



# AP Environmental Science Mrs. Hoffman

Email: [Kelly\\_K\\_Hoffman@mcpsmd.org](mailto:Kelly_K_Hoffman@mcpsmd.org)

Office Phone: (301) 284-4500 ext. 4593 Room: 3052

2015 – 2016



See Upcoming Events & Assignments at <http://hoffmangoesapes.weebly.com>

## **DESCRIPTION:**

AP Environmental Science is a two semester, interdisciplinary course designed to be the equivalent of a one-semester, introductory, college-level course. Students learn the scientific principles, concepts, and methodologies required to understand the environment, to evaluate the relative risks associated with environmental problems, and to examine alternative solutions for resolving and/or preventing them. Laboratory and field investigations provide opportunities to test concepts and principles that are introduced in the classroom. Two semesters of Biology is a prerequisite for this course and a two semester course in Chemistry is a recommended co-requisite.

## **CORE UNDERSTANDINGS:**

- **Science is a process.**
  - Science is a method of learning about the world.
  - Science constantly changes the way we understand the world.
- **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.
- **The Earth itself is one interconnected system.**
  - Natural systems change over time and space.
  - Biogeochemical systems vary in ability to recover from disturbances.
- **Humans alter natural systems.**
  - 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.
- **Environmental problems have a cultural and social context.**
  - Understanding the role of cultural, social and economic factors is vital to the development of solutions.
- **Human survival depends on developing practices that will achieve sustainable systems**

## **LABORATORY AND FIELD WORK:**

This course asks for a large commitment to laboratory work and projects. It is expected that you will follow the proper safety procedures. Some labs may require you to collect data independently around your home or neighborhood. Safety rules apply to all classroom activities and fieldwork conducted on the GHS school grounds or at Bohrer Park.

## **EXPECTATIONS:**

1. Keep an interactive logbook/binder for class notes, readings, homework and labs. Label the following sections:
  1. Warm ups, 2. Notes, 3. Labs/HW, 4. Study Guides/FRQ's, 5. Tests/Quizzes, 6. Handouts
2. Participate in class discussions. Environmental topics promote much discussion, so staying involved should be no problem. To discuss issues intelligently, you must be reading and reflecting at home.
3. Participate in field studies. An effective study of the environment can only be made through firsthand observation. The time and nature of the field investigations will be announced to enable the student to be appropriately dressed for the activity, participate in a manner consistent with all safety rules and be aware of any potential plant or animal irritants or hazards.
4. You are expected to come to class regularly. If you are absent from a class, arrange to make up missed work as soon as possible. Assignments that are due the day you are absent are still expected to be turned in via email.
5. Ask for help if you need it. I am available after school by appointment and most days at lunch.

## **GRADING:**

Grades will reflect individual achievement of the MCPS Standards for a specific marking period.

### Assignment Values\*

- Tests 40%
- Quizzes/Notebook checks 20%
- Projects 20%
- Labs 15%
- Homework/Classwork 5%

*\*Note: These values are approximations. There will be no extra credit.*

### Absent for a Due Date:

- If you are absent during a day that an **assignment or project is due, it is expected that you send photo evidence or an email attachment to show that you completed the assignment on time.** Once you return, you will turn in the actual assignment in for a grade.

### Late Work and Missing Work:

- Each assignment will have a **due date.** Your grade will drop one letter grade if it is not turned in on time.
- The **deadline** is the last day an assignment will be accepted for a grade (at the end of a unit). Work not turned in by the deadline will be considered missing and will be recorded in the grade book as a **ZERO.**

### Revision of Student Work:

- Assessed tasks may be revised to receive a higher grade until the end of the lesson sequence.
  - Revised work within a lesson sequence will be accepted until the lesson sequence assessment is given. Original work must be attached to the revised work.
  - The end-of-unit assessment corrections will be allowed for specific questions as determined by the teacher.
- Assignments scoring less than a 25% will be reduced to a zero. Assignments will be reassessed at the teacher's discretion.
- Quizzes may be taken a second time, however, the second score will take precedence over the first. The student is responsible for attending the makeup testing session, as announced by the teacher and posted on the website.

## **ACADEMIC DISHONESTY:**

I have **ZERO** tolerance for cheating, copying, or unapproved collaboration of any kind. It is assumed that you will strictly abide by the Academic Honor Code. Make sure that you cite all references, including internet sites, in all submitted work. Any work found to be plagiarized will result in a zero, no exceptions.

