AP Environmental Science 2018-2019 Syllabus

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Text


Other Resources

In addition to the textbook, we will draw information from supplemental environmental science textbooks, lab manuals, periodicals, readings/case studies, the Internet and field trip information.

Course Description

The AP® Environmental Science course is a full-year course designed to be the equivalent of a one-semester, introductory college course in environmental science. Unlike most other introductory-level college science courses, environmental science is offered from a wide variety of departments, including geology, biology, environmental studies, environmental studies, environmental science, chemistry, and geography. The AP Environmental Science course has been developed to be like a rigorous science course that stresses scientific principles and analysis and includes a laboratory component; as such, it is intended to enable students to undertake, as first-year college students, a more advanced study of topics in environmental science or, alternatively, to fulfill a basic requirement for a laboratory science and thus free time for taking other courses. In both breadth and level of detail, the content of the course reflects what is found in many introductory college courses in environmental science.

The goal of the course is to provide students with the scientific principles, concepts, and methodologies required to understand the interrelationships of the natural world, to identify and analyze environmental problems both natural and human-made, to evaluate the relative risks associated with these problems, to examine alternative solutions for resolving and/or preventing them, and to develop and focus their own political perspective.

Environmental science is interdisciplinary; it embraces a wide variety of topics from different areas of study. Yet there are several major unifying constructs, or themes, that cut across the many topics included in the study of environmental science.

The following themes provide a foundation for the structure of the AP Environmental Science course:

- 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.
Homework
May include but not be limited to:

- reading the current unit content and answering textbook questions
- reviewing lecture notes (from PowerPoints)
- readings and case studies
- making and studying wordslides (flash cards) for unit tests and quizzes
- lab write-ups
- essays
- creating posters, surveys, etc
- designing and analyzing models

Tests
Tests will be given approximately as entered on the course calendar and they will be composed of multiple-choice and free-response questions (FRQ’s). At the beginning of the year, the first test will be multiple choice only. Essay will be given as homework assignments. After the first Unit test, essays will be incorporated into the tests, and the essay portion of the test will be timed in order to make the test environment as similar to the AP Exam as possible.

The majority of the multiple-choice questions will come from lecture notes, text questions, and lab write-ups. We will work our way up to 100 questions as the AP Exam approaches.

You will be given four free-response (essay) questions on the AP Exam. To be effective, you’ll need to organize your thoughts and construct an essay in 22 minutes (four questions in 90 minutes). In this class we will take a very pragmatic approach to our writing. We’ll write training essays early in the year and, again, incorporate timed essays into our tests.

Possible essay topics will be given to you before the test to allow you to outline your answers.

- Students must pass a safety test before participating in labs.
- Weekly quizzes and one test are given per unit.
- We are on a block schedule. Each class meets every other day for 93 minutes.
- On average, a minimum of one period per week is spent engaged in lab and/or field work.

OPS Secondary Grading Practices*

All coursework and assessments are judged based on the level of student learning from “below basic” to “advanced.” This course will provide multiple opportunities to achieve at the “proficient” to “advanced” levels. Students are evaluated based on a proficiency scale or project rubric. Proficiency scales for this course are available upon request (teacher will identify location such as portal, teacher website, attached, etc.)

Weighting Assignments (Using A Multiplier) *

When entering grades in the grade book, teachers may assign greater weight to some assignments than others. For example, the final exam may impact a student’s summative grade more than a unit test. Teachers will have the option to use the multiplier to weigh both formative and summative assessments to a maximum of 4. If a weight of 2 or more
is applied to an assessment, this information will be communicated to students at the time the assessment is announced.

There are three types of coursework:

- **Practice** — assignments are brief and done at the beginning of learning to gain initial content (e.g., student responses on white boards, a valid sampling of math problems, keyboarding exercises, and diagramming sentences, checking and recording resting heart rate). Practice assignments are not generally graded for accuracy (descriptive feedback will be provided in class) and are not a part of the grade. Teachers may keep track of practice work to check for completion and students could also track their practice work. Practice work is at the student’s instructional level and may only include Basic (2) level questions.

