# Advanced Placement Environmental Science
# Syllabus - Spring 2019

**Course Description**: Modified from http://www.collegeboard.com – your site for AP course information:
AP Environmental Science is designed to be the equivalent of a one-semester, introductory college course in environmental science. The goal of the AP Environmental Science course is to provide students with the scientific concepts, principles, 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. To achieve these goals, we will focus on the following: personal experience in experimental design; understanding the unifying themes that integrate all biological and environmental science topics; and the application of knowledge and critical thinking to environmental and societal concerns. This will include experimental design, labs, in-class instructional activities, and practice AP exam materials (multiple choice and free response prompts).

**Textbook**: $141.28 by Andrew Friedland and Rick Relyea
*Environmental Science for AP* 2015, second edition

**Online resources**:
Students will have access to many resources at AP Central
https://apstudent.collegeboard.org/apcourse/ap-environmental-science
Students are encouraged to explore the available resources.

**Grade Weights**:
- Informal 0%
- Class Grades 80%
  - Formative 29%
  - Summative 71%
- Final Exam 20%

**Formative Assessments** are samples of student work before, during, and after instruction that identify academic needs and help provide continuous feedback to students. These assignments may include but are not limited to study guides, guided reading questions, journal writing, projects, hands-on activities, quizzes, homework, etc.

**Summative Assessments** are major culminating tasks such as projects, research, essays, labs, portfolio, tests, etc.

**Informal Activities**: Non-weighted practice opportunities that will assist the student in mastering the standards.

**AP Test Information**:
The APES test is scheduled for Monday, May 6, 2019, at 12:00 noon.
Information about the test, including registration and fees are available on the AP Central page. Course and test registration will be covered in class.

**The Nature of Science**: Please review the expectations below. Students in this course are expected to…

1. ...use representations and models to communicate scientific phenomena and solve scientific problems.
2. ...use mathematics appropriately.
3. ...engage in scientific questioning to extend thinking or to guide investigations within the context of the AP course.
4. ...plan and implement data collection strategies appropriate to a scientific question.
5. ...perform data analysis and evaluation of evidence.
6. ...work with scientific explanations and theories.
7. ...connect and relate knowledge across various scales, concepts and representations in and across domains.

**Course Themes**: From http://www.collegeboard.com – your site for AP course information:
Although Environmental Science is interdisciplinary, there are several major unifying constructs, or themes, that are covered in the course. The following themes provide a foundation for the structure of the AP Environmental Science course...

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.
4. 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.
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.

**Course Topics**; Modified from http://www.collegeboard.com – your site for AP course information:
This course covers the following topics:

I. **Earth Systems and Resources (10%-15%)**
    A. Earth Science Concepts (Geologic time scale; plate tectonics, earthquakes, volcanism; seasons; solar intensity and latitude) **Chapters 1 & 2**
    B. The Atmosphere (Composition; structure; weather and climate; atmospheric circulation and the Coriolis effect; atmosphere-ocean interactions; ENSO) **Chapters 3 & 4**
    C. Global Water Resources and Use (Freshwater/saltwater; ocean circulation; agricultural, industrial, and domestic use; surface and groundwater issues; global problems; conservation) **Chapter 9**
    D. Soil and Soil Dynamics (Rock cycle; formation; composition; physical and chemical properties; main soil types; erosion and other soil problems; soil conservation) **Chapter 8**

II. **The Living World (10%-15%)**
    A. Ecosystem Structure (Biological populations and communities; ecological niches; interactions among species; keystone species; species diversity and edge effects; major terrestrial and aquatic biomes) **Chapters 3 & 5**
    B. Energy Flow (Photosynthesis and cellular respiration; food webs and trophic levels; ecological pyramids) **Chapter 3**
    C. Ecosystem Diversity (Biodiversity; natural selection; evolution; ecosystem services) **Chapter 6**
    D. Natural Ecosystem Change (Climate shifts; species movement; ecological succession) **Chapters 3 & 5**
    E. Natural Biogeochemical Cycles (Carbon, nitrogen, phosphorus, sulfur, water, conservation of matter) **Chapters 3 & 4**

