AP ENVIRONMENTAL SCIENCE

SUMMER APES ASSIGNMENT FOR FALL 2017 STUDENTS

1. JOIN QUIZLET APES CLASS: https://quizlet.com/join/Cm5kS5nXV

MAKE SURE YOU JOIN THE CLASS OR YOU RUN THE RISK OF GETTING THE WRONG SET OF VOCABULARY WORDS! CHOOSE THE OPTION "ALPHABETICAL ORDER" AND THEY WILL BE ORGANIZED IN THE CORRECT ORDER FOR USE ALL YEAR. YOU MUST DEFINE BY HAND THE LIST ENTITLED "BEFORE SCHOOL LIST FOR 1st WEEK". THE DEFINITIONS WILL BE DUE THE FIRST DAY OF SCHOOL AND YOU WILL HAVE A TEST ON THEM THE FIRST WEEK OF SCHOOL.

2. CHOOSE SEMESTER PROJECT
AP Environmental Science Syllabus

Introduction

The AP Environmental Science course is designed to be the equivalent of a one-semester, introductory college course in environmental science. Unlike other introductory-level college science courses, environmental science is offered from a wide variety of departments, including geology, biology, environmental studies, environmental science, chemistry, and geography. Depending on the department offering the course, different emphases are placed on various topics. Some courses are rigorous science courses that stress scientific principles and analysis and that often include a laboratory component; other courses emphasize the study of environmental issues from a sociological or political perspective rather than a scientific one. The AP Environmental Science course has been developed to be most like the former; 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.

The AP Course Description and AP Exam have been prepared by environmental scientists and educators who serve as members of the AP Environmental Science Development Committee. 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 exam is representative of such a course and therefore is considered appropriate for the measurement of skills and knowledge in the field of environmental science. (© 2013 The College Board. Visit the College Board on the Web: www.collegeboard.org.)

Course Overview

The goal of the AP Environmental Science 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, and to examine alternative solutions for resolving or preventing them.

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. (© 2013 The College Board. Visit the College Board on the Web: www.collegeboard.org.)

1. Science is a process.
   - Science is a method of learning more about the world.
   - Science constantly changes the way we understand the world.

2. Energy conversions underlie all ecological processes.
   - Energy cannot be created; it must come from somewhere.
   - As energy flows through systems, at each step more of it becomes unusable.

3. The Earth itself is one interconnected system.
   - Natural systems change over time and space.
   - Biogeochemical systems vary in ability to recover from disturbances.

   - Humans have had an impact on the environment for millions of years.
   - Technology and population growth have enabled humans to increase both the rate and scale of their impact on the environment.

5. Environmental problems have a cultural and social context.
   - Understanding the role of cultural, social, and economic factors is vital to the development of solutions.

