use of Graphing Calculators**

Professional mathematics organizations have strongly endorsed the use of calculators in mathematics instruction and testing. The use of a graphing calculator in AP Calculus AB is considered an integral part of the course.

**The Big Ideas of AP Calculus**

The course is organized around the foundational concepts of calculus:

I. Limits:

   Students must have a solid, intuitive understanding of limits and be able to compute one-sided limits, limits at infinity, the limit of a sequence, and infinite limits. They should be able to apply limits to understand the behavior of a function near a point and understand how limits are used to determine continuity.

II. Derivatives:

   Students should be able to use different definitions of the derivative, estimate derivatives from tables and graphs, and apply various derivative rules and properties. Students should also be able to solve separable differential equations, understand and be able to apply the Mean Value Theorem, and be familiar with a variety of real-world applications, including related rates, optimization, and growth and decay models.

III. Integrals and the Fundamental Theorem of Calculus:

   Students should be familiar with basic techniques of integration, including basic antiderivatives and substitution, and properties of integrals. Students should also understand area, volume, and motion applications of integrals, as well as the use of the definite integral as an accumulation function. It is critical that students understand the relationship between integration and differentiation as expressed in the Fundamental Theorem of Calculus.

**Mathematical Practices for AP Calculus**

The Mathematical Practices for AP Calculus (MPACs) capture important aspects of the work that mathematicians engage in at the level of competence expected of AP Calculus students. These MPACs are highly interrelated tools that should be used frequently and in diverse contexts to support conceptual understanding of calculus.

1. Reasoning with definitions and theorems
2. Connecting concepts
3. Implementing algebraic/computational processes
4. Connecting multiple representations
5. Building notational fluency
6. Communicating
**AP Calculus AB Exam: 3 Hours 15 Minutes**

**Assessment Overview**

The AP Calculus AB Exam questions measure students' understanding of the concepts of calculus, their ability to apply these concepts, and their ability to make connections among graphical, numerical, analytical, and verbal representations of mathematics. Adequate preparation for the exam also includes a strong foundation in algebra, geometry, trigonometry, and elementary functions, though the course necessarily focuses on differential and integral calculus. Students may not take both the Calculus AB and Calculus BC Exams within the same year.

The free-response section tests students' ability to solve problems using an extended chain of reasoning. During the second timed portion of the free-response section (Part B), students are permitted to continue work on problems in Part A, but they are not permitted to use a calculator during this time.

**AP Calculus AB Sample Exam Questions**

**Sample Multiple-Choice Question**

![Graph of f](image)

The graph of the piecewise-defined function \( f \) is shown in the figure above. The graph has a vertical tangent line at \( x = -2 \) and horizontal tangent lines at \( x = -3 \) and \( x = -1 \). What are all values of \( x \), \(-4 < x < 3\), at which \( f \) is continuous but not differentiable?

(A) \( x = 1 \)

(B) \( x = -2 \) and \( x = 0 \)

(C) \( x = -2 \) and \( x = 1 \)

(D) \( x = 0 \) and \( x = 1 \)

**Sample Free-Response Question**

**Free Response: Section II, Part B**

No calculator is allowed or problems on this part of the exam.

![Graph of f](image)

The graph of a differentiable function \( f \) is shown above for \(-3 \leq x \leq 3\). The graph of \( f \) has horizontal tangent lines at \( x = -1 \), \( x = 1 \), and \( x = 2 \). The areas of regions A, B, C, and D are 5, 4, 5, and 3, respectively. Let \( g \) be the antiderivative of \( f \) such that \( g(3) = 7 \).

(a) Find all values of \( x \) on the open interval \(-3 < x < 3\) for which the function \( g \) has a relative maximum. Justify your answer.

(b) On what open intervals contained in \(-3 < x < 3\) is the graph of \( g \) concave up? Give a reason for your answer.

(c) Find the value of \( \lim_{x \to 0} \frac{g(x)+1}{2x} \), or state that it does not exist. Show the work that leads to your answer.

(d) Let \( h \) be the function defined by \( h(x) = 3f(2x + 1) + 4 \). Find the value of \( \int_{-1}^{0} h(x) \, dx \).

Educators: apcentral.collegeboard.org/apcalcb

Students: apstudent.collegeboard.org/apcalcb

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AP® CALCULUS BC

AP Calculus AB and AP Calculus BC focus on students’ understanding of calculus concepts and provide experience with methods and applications. Although computational competence is an important outcome, the main emphasis is on a multi-representational approach to calculus, with concepts, results, and problems being expressed graphically, numerically, analytically, and verbally. The connections among these representations are important.

Teachers and students should regularly use technology to reinforce relationships among functions, to confirm written work, to implement experimentation, and to assist in interpreting results. Through the use of the unifying themes of calculus (e.g., derivatives, integrals, limits, approximation, and applications and modeling) the courses become cohesive rather than a collection of unrelated topics.

AP Calculus BC Course Overview

AP Calculus BC is roughly equivalent to both first and second semester college calculus courses. It extends the content learned in AB to different types of equations (polar, parametric, vector-valued) and new topics (such as Euler’s method, integration by parts, partial fraction decomposition, and improper integrals), and introduces the topic of sequences and series. The AP course covers topics in differential and integral calculus, including concepts and skills of limits, derivatives, definite integrals, the Fundamental Theorem of Calculus, and series. The course teaches students to approach calculus concepts and problems when they are represented graphically, numerically, analytically, and verbally, and to make connections amongst these representations.

Students learn how to use technology to help solve problems, experiment, interpret results, and support conclusions.

RECOMMENDED PREREQUISITES

Before studying calculus, all students should complete the equivalent of four years of secondary mathematics designed for college-bound students: courses which should prepare them with a strong foundation in reasoning with algebraic symbols and working with algebraic structures. Prospective calculus students should take courses in which they study algebra, geometry, trigonometry, analytic geometry, and elementary functions. These functions include linear, polynomial, rational, exponential, logarithmic, trigonometric, inverse trigonometric, and piecewise-defined functions. In particular, before studying calculus, students must be familiar with the properties of functions, the composition of functions, the algebra of functions, and the graphs of functions. Students must also understand the language of functions (domain and range, odd and even, periodic, symmetry, zeros, intercepts, and descriptors such as increasing and decreasing). Students should also know how the sine and cosine functions are defined from the unit circle and know the values of the trigonometric functions at the numbers π/6, π/4, π/3, π/2, and their multiples. Students who take AP Calculus BC should have basic familiarity with sequences and series, as well as some exposure to polar equations.

Use of Graphing Calculators

Professional mathematics organizations have strongly endorsed the use of calculators in mathematics instruction and testing. The use of a graphing calculator in AP Calculus BC is considered an integral part of the course.

AP Calculus BC Course Content

The course is organized around the foundational concepts of calculus:

I. Limits:

Students must have a solid, intuitive understanding of limits and be able to compute one-sided limits, limits at infinity, the limit of a sequence, and infinite limits. They should be able to apply limits to understand the behavior of a function near a point and understand how limits are used to determine continuity.

II. Derivatives:

Students should be able to use different definitions of the derivative, estimate derivatives from tables and graphs, and apply various derivative rules and properties. Students should also be able to solve separable differential equations, understand and be able to apply the Mean Value Theorem, and be familiar with a variety of real-world applications, including related rates, optimization, and growth and decay models.

III. Integrals and the Fundamental Theorem of Calculus:

Students should be familiar with basic techniques of integration, including basic anti-derivatives and substitution, and properties of integrals. Students should also understand ares, volume, and motion applications of integrals, as well as the use of the definite integral as an accumulation function. It is critical that students understand the relationship between integration and differentiation as expressed in the Fundamental Theorem of Calculus.

IV. Series:

Students should be familiar with various methods for determining convergence and divergence of a series, Maclaurin series for common functions, general Taylor series representations, radius and interval of convergence, and operations on power series. The technique of using power series to approximate an arbitrary function near a specific value allows for an important connection back to the tangent-line problem.

Mathematical Practices for AP Calculus

The Mathematical Practices for AP Calculus (MPACs) capture important aspects of the work that mathematicians engage in, at the level of competence expected of AP Calculus students. These MPACs are highly interrelated tools that should be used frequently and in diverse contexts to support conceptual understanding of calculus.

1. Reasoning with definitions and theorems
2. Connecting concepts
3. Implementing algebraic/computational processes
4. Connecting multiple representations
5. Building notational fluency
6. Communicating
AP CALCULUS BC EXAM: 3 HOURS 15 MINUTES

Assessment Overview
The AP Calculus BC Exam questions measure students' understanding of the concepts of calculus, their ability to apply these concepts, and their ability to make connections among graphical, numerical, analytical, and verbal representations of mathematics. Adequate preparation for the exam also includes a strong foundation in algebra, geometry, trigonometry, and elementary functions, though the course necessarily focuses on differential and integral calculus. Students may not take both the Calculus AB and Calculus BC Exams within the same year. A Calculus AB sub-score is reported based on performance on the portion of the Calculus BC Exam devoted to Calculus AB topics.

The free-response section tests students' ability to solve problems using an extended chain of reasoning. During the second timed portion of the free-response section (Part B), students are permitted to continue work on problems in Part A, but they are not permitted to use a calculator during this time.

AP CALCULUS BC SAMPLE EXAM QUESTIONS

Sample Multiple-Choice Question
Which of the following statements about the series \( \sum_{n=1}^{\infty} \frac{(-1)^n}{1 + \sqrt{n}} \) is true?

(A) The series converges absolutely.
(B) The series converges conditionally.
(C) The series converges, but neither conditionally nor absolutely.
(D) The series diverges.

Sample Free-Response Question
Free Response: Section II, Part B
No calculator is allowed for problems on this part of the exam.

The function \( f \) has derivatives of all orders at \( x = 0 \), and the Maclaurin series for \( f \) is

\[ \sum_{n=0}^{\infty} \frac{\ln n}{3^n} x^n. \]

(a) Find \( f(0) \) and \( f'(0) \).

(b) Does \( f \) have a relative minimum, a relative maximum, or neither at \( x = 0 \)? Justify your answer.

(c) Using the ratio test, determine the interval of convergence of the Maclaurin series for \( f \). Justify your answer.
AP® STATISTICS

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AP Statistics Course Overview

The AP Statistics course is equivalent to a one-semester, introductory, non-calculus-based college course in statistics. The course introduces students to the major concepts and tools for collecting, analyzing, and drawing conclusions from data. There are four themes in the AP Statistics course: exploratory data analysis, sampling and experimentation, anticipating patterns, and statistical inference. Students use technology, investigations, problem solving, and writing as they build conceptual understanding.

Prerequisite

Students must have taken second-year algebra before enrolling in AP Statistics.

Use of Graphing Calculators and Computers

Professional mathematics organizations have strongly endorsed the use of calculators in mathematics instruction and testing. The use of a graphing calculator in AP Statistics is considered an integral part of the course. In addition, schools should make every effort to provide students and teachers easy access to computers to facilitate the teaching and learning of statistics.

Scale of AP Statistics

Students who are enrolled in AP Statistics are expected to

- Describe patterns and departures from patterns;
- Plan and conduct a study;
- Explore random phenomena using probability and simulation; and
- Estimate population parameters and test hypotheses.

Topic Outline for AP Statistics

I. Exploring Data

- Constructing and interpreting graphical displays of distributions of univariate data
- Summarizing and comparing distributions of univariate data
- Exploring bivariate and categorical data

II. Sampling and Experimentation

- Planning and conducting surveys and experiments using appropriate methods of data collection
- Generalizability of results and types of conclusions that can be drawn from observational studies, experiments, and surveys

III. Anticipating Patterns

- Exploring random phenomena using probability and simulation
- Combining independent random variables
- The normal distribution
- Sampling distributions

IV. Statistical Inference

- Estimating population parameters and testing hypotheses
- Tests of significance
AP STATISTICS EXAM: 3 HOURS

Assessment Overview
Exam questions are based on the topics and skills addressed in the AP Statistics course. Formulas and tables needed to complete exam questions are provided to students taking the exam. Students are expected to use a graphing calculator with statistical capabilities on the entire exam.

Format of Assessment

Section I: Multiple Choice | 40 Questions | 1 Hour, 30 Minutes | 50% of Exam Score

- Individual Questions

Section II: Free Response | 6 Questions | 1 Hour, 30 Minutes | 50% of Exam Score

- 5 Short-Answer Questions
- 1 Investigative Task

AP STATISTICS SAMPLE EXAM QUESTIONS

Sample Multiple-Choice Question

DESCRIPTIVE STATISTICS

<table>
<thead>
<tr>
<th>Variable</th>
<th>N</th>
<th>Mean</th>
<th>Median</th>
<th>tMean</th>
<th>StDev</th>
<th>Se Mean</th>
</tr>
</thead>
<tbody>
<tr>
<td>score</td>
<td>50</td>
<td>1045.7</td>
<td>1024.7</td>
<td>1041.9</td>
<td>221.9</td>
<td>31.4</td>
</tr>
</tbody>
</table>

Some descriptive statistics for a set of test scores are shown above. For this test, a certain student has a standardized score of $z = -1.2$. What score did this student receive on the test?

(A) 266.28
(B) 779.42
(C) 1008.02
(D) 1083.38
(E) 1311.98

Correct Answer: B

Sample Free-Response Question: Experimental Design

As dogs age, diminished joint and hip health may lead to joint pain and thus reduce a dog’s activity level. Such a reduction in activity can lead to other health concerns such as weight gain and lethargy due to lack of exercise. A study is to be conducted to see which of two dietary supplements, glucosamine or chondroitin, is more effective in promoting joint and hip health and reducing the onset of canine osteoarthritis. Researchers will randomly select a total of 300 dogs from ten different large veterinary practices around the country. All of the dogs are more than 6 years old, and their owners have given consent to participate in the study. Changes in joint and hip health will be evaluated after 6 months of treatment.

(a) What would be the advantage to adding a control group in the design of this study?

(b) Assuming a control group is added to the other two groups in the study, explain how you would assign the 300 dogs to these three groups using a completely randomized design.

(c) Rather than using a completely randomized design, one group of researchers proposes blocking on clinics, and another group of researchers proposes blocking on breed of dog. How would you decide which one of these two variables to use as a blocking variable?
SCIENCE
Course Flow Chart

KEY

- Course is a prerequisite; must be passed before enrolling in next

- Course may be taken as a co-requisite; enrolled in the same year.

AP Physics 2

AP Physics C

Biotechnology Honors

Physics 1 Honors

AP Physics 1

Chemistry 2 Honors (Organic Chemistry)

AP Chemistry

AP Enviro Science

Anatomy & Physiology

AP Biology

Chemistry 1 Honors

Astronomy Honors

Marine Science Honors

Biology 1 Honors
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AP Biology Course Overview

AP Biology is an introductory college-level biology course. Students cultivate their understanding of biology through inquiry-based investigations as they explore the following topics: evolution, cellular processes — energy and communication, genetics, information transfer, ecology, and interactions.

LABORATORY REQUIREMENT

This course requires that 25 percent of the instructional time will be spent in hands-on laboratory work, with an emphasis on inquiry-based investigations that provide students with opportunities to apply the science practices.

PREREQUISITE

Students should have successfully completed high school courses in biology and chemistry.

AP Biology Course Content

The course is based on four Big Ideas, which encompass core scientific principles, theories, and processes that cut across traditional boundaries and provide a broad way of thinking about living organisms and biological systems. The following are Big Ideas:

- The process of evolution explains the diversity and unity of life.
- Biological systems utilize free energy and molecular building blocks to grow, to reproduce, and to maintain dynamic homeostasis.
- Living systems store, retrieve, transmit, and respond to information essential to life processes.
- Biological systems interact, and these systems and their interactions possess complex properties.

Science Practices

Students establish lines of evidence and use them to develop and refine testable explanations and predictions of natural phenomena. Focusing on these disciplinary practices enables teachers to use the principles of scientific inquiry to promote a more engaging and rigorous experience for AP Biology students. Such practices require that students:

- Use representations and models to communicate scientific phenomena and solve scientific problems;
- Use mathematics appropriately;
- Engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course;
- Plan and implement data collection strategies in relation to a particular scientific question;
- Perform data analysis and evaluation of evidence;
- Work with scientific explanations and theories; and
- Connect and relate knowledge across various scales, concepts, and representations in and across domains.

Inquiry-Based Investigations

Twenty-five percent of instructional time is devoted to hands-on laboratory work with an emphasis on inquiry-based investigations. Investigations require students to ask questions, make observations and predictions, design experiments, analyze data, and construct arguments in a collaborative setting, where they direct and monitor their progress.
AP BIOLOGY EXAM: 3 HOURS

Assessment Overview
Exam questions are based on learning objectives, which combine science practices with specific content. Students learn to
- Solve problems mathematically — including symbolically
- Design and describe experiments and analyze data and sources of error
- Explain, reason, or justify answers with emphasis on deeper, conceptual understanding
- Interpret and develop conceptual models
Due to the increased emphasis on quantitative skills and application of mathematical methods in the questions, students are allowed to use simple four-function calculators (with square root) on the entire exam. Students also receive a formula list as part of their testing materials.