## **COMMUNICATION:**

- Student Handbook/ Planner
- Progress Reports/Interims
- Report Cards
- Edline ([www.edline.net](http://www.edline.net))
- Class website for daily activities, homework, review sites: **hoffmangoesapes.weebly.com**



Students and parents have the **option** to receive reminder text messages from me through the website [www.remind101.com](http://www.remind101.com). To become a part of my APES class reminders TEXT **(513) 259-2041** with the MESSAGE **"@apeshoff."** Standard text message rates apply. These messages will include important due date reminders for tests, quizzes, projects and any other major assignments. If you opt to not participate, the class website ([hoffmangoesapes.weebly.com](http://hoffmangoesapes.weebly.com)) will be updated regularly to show upcoming assignments in the gradebook.

## **OPPORTUNITIES FOR EXTRA HELP**

You are responsible for your education. I am here to help in any way possible and I encourage you to come to me for help. I am available at lunch or after school by appointment. My office is located in Room 3052.

# 2015 - 2016 Syllabus

**Environmental Science AP Test Date: 8 am, Monday, May 2, 2016**

UNIT	TIME	LABS AND ACTIVITIES	TEXTBOOK READINGS
<p><b>Intro to APES/Environmental Relationships/Environmental History</b></p> <ul style="list-style-type: none"> <li>• SM Practice/Lab reports</li> <li>• Tragedy of the commons</li> <li>• Ecological footprints</li> <li>• Overview of Environmental History</li> <li>• Sustainable Development</li> </ul>	<p>1-2 weeks</p>	<p><b>Ecological Footprint:</b> students estimate the land area required to support themselves</p> <p><b>Environmental History Timeline:</b> research a major environmental event/person in environmental history</p> <p><b>The Lorax vs. The Truax</b></p>	<p>Chapters 1, 2</p>
<p><b>Ecology</b></p> <p>A. Flow of Energy through Earth's Systems</p> <ul style="list-style-type: none"> <li>• Movement of energy/conservation of energy principles</li> <li>• Biotic and Abiotic factors</li> <li>• E Transfer, NPP, Trophic levels</li> </ul> <p>B. Cycling of Matter through Earth's Systems</p> <ul style="list-style-type: none"> <li>• H<sub>2</sub>O, C, N, P, S</li> <li>• Major elements vs. trace elements</li> </ul> <p>C. The Biosphere</p> <ul style="list-style-type: none"> <li>• Interactions of organisms and their environment</li> <li>• Changes in ecosystems over time- succession</li> <li>• Evolution of life- natural selection, extinction</li> <li>• Biodiversity</li> </ul>	<p>6 weeks</p>	<p><b>Field Research:</b> comparing biodiversity between 2 fields (old and new)</p> <p><b>Biological Energy Transfer Lab:</b> Calculating biological energy transfer in an open field food web</p> <p><b>Biome presentations:</b> research and present information on various biomes</p> <p><b>Shannon-Wiener Biodiversity Lab:</b> compare and calculate the biodiversity of trail mix samples; Comparing Biodiversity of cars</p> <p><b>Wanted Posters:</b> create wanted posters for alien species</p> <p><b>Lab Design:</b> students plan a lab to measure the importance of a particular element in nature</p> <p><b>Nutrient Cycle Stories:</b> Compose a 1st person story as a molecule travelling through a cycle.</p>	<p>Chapters 3, 4, 5.1, 7, 8, 9, 10, 11</p>
<p><b>Population Dynamics</b></p> <p>A. Population principles in ecosystems</p> <ul style="list-style-type: none"> <li>• Numerical growth patterns</li> <li>• Carrying Capacity</li> </ul> <p>B. Population Growth and Patterns in Ecosystems</p> <p>C. Human population issues</p> <ul style="list-style-type: none"> <li>• Global and regional numerical growth</li> <li>• Regional population distribution based on age and gender</li> <li>• Demographics- birth and death rates; Calculations</li> <li>• Cultural and economic influences on human population growth</li> </ul> <p>D. Land Use</p> <ul style="list-style-type: none"> <li>• Residential and commercial</li> <li>• Recreational and wilderness</li> </ul>	<p>2 weeks</p>	<p><b>World Population Lab:</b> build and study population pyramids from various countries</p> <p><b>Food for Thought Simulation:</b> statistics are compared for different regions around the world (resources/uses/pollution)</p> <p><b>Oh, Deer:</b> Determining population size and growth expected in a herd of deer</p> <p><b>Calculating Carrying Capacity:</b> Calculating the amount of land required to support your food supply for a year</p>	<p>Chapters 5.2, 5.3, 6, 22</p>