6. Human survival depends on developing practices that will achieve sustainable systems.
   - A suitable combination of conservation and development is required.
   - Management of common resources is essential.
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<thead>
<tr>
<th>Unit</th>
<th>Subject</th>
<th>Key Questions</th>
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| Intro:    | Overview EnviroScience                       | 1. What are some principles of sustainability?  
2. How are our ecological footprints affecting the Earth?  
3. Why do we have environmental problems?  
4. What is an environmentally sustainable society?  
5. What do scientists do?  
6. What is matter and what happens when it undergoes change?  
7. What is energy and what happens when it undergoes change? |
| Ch.1-2    | Sustainability                                |                                                                                                                                             |
| Unit #1   | Biogeochemical Cycles, and Systems            | 1. What are systems and how do they respond to change?  
2. How does the Earth’s life-support system work?  
3. What are the major components of an ecosystem?  
4. What happens to energy in an ecosystem?  
5. What happens to matter in an ecosystem? |
| Chapters 3, 19 | Climate disruption                             |                                                                                                                                             |
| Unit #2   | Ecosystems: What Are They and How Do They Work? | 1. How do scientists study ecosystems?  
2. What is biodiversity and why is it important?  
3. How does the Earth’s life change over time?  
4. How do speciation, extinction, and human activities affect biodiversity?  
5. What is species diversity and why is it important?  
6. What roles do species play in ecosystems?  
7. What role do humans play in the loss of species and ecosystem services?  
8. Why should we care about sustaining species and the ecosystem services they provide?  
9. How do humans accelerate species extinction and degradation of ecosystem services?  
10. How can we sustain wild species and their ecosystem services? |
| Chapters 3-4 | Ecology and the living world                  |                                                                                                                                             |
| Unit #3   | Populations                                   | 1. How do species interact?  
2. How do communities and ecosystems respond to changing environmental conditions?  
3. What limits the growth of populations?  
4. How do environmental scientists think about human population growth?  
5. What factors influence the size of the human population?  
6. How does a population’s age structure affect its growth or decline?  
7. How can we slow human population growth?  
8. What are the major population trends in urban areas?  
9. What are the major urban resource and environmental problems?  
10. How does transportation affect urban environmental impacts?  
11. How important is urban land-use planning?  
12. How can cities become more sustainable and livable? |
| Chapters 5-6, 22 |                     |                                                                                                                                             |
| Unit #4   | Land & Water as Resources                    | 1. What factors influence climate?  
2. How does climate affect the nature and location of biomes?  
3. How have human activities affected this world’s terrestrial ecosystems?  
4. What is the general nature of aquatic systems?  
5. Why are marine aquatic systems important?  
6. How have human activities affected marine ecosystems?  
7. Why are freshwater ecosystems important?  
8. How have human activities affected freshwater ecosystems?  
9. What are the major threats to forest ecosystems?  
10. How should we manage and sustain forests?  
11. How should we manage and sustain grasslands?  
12. How should we manage and sustain parks and nature reserves?  
13. What is the ecosystem approach to sustaining biodiversity and ecosystem services?  
14. What are the major threats to aquatic biodiversity and ecosystem services?  
15. How can we protect and sustain marine biodiversity?  
16. How should we manage and sustain marine fisheries?  
17. How should we protect and sustain wetlands?  
18. How should we protect and sustain freshwater lakes, rivers, and fisheries?  
19. What should be our priorities for sustaining aquatic biodiversity?  
20. What is food security and why is it difficult to attain?  
21. How is food produced?  
22. What environmental problems arise from industrialized food production?  
23. How can we protect crops from pests more sustainably?  
24. How can we improve food security? |
<p>| Chapters 8, 11, 13 |                               |                                                                                                                                             |</p>
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<tr>
<th>Unit #5</th>
<th>Soils/Geology/Earth Resources</th>
<th>1. What are the Earth’s major geological processes and what are mineral resources?</th>
<th>2. How long might supplies of nonrenewable resources last?</th>
<th>3. What are the environmental effects of using nonrenewable mineral resources?</th>
<th>4. How can we use mineral resources more sustainably?</th>
<th>5. What are the Earth’s major geological hazards?</th>
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<tbody>
<tr>
<td>Chapter 14</td>
<td>Pages 364-380</td>
<td>Page 290</td>
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<tr>
<td>Chapters 15-16</td>
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<td>Chapters 17-18</td>
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<td>Chapters 19, 21</td>
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Methods

Instruction throughout this course will vary based on the topics. Instruction will involve: lectures, class discussions, TED Talks, virtual demonstrations/videos, written assignments (in-class and homework assignments), research projects/presentations, current events exploration, formal/informal lab reports, field notes, and laboratory experiments.

A minimum of one class period’s time per week will be devoted to hands-on laboratory experiences, projects/presentations, equipment testing/practices, and/or fieldwork. All major laboratory experiments/projects will require a presentation or a formal/informal laboratory report.

No late work will be accepted. Assignments may be made up in excused absences.

Texts

REQUIRED:


*5 Steps to a 5 AP Environmental Science*, 2016 edition, Linda Williams (available at most bookstores or online suppliers like Abebooks.com or Amazon).

RECOMMENDED: *Preparing for the AP* *Environmental Science Examination*, David Hong, Karen Lionberger 2015 (available at most bookstores or suppliers)
Welcome to APES!! I am so glad that you chose to take an Advanced Placement class to challenge yourself and prepare for college-level academic work. AP offers the opportunity to earn college credit, in addition to greatly increasing knowledge in a specific subject area. Because this is a college-level class, it requires a great deal of outside reading, studying, and writing to help prepare you for success on the AP exam. There is a tremendous amount of material to cover in a very short amount of time; therefore, it is important that you remain self-motivated, organized, and, on pace. I suggest you make notecards of important information because this class requires much memorization of facts and processes. You can then use your notecards to review and study throughout the semester. There will be writing assignments throughout the semester geared toward preparing you for the constructed response section of the AP exam in May of 2018. In addition, you will write lab reports for the major labs and keep all artifacts in a binder for proof of your work when applying to college. Vocabulary is also an immense part of this class, so learn your words!