Format of Assessment

Section I: Multiple Choice | 69 Questions | 1 Hour, 30 Minutes | 50% of Exam Score

Multiple-Choice: 63 Questions
- Discrete Questions
- Questions in sets

Grid-In: 6 Questions
- Discrete Questions
- Questions integrate biology and mathematical skills

Section II: Free Response | 8 Questions | 1 Hour, 30 Minutes (includes 10-minute reading period) | 50% of Exam Score
- Long Free Response (2 questions, one of which is lab or data-based)
- Short Free Response (6 questions, each requiring a paragraph-length argument/response)

AP BIOLOGY SAMPLE EXAM QUESTIONS

Sample Multiple-Choice Question
Two flasks with identical medium containing nutrients and glucose are inoculated with yeast cells that are capable of both anaerobic and aerobic respiration. Culture 1 is then sealed to prevent fresh air from reaching the culture; culture 2 is loosely capped to permit air to reach the culture. Both flasks are periodically shaken.
Which of the following best predicts which culture will contain more yeast cells after one week, and most accurately justifies that prediction?
A. Culture 1, because fresh air is toxic to yeast cells and will inhibit their growth
B. Culture 1, because fermentation is a more efficient metabolic process than cellular respiration
C. Culture 2, because fresh air provides essential nitrogen nutrients to the culture
D. Culture 2, because oxidative cellular respiration is a more efficient metabolic process than fermentation.
Correct Answer: D

Sample Grid-in Question
The data below demonstrate the frequency of tasters and non-tasters in an isolated population at Hardy-Weinberg equilibrium. The allele for non-tasters is recessive.

How many of the tasters in the population are heterozygous for tasting?

<table>
<thead>
<tr>
<th>Tasters</th>
<th>Non-Tasters</th>
</tr>
</thead>
<tbody>
<tr>
<td>8235</td>
<td>4328</td>
</tr>
</tbody>
</table>

Sample Short Free-Response Question
The role of tRNA in the process of translation was investigated by the addition of tRNA with attached radioactive leucine to an in vitro translation system that included mRNA and ribosomes. The results are shown by the graph.

![Graph showing the role of tRNA in translation](image)

In a short paragraph, describe how this figure justifies the claim that the role of tRNA is to carry amino acids that are then transferred from the tRNA to growing polypeptide chains.

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AP® CHEMISTRY

About the Advanced Placement Program® (AP®)

The Advanced Placement Program® has enabled millions of students to take college-level courses and earn college credit, advanced placement, or both, while still in high school. AP Exams are given each year in May. Students who earn a qualifying score on an AP Exam are typically eligible, in college, to receive credit, placement into advanced courses, or both. Every aspect of AP course and exam development is the result of collaboration between AP teachers and college faculty. They work together to develop AP courses and exams, set scoring standards, and score the exams. College faculty review every AP teacher’s course syllabus.

AP Chemistry Course Overview

The AP Chemistry course provides students with a college-level foundation to support future advanced course work in chemistry. Students cultivate their understanding of chemistry through inquiry-based investigations, as they explore topics such as: atomic structure, intermolecular forces and bonding, chemical reactions, kinetics, thermodynamics, and equilibrium.

LABORATORY REQUIREMENT

This course requires that 25 percent of the instructional time engages students in lab investigations. This includes a minimum of 18 hands-on labs (at least six of which are inquiry based), and it is recommended that students keep a lab notebook throughout.

RECOMMENDED PREREQUISITES

Students should have successfully completed a general high school chemistry course and Algebra II.

AP Chemistry Course Content

The key concepts and related content that define the AP Chemistry course and exam are organized around underlying principles called the Big Ideas. They encompass core scientific principles, theories, and processes that cut across traditional boundaries and provide a broad way of thinking about the particulate nature of matter underlying the observations students make about the physical world. The following are the Big Ideas:

- The chemical elements are the building blocks of matter, which can be understood in terms of the arrangements of atoms.
- Chemical and physical properties of materials can be explained by the structure and the arrangement of atoms, ions, or molecules and the forces between them.
- Changes in matter involve the rearrangement and/or reorganization of atoms and/or the transfer of electrons.
- Rates of chemical reactions are determined by details of the molecular collisions.
- The laws of thermodynamics describe the essential role of energy and explain and predict the direction of changes in matter.
- Bonds or attractions that can be formed can be broken. These two processes are in constant competition, sensitive to initial conditions and external forces or changes.

Science Practices

Students establish lines of evidence and use them to develop and refine testable explanations and predictions of natural phenomena. Focusing on these disciplinary practices enables teachers to use the principles of scientific inquiry to promote a more engaging and rigorous experience for AP Chemistry students. Such practices require that students:

- Use representations and models to communicate scientific phenomena and solve scientific problems;
- Use mathematics appropriately;
- Engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course;
- Plan and implement data collection strategies in relation to a particular scientific question;
- Perform data analysis and evaluation of evidence;
- Work with scientific explanations and theories; and
- Connect and relate knowledge across various scales, concepts, and representations in and across domains.

Inquiry-Based Investigations

Twenty-five percent of instructional time is devoted to inquiry-based laboratory investigations. Students ask questions, make observations and predictions, design experiments, analyze data, and construct arguments in a collaborative setting, where they direct and monitor their progress.
AP CHEMISTRY: 3 HOURS 15 MINUTES

Assessment Overview

Exam questions are based on learning objectives, which combine science practices with specific content. Students learn to:

- Solve problems mathematically — including symbolically;
- Design and describe experiments;
- Perform data and error analysis;
- Explain, reason, or justify answers; and
- Interpret and develop conceptual models.

Students have a periodic table of the elements and a formula and constants chart to use on the entire exam. In addition, students may use a scientific or graphing calculator on the free-response section.

Format of Assessment

Section I: Multiple Choice: 50 Questions | 1 Hour, 30 Minutes | 50% of Exam Score

- Discrete items
- Items in sets
- A calculator is not permitted on Section I

Section II: Free Response: 7 Questions | 1 Hour, 46 Minutes | 50% of Exam Score

Three long- and four short-answer questions. The seven questions ensure the assessment of the following skills: experimental design, quantitative/qualitative translation, analysis of authentic lab data and observations to identify patterns or explain phenomena, creating or analyzing atomic and molecular views to explain observations, and following a logical/analytical pathway to solve a problem.

AP CHEMISTRY SAMPLE EXAM QUESTIONS

Sample Multiple-Choice Question

The dissolution of an ionic solute in a polar solvent can be imagined as occurring in three steps, as shown in the figure at left. In step 1, the separation between ions in the solute is greatly increased, just as will occur when the solute dissolves in the polar solvent. In step 2, the polar solvent is expanded to make spaces that the ions will occupy. In the last step, the ions are inserted into the spaces in the polar solvent. Which of the following best describes the enthalpy change, ΔH, for each step?

(A) All three steps are exothermic.
(B) All three steps are endothermic.
(C) Steps 1 and 2 are exothermic, and the final step is endothermic.
(D) Steps 1 and 2 are endothermic, and the final step is exothermic.

Correct Answer: D

Sample Free-Response Questions: Analyzing Lab Data and Observations

\[ 	ext{HIn}^{aq} + \text{H}_2\text{O}(l) \rightarrow \text{In}^{aq} + \text{H}_3\text{O}^{+}(aq) \]

Yellow

Blue

The indicator HIn is a weak acid with a pKₐ value of 5.0. It reacts with water as represented in the equation above. Consider the two beakers below. Each beaker has a layer of colorless oil (a nonpolar solvent) on top of a layer of aqueous buffer solution. In beaker X, the pH of the buffer solution is 3, and in beaker Y, the pH of the buffer solution is 7. A small amount of HIn is placed in both beakers. The mixtures are stirred well, and the oil and water layers are allowed to separate.

(B) In beaker X, the oil layer is yellow, whereas in beaker Y, the oil layer is colorless. Explain these observations in terms of both acid-base equilibria and interparticle forces.

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AP Environmental Science Course Overview
The AP Environmental Science course is designed to be the equivalent of a one-semester, introductory college course in environmental science, through which students engage with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world. The course requires that students identify and analyze natural and human-made environmental problems, evaluate the relative risks associated with these problems, and examine alternative solutions for resolving or preventing them. Environmental Science is interdisciplinary, embracing topics from geology, biology, environmental studies, environmental science, chemistry, and geography.

LABORATORY REQUIREMENT
Although there are no specific AP Environmental Science labs or field investigations required for the course, it is expected that students perform as many labs/field investigations as possible.

PREREQUISITE
Students should have completed two years of high school laboratory science — one year of life science and one year of physical science (for example, a year of biology and a year of chemistry). Due to the quantitative analysis required in the course, students should also have taken at least one year of algebra. Also desirable (but not necessary) is a course in earth science.

AP Environmental Science Course Content
Environmental science is interdisciplinary; it embraces a wide variety of topics from different areas of study. There are several unifying themes that cut across topics. The following are course themes:
- Science is a process.
- Energy conversions underlie all ecological processes.
- The Earth itself is one interconnected system.
- Humans alter natural systems.
- Environmental problems have a cultural and social context.
- Human survival depends on developing practices that will achieve sustainable systems.

Topic Outlines
I. Earth Systems and Resources
II. The Living World
III. Population
IV. Land and Water Use
V. Energy Resources and Consumption
VI. Pollution
VII. Global Change

Inquiry-Based Investigations
Because it is designed to be a course in environmental science rather than environmental studies, the AP Environmental Science course includes a strong laboratory and field investigation component.

The AP Environmental Science course requires teachers to provide students with opportunities to perform experiments and analyses involving the study of air, water, and soil qualities as an essential core for the lab/field investigation activities. These investigations challenge students' abilities to
- Critically observe environmental systems;
- Develop and conduct well-designed experiments;
- Utilize appropriate techniques and instrumentation;
- Analyze and interpret data, including appropriate statistical and graphical presentations;
- Think analytically and apply concepts to the solution of environmental problems;
- Make conclusions and evaluate their quality and validity;
- Propose further questions for study; and
- Communicate accurately and meaningfully about observations and conclusions.
AP ENVIRONMENTAL SCIENCE EXAM: 3 HOURS

Assessment Overview

Exam questions are based on each major topic area. They are designed to cover the breadth of students’ knowledge and depth of understanding of environmental science.

Format of Assessment

Section I: Multiple Choice: 100 Questions | 1 Hour, 30 Minutes | 60% of Exam Score

- Individual Questions
- Questions in sets

Section II: Free Response: 4 Questions | 1 Hour, 30 Minutes | 40% of Exam Score

- Data Set (1 question)
- Document-Based Question (1 question)
- Synthesis and Evaluation (2 questions)

AP ENVIRONMENTAL SCIENCE SAMPLE EXAM QUESTIONS

Sample Multiple-Choice Question

Directions: The lettered choices on the graph below refer to the numbered statements immediately following it. Select the one lettered choice that best fits each statement. Each choice may be used once, more than once, or not at all in each set.

Questions 1–3 refer to the lettered points of the curves plotted on the graph below. The curves show two possible patterns of change in population size over time for a certain species of small mammal in an ecosystem.

1. Population growing exponentially
2. Population decreasing at greatest rate
3. Population growing at a decreasing rate

Sample Free-Response Question: Data-Set Question

According to atmospheric temperature and CO₂ concentration records derived from Antarctic ice cores, Earth’s climate has undergone significant changes over the past 200,000 years. Two graphs are shown to the left. The upper graph shows the variation in atmospheric CO₂ concentration, and the lower graph shows the variation in air temperature. Both graphs cover the same time period from approximately 200,000 years ago up until the year 1950, which is represented as year 0 on the graph.

(A) Answer the following questions that relate to the graphs above. Remember that for any calculation you must clearly indicate how you arrived at your answer. Answers must also include appropriate units.

(i) Determine the net change in atmospheric CO₂ concentration between 140,000 years ago and 125,000 years ago.

(ii) Calculate the ratio of the change in the mean global temperature to the change in atmospheric CO₂ concentration between 140,000 years ago and 125,000 years ago.

(iii) Scientists predict that between 1950 and 2050, the atmospheric CO₂ concentration will increase by 200 ppm. Predict the change in mean global temperature between 1950 and 2050 using the ratio that you calculated in part (ii).

(iv) Describe one major assumption that was necessary to make the prediction in part (iii) above. Discuss the validity of the assumption.

(B) Identify and describe TWO major causes for the predicted 200 ppm increase in atmospheric CO₂ concentration between 1950 and 2050.

(C) Identify TWO gases other than CO₂ that contribute to the anthropogenic increase in mean global temperature. For each gas, describe a major human activity that leads to its release.

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AP Physics Program

The AP Program offers four physics courses.

**AP Physics 1** is a full-year course that is the equivalent of a first-semester introductory college course in algebra-based physics.

**AP Physics 2** is a full-year course that is the equivalent of a second-semester introductory college course in algebra-based physics. The course covers fluids; thermodynamics; electrical force, field, and potential; electric circuits; magnetism and electromagnetic induction; geometric and physical optics; and quantum, atomic, and nuclear physics.

**AP Physics C: Mechanics** is a half-year course that is the equivalent of a semester-long, introductory calculus-based college course. It covers kinematics; Newton's laws of motion; work, energy, and power; systems of particles and linear momentum; circular motion and rotation; and oscillations and gravitation.

**AP Physics C: Electricity and Magnetism** is a half-year course following Physics C: Mechanics that is the equivalent of a semester-long, introductory calculus-based college course. It covers electrostatics; conductors, capacitors, and dielectrics; electric circuits; magnetic fields; and electromagnetism.

**AP Physics 1: Algebra-Based Course Overview**

AP Physics 1 is an algebra-based, introductory college-level physics course. Students cultivate their understanding of physics through inquiry-based investigations as they explore these topics: kinematics; dynamics; circular motion and gravitation; energy; momentum; simple harmonic motion; torque and rotational motion; electric charge and electric force; DC circuits; and mechanical waves and sound.

**LABORATORY REQUIREMENT**

This course requires that 25 percent of the instructional time will be spent in hands-on laboratory work, with an emphasis on inquiry-based investigations that provide students with opportunities to demonstrate the foundational physics principles and apply the science practices.

Inquiry-based laboratory experiences support the AP Physics 1 course and AP Course Audit curricular requirements by providing opportunities for students to engage in the seven science practices as they design plans for experiments, make predictions, collect and analyze data, apply mathematical routines, develop explanations, and communicate about their work.

Colleges may require students to present their laboratory materials from AP science courses before granting college credit for laboratory work, so students should be encouraged to retain their laboratory notebooks, reports, and other materials.

**PREREQUISITES**

There are no prerequisite courses. 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.

**AP Physics 1: Course Content**

Students explore principles of Newtonian mechanics (including rotational motion); work, energy, and power; mechanical waves and sound; and introductory, simple circuits. The course is based on the big ideas, which encompass core scientific principles, theories, and processes that cut across traditional boundaries and provide a broad way of thinking about the physical world. The following are the big ideas:

- Objects and systems have properties such as mass and charge. Systems may have internal structure.
- Fields existing in space can be used to explain interactions.
- The interactions of an object with other objects can be described by forces.
- Interactions between systems can result in changes in those systems.
- Changes that occur as a result of interactions are constrained by conservation laws.
- 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.

**Science Practices**

Students establish lines of evidence and use them to develop and refine testable explanations and predictions of natural phenomena. Focusing on these disciplinary practices enables teachers to use the principles of scientific inquiry to promote a more engaging and challenging experience for AP Physics students. Such practices require that students:

- Use representations and models to communicate scientific phenomena and solve scientific problems;
- Use mathematics appropriately;
- Engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course;
- Plan and implement data collection strategies in relation to a particular scientific question;
- Perform data analysis and evaluation of evidence;
- Work with scientific explanations and theories; and
- Connect and relate knowledge across various scales, concepts, and representations in and across domains.
AP PHYSICS 1 EXAM: 3 HOURS

Assessment Overview
Exam questions are based on learning objectives, which combine science practices with specific content. Students are assessed on their ability to:

- Provide both qualitative and quantitative explanations, reasoning, or justification of physical phenomena, grounded in physics principles and theories;
- Solve problems mathematically — including symbolically — but with less emphasis on only mathematical routines used for solutions;
- Interpret and develop conceptual models; and
- Transfer knowledge and analytical skills developed during laboratory experiences to design and describe experiments and analyze data and draw conclusions based on evidence.

Students will be allowed to use a four-function, scientific, or graphing calculator on the entire AP Physics 1 and AP Physics 2 Exams. Scientific or graphing calculators (including the approved graphing calculators listed at www.collegeboard.org/ap/calculators) cannot have any unapproved features or capabilities.

Format of Assessment

Section I: Multiple Choice: 50 Questions | 1 Hour, 30 Minutes | 50% of Exam Score

- Discrete questions
- Questions in sets
- Multiple-correct questions (two options are correct)

Section II: Free Response: 5 Questions | 1 Hour, 30 Minutes | 50% of Exam Score

- Experimental Design (1 question)
- Quantitative/Qualitative Translation (1 question)
- Short Answer (3 questions, one requiring a paragraph-length argument)

AP PHYSICS 1 SAMPLE EXAM QUESTIONS

Sample Multiple-Choice Question

![Circuit Diagram]

1. The figure above shows three resistors connected in a circuit with a battery. Which of the following correctly ranks the energy $E$ dissipated in the three resistors during a given time interval?

(A) $E_{3000} > E_{2000} > E_{1000}$
(B) $E_{3000} > E_{1000} > E_{2000}$
(C) $E_{2000} > E_{3000} > E_{1000}$
(D) $E_{2000} > E_{1000} > E_{3000}$

Correct Answer: C

Sample Free-Response Question: Experimental Design

You are given a set of chimes that consists of eight hollow metal tubes open at both ends, like those shown at left. The chimes are played by striking them with a small hammer to produce musical sounds. Your task is to use the chimes to determine the speed of sound in air at room temperature. You have available a set of tuning forks and other common laboratory equipment but are not allowed to use electronic equipment, such as a sound sensor. (A tuning fork vibrates when struck and produces sound at a particular frequency, which is printed on the tuning fork.)

(A) Describe your experimental procedure in enough detail so that another student could perform your experiment. Include what measurements you will take and how you will take them.