UNIT	TIME	LABS AND ACTIVITIES	TEXTBOOK READINGS
<b>Food, Soil, Pests and Human Health</b> A. Food Resources B. Soil <ul style="list-style-type: none"> <li>• Soil types, profiles</li> </ul> C. Agriculture and Pest Management <ul style="list-style-type: none"> <li>• Impact of fertilizers</li> <li>• Impact of pesticides</li> </ul> D. Human Health <ul style="list-style-type: none"> <li>• Toxicology</li> <li>• LD-50</li> </ul>	2 weeks	<b>LD50 Lab:</b> calculate the LD50 of brine shrimp in sulfuric acid  <b>Soil Classification:</b> measuring physical properties of soil, investigate different soil profiles  <b>Sand and Squand Study:</b> Study the composition of various samples	Chapters 12, 17
<b>Geology and Waste</b> A. Geologic Time B. Plate tectonics C. Mineral resources D. Rocks <ul style="list-style-type: none"> <li>• The rock cycle</li> <li>• Factors causing erosion</li> </ul> E. Waste Management <ul style="list-style-type: none"> <li>• Solid Waste Management</li> <li>• Hazardous Materials</li> </ul>	3 weeks	<b>Rock and Mineral Identification:</b> using keys to identify rocks and minerals  <b>Mining Project:</b> research a mining town and the environmental effects it has caused  <b>Personal Materials Audit:</b> Keeping track of your usage patterns  <b>Measuring Your Impact:</b> Calculating the average per capita ecological footprint for the world  <b>Geology ROCKS! Board Game:</b> Create a Review game	Chapters 14, 21
<b>Energy Sources</b> A. Nonrenewable vs. Renewable B. Energy calculations	3 - 4 weeks	<b>Energy Presentations:</b> students do presentations on various forms of energy; presentation includes a homemade poster and an outline for the class  <b>Home Energy Audit:</b> perform a home energy audit tracking weekly energy usage	Chapters 15, 16
<b>Hydrosphere</b> A. Aquatic ecology B. Water resources C. Water Quality and pollution <ul style="list-style-type: none"> <li>• Uses of water</li> <li>• Point sources vs. Non-point pollution</li> <li>• Excess nutrients</li> </ul>	2 - 3 weeks	<b>Drip Drip:</b> examining water loss from leaks  <b>Determining Groundwater Contamination:</b> investigate pollution plume movement  <b>Water Diversions:</b> Investigating how water diversions affect surrounding ecosystems and human communities  <b>Water Quality Testing:</b> evaluating the quality of a local pond	Chapters 13, 20

UNIT	TIME	LABS AND ACTIVITIES	TEXTBOOK READINGS
<b>Atmosphere</b> A. Climate, Biomes and Weather B. Air Quality <ul style="list-style-type: none"> <li>• Particulates</li> <li>• Gas emissions and photochemical smog</li> <li>• Acid rain</li> <li>• Troposphere ozone</li> <li>• Indoor air quality</li> </ul> C. Examples of Global Change <ul style="list-style-type: none"> <li>• Greenhouse gas concentrations</li> <li>• Stratospheric ozone</li> <li>• El Nino</li> <li>• Habitat destruction</li> </ul>	4 - 5 weeks	<b>CO<sub>2</sub> You Spew:</b> examining personal carbon dioxide emissions  <b>Testing for Tropospheric Ozone Pollution:</b> analyze ozone pollution for local variation and possible impact on human health  <b>Lichen Field Study:</b> Analyzing the presence of lichens and tardigrades  <b>Global Warming and Atmospheric CO<sub>2</sub> Correlation:</b> Research CO <sub>2</sub> Concentrations in the atmosphere over the past 420,000 years  <b>Acid rain and seed germination lab:</b> design and implement an experiment to test the effect of acid rain on germination	Chapters 18, 19

**APES Movies:**

- The Lorax
- The 11<sup>th</sup> Hour
- The Cove
- Erin Brockovich
- A Civil Action
- An Inconvenient Truth

**Ongoing and Culminating Projects:**

- **Environmental Presentations:** Students will choose from topics covered on the AP Exam and present and reteach content
- **Current Event Presentations/Projects:** Students collect and summarize environmental articles from the credible sources throughout the first semester.
- **Final Project:** Students may choose from the following:
  - Design a webpage about an environmental topic
  - Film an infomercial/PSA on an environmental topic
  - Create a board game to review a particular environmental topic.
  - Analyze an Environmental Case Study
  - Design/create a Green home or community
  - Create art with recyclable materials
  - Create a portfolio of images from APES
  - Analyze an environmental movie (based on a true story or documentary)
  - Write a short story book for elementary or middle school students that teaches a lesson about the environment
  - Write a petition to a government official urging him or her to take specific action on an environmental topic