You are required to choose a semester project that pertains to an environmental science topic with an adult mentor (no parent mentors) that concludes with a 5-10 minute presentation of your project to your peers, a power point and brief research paper with 3-5 cited sources. We will spend the semester focusing on six main, interrelated topics: Earth systems and resources, ecology and the living world, human population and its effects on the environment, land and water use, the effects of pollution on humans and the environment, and climate change.

THINGS TO DO FOR APES BEFORE YOU COME BACK TO SCHOOL

- Purchase the workbook 5 Steps to a 5 AP Environmental Science for use at home to supplement the textbook provided in class, and to improve your success on the AP exam. I bought mine from Amazon for about $18. I often use it as a source of questions for in-class grades.
- Get Google Classroom & Quizlet on your device.
- Mark your calendar. Every APES student in the world takes the same test at the same time. That is scheduled for May 2018, & there is a testing fee-usually the parish pays all except around $35. More information will be sent home when it’s available.
  Complete the following assignments:
- Make HANDWRITTEN flashcards or define by HAND the #1A***BEFORE SCHOOL*** APES vocabulary for 1st week test (93 terms) found on Quizlet. Here is the link to join my class for your vocabulary words: https://quizlet.com/join/Cm5kS5nXV Your definitions are due the 1st day of school. You will be tested over them the 2nd day of school.
- Read over the semester project information included, and have your project chosen by the second week of school.
- Get familiar with the College Board website, apstudent.collegeboard.com. They are in charge of all things AP. Your College Board account follows you wherever you move, so you’ll need to be familiar with it and its resources.
- Gather your classroom supplies—white out for your scantron testing, 2 binders, two 3-Liter clear, smooth-sided soda bottles (look at Dollar Tree or Dollar General for store brands that have smooth sides), 1 gallon of distilled water, three rolls of paper towels, and a package of baby wipes/Clorex wipes. Bring those the first week we return to school.

I look forward to meeting you!

Mrs. Harper
In APES you will embark on an independent project, the goal of which is to make a positive difference in our local environment/community. The focus of your project is your choice, but it must be related to something covered in APES that particularly intrigues you, and be approved by me BEFORE you begin. My intent is that you be involved in something meaningful to you, so please research and select your project carefully, remembering that one person CAN make a difference! SERVICE PROJECTS ARE PREFERRED. Remember - common sense is required, along with documentation of your work AND the approval of an adult who must vouch for your performance of your task. Make sure you talk to your parents, and that your parents are on board with your plan BEFORE you start your project. Who knows? Parents often have fabulous ideas, and they can serve as wonderful resources for community contacts that could help you complete this task. KEEP ALL DOCUMENTS/ARTIFACTS FROM YOUR PROJECT IN A BINDER. COLLEGES OFTEN REQUIRE PROOF OF APES LAB ACTIVITIES AND PROJECTS BEFORE AWARDING CREDIT.

Your project will culminate in a 5-10 minute digital presentation documenting your work. It must include:

- Your original vision, motivation, and goal(s) for the project
- What you did—-who did you contact? Did you organize a work force? What stages of development did your work go through?
- What you accomplished—did you actually make a difference in the environment or the community?
- What did you learn?
- Pictures of you working on your project at the beginning, middle, and end. (That means at least 3 pictures of you working at the various stages).
- A picture of you with your adult mentor (who will be contacted to assure me that you really did your project well).