(B) Describe how you will use your measurements to determine the speed of sound in enough detail so that another student could duplicate your process.

(C) Describe one assumption you made about the design of your experiment, and explain how it might affect the value obtained for the speed of sound.

(D) A student doing a different experiment to determine the speed of sound in air obtained wavelength and period measurements and created the following plot of the data. Use the graph to calculate the speed of sound and include an explanation of your method.
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AP® PHYSICS 2

The AP Program offers four physics courses.

AP Physics 1 is a full-year course that is the equivalent of a first-semester introductory college course in algebra-based physics. The course covers kinematics; dynamics; circular motion and gravitation; energy; momentum; simple harmonic motion; torque and rotational motion; electric charge and electric force; DC circuits; and mechanical waves and sound.

AP Physics 2 is a full-year course, equivalent to a second-semester introductory college course in algebra-based physics.

AP Physics C: Mechanics is a half-year course that is the equivalent of a semester-long, introductory calculus-based college course. It covers kinematics; Newton’s laws of motion; work, energy, and power; systems of particles and linear momentum; circular motion and rotation; and oscillations and gravitation.

AP Physics C: Electricity and Magnetism is a half-year course following Physics C: Mechanics that is the equivalent of a semester-long, introductory calculus-based college course and covers electrostatics; conductors, capacitors, and dielectrics; electric circuits; magnetic fields; and electromagnetism.

AP® PHYSICS 2: Algebra-Based Course Content

Students explore principles of fluids, thermodynamics, electricity, magnetism, optics, and topics in modern physics. The course is based on seven big ideas, which encompass core scientific principles, theories, and processes that cut across traditional boundaries and provide a broad way of thinking about the physical world. The following are the big ideas:

- Objects and systems have properties such as mass and charge. Systems may have internal structure.
- Fields existing in space can be used to explain interactions.
- The interactions of an object with other objects can be described by forces.
- Interactions between systems can result in changes in those systems.
- Changes that occur as a result of interactions are constrained by conservation laws.
- 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.
- The mathematics of probability can be used to describe the behavior of complex systems and to interpret the behavior of quantum mechanical systems.

Science Practices

Students establish lines of evidence and use them to develop and refine testable explanations and predictions of natural phenomena. Focusing on these disciplinary practices enables teachers to use the principles of scientific inquiry to promote a more engaging and challenging experience for AP Physics students. Such practices require that students:

- Use representations and models to communicate scientific phenomena and solve scientific problems;
- Use mathematics appropriately;
- Engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course;
- Plan and implement data collection strategies in relation to a particular scientific question;
- Perform data analysis and evaluation of evidence;
- Work with scientific explanations and theories; and
- Connect and relate knowledge across various scales, concepts, and representations in and across domains.

LABORATORY REQUIREMENT

This course requires that 25 percent of the instructional time will be spent in hands-on laboratory work, with an emphasis on inquiry-based investigations that provide students with opportunities to demonstrate the foundational physics principles and apply the science practices.

Inquiry-based laboratory experiences support the AP Physics 2 course and AP Course Audit curricular requirements by providing opportunities for students to engage in the seven science practices as they design plans for experiments, make predictions, collect and analyze data, apply mathematical routines, develop explanations, and communicate about their work.

Colleges may require students to present their laboratory materials from AP science courses before granting college credit for laboratory work, so students should be encouraged to retain their laboratory notebooks, reports, and other materials.

PREREQUISITES

Students should have completed AP Physics 1 or a comparable introductory physics course, and should have taken or be concurrently taking pre-calculus or an equivalent course.
AP PHYSICS 2 EXAM: 3 HOURS

Assessment Overview

Exam questions are based on learning objectives, which combine science practices with specific content. Students are assessed on:

- Provide both qualitative and quantitative explanations, reasoning, or justification of physical phenomena, grounded in physics principles and theories;
- Solve problems mathematically — including symbolically — but with less emphasis on only mathematical routines used for solutions;
- Interpret and develop conceptual models; and
- Transfer knowledge and analytical skills developed during laboratory experiences to design and describe experiments and analyze data and draw conclusions based on evidence.

Students will be allowed to use a four-function, scientific, or graphing calculator on the entire AP Physics 1 and AP Physics 2 Exams. Scientific or graphing calculators (including the approved graphing calculators listed at www.collegeboard.org/ap/calculators) cannot have any unapproved features or capabilities.

Format of Assessment

<table>
<thead>
<tr>
<th>Section I: Multiple Choice: 50 Questions</th>
<th>1 Hour, 30 Minutes</th>
<th>50% of Exam Score</th>
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<tbody>
<tr>
<td>- Discrete questions</td>
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<td>- Questions in sets</td>
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<tr>
<td>- Multiple-correct questions (two options will be correct)</td>
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<table>
<thead>
<tr>
<th>Section II: Free Response: 4 Questions</th>
<th>1 Hour, 30 Minutes</th>
<th>50% of Exam Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>- Experimental Design (1 question)</td>
<td></td>
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<tr>
<td>- Quantitative/Qualitative Translation (1 question)</td>
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<tr>
<td>- Short Answer (2 questions, one requiring a paragraph-length argument)</td>
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</tbody>
</table>

AP PHYSICS 2 SAMPLE EXAM QUESTIONS

Sample Multiple-Choice Question

A student writes the following information for a process that involves a fixed quantity of ideal gas.

\[ W = -P\Delta V \]
\[ \Delta U = Q + W \]
\[ P = 2.0 \times 10^5 \text{Pa} \]
\[ \Delta V = -2.0 \times 10^{-2} \text{m}^3 \]
\[ \Delta U = -600 \text{J} \]

Which of the following descriptions best represents the process?

(A) The gas expands at a constant pressure of 200 kPa.
(B) The gas is cooled at constant volume until its pressure falls to 200 kPa.
(C) The gas is compressed at a constant pressure of 200 kPa.
(D) The gas is heated and its pressure increases at constant volume.

Correct Answer: C

Sample Free-Response Question: Experimental Design

Quantitative/Qualitative Translation

The figure at left represents a glass lens that has one flat surface and one curved surface. After incoming parallel rays pass through the lens, the rays pass through a focal point.

(A) The rays undergo refraction and change direction at the right surface of the lens, as shown. Explain why the angle of refraction of ray 1 is greater than that of ray 2.

(B) The index of refraction of the glass is \( n_{\text{air}} \) and the radius of curvature of the lens's right edge is \( R \). (The radius of curvature is the radius of the sphere of which that edge is a part. A smaller \( R \) corresponds to a lens that curves more.)

A teacher who wants to test a class's understanding about lenses asks the students if the equation \( f = \frac{n_{\text{air}}}{n_{\text{air}} - 1} R \) makes sense for the focal length of the lens in air. Is the teacher's equation reasonable for determination of the focal length? Qualitatively explain your reasoning, making sure you address the dependence of the focal length on both \( R \) and \( n_{\text{air}} \).

(C) An object is placed a distance \( f/2 \) (half of the focal length) to the left of the lens. On which side of the lens does the image form, and what is its distance from the lens in terms of \( R \)? Justify your answer. (Assume this is a thin lens.)

(D) The lens is now placed in water, which has an index of refraction that is greater than air but less than the glass. Indicate below whether the new focal length is greater than, less than, or equal to the focal length in air.

___ Greater than in air
___ Less than in air
___ The same as in air

Justify your answer qualitatively, with no equations or calculations.
AP® PHYSICS C: MECHANICS

About the Advanced Placement Program® (AP®)
The Advanced Placement Program® has enabled millions of students to take college-level courses and earn college credit, advanced placement, or both, while still in high school. AP® Exams are given each year in May. Students who earn a qualifying score on an AP Exam are typically eligible to receive college credit and/or placement into advanced courses in college. Every aspect of AP course and exam development is the result of collaboration between AP teachers and college faculty. They work together to develop AP courses and exams, set scoring standards, and score the exams. College faculty review every AP teacher's course syllabus.

AP Physics Program

The AP Program offers four physics courses.

AP Physics 1 is a full-year course that is the equivalent of a first-semester introduction college course in algebra-based physics.

AP Physics 2 is a full-year course, equivalent to a second-semester introductory college course in physics. The course covers fluid mechanics; thermodynamics; electricity and magnetism; optics; and quantum, atomic, and nuclear physics.

AP Physics C: Mechanics is a one-half-year course equivalent to a semester-long, introductory calculus-based college course. It covers Newtonian kinematics; Newton's laws of motion; work, energy, and power; systems of particles and linear momentum; circular motion and rotation; and oscillations and gravitation.

AP Physics C: Electricity and Magnetism, a one-half-year course following Physics C: Mechanics, is equivalent to a semester-long, introductory calculus-based college course and covers electrostatics; conductors, capacitors, and dielectrics; electric circuits; magnetic fields; and electromagnetism.

AP Physics C: Mechanics Course Overview

AP Physics C: Mechanics is equivalent to a one-semester, calculus-based, college-level physics course, especially appropriate for students planning to specialize or major in physical science or engineering. The course explores topics such as Newtonian mechanics; Newton's laws of motion; work, energy and power; systems of particles and linear momentum; circular motion and rotation; and oscillations and gravitation. Introductory differential and integral calculus is used throughout the course.

LABORATORY REQUIREMENT

AP Physics C: Mechanics should include a hands-on laboratory component comparable to a semester-long introductory college-level physics laboratory. Students should spend a minimum of 20 percent of instructional time engaged in hands-on laboratory work. Students ask questions, make observations and predictions, design experiments, analyze data, and construct arguments in a collaborative setting, where they direct and monitor their progress. Each student should complete a lab notebook or portfolio of lab reports.

PREREQUISITE

Students should have taken or be concurrently taking calculus.

AP Physics C: Mechanics Course Content

The AP Physics C: Mechanics course applies both differential and integral calculus and provides instruction in each of the following six content areas:

- Kinematics
- Newton's laws of motion
- Work, energy and power
- Systems of particles and linear momentum
- Circular motion and rotation
- Oscillations and gravitation

Learning Objectives for Laboratory and Experimental Situations

Students establish lines of evidence and use them to develop and refine testable explanations and predictions of natural phenomena. Focusing on these disciplinary practices and experimental skills enables teachers to use the principles of scientific inquiry to promote a more engaging and rigorous experience for AP Physics C: Mechanics students. Such practices or skills require students to

- Design experiments
- Observe and measure real phenomena
- Organize, display, and critically analyze data
- Analyze sources of error and determine uncertainties in measurement
- Draw inferences from observations and data
- Communicate results, including suggested ways to improve experiments and proposed questions for further study

A minimum of 20 percent of instructional time is devoted to hands-on and inquiry-based laboratory investigations.
AP PHYSICS C: MECHANICS EXAM: 1 HOUR, 30 MINUTES

Assessment Overview

The AP Physics C: Mechanics Exam includes questions posed in a laboratory or experimental setting. Questions assess understanding of content as well as experimental skills. The exam may also include questions that overlap several major topical areas or questions on miscellaneous topics such as identification of vectors and scalars, vector mathematics, or graphs of functions.

Students will be allowed to use a four-function, scientific, or graphing calculator on the entire AP Physics C: Mechanics and AP Physics C: Electricity and Magnetism Exams. Scientific or graphing calculators (including the approved graphing calculators listed at www.collegeboard.org/ap/registrants/calculators) cannot have any unapproved features or capabilities.

AP PHYSICS C: MECHANICS SAMPLE EXAM QUESTIONS

Sample Multiple Choice Question

(a) \( \frac{Mv}{m} \)

(b) \( \frac{(M + m)v}{m} \)

(c) \( \frac{(M - m)v}{m} \)

(d) \( \frac{mv}{M} \)

(e) \( \frac{mv}{(M - m)} \)

Correct Answer: B

Sample Free-Response Question

(a) On the figure below, draw and label the forces (not components) acting on the ball at their points of application as it rolls along the roof.

(b) Calculate the force due to friction acting on the ball as it rolls along the roof. If you need to draw anything other than what you have shown in part (a) to assist in your solution, use the space below. Do NOT add anything to the figure in part (a).

(c) Calculate the linear speed of the center of mass of the ball when it reaches the bottom edge of the roof.

(d) A wagon containing a box is at rest on the ground below the roof so that the ball falls a vertical distance of 3.0 m and lands and sticks in the center of the box. The total mass of the wagon and the box is 12 kg. Calculate the horizontal speed of the wagon immediately after the ball lands in it.

Educators: apcentral.collegeboard.org/apphysicscmechanics
Students: apstudent.collegeboard.org/apphysicscmechanics

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AP Physics C: Electricity and Magnetism, a half-year course following Physics C: Mechanics, is equivalent to a semester-long, introductory calculus-based college course and covers electrostatics; conductors, capacitors, and dielectrics; electric circuits; magnetic fields; and electromagnetism.

AP Physics C: Electricity and Magnetism Course Overview

AP Physics C: Electricity and Magnetism is a one-semester, calculus-based, college-level physics course, especially appropriate for students planning to specialize or major in physical science or engineering. The course explores topics such as electrostatics; conductors, capacitors, and dielectrics; electric circuits; magnetic fields; and electromagnetism. Introductory differential and integral calculus is used throughout the course.

LABORATORY REQUIREMENT

AP Physics C: Electricity and Magnetism should include a hands-on laboratory component comparable to a semester-long introductory college-level physics laboratory. Students should spend a minimum of 20 percent of instructional time engaged in hands-on laboratory work. Students ask questions, make observations and predictions, design experiments, analyze data, and construct arguments in a collaborative setting, where they direct and monitor their progress. Each student should complete a lab notebook or portfolio of lab reports.

PREREQUISITE

Students should have taken or be concurrently taking calculus.

AP Physics C: Electricity and Magnetism Course Content

The AP Physics C: Electricity and Magnetism course applies both differential and integral calculus, and builds upon the AP Physics C: Mechanics course by providing instruction in each of the following five content areas:

- Electrostatics
- Conductors, capacitors, and dielectrics
- Electric circuits
- Magnetic fields
- Electromagnetism

Learning Objectives for Laboratory and Experimental Situations

Students establish lines of evidence and use them to develop and refine testable explanations and predictions of natural phenomena. Focusing on these disciplinary practices and experimental skills enables teachers to use the principles of scientific inquiry to promote a more engaging and rigorous experience for AP Physics C: Electricity and Magnetism students. Such practices or skills require students to

- Design experiments
- Observe and measure real phenomena
- Organize, display and critically analyze data
- Analyze sources of error and determine uncertainties in measurement
- Draw inferences from observations and data
- Communicate results, including suggested ways to improve experiments and proposed questions for further study

A minimum of 20 percent of instructional time is devoted to hands-on and inquiry-based laboratory investigations.
AP PHYSICS C: ELECTRICITY AND MAGNETISM SAMPLE EXAM QUESTIONS

Sample Multiple-Choice Question

A uniform electric field \( \mathbf{E} \) of magnitude 6,000 V/m exists in a region of space as shown above. What is the electric potential difference, \( V_x - V_y \), between points \( X \) and \( Y \)?

(a) -12,000 V
(b) 0 V
(c) 1,800 V
(d) 2,400 V
(e) 3,000 V

Correct Answer: D

Sample Free-Response Question

In the circuit illustrated above, switch \( S \) is initially open and the battery has been connected for a long time.

(a) What is the steady-state current through the ammeter?
(b) Calculate the charge on the 10 \( \mu \)F capacitor.
(c) Calculate the energy stored in the 5.0 \( \mu \)F capacitor. The switch is now closed, and the circuit comes to a new steady state.
(d) Calculate the steady-state current through the battery.
(e) Calculate the final charge on the 5.0 \( \mu \)F capacitor.
(f) Calculate the energy dissipated as heat in the 40 ohm resistor in one minute once the circuit has reached steady state.
SOCIAL STUDIES
Course Flow Chart

12th Grade Required
- Economics Honors
- OR
- AP Macroeconomics
- AND
- US Government Honors
- OR
- AP US Government

Elective Choices (11th - 12th Grades)
- AP Microeconomics
- AP Psychology
- History of Vietnam War

11th Grade Required
- US History Honors
- OR
- AP United States History

Electives Choices (10th - 12th Grades)
- AP World History
- AP European History
- Sociology
- Law Studies
- International Relations II Honors
- Multicultural Studies
- Holocaust History Honors

10th Grade Required
- AP World History (if took AP Hum Geo in 9th)

9th Grade Required
- World History Honors
- OR
- AP Human Geography

Elective Offered 2019-2020
AP Comparative Government
The AP Program offers three history courses: AP European History, AP United States History, and AP World History. All three history courses focus on helping students develop historical thinking while learning required course content. Course themes foster deep analysis by making connections and comparisons across different topics.

AP European History is designed to be the equivalent of a two-semester introductory college or university European history course. In AP European History students investigate significant events, individuals, developments, and processes in four historical periods from approximately 1450 to the present. Students develop and use the same skills, practices, and methods employed by historians: analyzing primary and secondary sources; constructing historical arguments; making historical comparisons; and utilizing reasoning about contextization, causation, and continuity and change over time. The course also provides six themes that students explore throughout the course in order to make connections among historical developments in different times and places: interaction of Europe and the world; poverty and prosperity; objective knowledge and subjective visions; states and other institutions of power; individual and society; and national and European identity.

AP European History Course Content

The AP European History course is structured around themes and concepts in four different chronological periods from approximately 1450 to the present:

- Period 1: c. 1450 to c. 1648
- Period 2: c. 1648 to c. 1815
- Period 3: c. 1815 to c. 1914
- Period 4: c. 1914 to the present

Within each period, key concepts organize and prioritize historical developments. Themes allow students to make connections and identify patterns and trends over time.

