



UNIVERSITY HIGH SCHOOL

A Nationally Recognized Exemplary School

4771 Campus Drive, Irvine, California 92612 • (949) 936-7600, FAX (949) 936-7609

Website: <http://www.universityhigh.org>

June 3, 2019

Welcome 2019-2020 AP Environmental Science Students!

This course is designed to be the equivalent of an Environmental Science course taken during the first year of college. AP Environmental Science is a *full year college level laboratory course*. Students will examine environmental issues from an economic, scientific, sociological and historical point of view. The goal of this 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 and/or preventing them.

The book that we will be using is:

Title: **Environmental Science for AP ***

Authors: Andrew Friedland et. al

ISBN: 9780716738497 or 071673849X

Please check out the textbook prior to the summer break so that you can complete the summer assignment. Books will be available check out from the library through the last week of school. Alternatively, you may wish to purchase your own copy of the textbook. Advantages to purchasing your own copy of the text include: the ability to highlight the text as you actively read, annotating the figures, and retaining the text as a reference for college. Because the exam is in May, I require that students complete summer reading requirements before the start of school. This is necessary to ensure that all topics are addressed to fully prepare you for the AP exam. The assignment you will be responsible for this summer is listed below. You will have a test during the first or second week of school on the material covered in the summer assignment. You may contact me during the summer at JenniferBartlau@iusd.org if you have any questions.

Summer Assignment: You can find the link to the summer assignment on the UNI homepage. The assignment below is due the second week of class.

1. Read/study chapters 1 and 2 and ***hand write*** an outline/notes for each chapter. Your outline/notes should be thorough and may include images, definitions, concept maps, questions/thoughts about the text and/or answers to the concept check questions found in the textbook.
2. Read two current events and then complete two current event summaries. (Google Doc)
3. Go on a scavenger hunt to explore important environmental science topics and create a document to share with the class first week of school. This should be fun! (Google Slides)
4. Complete the basic math skills practice.
5. **OPTIONAL:** You will be required to do field work for this course, if you would like, you can complete some of your field hours prior to the beginning of the school year when you have more time. (Google Doc)

I am looking forward to a great year! Enjoy your summer.

Sincerely,

Ms. Jennifer Bartlau

AP Environmental Science Instructor

ESTABLISHED 1970

... a community of learners moving together toward the highest quality educational experience we can envision



Part Two: Current Events Digital Tables and Presentation

Introduction

AP Environmental Science is a fantastic course for increasing science literacy with regards to the media. An environmental issue is referenced up to 20 times in every edition of every newspaper every day in the United States and these stats are similar on the international scale. Environmental issues are multifaceted and relate to all aspects of each of our lives. Many issues may not touch our lives personally, but are noteworthy human issues such as social crisis or worldwide epidemics. The articles you choose for this assignment must have a clear connection to Environmental Science. You can preview the chapters in the text to get an idea of appropriate topics, or email me.

Current events will be ongoing throughout the year, so you will receive further instructions at the beginning of the year. For now, what you need to do is complete the following table for two current events related to environmental science. These current events **MUST BE PUBLISHED AFTER JUNE 1, 2019**. They will not be given credit if they are from a date prior to that. Your initial introduction to the course content will be Chapter 1 of the textbook so refer to the chapter to connect your current event to the course content.

Articles should be from sources that are science oriented or reputable such as Scientific American, Nature, Discover, and Science. Other appropriate sources include Grist, TreeHugger, The New York Times, Washington Post, LA Times, NPR, The Atlantic, Slate, Time, Newsweek, Orion Magazine, The Economist, The Wall Street Journal and National Geographic.

You can either recreate the table below or go to this link and make a copy: <http://bit.ly/APESCurrentEvent2019-2020>. Your completed table should be between 1 and 2 pages.

APES Current Events Summary Table - The summary table below should be done using complete sentences in a narrative style. The narrative should flow from one cell to the next. The order of the components can be modified however, the bibliographic information can come first and your opinion must come last (you could move stakeholders earlier in the table for example). You will complete this assignment in a Google Doc.