III. **Population (10%–15%)**
   A. Population Biology Concepts (Population ecology; carrying capacity; reproductive strategies; survivorship) **Chapter 6**
   B. Human Population **Chapter 7**

IV. **Land and Water Use (10%–15%)**
   A. Agriculture **Chapters 10 & 11**
   B. Forestry (Tree plantations; old growth forests; forest fires; forest management; national forests) **Chapter 10**
   C. Rangelands (Overgrazing; deforestation; desertification; rangeland management; federal rangelands) **Chapter 10**
   D. Other Land Use **Chapter 10**
   E. Mining (Mineral formation; extraction; global reserves; relevant laws and treaties) **Chapter 8**
   F. Fishing (Fishing techniques; overfishing; aquaculture; relevant laws and treaties) **Chapter 11**
   G. Global Economics (Globalization; World Bank; Tragedy of the Commons; relevant laws and treaties) **Chapter 20**

V. **Energy Resources and Consumption (10%–15%)**
   A. Energy Concepts (Energy forms; power; units; conversions; Laws of Thermodynamics) **Chapter 12**
   B. Energy Consumption **Chapter 12**
   C. Fossil Fuel Resources and Use (Formation of coal, oil, and natural gas; extraction/purification methods; world reserves and global demand; synfuels; environmental advantages/disadvantages of sources) **Chapter 12**
   D. Nuclear Energy (Nuclear fission process; nuclear fuel; electricity production; nuclear reactor types; environmental advantages/disadvantages; safety issues; radiation and human health; radioactive wastes; nuclear fusion) **Chapter 12**
   E. Hydroelectric Power (Dams; flood control; salmon; silting; other impacts) **Chapter 12**
   F. Energy Conservation (Energy efficiency; CAFE standards; hybrid electric vehicles; mass transit) **Chapter 13**
   G. Renewable Energy (Solar energy; solar electricity; hydrogen fuel cells; biomass; wind energy; small-scale hydroelectric; ocean waves and tidal energy; geothermal; environmental advantages/disadvantages) **Chapter 13**

VI. **Pollution (25%–30%)**
   A. Pollution Types **Chapters 14, 15, & 16**
   B. Impacts on the Environment and Human Health **Chapters 14, 15, 16, & 17**
   C. Economic Impacts (Cost-benefit analysis; externalities; marginal costs; sustainability) **Chapters 14, 15, & 16**

VII. **Global Change (10%–15%)**
   A. Stratospheric Ozone (Formation of stratospheric ozone; ultraviolet radiation; causes of ozone depletion; effects of ozone depletion; strategies for reducing ozone depletion; relevant laws and treaties) **Chapter 15**
   B. Global Warming (Greenhouse gases and the greenhouse effect; impacts and consequences of global warming; reducing climate change; relevant laws and treaties) **Chapter 19**
   C. Loss of Biodiversity **Chapter 18**

**Pacing Guide:** This guide is designed to keep the course on schedule to cover all required topics prior to the AP test. Objectives are aligned with the themes and topics defined by the College Board. Labs (other than those in **bold**), Instructional Activities, Field Trips and Online Discussions are subject to change.