AP History Disciplinary Practices and Reasoning Skills

The AP history courses seek to apprentice students to the practice of history by emphasizing the development of disciplinary practices and reasoning skills while learning historical content. The practices and skills that students should develop in all AP history courses are listed below, along with a condensed description of what students should be able to do with each. Every AP Exam question will assess one or more of these practices and skills.

AP History Disciplinary Practices

Practice 1: Analyzing Historical Evidence

Primary Sources
- Explain the relative historical significance of a source's point of view, purpose, historical situation, and/or audience.
- Evaluate a source's credibility and/or limitations.

Secondary Sources
- Explain how a historian's claim or argument is supported with evidence.
- Analyze patterns and trends in quantitative data in non-text-based sources.
- Evaluate the effectiveness of a historical claim or argument.

Practice 2: Argument Development
- Make a historically defensible claim in the form of an evaluative thesis.
- Support an argument using specific and relevant evidence.
- Use historical reasoning to explain relationships among pieces of historical evidence.
- Consider ways that diverse or alternative evidence could be used to qualify or modify an argument.

AP History Reasoning Skills

Skill 1: Contextualization
- Use context to explain the relative historical significance of a specific historical development or process.

Skill 2: Comparison
- Explain the relative historical significance of similarities and/or differences between different historical developments or processes.

Skill 3: Causation
- Explain the difference between primary and secondary causes and between short- and long-term effects.
- Explain the relative historical significance of different causes and/or effects.

Skill 4: Continuity and Change Over Time
- Explain the relative historical significance of specific historical developments in relation to a larger pattern of continuity and/or change.
### AP EUROPEAN HISTORY EXAM: 3 HOURS 15 MINUTES

#### Assessment Overview
The AP Exam questions measure students’ knowledge of European history and their ability to think historically. Questions are based on learning objectives, key concepts, course themes, and AP history disciplinary practices and reasoning skills.

#### Format of Assessment

<table>
<thead>
<tr>
<th>Section I, Part A: Multiple Choice</th>
<th>55 Questions</th>
<th>55 Minutes</th>
<th>40% of Exam Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Questions appear in sets of 2–5.</td>
<td></td>
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<tr>
<td>Students analyze primary and secondary texts, images, graphs, and maps.</td>
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<tr>
<td>Questions cover all course periods.</td>
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<tr>
<td>**Section I, Part B: Short Answer</td>
<td>3 Questions</td>
<td>40 Minutes</td>
<td>20% of Exam Score</td>
</tr>
<tr>
<td>Students respond to 2 required questions and choose between 2 options for a third question.</td>
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<tr>
<td>Questions 1 and 2 cover the years 1600 to 2001 of the course; students choose between answering either question 3 (covering periods 1–2) or question 4 (periods 3–4).</td>
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<tr>
<td>Students analyze historians’ interpretations, historical sources, and propositions about history.</td>
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</tbody>
</table>

<table>
<thead>
<tr>
<th>Section II, Part A: Document Based</th>
<th>1 Question</th>
<th>60 Minutes</th>
<th>25% of Exam Score</th>
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</thead>
<tbody>
<tr>
<td>Students assess written, visual, and quantitative sources as historical evidence.</td>
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<tr>
<td>Students develop an argument supported by an analysis of historical evidence.</td>
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<tr>
<td>Question covers the years 1600 to 2001 of the course.</td>
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</table>

<table>
<thead>
<tr>
<th>Section II, Part B: Long Essay</th>
<th>1 Question</th>
<th>40 Minutes</th>
<th>15% of Exam Score</th>
</tr>
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<tbody>
<tr>
<td>Students select one question among three different periods (1, 2–3, 3–4) of the course.</td>
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<tr>
<td>Students explain and analyze significant issues in European history.</td>
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<tr>
<td>Students develop an argument supported by an analysis of historical evidence.</td>
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</table>

#### AP EUROPEAN HISTORY SAMPLE EXAM QUESTIONS

**Sample Multiple-Choice Question**

The foundations of old knowledge have collapsed. Wise men have probed the depths of the earth, Treasures of buried sate furnishes the proofs of creation. [Religion] is no longer the epoch of fulfillment for the intelligent. Atlas does not hold up the earth, nor is Aphrodite divine, Plato’s wisdom cannot explain the principles of evolution. *Amr* is no slave of Zayd, nor is Zayd *Amr*’s master. *—* Loy depends upon the principle of equality. Neither the fame of Arabia, nor the glory of Cairo remains. This is the time for progress; the world is a world of science; Is it possible to maintain society in ignorance?*

*Sâdûlah Pasha, Ottoman intellectual, The Nineteenth Century, poem, 1878*

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*Zayd and *Amr* are Muslim names traditionally used in Islamic legal opinions in the generic sense of “John Doe 1” and “John Doe 2”*
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The last three lines of the poem best illustrate which of the following aspects of Europe’s relationship with the rest of the world in the late nineteenth century?

- (A) European imperial encroachments provoked a cultural backlash and a rejection of Western values in many areas of Africa and Asia.
- (B) Colonial subjects began organizing politically to overthrow European rule.
- (C) Many countries were made dependent on European economically and politically through treaties and trade agreements.
- (D) Adoption of Western ideas caused many non-Western peoples to call for the modernization of their own societies and states.

Correct Answer: D

**Sample Short-Answer Question: Comparison**

Answer parts A, B, and C.

A) Describe ONE important similarity between the wars of religion in France and the English Civil War.

B) Explain ONE important difference between the wars of religion in France and the English Civil War.

C) Explain ONE factor that accounts for the difference you identified between the wars of religion in France and the English Civil War.

**Sample Free-Response Question: Document-Based Question**

Evaluate the extent to which the experience of war altered the lives of European women during the First World War and its immediate aftermath. Students examine seven primary source documents, including a weekly magazine cover illustration, two letters (one from the Chief of the German General Staff to the German Chancellor, and one from a British frontline soldier to his fiancée), writings by a French female coutnress, a poem, a memoir, and a chart showing women as a percentage of the Industrial workforce in France in the early 20th century.

**Sample Free-Response Question: Long Essay Question Focused on Comparison**

Evaluate the most significant difference between the Italian Renaissance and the Northern Renaissance.
AP® COMPARATIVE GOVERNMENT
AND POLITICS

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The Advanced Placement Program® has enabled millions of students to take college-level courses and earn college credit, advanced placement, or both, while still in high school. AP Exams are given each year in May. Students who earn a qualifying score on an AP Exam are typically eligible, in college, to receive credit, placement into advanced courses, or both. Every aspect of AP course and exam development is the result of collaboration between AP teachers and college faculty. They work together to develop AP courses and exams, set scoring standards, and score the exams. College faculty review every AP teacher’s course syllabus.

AP Government Program

The AP Program offers two government courses: AP United States (U.S.) Government and Politics and AP Comparative Government and Politics. Each course is designed to be equivalent to a one-semester introductory college course. There is no prescribed sequence of study. A school may offer one or both courses.

AP Comparative Government and Politics Course Overview

AP Comparative Government and Politics introduces students to the rich diversity of political life outside the United States. The course uses a comparative approach to examine the political structures; policies; and the political, economic, and social challenges among six selected countries: Great Britain, Mexico, Russia, Iran, China, and Nigeria. Additionally, students examine how different governments solve similar problems by comparing the effectiveness of approaches to many global issues.

RECOMMENDED PREREQUISITES

There are no prerequisite courses for AP Comparative Government and Politics. Students should be able to read a college level textbook and write grammatically correct, complete sentences.

AP Comparative Government and Politics Course Content

Students compare and contrast political institutions and processes across six countries (Great Britain, Mexico, Russia, Iran, China, and Nigeria) and analyze and interpret data to derive generalizations. Topics include:

- Introduction to Comparative Politics
- Sovereignty, Authority, and Power
- Political Institutions
- Citizens, Society, and the State
- Political and Economic Change
- Public Policy

The emphasis should be on broad trends that allow comparison, rather than on details that are unrelated to larger trends and concepts.

Course Goals

Students successfully completing this course will:

- Compare and contrast political concepts, themes, and generalizations;
- Describe and explain typical patterns of political processes and behaviors and their consequences;
- Compare and contrast political institutions and processes across countries to derive generalizations; and
- Analyze and interpret basic data relevant to comparative government and politics.
AP COMPARATIVE GOVERNMENT AND POLITICS EXAM:
2 HOURS 25 MINUTES

Assessment Overview
The AP Comparative Government and Politics Exam asks students to explain and apply key and supporting concepts. The exam measures students' knowledge of the six core countries and their ability to compare and contrast political regimes; electoral systems; federal structures; civil rights; and state responses to economic, social, and religious challenges over time.

Format of Assessment

Section I: Multiple Choice | 55 Questions | 45 Minutes | 50% of Exam Score
- Address major conceptual understandings among the six core countries
- Apply skills of comparison and interpretation in addition to factual recall

Section II: Free Response | 8 Questions | 1 Hour, 40 Minutes | 50% of Exam Score
Short-Answer Concept (Five Questions)
- Students identify the significance, provide examples, or contrast concepts or terms.

Conceptual Analysis (One Question)
- Students use major concepts to identify and explain important relationships and to discuss the causes and implications of politics and policy.

Country Context (Two Questions)
- Students use concepts to analyze one or more countries studied.

AP COMPARATIVE GOVERNMENT AND POLITICS SAMPLE EXAM QUESTIONS

Sample Multiple-Choice Question
In the developed and developing worlds, respectively, the greatest demographic pressures on policy come from which of the following?

Developed
(A) Gender imbalances
(B) Aging
(C) Emigration
(D) Overpopulation
(E) High birth rates

Developing
(A) Aging
(B) Overpopulation
(C) Immigration
(D) High death rates
(E) Emigration

Correct Answer: B

Sample Free-Response Questions
Type: Short-Answer Concepts
Define political socialization. Identify one agent of political socialization. Explain how the agent you have identified promotes social politicalization.

Type: Conceptual Analysis
States vary in terms of their party systems and electoral systems.

(a) Identify and explain the type of electoral system that tends to create a multiparty system.
(b) Identify and explain the type of electoral system that tends to create a two-party system.
(c) Describe one reason that a one-party system might emerge.
(d) Explain one advantage each of multiparty, two-party, and one-party systems in a multiethnic society.

Type: Country Context
Various economic changes have affected the legal system in China.

(a) Describe two reforms to the legal system in China in the past two decades.
(b) Explain two reasons that reforms to the legal system have occurred.
(c) Describe two important features of the Chinese legal system that have not changed in the past two decades.
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AP Economics Program

The AP Program offers two courses in economics: AP Macroeconomics and AP Microeconomics. Each course corresponds to one semester of a typical introductory college course in economics. AP Macroeconomics focuses on the principles that apply to an economic system as a whole. AP Microeconomics focuses on the principles of economics that apply to the functions of individual decision-makers, both consumers and producers, within the economic system.

AP Microeconomics Course Overview

AP Microeconomics is an introductory college-level course that focuses on the principles of economics that apply to the functions of individual economic decision-makers. The course also develops students’ familiarity with the operation of product and factor markets, distributions of income, market failure, and the role of government in promoting greater efficiency and equity in the economy. Students learn to use graphs, charts, and data to analyze, describe, and explain economic concepts.

PREREQUISITE

There are no prerequisites for AP Microeconomics. Students should be able to read a college-level textbook and should possess basic mathematics and graphing skills.

AP Microeconomics Course Content

The AP Microeconomics course provides students with an understanding of the principles of economics as they apply to individual decision-making units, including individual households and firms. The course examines the theories of consumer behavior, the theory of the firm, and the behavior of profit-maximizing firms under various market structures. Students evaluate the efficiency of the outcomes with respect to price, output, consumer surplus, and producer surplus. They examine the behaviors of households and businesses in factor markets, and learn how the determination of factor prices, wages, interest, and rent influence the distribution of income in a market economy. There are ample opportunities to consider instances in which private markets may fail to allocate resources efficiently and examine various public policy alternatives aimed at improving the efficiency of private markets.

Topic Outline for AP Microeconomics

I. Basic Economic Concepts

II. The Nature and Functions of Product Markets
   a. Supply and demand
   b. Theory of consumer choice
   c. Production and costs
   d. Firm behavior and market structure

III. Factor Markets
   a. Derived Factor Demand
   b. Marginal revenue product
   c. Hiring decisions in the markets for labor and capital
   d. Market distribution of income

IV. Market Failure and the Role of Government
   a. Externalities
   b. Public goods
   c. Public policy to promote competition
   d. Income distribution
AP MICROECONOMICS EXAM: 2 HOURS 10 MINUTES

Assessment Overview
The AP Microeconomics Exam questions measure students' knowledge of microeconomics principles and their ability to reason within the discipline.

Format of Assessment

Section I: Multiple Choice | 60 Questions | 1 Hour, 10 Minutes | 66% of Exam Score
- Questions require the use of economics content knowledge and reasoning across the range of course topics.
- Some questions require analysis of different hypothetical situations.

Section II: Free Response | 3 Questions | 1 Hour (includes a 10-minute reading period) | 33% of Exam Score
- 1 Long free-response question (50% of section score)
- 2 Short free-response questions (each worth 25% of section score)
- Questions ask students to analyze unique scenarios using different course concepts.
- Some questions in the free-response section require graphical analysis.

AP MICROECONOMICS SAMPLE EXAM QUESTIONS

Sample Multiple-Choice Question
Assume that the original supply and demand curves of a commodity are S and D, respectively. Also assume that the government imposes an excise tax (per unit tax) of t dollars on the commodity, which shifts the supply curve to S'.

![Graph of supply and demand curves with tax]

The total amount of tax collected by the government is equal to
(a) P1GQ10
(b) P1GIP2
(c) P0P1JK
(d) P0P1GH
(e) P0P2IH

Correct Answer: B

Sample Free-Response Question
Assume that Company XYZ is a profit-maximizing firm that hires its labor in a perfectly competitive labor market and sells its product in a perfectly competitive output market.

(a) Define the marginal revenue product of labor (MRPL).

(b) Using correctly labeled side-by-side graphs, show each of the following:
(i) The equilibrium wage in the labor market
(ii) The labor supply curve the firm faces
(iii) The number of workers the firm will hire

(c) Company XYZ develops a new technology that increases its labor productivity. Currently this technology is not available to any other firm. For Company XYZ, explain how the increased productivity will affect each of the following:
(i) Wage rates
(ii) Number of workers hired

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AP Economics Program

The AP Program offers two courses in economics: AP Macroeconomics and AP Microeconomics. Each course corresponds to one semester of a typical introductory college course in economics. AP Macroeconomics focuses on the principles that apply to an economic system as a whole. AP Microeconomics focuses on the principles of economics that apply to the functions of individual decision-makers, both consumers and producers, within the economic system.

AP Macroeconomics Course Overview

AP Macroeconomics is an introductory college-level course that focuses on the principles that apply to an economic system as a whole. The course places particular emphasis on the study of national income and price-level determination; it also develops students’ familiarity with economic performance measures, the financial sector, stabilization policies, economic growth, and international economics. Students learn to use graphs, charts, and data to analyze, describe, and explain economic concepts.

PREREQUISITE

There are no prerequisites for AP Macroeconomics. Students should be able to read a college-level textbook and should possess basic mathematics and graphing skills.

AP Macroeconomics Course Content

The AP Macroeconomics course provides students with a thorough understanding of the principles of economics and how economists use these principles to examine aggregate economic behavior. Students learn how the measures of economic performance, such as gross domestic product (GDP), inflation, and unemployment are constructed and how to apply them to evaluate the macroeconomic conditions of an economy. The course recognizes the global nature of economics and provides ample opportunities to examine the impact of international trade and finance on national economies. Various economic schools of thought are introduced as students consider solutions to economic problems.

Topic Outline for AP Macroeconomics

I. Basic Economic Concepts
   a. National income accounts
   b. Inflation measurement and adjustment
   c. Unemployment

II. Measurement of Economic Performance
   a. Aggregate demand
   b. Aggregate supply
   c. Macroeconomics equilibrium

IV. Financial Sector
   a. Money, banking, and financial markets
   b. Loanable funds market
   c. Central bank and control of the money supply

V. Stabilization Policies
   a. Fiscal and monetary policies
   b. The Phillips curve

VI. Economic Growth
   a. Definition of economic growth
   b. Determinants of economic growth
   c. Growth policy

VII. Open Economy: International Trade and Finance
   a. Balance of payments accounts
   b. Foreign exchange market
   c. Imports, exports, and financial capital flows
   d. Relationships between international and domestic financial and goods markets
AP MACROECONOMICS EXAM: 2 HOURS 10 MINUTES

Assessment Overview
The AP Macroeconomics Exam questions measure students' knowledge of macroeconomics principles and their ability to reason within the discipline.

Format of Assessment

Section I: Multiple Choice | 60 Questions | 1 Hour, 10 Minutes | 66% of Exam Score
- Questions require the use of economics content knowledge and reasoning across the range of course topics.
- Some questions require analysis of different hypothetical situations.

Section II: Free Response | 3 Questions | 1 Hour (includes a 10-minute reading period) | 33% of Exam Score
- 1 long free-response question (50% of section score)
- 2 short free-response questions (each worth 25% of section score)
- Questions ask students to analyze unique scenarios using different course concepts.
- Some questions in the free-response section require graphical analysis.

AP MACROECONOMICS SAMPLE EXAM QUESTIONS

Sample Multiple-Choice Question

In the graph above, AD denotes the aggregate demand curve, SRAS the short-run aggregate supply curve, and LRAS the long-run aggregate supply curve. If no policy action were taken, which of the following changes would move the economy to its long-run equilibrium?

