# AP Environmental Science Syllabus FAll Semester 2022

**Course Overview**

Advanced Placement Environmental Science (“APES”) is a college-level environmental science course. This course is taught as a traditional science course, incorporating laboratory activities, virtual activities, short-term projects, long-term studies, field investigations, and the use of technology for gathering data. Experiences in the laboratory and field and through virtual internet labs will provide students with opportunities to relate classroom concepts to real-world applications of environmental science. Through these experiences, students will be recording data, gathering evidence and presenting it to their peers verbally and in writing in different formats both digitally and via poster sessions. Students will be able to explore specific real-world environmental issues and gain an awareness of the science behind these issues. Students will explore the impact of our growing human population and understand that they have a stake in the future of the environment. The course follows guidelines established by the College Board with the goal to provide students with scientific principles, concepts, and methodologies required to understand interrelationships in 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 alternatives for resolving and/or preventing them, including environmental policies and legislation. APES is interdisciplinary and incorporates a wide variety of topics from many different areas of study. There are several major unifying themes, or big ideas, that cut across the topics within APES. The following big ideas provide the foundation for the structure of the APES course:

**Big Idea 1: Energy Transfer**

**Big Idea 2: Interactions between Earth Systems**

**Big Idea 3: Interactions between Different Species and the Environment**

**Big Idea 4: Sustainability**

 In order for students to immerse themselves in the big ideas and content of the APES course, they will apply several major scientific skills and practices that allow them to engage in authentic scientific inquiry. The following scientific processes provide the foundation for the exploration of the APES course: ¨ Science Practice 1: Concept Application ¨ Science Practice 2: Visual Representations ¨ Science Practice 3: Text Analysis ¨ Science Practice 4: Scientific Experiments ¨ Science Practice 5: Data Analysis ¨ Science Practice 6: Mathematical Routines ¨ Science Practice 7: Environmental Solutions

# **Reading Materials**

This course will utilize the following BRAND NEW textbook:

Environment: the science behind the stories 7th edition 2021 otherwise known as the “Withgott” book

Additional Reading comes from the following books:

*The Ethics of What We Eat: Why Our Food Choices Matter* by Peter Singer and Jim Mason

*Cradle to Cradle: Remaking the Way We Make Things* by Michael Braungart and William McDonough

*Tomatoland, Third Edition: From Harvest of Shame to Harvest of Hope* by Barry Estabrook

*The Sixth Extinction: An Unnatural History,* by Elizabeth Kolbert

*Garbology: Our Dirty Love Affair with Trash* by Edward Humes

*The Big Thirst: The Secret Life and Turbulent Future of Water* by Charles Fishman

 Various Articles and Case Studies will also be utilized for students to become aware of current issues.

**Students will understand the big ideas and perform the science skills and practices through deep study of nine major topics indicated by the College Board as the units of study. The units within the APES course with corresponding exam weighting are as follows:**

 **Unit 1: The Living World: Ecosystems 6–8%**

 **Unit 2: The Living World: Biodiversity 6–8%**

 **Unit 3: Populations 10–15%**

 **Unit 4: Earth Systems and Resources 10–15%**

 **Unit 5: Land and Water Use 10–15%**

 **Unit 6: Energy Resources and Consumption 10–15%**

 **Unit 7: Atmospheric Pollution 7–10%**

 **Unit 8: Aquatic and Terrestrial Pollution 7–10%**

 **Unit 9: Global Change 15–20%**

Students will also engage with the course material by researching environmental policies and legislation implemented in connection with human interaction with the environment. The study of laws and policies expose students to environmental issues, the debates and negotiations among parties with competing interests that arise in connection with these issues and the outcomes of those debates and negotiations. **The requisite environmental policies and legislation are as follows:**

 **Clean Air Act**

 **Clean Water Act**

 **Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES)**

 **Comprehensive Environmental Response, Compensation, and Liability Act (CERCLA)**

 **Montreal Protocol**

 **Kyoto Protocol**

 **Endangered Species Act**

 **Safe Drinking Water Act (SDWA)**

 **Delaney Clause of Food, Drug and Cosmetic Act**

 **Resource Conservations and Recovery Act (RCRA)**

**Recommended Student Materials**

The key to success in an advanced placement course is organization. For you to be organized it is recommended that you have the following:

* **Lined composition book** for chapter textbook questions/notes.
* **Binder** with the following sections
	+ Powerpoint notes
	+ Laboratory
	+ Practice Questions
	+ Additional Readings
	+ Homework and various class work
* 3 x 5 index cards
* Pens and pencils for writing
* Calculator
* UCPS Chromebook or other laptop computer

# **Methodologies**

# **Lab Component**

Laboratory investigations are a very important component of this course. 25% of our instructional time will be devoted to lab work. Through lab work, you are required to use higher thinking skills, apply concepts in real situations and perform science skills such as data collection, analysis and communicating results. Laboratory exercises utilize the inquiry method. You will keep lab journals for all laboratory investigations, and will need to present complete lab write-ups including background information, data collection, data analysis, conclusions and further inquiries.

**Lectures**

Because this course parallels an introductory college course, I will lecture several times per unit. In lecture, I will present topics in relation to the current data available. I will utilize pictures, graphs, and other various visual aids. Lectures will consist of note taking as well as discussion.

**Field Trips**

A field trip to the Monroe, NC wastewater treatment plant will be scheduled.

**Classroom Policies**

1. Late work will not be accepted. However, I understand that life happens and sometimes you need a little more time to do your best**.** You may turn in an assignment late up to the date of the unit exam for **half credit only if you contact me in advance to get approval.**
2. The key to your success in Environmental Science is attending class each day. If you have many absences, you will fall behind.
3. In order to learn you need to be present in class. You may leave for the restroom only in the case of emergency.
4. If a student would like extra help on an assignment or is having difficulty with the current topic, he/she may come in for tutoring before school. Please always email me with any questions or concerns.
5. Students are expected to behave as adults. Behavior that is disruptive to the learning environment will not be tolerated.
6. Absolutely no food or drink (except water).

**Student Assessment**

Tests and Quizzes 45%

 Lab Reports 35%

 Other 20% (Homework and class assignments)

**AP Exam on May 2, 2023 at 8AM at the PDC. The exam is 2 hours and 40 minutes long.**

**Exam Information:**

**Section I: Multiple Choice**

80 Questions | 1 Hour 30 Minutes | 60% of Exam Score

* New question type analyzing texts: 2 sets of approximately 3–4 questions per set will assess students' ability to evaluate sources of information with a text-based stimulus.
* Questions will now place equal emphasis on the analysis of quantitative data and data in the form of models and representations.
* Each question will have 4 options.

**Section II: Free Response**

3 Questions | 1 Hour 10 Minutes | 40% of Exam Score

The three free-response question types will now remain the same from year to year:

* Question 1 will ask students to design an investigation.
* Question 2 will ask students to analyze an environmental problem and propose a solution.
* Question 3 will ask students to analyze an environmental problem and propose a solution doing calculations.

 A four-function (with square root), scientific, or graphing calculator may be used on the exam.

AP Environmental Science

Fall 2022

***Return this paper with signatures!***

**Syllabus Acknowledgement**

I acknowledge that I have read and understand the class syllabus for APES.

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Student Printed Name Student Signed Name

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Parent Printed Name Parent Signed Name

**Parent/ Guardian Contact Information and Preferences (please print clearly)**

Parent/Guardian Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Daytime Phone: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Home Phone: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Email Address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Parent/Guardian Name: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Daytime Phone: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ Home Phone: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

Email Address: \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_

My preferred method of contact is through email for communication with parents/guardians.

\_\_\_ Yes, the teacher MAY contact me via email regarding my son or daughter’s.