- **Formative (35% of the final grade)** — assessments/assignments occur during learning to inform and improve instruction. They are minor assignments (e.g., a three paragraph essay, written responses to guiding questions over an assigned reading, completion of a comparison contrast matrix). Formative assignments are graded for accuracy and descriptive feedback is provided. Formative work may be at the student’s instructional level or at the level of the content standard. Formative assessments/assignments will have all levels of learning — Basic (2), Proficient (3), and Advanced (4), which means that for every formative assessment/assignment, students will be able to earn an Advanced (4). Teachers will require students to redo work that is not of high quality to ensure rigor and high expectations. The students’ score on a formative assessment that was redone will be their final score. It is recommended to have three to five formative assessments for every one summative assessment.

- **Summative (65% of the final grade)** — assessments/assignments are major end of learning unit tests or projects used to determine mastery of content or skill (e.g., a research paper, an oral report with a power point, major unit test, and science fair project). Summative assessments are graded for accuracy. Summative assessments assess the student’s progress on grade level standards and may not be written at the student’s instructional level. Summative assessments/assignments will have all levels of learning — Basic (2), Proficient (3), and Advanced (4), which means that for every formative assessment/assignment students will be able to earn an advanced (4).

To maintain alignment of coursework to content standards, which is a key best practice for standards-based grading, teachers will utilize a standardized naming convention for each of the standards within a course. The content standard will be marked on each assignment entered into Infinite Campus (District Grading Program) using all capital letters followed by a colon. After the colon will be the title of the coursework.

At the end of the grading period, scores are converted to a letter grade using this grading scale.

- \( A = 3.26 \) – 4.00
- \( B = 2.51 \) – 3.25
- \( C = 1.76 \) – 2.50
- \( D = 1.01 \) – 1.75
- \( F = 0.00 \) – 1.00

**Redoing/Revising Student Coursework**

1. Students are responsible for completing all coursework and assessments as assigned.
2. Students may be allowed redos and revisions of coursework for full credit during that unit of study based upon the teacher’s professional judgment and evidence collected throughout the unit. Scores for student work after retaking, revising or redoing will not be averaged with the first attempt at coursework or assessment but will replace the original student score.
3. Students are expected to complete assessments when given to the class, or if a student was justifiably absent, at a time designated by the teacher.

4. Redoing, retaking or revising will be done at teacher discretion in consultation with the student and parent(s). Teachers may schedule students before, during, or after school to address needed areas of improvement if not convenient during class. The time and location for redoing, retaking or revising will be done at the teacher’s discretion in consultation with the student and parent(s).

**Late Coursework**

Students are expected to complete coursework on time. Late coursework may be accepted for full credit until the end of the unit based on the teacher’s professional judgment and evidence collected throughout the unit. Accepted late work will not result in a reduction in grade and the M (Missing) will be replaced with the score earned by the student. The teacher or school may make exceptions depending upon student circumstances (such as prolonged absences due to illness).

**Missing Coursework**

Work not turned in at all will be recorded in Infinite Campus (district grade book) as an M for missing, which calculates to a score of zero.

**Independent Practice**

The role of independent practice is to develop knowledge and skills effectively and efficiently during the unit of study. Independent practice helps guide the learning process by providing accurate, timely and helpful feedback to students without penalty.