(a) An increase in aggregate demand
(b) An increase in exports
(c) An increase in wages
(d) A decrease in wages
(e) A decrease in the expected price level

Correct Answer: C

Sample Free-Response Question
Country Y is experiencing severe and unanticipated inflation.

(a) Explain the effect of this inflation on each of the following:
   (i) A family with savings in a fixed-interest-rate time deposit account
   (ii) A business repaying a long-term, fixed-interest-rate loan

(b) Identify one fiscal policy action that could be implemented to reduce inflation.

(c) Identify an open-market operation that could be implemented to reduce inflation.

(d) Suppose that Country Y continues to experience high inflation in the long run. Indicate the effect of this inflation on the nominal interest rate in Country Y.

(e) If Country Y's inflation is high relative to that of other countries, explain the effect of this inflation on the international value of Country Y's currency.
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AP Government Program

The AP Program offers two government courses: AP U.S. Government and Politics and AP Comparative Government and Politics. Each course is designed to be equivalent to a one semester introductory college course. There is no prescribed sequence of study or course length. Both courses are designed to be half-year courses, although some high schools teach them as full-year courses. A school may offer one or both courses.

AP U.S. Government and Politics Course Content

COURSE UNITS

The AP U.S. Government and Politics course is organized around five units, which focus on major topics in U.S. government and politics. The units are:

- Foundations of American Democracy
- Interaction Among Branches of Government
- Civil Liberties and Civil Rights
- American Political Ideologies and Beliefs; and
- Political Participation

Foundational documents and Supreme Court cases are an integral part of the course and necessary for students to understand the philosophical underpinnings, significant legal precedents, and political values of the U.S. political system and may serve as the focus of AP Exam questions. The course requires study of:

- 9 foundational documents, including the U.S. Constitution
- 15 landmark Supreme Court cases

POLITICAL SCIENCE RESEARCH OR APPLIED CIVICS PROJECT

The required project adds a civic component to the course, engaging students in exploring how they can affect, and are affected by, government and politics throughout their lives. The project might have students collect data on a teacher-approved political science topic, participate in a community service activity, or observe and report on the policymaking process of a governing body. Students should plan a presentation that relates their experiences or findings to what they are learning in the course.

AP U.S. GOVERNMENT AND POLITICS DISCIPLINARY PRACTICES

Practice 1: Apply political concepts and processes to scenarios in context
Practice 2: Apply Supreme Court decisions
Practice 3: Analyze and interpret quantitative data represented in tables, charts, graphs, maps, and infographics
Practice 4: Read, analyze, and interpret foundational documents and other text-based and visual sources
Practice 5: Develop an argument in essay format

PREREQUISITES

There are no prerequisite courses for AP U.S. Government and Politics. Students should be able to read a college-level textbook and write grammatically correct, complete sentences.
AP U.S. GOVERNMENT AND POLITICS EXAM: 3 HOURS

Assessment Overview
The AP U.S. Government and Politics Exam measures students' understanding of required content. Students must be able to define, compare, explain, and interpret political concepts, policies, processes, perspectives, and behaviors that characterize the U.S. political system.

Format of Assessment

Section I: Multiple Choice | 55 Questions | 80 Minutes | 50% of Exam Score
- Quantitative Analysis: Analysis and application of quantitative-based source material
- Qualitative Analysis: Analysis and application of text-based (primary and secondary) sources
- Visual Analysis: Analysis and application of qualitative visual information
- Concept Application: Explanation of the application of political concepts in context
- Comparison: Explanation of the similarities and differences of political concepts
- Knowledge: Identification and definition of political principles, institutions, processes, policies, and behaviors

Section II: Free Response | 4 Questions | 100 Minutes | 50% of Exam Score
- Concept Application: Respond to a political scenario, explaining how it relates to a political principle, institution, process, policy, or behavior
- Quantitative Analysis: Analyze quantitative data, identify a trend or pattern, draw a conclusion for the visual representation, and explain how it relates to a political principle, institution, process, policy, or behavior
- SCOTUS Comparison: Compare a nonrequired Supreme Court case with a required Supreme Court case, explaining how information from the required case is relevant to that in the nonrequired one
- Argument Essay: Develop an argument in the form of an essay, using evidence from one or more required foundational documents

Sample Multiple-Choice Question
Which of the following actions by public school students would most likely be protected symbolic speech based on the precedent established by Tinker v. Des Moines Independent Community School District (1969)?

(A) Leading prayers over the school's public address system
(B) Publishing an editorial in the school newspaper
(C) Protesting a school board decision by disrupting a school assembly
(D) Wearing t-shirts objecting to a school board decision

Correct Answer: D

Sample Free-Response Question
Develop an argument that explains which of the three models of representative democracy — participatory, pluralist, and elite — best achieves the founders' intent for American democracy in terms of ensuring a stable government run by the people.

In your essay, you must:
- Articulate a defensible claim or thesis that responds to the prompt and establishes a line of reasoning
- Support your claim with at least TWO pieces of accurate and relevant information
  - one piece of evidence from one of the following foundational documents:
    - Brutus 1
    - Federalist No. 10
    - U.S. Constitution
  - one piece of evidence from another foundational document on the list above or from your study of the electoral process
- Use reasoning to explain why your evidence supports your claim/thesis
- Respond to an opposing or alternative perspective using refutation, concession, or rebuttal
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AP Human Geography Course Overview

The AP Human Geography course is equivalent to an introductory college-level course in human geography. The course introduces students to the systematic study of patterns and processes that have shaped human understanding, use, and alteration of Earth’s surface. Students employ spatial concepts and landscape analysis to examine socioeconomic organization and its environmental consequences. They also learn about the methods and tools geographers use in their research and applications. The curriculum reflects the goals of the National Geography Standards (2012).

PREREQUISITE

There are no prerequisites for AP Human Geography. Students should be able to read college-level texts and apply the conventions of Standard Written English in their writing.

Goals of AP Human Geography

Upon successful completion of the course, students will be able to:

- Interpret maps and analyze geospatial data;
- Understand and explain the implications of associations and networks among phenomena in places;
- Recognize and interpret the relationships among patterns and processes at different scales of analysis;
- Define regions and evaluate the regionalization process; and
- Characterize and analyze changing interconnections among places.

Topic Outline for AP Human Geography

The AP Human Geography course is organized around seven major topics:

- Geography: Its Nature and Perspectives
- Population and Migration
- Cultural Patterns and Processes
- Political Organization of Space
- Agriculture, Food Production, and Rural Land Use
- Industrialization and Economic Development
- Cities and Urban Land Use
**AP HUMAN GEOGRAPHY EXAM: 2 HOURS 15 MINUTES**

**Assessment Overview**

The AP Human Geography Exam requires students to explain and apply key and supporting geographical concepts. The exam employs multiple-choice questions and free-response questions based on components of the seven major curriculum topics. Students must be able to define, explain, and apply geographical concepts and interpret geographical data.

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**Format of Assessment**

**Section I: Multiple Choice | 75 Questions | 1 Hour | 50% of Exam Score**

- Define, explain, and apply geographic concepts
- Interpret geographic data

**Section II: Constructed Response | 3 Questions | 1 Hour, 15 Minutes | 50% of Exam Score**

- Synthesize different topical areas
- Analyze and evaluate geographical concepts
- Supply appropriately selected and well-explained real-world examples to illustrate geographic concepts
- Interpret verbal descriptions, maps, graphs, photographs, and/or diagrams
- Formulate responses in narrative form

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**AP HUMAN GEOGRAPHY SAMPLE EXAM QUESTIONS**

**Sample Multiple-Choice Question**

Physiological population density is viewed as a superior measure of population density for which of the following reasons?

(a) It is more reflective of population pressure on arable land.

(b) It yields the average population density.

(c) It is more reflective of the world’s largest population concentrations.

(d) It measures the average by dividing total land area by total number of people.

(e) It best reflects the percentage of a country’s population that is urbanized.

**Correct Answer: A**

**Sample Free-Response Question**

Employment structures are the proportion of people working in different sectors of the economy.

(a) Describe two reasons why a low percentage of people work in jobs in the tertiary sector of a country like Laos.

(b) Describe two reasons why a low percentage of people work in primary jobs in countries such as the United States.

(c) Predict and describe how the structure of employment will change as Brazil becomes more developed.
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AP Psychology Course Overview

The AP Psychology course introduces students to the systematic and scientific study of human behavior and mental processes. While considering the psychologists and studies that have shaped the field, students explore and apply psychological theories, key concepts, and phenomena associated with such topics as the biological bases of behavior, sensation and perception, learning and cognition, motivation, developmental psychology, testing and individual differences, treatment of abnormal behavior, and social psychology. Throughout the course, students employ psychological research methods, including ethical considerations, as they use the scientific method, evaluate claims and evidence, and effectively communicate ideas.

RECOMMENDED PREREQUISITES

There are no prerequisites for AP Psychology. Students should be able to read a college-level textbook and write grammatically correct, complete sentences.

AP Psychology Course Content

The AP Psychology course includes the systematic and scientific study of behavior and mental processes represented by the following topics:

- History and Approaches
- Research Methods
- Biological Bases of Behavior
- Sensation and Perception
- States of Consciousness
- Learning
- Cognition
- Motivation and Emotion
- Developmental Psychology
- Personality
- Testing and Individual Differences
- Abnormal Behavior
- Treatment of Abnormal Behavior
- Social Psychology
AP PSYCHOLOGY EXAM: 2 HOURS

Assessment Overview

The AP Psychology Exam measures students’ knowledge of the 14 key topics and fields of study in psychology and tests their ability to define, compare, and apply concepts and research findings. Questions are based on key terminology, scientific methodology, and theories associated with each subfield.

Free-response questions may require students to interrelate different content areas and to analyze and evaluate psychological constructs and, more generally, theoretical perspectives.

Format of Assessment

<table>
<thead>
<tr>
<th>Section I: Multiple Choice</th>
<th>100 Questions</th>
<th>1 Hour, 10 Minutes</th>
<th>66.6% of Exam Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Define and explain content from a range of course topics</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>2. Apply skills of comparison and interpretation to course concepts, theories, and scientific methods</td>
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<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Section II: Free Response</th>
<th>2 Questions</th>
<th>50 Minutes</th>
<th>33.3% of Exam Score</th>
</tr>
</thead>
<tbody>
<tr>
<td>Topics/themes addressed by these questions may include (but are not limited to) the following:</td>
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<tr>
<td>1. Analyze a unique scenario using concepts from different theoretical frameworks or subdomains in the field</td>
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<tr>
<td>2. Design, analyze, or critique a research study</td>
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</tbody>
</table>

AP PSYCHOLOGY SAMPLE EXAM QUESTIONS

Sample Multiple-Choice Question

Which of the following scenarios is the best example of the mere-exposure effect?

(A) After tasting a soft drink for the first time, Frank immediately decides it is his favorite drink.

(B) A year after beginning her exercise program, Georgina wants to expand her regimen.

(C) Hal begins to like a certain sports car after seeing it frequently on the road, even though he did not like the car at first.

(D) Kristy initially thinks her new neighbor is attractive, but once she becomes better acquainted with him, she finds him less appealing.

(E) After going away to college, Joy finds she is less and less interested in spending time with her old friends from high school.

Answer: C

Sample Free-Response Question

To demonstrate an understanding of psychological concepts, perspectives, and research methodology, students must answer the questions clearly, in complete sentences, and within the context of the prompt. Outlines and lists alone are not acceptable responses. Providing definitions of the psychological terms alone may not score points but may help students better apply the concepts. Responses that contradict themselves, involve circular definitions, or simply restate the question are unacceptable.

ABSTRACT

1. We conducted a variation of Asch’s (1951) conformity study in which participants made judgments about the length of lines. We randomly assigned participants to one of two conditions and told them that the study involved perceptual abilities. In the first condition, participants estimated the length of lines after hearing five people pretending to be participants (confederates) give inaccurate estimates. In the second condition, participants estimated the length of lines without hearing estimates of confederates. As we expected, participants in the first condition were less accurate in their estimates of line length, demonstrating the tendency to conform to majority influence.

A) How would each element below be related to the specific content of the experiment reported in the abstract?

- Control group
- Deception
- Operational definition of the dependent variable
- Hypothesis
- Debriefing

B) How might participants’ estimates of line length in the study be related to the following?

- Cognitive dissonance
- Maslow’s hierarchy of needs

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AP History Program

The AP Program offers three history courses: AP European History, AP United States History, and AP World History. All three history courses focus on the development of historical thinking while learning required course content. Course themes foster deep analysis by making connections and comparisons across different topics.

AP United States History Course Overview

AP U.S. History is designed to be the equivalent of a two-semester introductory college or university U.S. history course. In AP U.S. History students investigate significant events, individuals, developments, and processes in nine historical periods from approximately 1491 to the present. Students develop and use the same skills, practices, and methods employed by historians: analyzing primary and secondary sources; developing historical arguments; making historical comparisons; and utilizing reasoning about contextualization, causation, and continuity and change over time. The course also provides seven themes that students explore throughout the course in order to make connections among historical developments in different times and places: American and national identity; migration and settlement; politics and power; work, exchange, and technology; America in the world; geography and the environment; and culture and society.

PREREQUISITES

There are no prerequisites for AP U.S. History. Students should be able to read a college-level textbook and write grammatically correct, complete sentences.

AP United States History Course Content

The AP U.S. History course is structured around themes and concepts in nine different chronological periods from approximately 1491 to the present:

- Period 1: 1491–1607
- Period 2: 1607–1764
- Period 3: 1754–1800
- Period 4: 1800–1848
- Period 5: 1844–1877
- Period 6: 1865–1898
- Period 7: 1890–1945
- Period 8: 1945–1980
- Period 9: 1980–Present

Within each period, key concepts organize and prioritize historical developments. Themes allow students to make connections and identify patterns and trends over time.

AP History Disciplinary Practices and Reasoning Skills

The AP history courses seek to apprentice students to the practice of history by emphasizing the development of disciplinary practices and reasoning skills while learning historical content. The practices and skills that students should develop in all AP history courses are listed below, along with a condensed description of what students should be able to do with each. Every AP Exam question will assess one or more of these practices and skills.

AP HISTORY DISCIPLINARY PRACTICES

Practice 1: Analyzing Historical Evidence

Primary Sources

- Explain the relative historical significance of a source's point of view, purpose, historical situation, and/or audience.
- Evaluate a source's credibility and/or limitations.

Secondary Sources

- Explain how a historian's claim or argument is supported with evidence.
- Analyze patterns and trends in quantitative data in non-text-based sources.
- Evaluate the effectiveness of a historical claim or argument.

Practice 2: Argument Development

- Make a historically defensible claim in the form of an evaluative thesis.
- Support an argument using specific and relevant evidence.
- Use historical reasoning to explain relationships among pieces of historical evidence.
- Consider ways that diverse or alternative evidence could be used to qualify or modify an argument.

AP HISTORY REASONING SKILLS

Skill 1: Contextualization

- Use context to explain the relative historical significance of a specific historical development or process.

Skill 2: Comparison

- Explain the relative historical significance of similarities and/or differences between different historical developments or processes.

Skill 3: Causation

- Explain the difference between primary and secondary causes and between short- and long-term effects.
- Explain the relative historical significance of different causes and/or effects.

Skill 4: Continuity and Change Overtime

- Explain the relative historical significance of specific historical developments in relation to a larger pattern of continuity and/or change.
AP U.S. HISTORY EXAM: 3 HOURS 15 MINUTES

Assessment Overview
The AP Exam questions measure students’ knowledge of U.S. history and their ability to think historically. Questions are based on learning objectives, key concepts, course themes, and AP history disciplinary practices and reasoning skills.

Format of Assessment

Section I, Part A: Multiple Choice | 55 Questions | 55 Minutes | 40% of Exam Score

- Questions appear in sets of 2-5.
- Students analyze primary and secondary texts, images, graphs, and maps.
- Questions cover all course periods.

Section I, Part B: Short Answer | 3 Questions | 40 Minutes | 20% of Exam Score

- Students respond to 2 required questions and choose between 2 options for a third question.
- Questions 1 and 2 cover periods 3-8 of the course; students choose between answering either question 3 (covering periods 1-5) or question 4 (periods 6-8).
- Students analyze historians’ interpretations, historical sources, and propositions about history.

Section II, Part A: Document Based | 1 Question | 60 Minutes | 25% of Exam Score

- Students assess written, visual, and quantitative sources as historical evidence.
- Students develop an argument supported by an analysis of historical evidence.
- Question covers periods 3-8 of the course.

Section II, Part B: Long Essay | 1 Question | 40 Minutes | 15% of Exam Score

- Students select one question among three different periods (1-3, 4-6, 7-9) of the course.
- Students explain and analyze significant issues in U.S. history.
- Students develop an argument supported by an analysis of historical evidence.

AP U.S. HISTORY SAMPLE EXAM QUESTIONS

Sample Multiple-Choice Question
“...Our... destiny [is] to overspread the continent allotted by Providence for the free development of our yearly multiplying millions... The Anglo-Saxon foot is already on [California’s] borders. Already the advance guard of the irresistible army of Anglo-Saxon emigration has begun to pour down upon it, armed with the [plow] and the rifle, and marking its trail with schools and colleges, courts and representative halls, mills and meetinghouses. A population will soon be in actual occupation of California... Their right to independence will be the natural right of self-government belonging to any community strong enough to maintain it.” — John O’Sullivan, 1846

The process described in the passage above most directly led to political controversies in the 1840s and 1850s over the

(A) expansion of slavery into newly acquired territories
(B) authority of the Supreme Court to overturn federal laws
(C) role of the federal government in economic development
(D) use of natural resources in newly acquired territories

Sample Short-Answer Question Focused on Causation

Use the image and your knowledge of United States history to answer parts A, B, and C.