\_\_\_ No, contact me via phone. Best hours to reach: \_\_\_\_\_\_\_\_\_\_\_

 **SCHOOL**

 **LABORATORY SAFETY CONTRACT**

Science is a hands on laboratory class. Safety in the science classroom is the number one priority for students, teachers, and parents. To ensure a safe science classroom, a list of rules have been developed and provided to you in this student safety contract. These rules must be followed at all times. Students and parents must sign off with their individual science instructor acknowledging these rules before participating in any science laboratories. **\*If you are reading this, you are on the right track to following directions! Please see me for 10 extra points on your first quiz. I will only give this to the first person to acknowledge this!**
General Guidelines
1. Conduct yourself in a responsible manner at all times in the laboratory. Never fool around; do not wander around the room, distract other students, or interfere with the lab experiments of other students.
2. No student may work in the lab without an instructor present.
3. Never touch any equipment, chemicals, or other materials until you are instructed to do so.
4. You may not eat or drink in the lab.
5. Carefully follow all teacher-given and written instructions. Unauthorized experiments are prohibited.
6. Be prepared for your work in the laboratory. Read all procedures thoroughly before entering the laboratory.
7. Work areas should be kept clean and neat at all times. Bring only your lab instructions, worksheets, and/or reports to the work area. Other materials (books, purses, back pacts, etc.) must be stored away from the work area.
8. Know the locations and operating procedures of all safety equipment including the first aid kid, eyewash stations, safety shower, fire extinguisher and fire blanket. Know where the fire alarm and exits are located.
9. Dispose of all chemical waste properly. Never mix chemicals in sink drains. Sinks are to be used only for water and those solutions that may be disposed of properly in the sink (as instructed by teacher). Solid chemicals, metal, matches, filter paper and all other insoluble materials are to be disposed of in the proper waste containers.
10. Keep hands away from face, eyes, mouth and body while using chemical or preserved specimens. Wash your hands with soap and water after performing all experiments. Clean and wipe all work surfaces and apparatus at the end of the experiment. Throw away all trash and waste into appropriate containers.
11. You will be assigned a lab station at which to work. You may not wander around the lab.
12. If there is a fire drill during your lab period, turn off gas values, fume hoods and electrical equipment before leaving. Bring your back pack/purse with you outside.
13. Handle all living organisms used in a laboratory activity in a humane manner. Preserved biological materials are to be treated with respect and disposed of property.
14. When using knives and other sharp instruments, always carry with tips and points pointing down and away. Always cut away from your body. Never try to catch falling sharp instruments. Grasp sharp instruments only by the handles.

Clothing
15. Laboratory goggles MUST be worn any time chemicals, heat or glassware are used.
16. Contact lenses may be worn with the use of unvented goggles,
17. Dress for safety when working in the lab. Long hair must be tied back and dangling jewelry and loose or baggy clothing must be secured. Shoes must completely cover the foot. Sandals are NOT permitted.

Accidents and Injuries
18. Report any accident (spill, breakage, etc.) or injury (cut, burn, etc.) to the instructor immediately for clean up procedures.
19. If a chemical should splash in your eye(s) or on your skin, immediately flush with running water from the eyewash station or safety shower for at least 20 minutes. Notify your teacher immediately.
Handling Chemicals
20. All chemicals in the laboratory are to be considered dangerous. Do not touch or smell any chemicals unless specifically instructed to do so. The proper techniques for smelling chemical fumes will be demonstrated to you. NEVER taste any chemicals.
21. Acids must be handled with extreme care. Always add acid to water slowly and carefully swirl or stir the solution.
22. Never remove chemicals or other materials from the laboratory area.

Handling Glassware and Equipment
23. Examine glassware before each use. Never use chipped, cracked or dirty glassware.

24. Report damaged electrical equipment immediately. Look for things such as frayed cords, exposed wires, and loose connections. Do not use damaged electrical equipment.
25. If you do not understand how to use a piece of equipment, as the instructor for help.
26. Do not immerse hot glassware in cold water, it may shatter.

Heating Substances
27. Use extreme caution when using a gas burner. Keep hair, clothing and hands are a safe distance from the flame at all times. Do not put any substance into the flame unless specifically instructed to do so. Never reach over an exposed flame. Light gas burners only as instructed by the teacher.
28. Never leave a lit burner or anything that is being heated unattended for any amount of time. Never leave anything that is being heated unattended. Always turn the burner or hot plate off when not in use.
29. You will be instructed in the proper method of heating and boiling liquids in test tubes. Never point the open end of a test tube being heated at yourself or anyone else.
30. Heated metal and glass remain very hot for a long time. They should be set aside to cool and picked up with caution. Use tongs if necessary.
31. Never look into a container that is being heated