# DID YOU KNOW??



- Recycling one aluminum can saves enough energy to run a TV for three hours.
- During the time it takes you to read this sentence, 50,000 12-ounce aluminum cans are made.
- Aluminum cans may be recycled ad infinitum (forever!).
- We consume over 80 trillion aluminum cans every year.
- The world's tallest tree is a coast redwood in California, measuring more than 360 feet or 110 meters.
- The world's oldest trees are 4,600 year old Bristlecone pines in the USA.
- Every day, American businesses generate enough paper to circle the earth 20 times!
- Each year, Americans throw away 25 trillion Styrofoam cups.
- Only 1% of the world's water supply is usable, 97% are the oceans and 2% is frozen (for now).
- Recycling a single run of the Sunday New York Times would save 75,000 trees.
- On average, ONE supermarket goes through 60,500,000 paper bags per year!
- An automatic dishwasher uses less hot water than doing dishes by hand, an average of six gallons less per cycle, or over 2,000 gallons per year.
- The amount of wood and paper we throw away each year is enough to heat 50,000,000 homes for 20 years.
- Every time you open the refrigerator door, up to 30 percent of the cold air can escape.
- Americans use 2,500,000 plastic bottles every hour, most of which are thrown away!
- Plastic bags and other plastic garbage thrown into the ocean kill as many as 1,000,000 sea creatures every year.
- A modern glass bottle takes 4000 years or more to decompose.
- About one-third of an average landfill is made up of packaging material.
- The U.S. is the #1 trash-producing country in the world at 1,609 pounds per person per year. This means that 5% of the world's people generate 40% of the world's waste. We toss out two billion plastic razors, a million and a half tons of paper towels, and 12 billion disposable diapers annually.
- More than 20,000,000 Hershey's Kisses are wrapped each day, using 133 square miles of tinfoil. All that foil is recyclable!!
- Rainforests are being cut down at the rate of 100 acres per minute.
- If you walk a mile along an average US highway, you will see, on average about 1,457 pieces of litter.
- You burn more calories sleeping than you do watching TV.
- On the average, the 140 million cars in America are estimated to travel almost 4 billion miles in a day, and according to the Department of Transportation, they use over 200 million gallons of gasoline doing it.
- Every year we throw away 24 million tons of leaves and grass. Leaves alone account for 75% of our solid waste in the fall.
- Over 100 pesticide ingredients are suspected to cause birth defects, cancer, and gene mutations.
- Every day 40,000 children die from preventable diseases.
- One ton of carbon dioxide that is released in the air can be prevented by replacing every 75 watt light bulbs with energy efficient bulbs.
- By turning down your central heating thermostat one degree, fuel consumption is cut by as much as 10%.
- Insulating your attic reduces the amount of energy loss in most houses by up to 20%.
- About 1% of U.S. landfill space is full of disposable diapers, which take 500 years to decompose.
- Every day 50 to 100 species of plants and animals become extinct as their habitat and human influences destroy them.
- Medicines produced in tropical forests bring in 30 billion dollars a year commercially.
- Large areas of South and Central America are cleared and burned for cattle ranching. This is so that farmers can provide cheap beef to consumers in the West.
- Every year approximately four billion tons of carbon accumulates in the air each year, about 30% of this comes directly from the continued burning of the rainforests.
- Already over half of the world's tropical forests have been lost.

## AP Environmental Science Acknowledgement

I \_\_\_\_\_ (student name) have read the above course outline and expectations.  
I agree to follow the academic and safety rules set forth in this contract.

\_\_\_\_\_  
Student signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
**Student** E-mail Address

-----  
I \_\_\_\_\_ (Guardian name) have read the above course outline and expectations. I understand that my son/daughter must obey these rules to insure the safety of all the participants in the class.

Does the student have any allergies?

Yes

No

If yes, please describe below.

\_\_\_\_\_  
\_\_\_\_\_

Is there anything you feel I should know?

\_\_\_\_\_  
\_\_\_\_\_

\_\_\_\_\_  
Parent/guardian signature

\_\_\_\_\_  
Date

\_\_\_\_\_  
**Parent** E-mail Address

**Environmental Science AP Test Date: 8 am, Monday, May 2, 2016**