A) Describe the point of view reflected in the image regarding ONE of the following: Migraton
Technology
American Indians

B) Explain ONE historical cause for the rise of the point of view you identified in Part A.

C) Explain how the point of view you identified in Part A helped to shape ONE specific United States government action between 1845 and 1900.

Sample Free-Response Question: Document-Based Question

Analyze major changes and continuities in the social and economic experiences of African Americans who migrated from the rural South to urban areas in the North in the period 1910-1930. Students examine seven primary source documents, including a map, newspaper articles, a letter, song lyrics, and a folk saying.

Sample Free-Response Question: Long Essay Question Focused on Continuity and Change over Time

Evaluate the extent to which increasing integration of the United States into the world economy changed in United States society from 1945 to the present.

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The AP Program offers three history courses: AP European History, AP United States History, and AP World History. All three history courses focus on helping students develop historical thinking while learning required course content. Course themes foster deep analysis by making connections and comparisons across different topics.

AP World History Course Overview

AP World History is designed to be the equivalent of a two-semester introductory college or university world history course. In AP World History students investigate significant events, individuals, developments, and processes in six historical periods from approximately 8000 B.C.E. to the present. Students develop and use the same skills, practices, and methods employed by historians: analyzing primary and secondary sources; developing historical arguments; making historical comparisons; and utilizing reasoning about contextualization, causation, and continuity and change over time. The course provides five themes that students explore throughout the course in order to make connections among historical developments in different times and places: Interaction between humans and the environment; development and transformation of social structures; state building, expansion, and conflict; creation, expansion, and interaction of economic systems; and development and transformation of social structures.

PREREQUISITES

There are no prerequisites for the AP World History course. Students should be able to read a college-level textbook and write grammatically correct, complete sentences.

AP World History Course Content

The AP World History course is structured around themes and concepts in six different chronological periods from approximately 8000 BCE to the present:

- Technological and Environmental Transformations (to c. 600 BCE)
- Organization and Reorganization of Human Societies (c. 600 BCE to c. 800 CE)
- Regional and Transregional Interactions (c. 800 CE to c. 1450)
- Global Interactions (c. 1450 to c. 1750)
- Industrialization and Global Integration (c. 1750 to c. 1900)
- Accelerating Global Change and Realignment (c. 1900 to the Present)

Within each period, key concepts organize and prioritize historical developments. Themes allow students to make connections and identify patterns and trends over time.

AP History Disciplinary Practices and Reasoning Skills

The AP history courses seek to apprentice students to the practice of history by emphasizing the development of disciplinary practices and reasoning skills while learning historical content. The practices and skills that students should develop in all AP history courses are listed below, along with a condensed description of what students should be able to do with each. Every AP Exam question will assess one or more of these practices and skills.

AP History Disciplinary Practices

Practice 1: Analyzing Historical Evidence

Primary Sources
- Explain the relative historical significance of a source’s point of view, purpose, historical situation, and/or audience.
- Evaluate a source’s credibility and/or limitations.

Secondary Sources
- Explain how a historian’s claim or argument is supported by evidence.
- Analyze patterns and trends in quantitative data in non-text-based sources.
- Evaluate the effectiveness of a historical claim or argument.

Practice 2: Argument Development

- Make a historically defensible claim in the form of an evaluative thesis.
- Support an argument using specific and relevant evidence.
- Use historical reasoning to explain relationships among pieces of historical evidence.
- Consider ways that diverse or alternative evidence could be used to qualify or modify an argument.

AP History Reasoning Skills

Skill 1: Contextualization
- Use context to explain the relative historical significance of a specific historical development or process.

Skill 2: Comparison
- Explain the relative historical significance of similarities and/or differences between different historical developments or processes.

Skill 3: Causation
- Explain the difference between primary and secondary causes and between short- and long-term effects.
- Explain the relative historical significance of different causes and/or effects.

Skill 4: Continuity and Change Over Time
- Explain the relative historical significance of specific historical developments in relation to a larger pattern of continuity and/or change.
AP WORLD HISTORY EXAM: 3 HOURS 15 MINUTES

Assessment Overview
The AP Exam questions measure students’ knowledge of world history and their ability to think historically. Questions are based on learning objectives, key concepts, course themes, and AP history disciplinary practices and reasoning skills. Exam questions represent various geographical regions, with no more than 20 percent of the multiple-choice questions focusing solely on Europe.

Format of Assessment

Section I | Part A: Multiple Choice | 56 Questions | 55 Minutes | 40% of Exam Score
- Students analyze primary and secondary texts, images, graphs, and maps.
- Questions cover all course periods.

Section II Part A: Document Based | 1 Question | 60 Minutes | 25% of Exam Score
- Students assess written, visual, and quantitative sources as historical evidence.
- Students develop an argument supported by an analysis of historical evidence.
- Question covers periods 3–6 of the course.

Section I Part B: Short Answer | 3 Questions | 40 Minutes | 20% of Exam Score
- Students respond to 2 required questions and choose between 2 options for a third question.
- Questions 1 and 2 cover periods 3–8 of the course; students choose between answering either question 3 (covering periods 1–8) or question 4 (periods 4–8).
- Students analyze historians’ interpretations, historical sources, and propositions about history.

Section II Part B: Long Essay | 1 Question | 40 Minutes | 15% of Exam Score
- Students select one question among three different periods (1–2, 3–4, 5–6) of the course.
- Students explain and analyze significant issues in world history.
- Students develop an argument supported by an analysis of historical evidence.

AP WORLD HISTORY SAMPLE EXAM QUESTIONS

Sample Multiple-Choice Question

“The ruler is a boat; people are the water. The water can carry the boat; the water can capsize the boat... A man may be the descendant of kings, lords, or nobles, but if he does not observe the norms of ritual and proper behavior he must be relegated to the status of a commoner. Similarly, he may be a descendant of commoners, but if he accumulates learning of the texts, corrects his behavior, and observes the norms of ritual and proper behavior—then he must be elevated to the ranks of high ministers, lords, and nobles.”

Xunzi, Chinese philosopher, circa 250 B.C.E.

Ideas similar to those expressed in the passage have directly contributed to the development of which of the following aspects of later Chinese imperial history?

A) The long-standing tradition of Chinese leadership in technological, agricultural, and commercial innovation relative to the rest of the world
B) The expectation that emperors must be judged by a different set of ethical standards all other members of society
C) The virtual elimination of the threat of rebellion against established political authority
D) The practice of recruiting capable bureaucrats on the basis of educational achievement rather than noble birth

Correct Answer: D

Sample Short-Answer Question: Comparison

A) Identify ONE similarity in the way elites used art or architecture in Europe and in Asia during the period 1450–1750.
B) Explain ONE difference in the way elites used art or architecture in Europe and in Asia during the period 1450–1750.
C) Explain ONE reason for the difference in the way elites used art or architecture in Europe and in Asia during the period 1450–1750.

Sample Free-Response Question: Document-Based Question

Evaluate the extent to which industrialization in Japan was similar to industrialization in Russia between 1850 and 1914.

Students examine seven primary source documents, including a secret diplomatic letter, excerpts from two different magazine articles, image of Japanese silk factory, excerpts from two different memoirs, chart documenting Japanese silk workers’ impressions of life in the factories.

Sample Free-Response Question: Long Essay Question: Focused on Continuity and Change over Time

Evaluate the extent to which the relationship between labor systems and social hierarchies changed in the period c. 600 C.E. to c. 1750 C.E.
# TECHNOLOGY

## Advanced Placement Computer Science

**ADVANCED PLACEMENT COMPUTER SCIENCE PRINCIPLES (Grades 9 - 12)**

<table>
<thead>
<tr>
<th>Credit: 1.0</th>
<th>Two Semesters</th>
<th>Weighted: Y = 1.5</th>
<th>Bright Futures: TBA</th>
<th>SUS Admission: TBA</th>
</tr>
</thead>
</table>

AP Computer Science Principles offers a multidisciplinary approach to teaching the underlying principles of computation. The course will introduce students to the creative aspects of programming, abstractions, algorithms, large data sets, the Internet, cybersecurity concerns, and computing impacts. AP Computer Science Principles will give students the opportunity to use technology to address real-world problems and build relevant solutions. Together, these aspects of the course make up a rigorous and rich curriculum that aims to broaden participation in computer science. The course focuses on the innovative aspects of computing as well as the computational thinking practices that help students see how computing is relevant to many areas of their everyday lives. The course is organized around seven big ideas: Creativity, Abstraction, Data and Information, Algorithms, Programming, The Internet, and Global Impact.

**Recommended Prerequisite:** Successful completion of Algebra I.

## ADVANCED PLACEMENT COMPUTER SCIENCE I (Grades 10 - 12)

<table>
<thead>
<tr>
<th>Credit: 1.0</th>
<th>Two Semesters</th>
<th>Weighted: Y = 1.5</th>
<th>Bright Futures: N</th>
<th>SUS Admission: E</th>
</tr>
</thead>
</table>

This course follows the description provided by the College Board. The **AP Computer Science A** curriculum is deliberately streamlined with a wide array of computing and STEM-related fields, and emphasizes object-oriented programming methodology with an emphasis on problem solving and algorithm development. The AP Computer Science A course is intended to serve as both an introductory course for computer science majors and as a course for people who will major in other disciplines and want to be informed citizens in today's technological society. It is recommended that students have previously completed or are concurrently enrolled in advanced science (physics) and mathematics courses.

**Recommended Prerequisites:**
Completion of Advanced Placement Computer Science Principles
Completion or concurrent enrollment in Algebra II and advanced science courses.
About the Advanced Placement Program® (AP®)
The Advanced Placement Program® has enabled millions of students to take college-level courses and earn college credit, advanced placement, or both, while still in high school. AP Exams are given each year in May. Students who earn a qualifying score on an AP Exam are typically eligible, in college, to receive credit, placement into advanced courses, or both. Every aspect of AP course and exam development is the result of collaboration between AP teachers and college faculty. They work together to develop AP courses and exams, set scoring standards, and score the exams. College faculty review every AP teacher's course syllabus.

AP Computer Science Program

There are two AP computer science offerings, and students can take either course in any order. The AP Computer Science A course and exam continue to focus on computing skills related to programming in Java. The new AP Computer Science Principles course complements AP Computer Science A as it aims to broaden participation in the study of computer science. The courses underscore the importance of communicating solutions appropriately and in ways that are relevant to current societal needs. AP Computer Science courses can help address traditional issues of equity, access, and broadening participation in computing while providing a strong and engaging introduction to fundamental areas of the discipline.

AP Computer Science A Course Overview

AP Computer Science A is equivalent to a first-semester, college-level course in computer science. The course introduces students to computer science with fundamental topics that include problem solving, design strategies and methodologies, organization of data (data structures), approaches to processing data (algorithms), analysis of potential solutions, and the ethical and social implications of computing. The course emphasizes both object-oriented and imperative problem solving and design using Java language. These techniques represent proven approaches for developing solutions that can scale up from small, simple problems to large, complex problems. The AP Computer Science A course curriculum is compatible with many CST courses in colleges and universities.

RECOMMENDED PREREQUISITES

The assumed prerequisites for entering the AP Computer Science A course include knowledge of basic English and algebra. A student in the AP Computer Science A course should be comfortable with functions and the concepts found in the uses of function notation, such as \( f(x) = x + 2 \) and \( f(x) = g(h(x)) \). It is important that students and their advisers understand that any significant computer science course builds upon a foundation of mathematical reasoning that should be acquired before attempting such a course.

Lab Requirements

The AP Computer Science A course must include a minimum of 20 hours of hands-on structured lab experiences to engage students in individual or group problem solving. Thus, each AP Computer Science A course includes a substantial laboratory component in which students design solutions to problems, express their solutions precisely (e.g., in the Java programming language), test their solutions, identify and correct errors (when mistakes occur), and compare possible solutions.

Computer Language

The AP Computer Science A course requires that solutions of problems be written in the Java programming language. Because the Java programming language is extensive with far more features than could be covered in a single introductory course, the AP Computer Science A Exam covers a subset of Java. The AP Java subset can be found in Appendix A of the Course Description.

Syllabus of AP Computer Science A

Students should be able to:
- Design, implement, and analyze solutions to problems;
- Use and implement commonly used algorithms;
- Develop and select appropriate algorithms and data structures to solve new problems;
- Write solutions fluently in an object-oriented paradigm;
- Write, run, test, and debug solutions in the Java programming language, utilizing standard Java library classes and interfaces from the AP Java subset;
- Read and understand programs consisting of several classes and interacting objects;
- Read and understand a description of the design and development process leading to such a program; and
- Understand the ethical and social implications of computer use.

Topic Outline for AP Computer Science A

I. Object-Oriented Programming Design
   A. Program and class design

II. Program Implementation
   A. Implementation techniques
   B. Programming constructs
   C. Java library classes and interfaces included in the AP Java Subset

III. Program Analysis
   A. Testing
   B. Debugging
   C. Runtime exceptions
   D. Program correctness
   E. Algorithm analysis
   F. Numerical representations of integers

IV. Standard Data Structures
   A. Primitive data types (int, boolean, double)
   B. Strings
   C. Classes
   D. Lists
   E. Arrays (1-dimensional and 2-dimensional)

V. Standard Operations and Algorithms
   A. Operations on data structures
   B. Searching
   C. Sorting

VI. Computing in Context
   A. System reliability
   B. Privacy
   C. Legal issues and intellectual property
   D. Social and ethical ramifications of computer use
AP COMPUTER SCIENCE A EXAM: 3 HOURS

Assessment Overview
All code on the AP Computer Science A Exam is consistent with the AP Java subset that can be found in Appendix A of the Course Description. All questions involving code should be answered in Java. Students are not tested on minor points of syntax.

Format of Assessment

Section I: Multiple Choice | 40 Questions | 1 Hour, 30 Minutes | 50% of Exam Score

- Discrete Question topics will include: programming fundamentals, data structures, logic, algorithms/problem solving, object-oriented programming, recursion, and software engineering.

Section II: Free Response | 4 Questions | 1 Hour, 30 Minutes | 50% of Exam Score

- Short Answer (each requiring Java programming language)
- Solve problems involving more extended reasoning.

AP COMPUTER SCIENCE A SAMPLE EXAM QUESTIONS

Sample Multiple-Choice Question
A car dealership needs a program to store information about the cars for sale. For each car, they want to keep track of the following information: number of doors (2 or 4), whether the car has air-conditioning, and its average number of miles per gallon. Which of the following is the best object-oriented program design?

(a) Use one class, Car, with three instance variables: int numDoors, boolean hasAir, and milesPerGallon.

(b) Use four unrelated classes: Car, Doors, AirConditioning, and MilesPerGallon.

(c) Use a class Car with three subclasses: Doors, AirConditioning, and MilesPerGallon.

(d) Use a class Car, with a subclass Doors, with a subclass AirConditioning, with a subclass MilesPerGallon.

(e) Use three classes: Doors, AirConditioning, and MilesPerGallon, each with a subclass Car.

Correct Answer: A

Sample Free-Response Question: Experimental Design
A travel agency maintains a list of information about airline flights. Flight information includes a departure time and an arrival time. You may assume that the two times occur on the same day. These times are represented by objects of the Time class.

The declaration for the Time class is shown below. It includes a method minutesUntil, which returns the difference (in minutes) between the current Time object and another Time object.

Students are provided with a scenario and part of the program to solve that scenario. They are then asked to complete a method in that program so that the program can calculate the duration of flights.
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The Advanced Placement Program® has enabled millions of students to take college-level courses and earn college credit, advanced placement, or both, while still in high school. AP Exams are given each year in May. Students who earn a qualifying score on an AP Exam are typically eligible, in college, to receive credit, placement into advanced courses, or both. Every aspect of AP course and exam development is the result of collaboration between AP teachers and college faculty. They work together to develop AP courses and exams, set scoring standards, and score the exams. College faculty review every AP teacher's course syllabus.

AP Computer Science Program

There are two computer science offerings, and students can take either course in any order. The AP Computer Science A course and exam continues to focus on computing skills related to programming in Java. The new AP Computer Science Principles course complements AP Computer Science A as it aims to broaden participation in the study of computer science. The courses underscore the importance of communicating solutions appropriately and in ways that are relevant to current societal needs. AP Computer Science courses can help address traditional issues of equity, access, and broadening participation in computing while providing a strong and engaging introduction to fundamental areas of the discipline.

AP Computer Science Principles Course Overview

The AP Computer Science Principles course is designed to be equivalent to a first-semester introductory college computing course. In this course, students will develop computational thinking skills vital for success across all disciplines, such as using computational tools to analyze and study data and working with large data sets to analyze, visualize, and draw conclusions from trends. The course engages students in the creative aspects of the field by allowing them to develop computational artifacts based on their interests. Students will also develop effective communication and collaboration skills by working individually and collaboratively to solve problems, and will discuss and write about the impacts these solutions could have on their community, society, and the world.

PREREQUISITES

It is recommended that a student in the AP Computer Science Principles course should have successfully completed a first-year high school algebra course with a strong foundation on basic linear functions and composition of functions, and problem solving strategies that require multiple approaches and collaborative efforts. In addition, students should be able to use a Cartesian (x, y) coordinate system to represent points in a plane. It is important that students understand that any significant computer science course builds upon a foundation of mathematical and computational reasoning that will be applied throughout the study of the course.

Computer Language

Unlike AP Computer Science A, which is taught in Java, the AP Computer Science Principles course does not have a designated programming language. Teachers select the programming language(s) that is most appropriate for their students.

AP Computer Science Principles Course Content

The following are the major areas of study, or big ideas, that are foundational to studying computer science:

- **Creativity:** Computing is a creative activity. Creativity and computing are prominent forces in innovation; the innovations enabled by computing have had and will continue to have far-reaching impact.