| Days | Book | Stndrds | Unit Title |
|---|---|---|---|
| 10 | Chapters 1, 2, 14, 15, 16, & 20 | | **Unit One: An Introduction to Environmental Science** |
| | | | Objectives |
| | | CT | Characterize the interdisciplinary nature of environmental science |
| | | CT1 | Understand the scientific method and nature of scientific inquiry |
| | | CT1 | Examine the influences of culture and worldview on the choices people make |
| | | CT5 | Describe the precepts of classical and neoclassical economic theory, including laissez-faire policies and cost-benefit analysis, and their implications for the environment |
| | | CT5, 6c | Explain the fundamentals of environmental economics and ecological economics |
| | | CT4, 4g | Compare and contrast the ideas of Thomas Malthus and Essay on the Principle of Populations, Paul and Anne Erlich and The Population Bomb, and Garrett Hardin and the"The Tragedy of the Commons" |
| | | CT5, 6c | Compare the concepts of economic growth, economic health, and sustainability |
| | | CT5, 6c | Analyze the internal, external, and marginal costs of economic decisions based on long-term effects and sustainability |
| | | CT6 | Outline the nature, evolution, and expansion of environmental ethics |
| | | CT5, CT6 | Describe environmental policy and assess its societal context |
| | | 4g | Identify institutions important to environmental policy such as the United Nations, the European Union, and World Bank and recognize major U.S. environmental laws such as the Environmental Policy Act, the Clean Air Act and the Clean Water Act |
| | | | Delineate the steps of the environmental policy process and identify the role of science in policymaking |
| | | | Describe the molecular building blocks of organisms |
| | | CT2 | Differentiate among the forms of energy and apply the Laws of Thermodynamics in systems |
| | | CT3 | Distinguish photosynthesis, respiration, and chemosynthesis and summarize their importance to living things |
| | | CT3, CT4, 1a | Recognize the importance of the fossil record to inferring the history of past life on Earth |
| | | | **LABS** |
| | | | **Tragedy of the Commons Lab** |
| | | | INSTRUCTIONAL ACTIVIES |
| | | | Calculating Your Ecological Footprint |
| | | | Three Gorges Dam Cost and Benefit Analysis |
| | | | "What Did T-rex Taste Like?" – Introduction to Phylogenies |
| | | | Online Discussions |
| | | | Ecological Footprints |
| | | | Laws of Thermodynamics and Your Daily Life |
| 12 | Chapt | | **Unit Two: The Living World** |

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| | | | Objectives |
| | | 2c | Explain the process of natural selections and cite evidence for this process |
| | | 2c | Describe the ways in which evolution influences biodiversity |
| | | 7c | Discuss reasons for species extinction and mass extinction events and relate them to the geologic time scale **(Same1)** |
| | | 7c | Evaluate the primary causes of biodiversity loss, specify the benefits of biodiversity, assess the science and practice of conservation biology |
| | | 2a, 7c | Identify efforts and challenges involved in the conservation of biodiverisity |
| | | 2a | Compare and contrast the major types of species interactions |
| | | 2b | Characterize feeding relationships and energy flow, using them to construct trophic levels and food webs |
| | | 2b | Apply the second law of thermodynamics and the concept of biomagnifications to trophic levels |
| | | 2a | Describe fundamental and realized niches |
| | | 2a | Distinguish characteristics of a keystone species |
| | | 2d | Describe the processes of primary and secondary succession and describe pine, mixed and hardwood forests |
| | | 2d | Perceive and predict the potential impacts of invasive species in communities |
| | | 4d2 | Explain the goals ecological restoration |
| | | 2a | Describe the major terrestrial biomes of the world |
| | | 2a | Define ecosystems and evaluate how living and non-living entities interact at the population, community, and ecosystem levels |
| | | 2a | Outline the fundamentals of landscape ecology and relate them to edge effects |
| | | 2e | Compare and contrast how carbon, phosphorus, nitrogen, sulfur, and water cycle through the environment and relate them to the Law of Conservation of Matter |
| | | 7c | Contrast the background extinction rates with periods of mass extinction including the sixth mass extinction scientists believe may be occurring today **(Same1)** |
| | | 7c | Evaluate the primary causes of biodiversity loss such as habitat alteration, invasive species, pollution, and climate change |
| | | 7c | Assess the science and practice of conservation biology and compare and contrast traditional and innovative biodiversity conservation efforts and legislation |
| | | | LABS |
| | | | Geologic Timescale Inquiry Activity |
| | | | Virtual Lab from Hippocampus- Predator/Prey Relationships |
| | | | **Primary Consumer Energy Flow** |
| | | | Field Activity- Primary and Secondary Succession |
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| | | | INSTRUCTIONAL ACTIVIES |
| | | | Video- Historical Geology: A Glimpse of the Earth's Past |
| | | | Construction of Biomass Pyramids |
| | | | Biomes Project and Presentation |
| | | | Video- Processes and Cycles in the Environment: Hypoxia |
| | | | You Decide- Can We Prevent the Extinction of Species |
| 7 | Chapters 6 & | | **Unit Three: Population** |
| | | | Objectives |