**SAMPLE RUBRIC—EXPECT SMALL ADJUSTMENTS**

<table>
<thead>
<tr>
<th>TASK REQUIRED</th>
<th>POINTS EXPLANATION/NOTES</th>
<th>POINTS</th>
<th>DATE DUE</th>
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<tr>
<td>Topic Approved by-teacher</td>
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<td>Adult Mentor's credentials and contact information (email &amp; phone #) submitted &amp; approved by teacher</td>
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<td>Due Date Determined &amp; honored</td>
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<td>Approval of TYPED/PRINTED explanation of your project with details of how it will be done. NOT A NOVEL, KEEP IT SHORT &amp; SWEET. Include your vision, motivation, and goal for this project. All your paperwork will be kept for college!</td>
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<tr>
<td>MENTOR'S ASSESSMENT OF STUDENT EFFORT</td>
<td>SEMESTER PROJECT</td>
<td>Information for prospective 8th graders</td>
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<td>Mentor's confirmation with me of student work completed in a diligent, thorough manner with a cooperative attitude that reflects the BHS Tiger Expectations: Be Respectful, Be Responsible, Be Ready</td>
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<tr>
<td>PRESENTATION ASSESSMENT</td>
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<td>PowerPoint submitted in class on due date with thorough explanation of project. Presentation is a digital version of the PowerPoint that is 5 minutes minimum- 10 minute maximum. Presentation is informative, includes what student has learned, and student behavior/dress are appropriate for an informational presentation. All artifacts are to be kept in a binder with a printed version of PowerPoint for college.</td>
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<td>POWERPOINT ASSESSMENT</td>
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<td>PowerPoint includes:</td>
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<td>1st Slide: Vision, motivation/goal(s) for the project</td>
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<td>2nd Slide: Actions. Who did you contact? Who was your work force? What stages of development did you go through?</td>
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<td>3rd Slide: What did you accomplish? Did you make a difference? How?</td>
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<tr>
<td>Next Slides: Findings/Research/Interesting Information.</td>
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<tr>
<td>What did you learn?</td>
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<tr>
<td>Picture of student with mentor, picture of student at beginning, middle, &amp; end of project doing some kind of work—that's a minimum of 4 pictures of YOU DOING YOUR PROJECT. Minimum of 2 graphs or charts included with title &amp; explanation.</td>
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<td>3-5 credible sources cited for your research. You will keep your PowerPoint for college! All your artifacts must be maintained in a binder. Interesting format/facts. Student made information interesting &amp; fun if possible with graphics, music, colors, etc.</td>
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Here are some ideas—if you have a good original idea, feel free to present it to me for approval before you begin.

1. Coordinate the recycling program at BHS this semester. (Empty school containers & transport recyclables to a recycling facility.) Keep a record of the weight of the recyclables. Chart it. Research a specific aspect of recycling. Cite credible sources.

2. Help an elderly neighbor with their yard work. Recycle yard waste and research a specific aspect of yard waste. Use no environmentally toxic pesticides. Take before and after pictures. Minimum of 2 (2 yards or same yard twice) during the 8 weeks. Cite credible sources.

3. Adopt a highway, cleaning it at least 3 times during the project. Properly dispose/recycle trash collected there. Did you find anything interesting? Weigh the trash you collected. Include a chart/graph. Research pollution or recycling. Cite credible sources.

4. Make a video explaining how the use of one of these techniques/practices works to lower one’s environmental impact: alternative energy options like geothermal heating/cooling systems, solar panels; hybrid cars; ways to cut fuel use; ways to save electricity; ways to decrease water use; how to lower your energy bills, etc. (Choose one). Include an interview with an expert on the subject. Cite credible sources.

5. Learn and make your own compost bin at home. Research composting. Cite credible sources.

6. Make (or find and hike) a local nature trail & take a group of kids out for a nature hike! Teach them to identify a minimum of 15 trees/plants found on your hike by their leaves and other physical characteristics. Include poison ivy, poison oak, & sumac. Teach us on your PowerPoint, with pictures of leaves (and bark) with identifying traits. How tall do the trees reach? How long do they live? What lives in them? Cite credible sources.

7. Get a crew together and remove invasive species from our school or community. Your PowerPoint should teach us about the invasive species: pictures so we can identify it, names, where it originated, how to control it, etc. Cite credible sources.

8. Plant trees and/or gardens for the elderly. “Bucket” gardens count! At least 5 plants minimum. Measure growth and make graphs using your information. Include the environmental impact expected by planting your choices. Cite credible sources.

9. Test two local streams for water quality and graph your results. 5 sample minimum over 2 months. See me for details.

10. Implement your own version of “Reduce, Reuse, Recycle” by holding a rummage sale to sell used items. Donate the money to a worthy cause. Include proof of amount raised and a picture of your presentation to the organization benefitting from your project. What environmental impact did you make? Research textile waste/landfills, etc. Cite credible sources.