- **Abstraction:** Abstraction reduces information and detail to facilitate focus on relevant concepts. It is a process, a strategy, and the result of reducing detail to focus on concepts relevant to understanding and solving problems.

- **Data and Information:** Data and information facilitate the creation of knowledge. Computing enables and empowers new methods of information processing, driving monumental change across many disciplines—from art to business to science.

- **Algorithms:** Algorithms are used to develop and express solutions to computational problems. Algorithms realized in software have affected the world in profound and lasting ways.

- **Programming:** Programming enables problem solving, human expression, and creation of knowledge. Programming and the creation of software have changed our lives. It results in the creation of software, and facilitates the creation of computational artifacts, such as music, images, and visualizations.

- **The Internet:** The Internet pervades modern computing. The Internet and the systems built on it have had a profound impact on society. Computer networks support communication and collaboration.

- **Global Impact:** Computing has global impact. Our methods for communicating, collaborating, problem solving, and doing business have changed and are changing due to innovations enabled by computing.

Computational Thinking Practices

The course also incorporates computational thinking practices that set clear expectations of what students will do in the course:

- **Connecting Computing:** Students learn to draw connections between different computing concepts.

- **Creating computational artifacts:** Students engage in the creative aspects of computing by designing and developing interesting computational artifacts as well as by applying computing techniques to creatively solve problems.

- **Abstracting:** Students use abstraction to develop models and simulations of natural and artificial phenomena, use them to make predictions about the world, and analyze their efficacy and validity.

- **Analyzing problems and artifacts:** Students design and produce solutions, models, and artifacts, and they evaluate and analyze their own computational work as well as the computational work others have produced.

- **Communicating:** Students describe computation and the impact of technology and computation, explain and justify the design and appropriateness of their computational choices, and analyze and describe both computational artifacts and the results or behaviors of those artifacts.

- **Collaborating:** Students collaborate on a number of activities, including investigation of questions using data sets and in the production of computational artifacts.
**AP Computer Science Principles Exam Structure**

**Assessment Overview**
This assessment comprises two parts: performance tasks and the end-of-course AP Exam and the through-course AP assessment.

The AP Computer Science Principles Exam will be a multiple-choice, paper and pencil exam.

The two performance tasks require students to explore the impacts of computing and create computational artifacts through programming.

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**Format of Assessment**

**AP Computer Science Principles Exam: 2 Hours (60% of AP Exam score)**
- Multiple Choice (single- and multiple-select) | 74 Questions | 120 minutes | 60% of assessment score

**AP Computer Science Principles Through-Course Performance Tasks (2) (Combined 40% of AP Exam Score):**
- Explore – Impact of Computing Innovations | 8 hours (classroom time) | 16% of assessment score
- Create – Application to Ideas | 12 hours (classroom time) | 24% of assessment score

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**AP Computer Science Principles Sample Exam Questions**

**Sample Multiple-Choice Question**
Consider the code segment below.

If the variables onTime and absent both have the value false, what is displayed as a result of running the code segment?

(A) Is anyone there?
(B) Better late than never.
(C) Hello. Is anyone there?
(D) Hello. Better late than never.

Answer: B

---

**Performance Task: Create – Applications from Ideas**
- This performance task focuses on students developing computer programs and describing significant aspects of the program that allow it to run correctly.
  - Students have the flexibility to write programs that reflect their interests (e.g., their desire to solve a problem, program a game, or produce digital art appealing to a specific audience, etc.) This allows students to engage in the study of computer science from a creative perspective. Students will provide evidence of their knowledge of important programming concepts such as developing algorithms and using abstractions. Students are required to submit an individual program but are able to collaborate on the development of their program.

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**Performance Task: Explore – Impacts of Computing Innovations**
- This performance task focuses on students using and applying computational analysis in the exploration of a significant computing innovation to determine and describe the impact of the innovation on people and society.
  - Students select and explore an innovation of their choosing. Then, they create a computational artifact about the innovation and describe how it works and how it is used, its purpose, how it consumes and/or produces data, and the harmful and beneficial effects of the innovation on people and society.

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Educators: apcentral.collegeboard.org/apcsp
Students: apstudent.collegeboard.org/apcsp

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WORLD LANGUAGE
Course Flow Chart

*AP Chinese

AP French Language

AP Spanish Language

*AP Spanish Literature

Chinese 4

French 4

Spanish 4

Chinese 3

French 3

Spanish 3

Chinese 2

French 2

Spanish 2

Chinese 1

French 1

Spanish 1

Pine View requires a minimum of three high school credits in the same language.

*Available only with adequate enrollment.
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World Languages and Cultures Learning Objectives

The AP Chinese Language and Culture course provides students with opportunities to demonstrate their proficiency at the Intermediate to Pre-Advanced range in each of the three modes of communication described in the ACTFL Performance Descriptors for Language Learners.

Students are expected to

- Engage in spoken interpersonal communication;
- Engage in written interpersonal communication;
- Comprehend information from a variety of audio, visual, and audiovisual resources;
- Comprehend information from a variety of written and print resources;
- Plan, produce, and present spoken presentational communications; and
- Plan and produce written presentational communications.

AP World Languages and Cultures Program

The AP World Languages and Cultures program features eight courses and exams and includes the following languages: Chinese, French, German, Italian, Japanese, Latin, and Spanish (both Language and Literature).

In today’s global community, competence in more than one language is an essential part of communication and cultural understanding. Study of another language not only provides individuals with the ability to express thoughts and ideas for their own purposes, but also provides them with access to perspectives and knowledge that is only available through the language and culture. The proficiencies acquired through the study of languages and literatures give language learners cognitive, analytical, and communication skills that carry over into many other areas of their academic studies. The three modes of communication (Interpersonal, Interpretive, and Presentational) defined in the World Readiness Standards for Learning Languages and described in more detail in the ACTFL Performance Descriptors for Language Learners are foundational to the AP World Language and Culture courses.

AP Chinese Language and Culture Course Overview

The AP Chinese Language and Culture course in Mandarin Chinese emphasizes communication (understanding and being understood by others) by applying interpersonal, interpretive, and presentational skills in real-life situations. This includes vocabulary usage, language control, communication strategies, and cultural awareness. The AP Chinese Language and Culture course strives not to overemphasize grammatical accuracy at the expense of communication. To best facilitate the study of language and culture, the course is taught almost exclusively in Chinese.

The AP Chinese Language and Culture course engages students in an exploration of culture in both contemporary and historical contexts. The course develops students’ awareness and appreciation of cultural products, (e.g., tools, books, music, laws, conventions, institutions); practices (patterns of social interactions within a culture); and perspectives (values, attitudes, and assumptions).

Recommended Prerequisites

There are no prerequisite courses; however students are typically in their fourth year of high school-level study. In the case of native or heritage speakers, there may be a different course of study leading to this course.
AP CHINESE LANGUAGE AND CULTURE EXAM:
2 HOURS 15 MINUTES

Assessment Overview

The exam assesses students' interpersonal, interpretive, and presentational communication skills in Mandarin Chinese, as well as knowledge of Chinese culture. The exam is administered on a computer. The student reads on the screen, listens through headphones, types using the keyboard, and speaks into a microphone.

Students may choose between traditional or simplified Chinese characters for reading and writing in Chinese. The selected display and input options have no effect on a student's score. All Chinese text displayed on the screen is available in either traditional Chinese characters or simplified Chinese characters. Students have two options for typing Chinese text: Microsoft Pinyin IME (MSPY) or Microsoft New Phonetic IME.

EXAM COMPONENTS

Multiple-Choice Section

Part A:

Listening: Interpersonal Communication: Rejoinders
Assesses interpersonal communication skills in the listening modality by requiring students to identify the appropriate continuation of a conversation.

Listening: Interpretive Communication of Audio Resources
Assesses interpretive communication skills by requiring students to answer questions about different types of listening stimuli.

Students respond to questions based on a variety of audio materials, including:
• Announcement
• Conversation
• Instructions
• Message
• Report

Free-Response Section

Presentational Writing: Story Narration (15 minutes)
Students narrate the story depicted in a series of pictures.

Interpersonal Writing: Email Response (15 minutes)
Students read and respond to an email message.

Interpersonal Speaking: Simulated Conversation (4 minutes: 20 seconds to respond to each of 6 prompts)
Students participate in a conversation by responding to six prompts.

Presentational Speaking: Cultural Presentation (6 minutes: 4 minutes to prepare and 2 minutes to present)
Students prepare and deliver a presentation to respond to a prompt about the significance of a Chinese cultural practice or product.

Format of Assessment

Section I: Multiple Choice | 70 Questions | 1 Hour, 20 Minutes | 50% of Exam Score

Part A: Listening (2 Sections)
• Interpersonal Communication: Rejoinders (10–15 Questions)
• Interpretive Communication: Listening Selections (15–20 Questions)

Part B: Reading Selections (35–40 Questions)

Section II: Free Response | 4 Tasks | 41 Minutes | 50% of Exam Score

• Task 1 — Presentational Writing: Story Narration (1 prompt)
• Task 2 — Interpersonal Writing: Email Response (1 prompt)
• Task 3 — Interpersonal Speaking: Conversation (1 conversation: 6 prompts)
• Task 4 — Presentational Speaking: Cultural Presentation (1 prompt)
AP® FRENCH LANGUAGE AND CULTURE

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AP World Languages and Cultures Program

The AP World Languages and Cultures program features eight courses and exams and includes the following languages: Chinese, French, German, Italian, Japanese, Latin, and Spanish (both Language and Literature courses).

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AP French Language and Culture Course Overview

The AP French Language and Culture course emphasizes communication (understanding and being understood by others) by applying interpersonal, interpretive, and presentational skills in real-life situations. This includes vocabulary usage, language control, communication strategies, and cultural awareness. The AP French Language and Culture course strives not to overemphasize grammatical accuracy at the expense of communication. To best facilitate the study of language and culture, the course is taught almost exclusively in French.

The AP French Language and Culture course engages students in an exploration of culture in both contemporary and historical contexts. The course develops students' awareness and appreciation of cultural products (e.g., tools, books, music, laws, conventions, institutions); practices (patterns of social interactions within a culture); and perspectives (values, attitudes, and assumptions).

PREREQUISITE

There are no prerequisites; however, students are typically in their fourth year of high school-level study. In the case of native or heritage speakers, there may be a different course of study leading to this course.

Course Themes

The AP French Language and Culture course is structured around six themes:

- Beauty and Aesthetics
- Contemporary Life
- Families and Communities
- Global Challenges
- Personal and Public Identities
- Science and Technology

Themes facilitate the integration of language, content, and culture and promote the use of the language in a variety of contexts. The themes may be combined, as they are interrelated.

World Languages and Cultures Learning Objectives

The AP French Language and Culture course provides students with opportunities to demonstrate their proficiency at the Intermediate to Pre-Advanced range in each of the three modes of communication described in the ACTFL Performance Descriptors for Language Learners.

Students are expected to:

- Engage in spoken interpersonal communication;
- Engage in written interpersonal communication;
- Synthesize information from a variety of authentic audio, visual, and audiovisual resources;
- Synthesize information from a variety of authentic written and print resources;
- Plan, produce, and present spoken presentational communications; and
- Plan and produce written presentational communications.
AP FRENCH LANGUAGE AND CULTURE EXAM: 3 HOURS

Assessment Overview
Exam questions are based on the six learning objectives and assess all themes. As much as possible, students read and listen to authentic texts from the francophone world throughout the exam.

Format of Assessment

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EXAM QUESTION TYPES

Note: On the AP French Language and Culture Exam, all directions, questions, and texts are presented in French.

Multiple-Choice Section

Part A:

Print Texts
Students respond to questions based on a variety of authentic print materials, including:
- Journalistic Texts
- Literary Texts
- Announcements
- Advertisements
- Letters
- Maps
- Tables

Part B:

Print and Audio Texts
Students respond to a variety of authentic audio texts*, including:
- Interviews
- Podcasts
- Public Service Announcements
- Conversations
- Brief Presentations

Audio Texts
Students respond to questions based on audio texts* that are paired with print materials.
*Note: All audio texts are played twice.

Free-Response Section

Interpersonal Writing: Email Reply (15 minutes)
Students read and respond to an email message.

Presentational Writing: Persuasive Essay (55 minutes: 15 minutes to examine texts and 40 minutes to write)
Students examine three authentic texts (article, table or graphic, audio text), then have 40 minutes to organize and write a persuasive essay in response to a prompt. In their essays they must present and defend their own viewpoint using information from all three sources.

Interpersonal Speaking: Simulated Conversation (2 minutes 40 seconds: 1 minute to preview and 20 seconds each for five prompts)
Students have one minute to preview a conversation, including an outline of each turn in the conversation, and then respond to five prompts.

Presentational Speaking: Cultural Comparison (6 minutes: 4 minutes to prepare and 2 minutes to present)
Students respond to a prompt by giving a presentation in which they compare cultural features of their own community to those found in an area of the French-speaking world with which they are familiar.
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**AP World Languages and Cultures Program**

The AP World Languages and Cultures program features eight courses and exams and includes the following languages: Chinese, French, German, Italian, Japanese, Latin, and Spanish (both Language and Literature courses).

In today’s global community, competence in more than one language is an essential part of communication and cultural understanding. Study of another language not only provides individuals with the ability to express thoughts and ideas for their own purposes, but also provides them with access to perspectives and knowledge that is only available through the language and culture. The proficiencies acquired through the study of languages and literatures endow language learners with cognitive, analytical, and communication skills that carry over into many other areas of their academic studies. The three modes of communication (Interpersonal, Interpretive, and Presentational) defined in the World-Readiness Standards for Learning Languages and described in more detail in the ACTFL Performance Descriptors for Language Learners, are foundational to AP World Languages and Cultures courses.

**AP Spanish Language and Culture Course Overview**

The AP Spanish Language and Culture course emphasizes communication (understanding and being understood by others) by applying interpersonal, interpretive, and presentational skills in real-life situations. This includes vocabulary usage, language control, communication strategies, and cultural awareness. The AP Spanish Language and Culture course strives not to overemphasize grammatical accuracy at the expense of communication. To best facilitate the study of language and culture, the course is taught almost exclusively in Spanish.

The AP Spanish Language and Culture course engages students in an exploration of culture in both contemporary and historical contexts. The course develops students’ awareness and appreciation of cultural products (e.g., tools, books, music, laws, conventions, institutions); practices (patterns of social interactions within a culture); and perspectives (values, attitudes, and assumptions).

**Course Themes**

The AP Spanish Language and Culture course is structured around six themes:

- Beauty and Aesthetics
- Contemporary Life
- Families and Communities
- Global Challenges
- Personal and Public Identities
- Science and Technology

Themes facilitate the integration of language, content, and culture and promote the use of the language in a variety of contexts.

The themes may be combined, as they are interrelated.

**World Languages and Cultures Learning Objectives**

The AP Spanish Language and Culture course provides students with opportunities to demonstrate their proficiency at the Intermediate to Pre-Advanced range in each of the three modes of communication described in the ACTFL Performance Descriptors for Language Learners.

Students are expected to:

- Engage in spoken interpersonal communication;
- Engage in written interpersonal communication;
- Synthesize information from a variety of authentic audio, visual, and audiovisual resources;
- Synthesize information from a variety of authentic written and print resources;
- Plan, produce, and present spoken presentational communications; and
- Plan and produce written presentational communications.

**Recommended Prerequisites**

There are no prerequisites; however, students are typically in their fourth year of high school-level Spanish language study. In the case of native or heritage speakers, there may be a different course of study leading to this course.
AP SPANISH LANGUAGE AND CULTURE EXAM: 3 HOURS

Assessment Overview
Exam questions are based on the six learning objectives and assess all themes. As much as possible, students read and listen to authentic texts from the Spanish-speaking world throughout the exam.

Format of Assessment
Section I: Multiple Choice | 65 Questions | ~1 Hour, 35 Minutes | 50% of Exam Score

Part A: 30 questions; 40 minutes
- Interpretive Communication: Print Tests

Part B: 35 questions; ~55 minutes
- Interpretive Communication: Print and Audio Texts (combined)
- Interpretive Communication: Audio Texts

Section II: Free Response | 4 Tasks | ~1 Hour, 28 Minutes | 50% of Exam Score

- Task 1 — Interpersonal Writing: Email Reply (1 prompt)
- Task 2 — Presentational Writing: Persuasive Essay (1 prompt)
- Task 3 — Interpersonal Speaking: Simulated Conversation (5 prompts)
- Task 4 — Presentational Speaking: Cultural Comparison (1 prompt)

EXAM COMPONENTS

Note: On the AP Spanish Language and Culture Exam, all directions, questions, and texts are presented in Spanish.

Multiple-Choice Section
Part A:
Print Texts
Students respond to questions based on a variety of authentic print materials, including:
- Journalistic Texts
- Literary Texts
- Announcements
- Advertisements
- Letters
- Maps
- Tables

Part B:
Print and Audio Texts
Students respond to a variety of authentic audio texts*, including:
- Interviews
- Podcasts
- Public Service Announcements
- Conversations
- Brief Presentations

Audio Texts
Students respond to questions based on audio texts* that are paired with print materials.

*Note: All audio texts are played twice.

Free-Response Section
Interpersonal Writing: Email Reply (15 minutes)
Students read and respond to an email message.

Presentational Writing: Persuasive Essay (55 minutes: 15 minutes to examine texts and 40 minutes to write)
Students examine three authentic texts (article, table or graphic, audio text), then have 40 minutes to organize and write a persuasive essay in response to a prompt. In their essays they must present and defend their own viewpoint using information from all three sources.