*Indicates standardized language (take asterisk and this line out during the final edit leave only common language).
<table>
<thead>
<tr>
<th>Course Schedule</th>
<th>Duration (estimated)</th>
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</table>
| **Unit 1: Sustainability** | 2 weeks  
Test Date: September 4<sup>th</sup> |
| • Tragedy of the Commons Simulation  
• Ecological Footprint Activity  
• TED Talk – Genuine Progress Indicator  
• Case Study: Ecosystem Services  
• Lab: Chemistry Concepts  
• Test: Unit 1 (Chapters 1,2,9&10) | 2 weeks  
Test Date: September 4<sup>th</sup> |
| **Unit II: Ecosystem Ecology** | 4-5 weeks  
Test Date: October 8<sup>th</sup> |
| • Trophic Cascades (Lecture)  
• Field Trip: Fontanelle Forest (Hummel Park)  
• Lab: Photosynthesis and Cellular Respiration Algae Beads (Lecture)  
• Lab: Owl Pellets with Data Analysis  
• Biogeochemical Cycle (Lecture)  
• Film: HHMI Carbon Cycling  
• Carbon Cycling Game/Activity  
• Nitrogen Cycle Game/Activity  
• Lab: Populations (Lecture)  
• Test: Unit II (Chapters 3 & 7) | 4-5 weeks  
Test Date: October 8<sup>th</sup> |
| **Unit III: Water** | 2-3 Weeks  
Test Date: October 25<sup>th</sup> |
| • Film: Flow  
• Field Trip: Wetlands – Water Issues  
• Lab: Modified Water Testing with Data Analysis (Lectures)  
• Sewage Treatment Demo/Presenter (Missouri River Wastewater Treatment Plant)  
• Test: Unit III (Chapters 13 & 17) | 2-3 Weeks  
Test Date: October 25<sup>th</sup> |
| **Unit IV: Evolution and Biodiversity** | 2-3 Weeks  
Test Date: November 13<sup>th</sup> |
| • Lab: Niche Partitioning (Lecture)  
• Lab: Wooly Worm Lab  
• Lab: School Forest Biodiversity  
• Film: End of the Line (Lecture)  
• Lab: Elephant Conservation  
• Test: Unit IV (Chapters 4 & 6) | 2-3 Weeks  
Test Date: November 13<sup>th</sup> |
| **Unit V: Climate, Biomes and Land Use** | 2-3 Weeks  
Test Date: December 11<sup>th</sup> |
| • Lab: Solar Insolation (Lecture)  
• Lab Demo: Heat Transfer (Lecture)  
• Biome Speed Dating  
• Lab: Coral Bleaching  
• Lab: Ocean Acidification (Lecture)  
• Lab/ Field Trip: Fontanelle Forestry Field Work Assignment | 2-3 Weeks  
Test Date: December 11<sup>th</sup> |
| Unit VI: Earth Systems and Resource Distribution | • Lab: Mapping Earthquakes and Volcanoes (Lecture)  
• Lab: Soils (Lecture)  
• Lab: Termites  
• Article Reading: Soils and Carbon  
• Lab: Cookie Mining (Lecture)  
• Test: Unit VI (Chapter 11) | 2-3 Weeks  
Test Date: January 22\(^{nd}\) |
| --- | --- | --- |
| Unit VII: Human Population and Food Resources | • GeolInquires on Urban Sprawl  
• Film: World in the Balance – Population Paradox  
• Demographic Transition (Lecture)  
• Age Structure Diagram Activity (Lecture)  
• Lab: Food Testing (Lecture)  
• Scavenger Hunt  
• Film: Fresh  
• Lab: Plant Alfalfa  
• Test: Unit VII (Chapters 8 & 12) | 3-4 Weeks  
Test Dates: February 19\(^{th}\) |
| Unit VIII: Waste, Human Health and Environmental Risk | • Solid Waste Inventory Project  
• Speaker: A1 Landfill & Drop-Off  
• Lab: Set Up Toxicity (Lecture)  
• Lab: Emerging Infectious Diseases (Lecture)  
• Lab: ELISA (Lecture)  
• Test: Unit VIII (Chapters 16 & 18) | 2-3 Weeks  
Test Date: March 20\(^{th}\)  
(Spring Break 11\(^{th}\)-15\(^{th}\)) |
| Unit IX: Energy Resources | • Film: Switch  
• Lab: Energy Efficiency (Lecture)  
• Lab: Renewable Energy  
• Lab: Biofuels (Lecture)  
• Project: Modeling Solar Energy at School  
• Test: Unit IX (Chapters 14 & 15) | 2-3 Weeks  
Test Date: April 10\(^{th}\) |
| Unit X: Air Pollution | • Indoor Air Pollution Activity  
• Lab: Modeling Greenhouse Gases (Lecture)  
• Film: HHMI Climate Change-How Do We Know Were Not Wrong  
• Lab: Source Emissions of Carbon Dioxide Emissions | 3-4 Weeks  
Test Date: May 14\(^{th}\) |
<table>
<thead>
<tr>
<th>Event</th>
<th>Description</th>
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<tbody>
<tr>
<td>TED Talk James Hanson (Lecture)</td>
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<tr>
<td>Lab: Data Points: Examining Changes in CO2 Concentration</td>
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<tr>
<td>Ozone Drawing Model (Lecture)</td>
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<tr>
<td>Air Pollution Investigation</td>
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<tr>
<td>Test: Unit X (Chapters 19 &amp; 20)</td>
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*Project: Career Choice & Resume to Apply (if time permits)*

- Lauritzen gardens
- Hummel Park
- Water Treatment Plant
- Youth Summit Conference
- Film Stream – Find out what they’re showing
- Zoo
- Glacier Creek
- Sandhills Creek and Cranes
- Awesome Aquifer Kits
- UNO kits are ablke to rent