A.P. Environmental Science Syllabus

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Tutorial Times: Monday: 3:00PM - 3:30 PM
Tuesday: 6:45 AM – 7:15 AM
Wednesday: 3:00 PM - 3:30 PM

I would like to welcome you to AP Environmental Science. You might not know it, but you are making history in Alvin ISD! Alvin ISD has not offered an AP Environmental Science (APES) course in more than fifteen years. I am honored to have the opportunity to introduce you to the field of environmental science. It is a subject I embrace with passion and I am hoping you will learn to share my enthusiasm. Please find below some general information to help us start out the year. Parents, please feel free to contact me with any questions or comments. You can reach me at the above e-mail address or telephone number. Parents and students, if you would like to receive text message reminders from me regarding upcoming assignments, tests, or other important information, please send a text message to (585) 245-0333 with the message: @mrsduane

What is environmental science?

Environmental science is an interdisciplinary science, meaning it incorporates the fields of biology, geology, physics and chemistry in one field of study. Environmental science focuses on the interaction between the living and non-living aspects of the environment. We will learn how humans affect the earth and how the earth affects humans.

Course Description

The College Board provides the following course description for AP environmental science:

The AP Environmental Science course is 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 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 course.

Class Expectations:
1. Be on time and in dress code.
2. Bring all materials to class.
3. Follow directions.
4. Be enthusiastic!
5. Be respectful.
**AISD Science Grading Policy:**

**Tests: (40%)** – There will be two to four major tests per nine weeks. Calculators are not allowed because they are not allowed on the AP exam. Electronic devices will not be allowed on test days. Tests will be composed of multiple choice questions and free response questions to prepare you for the AP exam. **All tests are cumulative so be prepared!**

**Labs: (40%)** – Lab grades are based on completion of lab assessments, participation during lab, adherence to safety regulations, housekeeping, and the written assignment. Safety procedures will be followed during the entire period.

Failure to comply with behavior expectations can result in removal from the lab activities and a zero for a lab grade. A safety contract will be sent home and filled out by the student as well as the parent/guardian. These documents will be kept on file and are needed before a student can participate in any lab.

**Daily work (including homework and quizzes): (20%)** - You will have to work outside of class to be successful in APES. There will not be homework every night but you are expected to look over your notes daily for review.

**Absences:** Absences are not expected on test days or lab days. In the event of absences due to school business, trips, etc., arrangements for assignments should be made prior to the function. **It is the responsibility of the student to ask for and then complete make-up work after an absence.** Please refer to the Manvel High School student handbook for policy on time allowed for make-up tests and labs. **LABS, TESTS, AND QUIZZES MUST BE MADE UP DURING TUTORIALS.**

**AP Exams:** You are expected to take the AP exam on May 6, 2013. Alvin ISD no longer covers the cost of the AP exam. Please refer to the Alvin ISD AP contract for more information.


**Course Outline:** If you would like to view the course outline, please see my website at [http://www.alvinisd.net//Domain/1040](http://www.alvinisd.net//Domain/1040). You may also access my website by going to:

- [www.Alvinisd.net](http://www.Alvinisd.net) → schools → Manvel HS → Faculty → Duane, Julie

I look forward to an exciting year! Mrs. Duane

**Please sign below to acknowledge you have read the APES syllabus.**

Parent Name Printed: ________________________________ Parent Signature: ________________________________

Parent e-mail: ________________________________ Parent Phone Number: ________________________________

Student Name Printed: ________________________________ Student Signature: ________________________________
Course Outline

* Please note: the following timeline, activities, and labs are tentative and subject to change. The duration of each unit could be lengthened or shortened as needed.

Unit 1 - Introduction to Environmental Science (2 weeks)

Topics:
- History of the Environmental Movement (Ch. 1)
- Environmental Issues and Sustainability (Ch. 1 & 25)

Activities/Labs:
- Survival Island Lab

Videos:
- Zombie Alligators
- The Lorax

Unit 2 - Science, Matter, Energy and Cycles (2 weeks)

Topics:
- Scientific Processes (scientific notation, significant figures, arithmetic without calculator, and unit conversions)
- Scientific Method (Ch. 2-1)
- Matter: chemistry review (Ch. 2-2, 2-3)
- Energy: laws of thermodynamics (Ch. 2-4)
- Cycles: systems, feedback loops, nutrient cycles
  - carbon, nitrogen, phosphorous, sulfur, and water (Ch. 2-5, 3-4)

Activities/Labs:
- Experimental Design: the effect of pollution on plants (long term data collection)
- How Scientists Do Science
- Cats in Borneo

Unit 3 - Ecosystems, Biomes, and Climate (3 weeks)