Interpersonal Speaking: Simulated Conversation (2 minutes 40 seconds: 1 minute to preview and 20 seconds each for five prompts)
Students have one minute to preview a conversation, including an outline of each turn in the conversation, and then respond to five prompts.

Presentational Speaking: Cultural Comparison (6 minutes: 4 minutes to prepare and 2 minutes to present)
Students respond to a prompt by giving a presentation in which they compare cultural features of their own community to those found in an area of the Spanish-speaking world with which they are familiar.
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AP World Languages and Cultures Program

The AP World Languages and Cultures program features eight courses and exams and includes the following languages: Chinese, French, German, Italian, Japanese, Latin, and Spanish (both language and literature).

In today’s global community, competence in more than one language is an essential part of communication and cultural understanding. Study of another language through its literature provides students with access to cultural perspectives and knowledge, encourages them to make connections and comparisons between cultures and literary works, and helps them develop the ability to think critically. The proficiencies acquired through the study of languages and literatures endow language learners with cognitive, analytical, and communication skills that carry over into many other areas of their academic studies.

AP Spanish Literature and Culture Course Overview

The AP Spanish Literature and Culture course uses a thematic approach to introduce students to representative texts (short stories, novels, poetry, and essays) from Peninsular Spanish, Latin American, and United States Hispanic literature. Students develop proficiencies across the full range of communication modes (interpersonal, presentational, and interpretive), thereby honing their critical reading and analytical writing skills. Literature is examined within the context of its time and place, as students reflect on the many voices and cultures present in the required readings. The course also includes a strong focus on cultural connections and comparisons, including exploration of various media (e.g., art, film, articles, literary criticism).

RECOMMENDED PREREQUISITES

While there are no prerequisites for this course, AP Spanish Literature and Culture is designed for students who have successfully completed at least three years of high school-level Spanish language study. While not a prerequisite, students may wish to complete the AP Spanish Language and Culture course before taking AP Spanish Literature and Culture, as the texts are presented in Spanish. In the case of native or heritage speakers, there may be a different course of study leading to this course.

Course Themes

The AP Spanish Literature and Culture course is structured around six themes:

- Las sociedades en contacto (Societies in Contact)
- La construcción del género (The Construction of Gender)
- El tiempo y el espacio (Time and Space)
- La creación literaria (Literary Creation)
- Las relaciones interpersonales (Interpersonal Relationships)
- La dualidad del ser (The Dual Nature of Being)

Themes promote the exploration of literature in a variety of contexts and develop students' abilities to make cross-textual and cross-cultural connections. The themes may be combined, as they are interrelated.

AP Spanish Literature and Culture Learning Objectives

At the core of the AP Spanish Literature and Culture course are learning objectives, which outline the expectations for what students should know and be able to do. These expectations are in accordance with the five goal areas (the “five C’s”) of the World-Readiness Standards for Learning Languages: Communication, Cultures, Connections, Comparisons, and Communities.

For Communication, students continue to develop proficiency in the three modes of communication:

- Interpersonal Communication (the active negotiation of meaning among individuals)
- Interpretive Communication (the appropriate cultural interpretation of meanings that occur in written or spoken form with no active negotiation of meaning)
- Presentational Communication (the creation of written or spoken messages in a manner that facilitates interpretation by an audience with no active negotiation of meaning)

For Cultures, Connections, Comparisons, and Communities, students gain knowledge and understand the relationships between products, practices, and perspectives of the cultures studied in literary texts and through other media.

Additionally, students continue to develop language proficiency across a full range of language skills, with special attention focused on language used in critical reading and analytical writing.
AP SPANISH LITERATURE AND CULTURE EXAM: 3 HOURS

Assessment Overview

The exam assesses learning objectives for the interpretive and presentational modes of communication and students' ability to analyze literature in context. Exam questions are based on works from the required reading list and works that are not on the required reading list. Assessing students on works beyond the required readings allows them to apply what they learned from the required readings and from other areas of study.

Format of Assessment

Section I: Multiple Choice | 65 Questions | 1 Hour, 20 Minutes | 50% of Exam Score

Part A: 15 Questions; ~20 Minutes
- Interpretive Listening: Audio Texts

Part B: 50 Questions; ~60 Minutes
- Reading Analysis: Print Texts

Section II: Free Response | 4 Tasks | 1 Hour, 40 Minutes | 50% of Exam Score

- Task 1 — Text Explanation (short answer)
- Task 2 — Text and Art Comparison (short answer)
- Task 3 — Analysis of a Single Text (essay)
- Task 4 — Text Comparison (essay)

EXAM COMPONENTS

Note: On the AP Spanish Literature and Culture Exam, all directions, questions, and texts are presented in Spanish.

Multiple-Choice Section

Part A:
Interpretive Listening (15 Questions)
Students respond to three sets of questions based on authentic audio texts related to course content. The audio texts include an interview with an author, a recited poem that is not from the required reading list, and a presentation on a literary topic. The interview and presentation are played once, and the poem is played twice.

Part B:
Reading Analysis (50 Questions)
Students respond to six sets of questions based on literary readings representing a variety of genres, periods, and places in the Spanish-speaking world. These literary readings include, but are not limited to, works from the required reading list.

Free-Response Section

Short Answer Questions
- Text Explanation
  - Students read an excerpt from a text on the required reading list, identify the author and period of the text, and explain the development of a particular theme found in the excerpt in relation to the whole work from which the excerpt is taken.
- Text and Art Comparison
  - Students read an excerpt of a text on the required reading list and are provided with an image of a work of art (a painting, photograph, sculpture, or drawing) related by theme to the text. They compare how a particular theme is represented in both the text and the image, and they connect the theme to the genre, period or movement of the text.

Essay Questions
- Analysis of a Single Text
  - Students read an excerpt from a text on the required reading list (or the whole work in the case of a short poem) and then analyze how the text represents the characteristics of a particular genre and also a particular historical, cultural, or social context. Students also comment on the relevant literary devices in the text and cite examples in support of their analysis.
- Text Comparison
  - Students read two excerpts related by theme—one from a text on the required list, the other from a text not on the list. Again, the whole work may be included in the case of a short poem. Students are asked to analyze the effect of the literary devices that the authors use to develop a particular theme that is provided in the prompt. Students compare the presentation of the theme in the two works and cite examples from both texts in support of their analysis.

Note: Students may complete the four free-response tasks in any order they wish. It is recommended that they spend about 15 minutes on each of the short answer tasks and about 35 minutes on each of the essay questions.

Note: In the free-response section, students receive scores for content and language usage. (Scores are weighted 70% for content and 30% for language.)
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AP Art History Course Overview

The AP Art History course is equivalent to a two-semester introductory college course that explores the nature of art, art making, and responses to art. By investigating specific course content of 250 works of art characterized by diverse artistic traditions from prehistory to the present, the course fosters an in-depth, holistic understanding of the history of art from a global perspective. Students become active participants in the global art world, engaging with its forms and content. They experience, research, discuss, read, and write about art, artists, art making, responses to, and interpretations of art.

RECOMMENDED PREREQUISITES

There are no prerequisite courses for AP Art History.

AP Art History Course Content

Functions and effects of art are the focus of the AP Art History course. Students consider influential forces like patronage, politics, class, belief, gender, and ethnicity in their analysis of art forms. They examine styles, techniques, themes, and chronology, comparing and contrasting art forms from varied perspectives. Students explore a specific set of 250 works of art in 10 content areas beginning with art from global prehistory and ending with global works from the present.

I. Global Prehistory, 30000–500 BCE: ~4% (11 works)
II. Ancient Mediterranean, 3500 BCE–300 CE: ~15% (36 works)
III. Early Europe and Colonial Americas, 200–1750 CE: ~20% (51 works)
IV. Later Europe and Americas, 1750–1980 CE: ~22% (54 works)
V. Indigenous Americas, 1000 BCE–1980 CE: ~6% (14 works)
VI. Africa, 1100–1980 CE: ~6% (14 works)
VII. West and Central Asia, 500 BCE–1980 CE: ~4% (11 works)
VIII. South, East, and Southeast Asia, 300 BCE–1980 CE: ~8% (21 works)
IX. The Pacific, 700–1980 CE: ~4% (11 works)
X. Global Contemporary, 1980 CE–Present: ~11% (27 works)

Within each content area, students explore essential contextual information about regions, cultures, and time periods. Students have options for focused, intensive learning about artworks, themes, and cultures they select as personally relevant and meaningful.

As students study works of art in the required course content, they apply essential art historical skills within the learning objectives, such as visual, contextual, and comparative analysis. The following are big ideas and learning objectives of the AP Art History course:

- Big Idea 1: Artists manipulate materials and ideas to create an aesthetic object, act, or event.
  - Students differentiate the components of form, function, content, and/or context of a work of art.
  - Students explain how artistic decisions about art making shape a work of art.

- Big Idea 2: Art making is shaped by tradition and change.
  - Students describe features of tradition and/or change in a single work of art or in a group of related works.
  - Students explain how and why specific traditions and/or changes are demonstrated in a single work or group of related works.
  - Students analyze the influence of a single work of art or group of related works on other artistic production.

- Big Idea 3: Interpretations of art are variable.
  - Students identify a work of art.
  - Students analyze how formal qualities and/or content of a work of art elicit(s) a response.
  - Students analyze how contextual variables lead to different interpretations of a work of art.
  - Students justify attribution of an unknown work of art.
  - Students analyze relationships between works of art based on their similarities and differences.
**AP ART HISTORY EXAM: 3 HOURS**

**Assessment Overview**

Students demonstrate achievement of AP Art History learning objectives by applying their historical knowledge and skills to address course content. Using works of art studied within the required set of 250 works, or works they chose to study beyond the required content, students have many opportunities to evidence their understanding of art historical concepts. A single exam question is likely to encompass multiple learning objectives and may address works of art from different content areas. This underscores the exam's focus on assessing students’ in-depth critical analysis of relationships among works of art, art historical concepts, and global cultures.

**AP ART HISTORY SAMPLE EXAM QUESTIONS**

**Sample Multiple-Choice Question**

![Monument](image)

Monuments like the Buddha at Bamiyan most directly influenced the form and scale of Buddhist statues created for

(A) Borobudur Temple in Indonesia
(B) Angkor Wat in Cambodia
(C) Todai-ji in Japan
(D) The Longmen caves in China

Correct Answer: D

**Sample Free-Response Question**

Interpretation of specific works of art or architecture can change over time due to shifting historical and cultural contexts. Select and completely identify a specific work of art or architecture whose meaning has changed over time. The work of art or architecture may be from any time, culture, or medium.

You must identify both the original meaning and a subsequent meaning of the work of art or architecture.

Then, using visual and/or contextual evidence, analyze both how and why the meaning of the work of art or architecture has changed over time.

To answer the question, you may either select a work of art or architecture from the list below or select one of your own choosing. The work you select may be from required course content or from your own study.

When identifying the work you select, you should try to include all four of the following: title or designation, name of the artist and/or culture of origin, date of creation, and materials. To earn credit for your identification, you must provide at least two accurate identifiers of the work you select but you will not lose credit if additional identifiers you provide are incorrect (30 minutes)

Angkor
Basilica (Baptistère de St. Louis)
Great Mosque at Córdoba
Qonkancha
Wall plaque from Oba's Palace

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AP Studio Art Program

The AP Program offers three studio art courses and portfolios: 2-Dimensional Design, 3-Dimensional Design, and Drawing. The AP Studio Art portfolios are designed for students who are seriously interested in the practical experience of art. Students submit portfolios for evaluation at the end of the school year. The three portfolios correspond to the most common college foundation courses. Students may choose to submit any or all of the Drawing, 2-Dimensional Design, or 3-Dimensional design portfolios. Students create a portfolio of work to demonstrate the artistic skills and ideas they have developed, refined, and applied over the course of the year to produce visual compositions.

PREREQUISITE

Although there is no prerequisite for AP Studio Art, prior experiences in studio art courses that address conceptual, technical, and critical thinking skills can support student success in the AP Studio Art Program.

AP Studio Art Content

AP Studio Art students work with diverse media, styles, subjects, and content. Each of the three portfolios consists of three sections:

- The Range of Approaches (Breadth) section illustrates a range of ideas and approaches to art making.
- The Sustained Investigation (Concentration) section shows sustained, deep, and multiperspective investigation of a student-selected topic.
- The Selected Works (Quality) section represents the student’s most successful works with respect to form and content.

Students’ work is informed and guided by observation, research, experimentation, discussion, critical analysis, and reflection, relating individual practices to the art world. Students are asked to document their artistic ideas and practices to demonstrate conceptual and technical development over time. The AP Studio Art Program supports students in becoming inventive artistic scholars who contribute to visual culture through art making.

Disciplinary Practices and Habits of Mind

Each AP Studio Art course and portfolio assessment focuses on students developing these practices and habits of mind through work with 2-dimensional design, 3-dimensional design, and drawing media and approaches, including the following:

- Critical analysis
- Evidence-based decision-making
- Innovative thinking
- Articulation of design elements and principles
- Systematic investigation of formal and conceptual aspects of art making
- Technical competence with materials and processes to communicate ideas
- Incorporation of expressive qualities in art making
- Demonstration of artistic intention
- Creation of a body of work unified by a visual or conceptual theme
Assessment Overview
In early May, students submit actual works and digital images of works for 2-D Design, 3-D Design, and Drawing Portfolios; for 3-D Design, only digital images are submitted. These works should demonstrate artistic growth and development. Students also submit an artist statement in which they describe ideas investigated and explain how the ideas evolved as they created their body of work. All portfolios are assessed by at least seven highly experienced studio art educators (AP Studio Art teachers or college faculty) who apply standard scoring criteria.

Format of Assessment
Section I: Selected Works (Quality) | 5 actual works for 2-D and Drawing, 12 digital images for 3-D | 33% of Portfolio Score
- Demonstrate mastery of design in concept, composition, and execution

Section II: Sustained Investigation (Concentration) | 12 digital images | 33% of Portfolio Score
- Describe an in-depth explanation of a particular design concern

Section III: Range of Approaches (Breadth) | 12 digital images for 2-D and Drawing, 16 digital images for 3-D | 33% of Portfolio Score
- Demonstrate understanding of design issues

Educators: apcentral.collegeboard.org/studioartdrawing
Educators: apcentral.collegeboard.org/studioart2d
Educators: apcentral.collegeboard.org/studioart3d
Students: apstudent.collegeboard.org/studioartdrawing
Students: apstudent.collegeboard.org/studioart2d
Students: apstudent.collegeboard.org/studioart3d

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AP Music Theory Course Overview

The AP Music Theory course corresponds to one or two semesters of a typical introductory college music theory course that covers topics such as musicianship, theory, musical materials, and procedures. Musicianship skills, including dictation and other listening skills, sight singing, and harmony, are considered an important part of the course. Through the course, students develop the ability to recognize, understand, and describe basic materials and processes of tonal music that are heard or presented in a score. Development of aural skills is a primary objective. Performance is also part of the curriculum through the practice of sight singing. Students understand basic concepts and terminology by listening to and performing a wide variety of music. Notational skills, speed, and fluency with basic materials are also emphasized.

RECOMMENDED PREREQUISITES

There are no prerequisite courses for AP Music Theory. Students should be able to read and write musical notation, and it is strongly recommended that the student has acquired at least basic performance skills in voice or on an instrument.

AP Music Theory Course Content

The AP Music Theory course supports mastery of the rudiments and vocabulary of music, including hearing and notation:

- Pitches
- Intervals
- Scales and keys
- Chords
- Meter
- Rhythm

Building on this foundation, the course progresses to include more complex and creative tasks, such as melodic and harmonic dictation; composition of a bass line for a given melody, implying appropriate harmony; realization of a figured bass; realization of a Roman numeral progression; analysis of melody, harmony, rhythm, texture, and form in repertoire drawn mostly from the Western European Common Practice style, but also including jazz, 20th century works, and world music; and sight singing of simple melodies.

Students learn to identify, both aurally and through score reading, tonal procedures based in common-practice tonality, such as:

- Functional triadic harmony in traditional four-voice texture (with vocabulary including nonharmonic tones, seventh chords, and secondary dominants)
- Cadences
- Melodic and harmonic compositional processes (e.g., sequence, motivic development)
- Standard rhythms and meters
- Phrase structure (e.g., contrasting period, phrase group)
- Small forms (e.g., rounded binary, simple ternary, theme and variation, strophic)
- Modulation to closely related keys
AP MUSIC THEORY EXAM: 2 HOURS, 40 MINUTES

Assessment Overview
The AP Music Theory Exam evaluates students' understanding of musical structure and compositional procedures through recorded and notated examples. Listening skills are emphasized, particularly those involving recognition and comprehension of melodic and rhythmic patterns, harmonic functions, small forms, and compositional techniques. Most of the musical examples are from standard Western tonal repertoire; some examples of contemporary, jazz, vernacular music, or music beyond the Western tradition are included.

The exam requires fluency in reading musical notation and a strong grounding in music fundamentals, terminology, and analysis.

AP MUSIC THEORY SAMPLE EXAM QUESTIONS

Sample Multiple-Choice Question

The correct analysis of the chord above is

(A) II and in A-flat major
(B) VII in E-flat major
(C) II and in D-flat major
(D) VII in B-flat major

Correct Answer: A

Sample Free-response Question

Suggested time — 10 minutes

Write the following progression in four voices, following eighteenth-century voice-leading procedures. Continue logically from the spacing of the first chord. Do not add embellishments unless indicated by the Roman and Arabic numerals. Use only quarter and half notes.

\[ \text{D}\text{I} \quad \text{V}_{7}\text{IV} \quad \text{V}_6 \quad \text{II} \quad \text{V}_4-3 \quad \text{I} \]