Include bibliographic information including title, date, author, source, and a link.	
Include a clear, thorough summary about the content of the article. Be sure to identify the 'Ws' (the Who, What, Where, When, and Why).	
Discuss the environmental/scientific, economic, and social/political implications of the article.	All three must be addressed, environmental, economic and social.
Identify and Discuss the stakeholders in the article and describe how each is affected by the issue. This includes humans and other organisms.	
Identify and Explain the content in chapter one and two that this article relates to. Include and highlight as many vocabulary words as possible. For each item explain HOW the article relates to it. This can be a bulleted list of sentences.	
Present your take on the issue. How does it apply to your life? (It does!) Do you think it should be resolved in some way? Provide reasons/evidence that support your perspective. Use at least one of the given sentence starters to help you relate the issue to your life.	<p>This issue relates directly to my life because...</p> <p>This issue relates indirectly to my life because...</p> <p>I believe that...</p> <p>This issue should....because...</p>
Include an image for each article that you think represents the article, the issue, or your stance and caption the image.	
Copy and paste the original article below.	

Part Three: Summer Scavenger Hunt

Make a Google Slideshow to share what you did/saw this summer related to environmental science. This should be fun! The purpose is for you to start engaging with the content over the summer to better prepare you for the school year. Environmental science is all around you; this project should help you become aware of the fact.

On each slide, be sure to include the following:

1. Label the slide as the category being displayed. (Lithosphere, Species Interactions, Forest, etc....)
2. Photo of the item with you in it. (Selfie?)
3. Photo caption naming the specific object. (Igneous Rock, Mutualism, Native Tree, etc....)
4. An explanation as to why you chose the item. How does it relate to environmental science or your current ideas regarding environmental science?
5. Date photo was taken.
6. Location – be specific. (Irvine, California or Arches National Park, Utah)

Choose twenty items from the following list and make a slide for each item you choose. Your slide show will have 21 slides, one slide per item and one cover slide (name, date, and period). Be prepared to show your finished product with the class.

#	Category/Identification	Ideas/Criteria/Guidelines	Also Include
1	Lithosphere	Igneous rock, sedimentary rock, metamorphic rock, non-native rock,	Name of Rock
2	Hydrosphere	Ocean, bay, flowing or standing water, watershed	Name of water body
3	Atmosphere	Clouds, smog, fog, etc.	Name of cloud type or smog type
4	Biogeochemical Cycles	Nitrogen, Carbon, Water, Phosphorus	Where the element is, has come from and is going.
5	Energy Flow	Carnivore consuming, Herbivore consuming, photosynthesis happening	Names of participating species.
6	Biodiversity	Native, threatened or endangered animal in its habitat. Non-native animal in its habitat.	Name of species.
7	Species Interactions	Mutualism between two plants, two animals or between a plant and animal.	Name of each species and how each species benefits.
8	Species Interactions	Competition, Parasitism, Predation	Name of each species and how they impact each other.
9	Population Growth	A human less than 1 year old. A human less than 2 years old. A human less than five years old.	Name of the human and a photo caption.
10	Forest	Native tree you can't reach more than one quarter of the way around. Native tree you cannot reach more than halfway around. Non-native tree you cannot reach more than half way around.	Name of species.
11	Biodiversity Preserve	National park system unit. State park system unit. County or city park system unit.	Name of Park

12	Food Crops	Food crop being grown on a farm. Food crop being grown in a garden. Food crop being processed or retailed.	Name of food crop.
13	Meat	Animals being raised for food in a farm or CAFO. Animals being raised for food in a household. Meat being retailed. Animals at a ranch.	Name of animal.
14	Fishing	Commercial fishing operation. Recreational fishing. Fresh fish being retailed.	Name of fish.
15	Water Resources	Agricultural irrigation system. Man-made dam. Man-made reservoir.	How the water you observed is being used.
16	Water Pollution	Wastewater treatment facility. Source of water pollution. Polluted water or solid water pollutant.	Type of water pollution observed.
17	Air Pollution	Stationary, point source emitting pollution. Mobile source emitting pollution. Air pollution without identified source.	Type of air pollution. As specific as possible.
18	Renewable Energy	Renewable power generation plant (solar, wind, geothermal...) Renewable residential or commercial generator. Renewably powered appliance.	Type of renewable energy.
19	Water Resources	Water transport system. Water storage system. Water delivery and use.	Where water comes from and where it goes.
20	Fossil Fuels	Fossil fuel production or processing (mine, well, refinery...). Non-gasoline fossil fuel use or retail. Gasoline retail.	Name of fossil fuel.
21	Solid Waste	REDUCING waste generation (instead of reusing, recycling or discarding). REUSING potential waste (instead of recycling or discarding). RECYCLING potential waste (instead of discarding).	Potential waste that is being averted.
22	Urbanization	LEED platinum or gold building. LEED silver or certified building. Other "green" building.	Name of or occupants of building. Description of "green" features.
23	Urbanization	New development previously natural habitat. New development on previously rural land. New development on previously urban land.	What was the land used for before? What will the land be used for in the future?
24	Transportation	Riding public mass transit. Public mass transit. Private mass transit.	Destination and ride commentary.
25	Politics and Economics	University building, from which the environment is studied. Community college building from which the environment is studied. Commercial or public building from which the environment is worked with.	Name of someone who works there, and hopefully a quote from him or her about the environment.