11. Throw a healthy foods dinner party for our class. Bring in samples for the class to try. Create a cookbook with the recipes for what you serve, and pass the recipes out to the class. Research obesity and the effects of environment/diet on health. Cite your sources. Only one of these projects per class!

12. Using video or PowerPoint, teach people how to grow a lawn without synthetic fertilizers or pesticides. Research pesticides and the associated risks/benefits. Cite credible sources.
13. Do a survey in school of student’s awareness of an environmental issue of your choice. Analyze the data. Graph your data. Educate us! 25 student minimum with survey. Why is this issue important? Cite credible sources.

14. Plant seeds with kids. 5 plant minimum. Pots count! Measure growth over a 2 month period & graph it. Give the children the plants as a gift when you’re done. What environmental impact can you expect from your project? Research the types of plants that grow well in our climate/native vs. nonnative species, etc. Cite credible sources.

15. Contact a local or state environmental organization and participate in one of their projects. Most of these sites have an email service of current alerts and actions on behalf of the environment. Provide credible resources for the presentation.

16. Write a children’s book (with illustrations) that cover topics we covered this semester. Read the book to our class. Cite at least 5 credible sources.

17. Do some restoration work in your community. Contact the appropriate agencies and plant trees, shrubs and perennials around Benton. Start with the city hall, a local garden club, etc. What environmental impact did your project make? Cite credible sources.

18. Do a Red River, Cypress-Lake, or Black Bayou clean-up and recycle the recyclable materials. Document how far you went along the river. Identify the trash & make a chart showing us the top 5 most common items that appeared. How can we decrease this problem? Cite credible sources.

19. Make your home more energy/resource efficient. Gently encourage conservation/non-wasteful habits regarding eating, electricity use, recycling---something! Try not to get kicked out of the house. Note: you must have parental permission (blessing!) before you do ANYTHING at your home!!!! Cite credible sources. Here are some ideas:
   - fix dripping faucets
   - weather strip door/windows
   - convince your family to switch to more environmentally friendly cleaning products
   - start a recycling campaign at home (visit the town dump and see how they handle recyclable materials)
   - research how to dispose of used oil, old pesticides, and other toxins
   - work out a plan to reduce your electric bills and water usage (go to the hardware store and learn about energy and water saving devices)

20. Volunteer at a local farm. They could use your enthusiasm and help! Tell us what you did & what you learned along with credible sources for the information you share. Research an aspect of agriculture/Land use as it affects the environment. Incorporate a graph/chart of some kind.

21. Volunteer at a local animal shelter. Do something meaningful for homeless animals. Chart the population diversity in the shelter. How diverse is the population? Is there a trend? What is the average length of time an animal stays in this particular shelter? What percentage of their population is adopted vs. euthanized? How could the population be decreased other than euthanasia? Cite credible sources.

22. Clean up along a running trail. Did you find invasive species? What biodiversity was noticed? Were non-native plant/tree species found? Take before and after shots. Document how much ground you covered. Weigh your trash and recycle what you can. Did you find any interesting waste? Research pollution or recycling. Cite credible sources.

23. Volunteer for the Salvation Army. Recycle clothes from your neighborhood. Weigh your recycled clothes. How can we decrease the amount of clothing waste that occurs? Research the time it takes the various clothing materials to decompose & make a comparison chart/graph. Cite credible resources.
24. Take kids fishing and teach them how to protect our waterways. What did they catch? Make a pamphlet that teaches us how to identify local fish with common & scientific names, their diet, their niche, etc. Include a chart/graph that includes population diversity in our area. Cite 3 credible sources.

25. Improve the landscaping of the school by building bird feeders and birdhouses, planting flowers, or weeding the grounds. What is the environmental impact of birds in our area? Why is it important to remove invasive plant species or weeds from landscaping? Why is it better to plant native species rather than non-native oriental species plants? Cite credible sources.

26. Interview a Department of Wildlife & Fisheries park ranger, or better yet, spend the day with them. Get their perspective on environmental issues. Make a chart/graph of topics of concern. Cite credible sources.

HAVE FUN !!!!!