Topics:
- Ecosystems: Food chains, food webs, trophic level, energy transfer, ecological pyramids, photosynthesis and cellular respiration (Ch. 3-1, 3-2, 3-3)
- Species Interactions (Ch. 5-1)
- Ecological Succession (Ch. 5-3)
- Climate: weather vs. climate, atmospheric circulation and the coriolis effect, el nino, solar intensity and latitude (Ch. 7-1)
- Biomes (Ch. 7-2)

Activities/Labs:
- Owl Pellet Biomass
- Lynx and Hair
- Interacting Populations (Carrolina Kit)
Specific Heat and Climate
Biome project

Unit 4 - Biodiversity, Evolution, and Species (2 weeks)
Topics:
- Importance of biodiversity (Ch. 4-1)
- Natural Selection and evolution (Ch. 4-2, 4-3)
- Speciation (Ch. 4-4)
- Species Diversity: keystone species, indicator species, invasive species (Ch. 4-5, 4-6)
- Endangered Species/Extinction (Ch. 9)
- Sustaining Biodiversity (Ch. 10-4, 10-5)
Activities/Labs:
- Something's Fishy (sampling)
- Parking lot biodiversity
- Wanted Poster (endangered species)
Movies/Videos:
- Cane Toads

Unit 5 - Population Growth and Human Populations (2 weeks)
Topics:
- Population growth (Ch. 15-2)
  - carrying capacity, reproductive strategies, survivorship
- Human Population dynamics
  - size, distribution, fertility rates, growth rates, doubling time, demographic transition, age-structure diagrams
- Population size
  - strategies for sustainability, national policies
- Impacts of Population Growth (Ch. 6)
  - hunger, disease, economic, resources, habitat use and destruction
Activities/Labs:
- Duckweed population study
- Human Demography Study
Videos:
- Naked Science: The Human Family Tree
- History Channel: The Plague (if time allows)

Unit 6 - Earth Systems (2 weeks) and Soil (2 weeks)
Topics:
- Geologic Processes and Hazards (Ch. 14-1, 14-2)
  - plate tectonics, volcanism, earthquakes, rock cycle, geologic time scale
- Mineral Resources: mining (Ch. 14-3, 14-4)
Soil formation, composition, type, physical and chemical properties
Food, Soil and Pest Management (Ch. 12)
Soil erosion and conservation

Activities/Labs:
- Chemical and physical weathering kit
- Physical and chemical properties of soil
- Soil Sampling and Testing
- Earthquake tracking
- Cookie Mining Lab

Videos:
- National Geographic How the Earth Was Made Video Series
- Food Inc.

End 1st Semester

Unit 7 - Land Use & Pollution (2 weeks)
Topics:
- Forest Resources (Ch. 10-1, 10-2)
- Grassland Resources (Ch. 10-3)
- Solid and Hazardous Waste (Ch. 21)

Activities/Labs:
- Composting
- Decomposition in Landfills

Unit 8 - Energy (2 weeks)
Topics:
- Nonrenewable Energy (Ch.15)
  - Oil, natural gas, coal, and nuclear energy
- Hydraulic Fracturing
- Renewable Energy (Ch.16)
  - solar, hydropower, wind power, biomass, geothermal energy, and hydrogen

Activities/Labs:
- Energy Research Project

Movies/Videos:
- Gas Land
- CSI episode: Fracking (if time allows)
- Crude Awakening
- Deep Water Horizon Documentaries
Unit 9 - Water Resources & Pollution (4 weeks)

Topics:
- Aquatic biological resources (freshwater and marine ecosystems) (Ch. 8)
- Threats to aquatic ecosystems (Ch. 11)
- Drinking water availability and issues (Ch. 13)
- Water Pollution (Ch. 20)
- Groundwater/stream pollution
- Ocean Acidification (atmosphere-ocean interactions)
- Waste water treatment
- Water conservation

Activities/Labs:
- Water Quality Testing
- Groundwater Contamination Forensics
- Stream Contamination Forensics
- Waste water treatment Demo

Movies/Videos:
- Blue Gold
- NRCD Acid Test

Unit 10 - Atmosphere, Air, Pollution and Climate Change (3 weeks)

Topics:
- The atmosphere and air pollution (Ch. 18)
  - Nature of atmosphere: composition and structure
  - Outdoor air pollution
  - Acid Deposition
  - Indoor air pollution
- Climate change and ozone disruption (Ch. 19)

Activities/Labs:
- Air Particulate study
- Greenhouse Effect and Global Warming Lab
- Air Pollution Investigation Kit

Movies/Videos:
- The 11th Hour

Unit 11 - Toxicology and Human Health (1 week)

Topics:
- Biological hazards and chemical hazards (Ch.17)
- Risk Analysis

Activities/Labs:
- LD$_{50}$ Brine shrimp lab
Unit 12 - Economics, Politics, and Sustainability (2 weeks)
Ch. 22, 23, 24

April 22nd through May 3rd – Review Concepts to Prepare for AP Test

May 6, 2013: AP Test

May 7th through May 31st – Environmental Video Series and Competitions