26	Politics and Economics	Worker in an environment-related profession. Volunteer in environment related work. Environmental aware person.	Name and environmental role of person and a quote from the person.
27	Beauty	A non-human "thing" in the environment that you find extraordinarily beautiful.	What it is and why it is beautiful?
28	Anthropogenic	Take a picture of something man made.	Comment on the impact of the use of your chosen object on the environment.
29	Choice.	Anything relevant to the environment.	Relate what you take a picture of to environmental science.

CREDIT

1. Full credit is the expectation. Follow all guidelines, and full credit is easy to achieve.
2. Clarity and quality of imagery is important.
3. Accuracy and thoroughness of documentation are important.
4. Creativity and entertainment value are way better than no creativity or entertainment value; they can compensate for minor deficiencies, but not for major deficiencies.
5. Evidence of trespassing, obstruction of traffic, violation of laws, jeopardizing safety or compromising integrity will cost credit. Photoshopping or other image manipulation to gain advantage constitutes an absolute abandonment of integrity.

SUGGESTIONS

Have fun with it; it's not supposed to be "work."

Build it gradually throughout the summer. Saving it all for the last day would make it "work".

If you have no imaging device, you can borrow one from a friend or family member.

Please email and let me at the beginning of the summer if you do not have access to a camera.

Part Four: Basic Math Skills

Some basic math skills such as algebraic computation, unit conversions, graph interpretation, and rate calculations are required in the course. If you do not know how to do these calculations, go online and reteach yourself. These problems have been set up with numbers that multiply and divide evenly to produce whole number answers, just like you would find on a typical APES exam.

- 14000 millimeters = ? meters _____
- 6544 liters = ? milliliters _____
- 0.078 kilometers = ? meters _____
- 17 grams = ? kilograms _____

Show ALL work for the problems below:

Use the Tabel below to help you complete the following. Show all of your work, including the cancelling of units.

1 square mile = 640 acres	1 hectare = 2.5 acres
1 barrel = 42 gallons	1 liter = 0.3 gallons
1 metric ton = 2000 pounds	1 kilogram = 2.2 pounds
1 kWh = 3400 BTU	1 BTU = 250 calories
1 BTU = amount of energy to raise temp of 1 lb water 1°F	
Density of water = 1g/ml = 8 lbs/gallon	

Unit Conversions—All APES students should be able to convert from one system of units to another.

- A 100 square mile area of national forest is how many acres? How many hectares?
- A city that uses ten billion BTUs of energy each month is using how many kilowatt-hours of electricity?
- Fifty eight thousand kilograms of solid waste is equivalent to how many metric tons?
- If one barrel of crude oil provides six million BTUs of energy, how many BTUs of energy will one liter of crude oil provide? How many calories of energy will one gallon of crude oil provide?
- For crude oil, if 150 pounds of CO₂ is released per million BTUs of energy, how much CO₂ is produced by each barrel of crude oil? (use information from previous problem)

Percentages—All APES students should be able to work comfortably with percentages.

- A natural gas power plant is 60% efficient. If one cubic meter of natural gas provides 1000 BTUs of electricity, how many BTUs of waste heat are produced?
- If 35% of a natural area is to be developed, leaving 500 acres untouched, how many acres are to be developed?
- Calculate the percentage growth rate for a country with a population of 6 million: in a year in which it had 100,000 births, 70,000 deaths, 30,000 immigrants and 50,000 emigrants.
- If the concentration of mercury in a water supply changes from 65 ppm to 7 ppm in a ten-year period, what is the percentage change of the mercury concentration?

Energy—The APES exam always has questions about energy use. Be prepared!

- How much energy is required to raise the temperature of 1000 gallons of water by 25°F?
- By how many degrees Fahrenheit can the temperature of one metric ton of water be raised with the addition of 110 thousand BTUs of heat?
- If 500 thousand BTUs of energy are available to raise the temperature of a water boiler from 20°F to 100°F, how many gallons of water can be added to the boiler?

Part Five (Optional): Get a Head Start on Field Hours

Over the course of the year you will complete 8-12 hours of field work in 4 separate experiences ranging from 1-3 hours each. Typically this is arranged so that you complete 2 experiences for each semester gradebook. If you would like to get a head start on your experiences you are welcome to do one this summer. Please email me if you have questions about opportunities as many come up. Copy the link below to access the assignment. You will submit your link through Canvas at the beginning of the school year. Here is the Google Doc: <http://bit.ly/2WbgMgE>

	Category Description
<i>You may select from these categories as many times as you like.</i>	<p><i>Open Ocean, Estuary, or Nature Preserve visit:</i> Whale Watching, Bolsa Chica Wetlands in Huntington Beach, Upper Newport Bay, San Joaquin Marsh in Irvine, Back Bay Science Center, Davey's Locker.</p> <p><i>Environment Related Organizations and Talks:</i> Audubon House, California Native Plant Society, Rock Club, Irvine Ranch Conservancy, UCI open seminars, Orange County Society of Conservation Biology, Nix Nature Center at Laguna Wilderness Park, The Ecology Center, Shadetree Nursery, Starr Ranch, Crystal Cove State Park, OC Coastkeeper, Surfrider Foundation.</p> <p><i>Job Shadowing in an ES field</i></p> <p><i>Any type of environmental remediation work.</i></p>
<i>Limited to selecting from this category ONLY ONCE.</i>	<p><i>Aquariums:</i> Cabrillo Marine Aquarium/Museum, Sea World San Diego, Steven Birch Aquarium at Scripps Institute of Oceanography, Aquarium of the Pacific, Monterey Bay Aquarium.</p> <p><i>Zoos and Rescue Shelters:</i> Los Angeles, San Diego, or Irvine Regional Park Zoos.</p>
<i>Limited to selecting from this category ONLY ONCE.</i>	<i>Hiking or Camping:</i> Anything from local general areas to nearby State or National Parks, must be accompanied by a docent or volunteer + a visit to the visitors center.
<i>Email us if you have another idea.</i>	

Following your fieldwork experience you need to submit a **one page (or more)** written summary of your experience describing how it relates to the class and your life. You will use one ongoing document for your fieldwork entries. Use the following checklist to make sure your write up is up to par for submission. A header is included on the following page. Please use this header for your Field Hours document. There should be one paragraph each: a description of what you did

for field work , how what you participated in relates to chapter one, and finally your own reflection/opinion about what you did for field work.

- ✓ **Format:** my name is on my paper, the date of attendance is listed, no larger than size 12 font is used, no larger than 1 inch margins are used, one and a half or double space.
- ✓ **Evidence:** Evidence is attached to or included in your write up. This could be a ticket, a picture of you at the event, confirmation email, etc.
- ✓ **What you learned and did:** Summarize what you did and what you learned at the event.
- ✓ **How it relates to the content:** Give a few clear examples of how the things you learned relate directly to the content of our course. Use of specific vocabulary is recommended here. It would be wise to use sentence frames such as: In APES we learned _____, this experience relates directly to that content because _____.
- ✓ **Personal reflection:** Describe how this experience relates to your own life and experience with nature.

If you do all of the above, you should get full credit on your field hours.

APES 2017- 2018 Field Hours

Name

Experience	Category Selected	Date of Experience	Time of Experience
Ex.	Aquarium of the Pacific	6/15/2018	10:00 – 1:00
1			
2			
3			
4			

Field Work Experience #1: _____