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| | | 3a | Outline the characteristics of populations that help predict population growth and assess the role of logistic growth, carrying capacity, reproductive strategies and limiting factors in population ecology |
| | | 3b1 | Assess the scope and history of human population growth |
| | | CT4 | Evaluate how human population, affluence, and technology affect the environment |
| | | 3b1 | Explain and apply fundamentals of demography such as density, distribution, age structure, and sex ratios, as well as rates of birth, death, immigration and emigration. |
| | | 3b1 | Interpret age structure diagrams and discuss their data's implications |
| | | 3b1 | Calculate doubling times |
| | | 3b1 | Outline and assess the concept of demographic transition |
| | | 3b2 | Describe how wealth and poverty, the status of women, national policy implementation and family planning programs affect fertility rates and population growth using case studies from various parts of the world |
| | | 3b3 | Identify adverse effects of human population growth such as hunger, disease, economic effects, resource depletion and habitat destruction |
| | | | LABS |
| | | | **Population Growth with Lemna minor** |
| | | | INSTRUCTIONAL ACTIVIES |
| | | | Survivorship Curves Activity |
| | | | Calculations Practice- Population Math |
| | | | Online Discussions |
| | | | Carrying Capacity and Density-Dependent and Independent Factors |
| | | | China's Reproductive Policy |
| 7 | Chapters 1, 2, 8, 10, & 11 | | **Unit Four: Soil Dynamics and Agriculture** |
| | | | Objectives |
| | | 1a | Distinguish among the various plate tectonic settings and the phenomena that result from the convection of the mantle (volcanoes, earthquakes, mountain-building, etc) |
| | | 1d | Relate the transformations present in the rock cycle to plate tectonics and the creation and destruction of lithosphere and the process of soil formation |
| | | 1d | Characterize soil properties such as color, texture, structure and pH |
| | | 1d | Identify region differences in soil traits and their effects on agricultural types and practices |
| | | 1d | State the causes and predict the consequences of soil erosion and degradation |
| | | 1d | Recite the history and explain the principles of soil conservation |
| | | 4a1 | Recognize basic human nutritional requirements and explain the challenges of meeting those needs with a growing human population |
| | | 4a1, 4a2 | Discuss the benefits and challenges related to pesticide use, irrigation practices, and fertilizers application |
| | | 4a1 | Identify the goals, methods, and environmental impacts of the Green Revolution |
| | | 4a1 | Describe the science behind genetically modified food and evaluate the debate over its genetically modified food |
| | | 4a2 | Categorize and evaluate strategies of pest management including integrated pest management and relate relevant laws |
| | | | Describe sustainable agriculture practices such as organic farming |
| | | | LABS |

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| | | | **Soil Productivity** |
| | | | **Soil Formation and Properties** |
| | | | INSTRUCTIONAL ACTIVIES |
| | | | Plate Tectonics Investigation |
| | | | Geoblox Manipulatives- Plate Boundaries |
| | | | Films- King Corn, Food Inc., The Future of Food |
| | | | Online Discussions |
| | | | Earth's Soil Resources |
| | | | The Green Revolution and Population |
| 7 | Chapters 8, 10, 14, & 15 | | **Unit Five: Land Management and Urbanization** |
| | | | Objectives |
| | | 4e | Outline the process of mineral formation and extraction and identify global reserves and relevant laws and treaties |
| | | 4b | Explain the fundamentals of forest management and describe the major methods of harvesting timber |
| | | 4d | Identify major land management agencies, including those at the federal level, and the areas they manage including national forests, wilderness areas, wildlife refuges, national parks and wetlands |
| | | 4b | Explain the role of fires in forest ecosystems and describe the effects of fire suppression |
| | | 4b | Compare and contrast old growth forests, new growth forests and tree plantations in terms of biodiversity, ecosystem services, and complexity |
| | | 4d3 | Discuss the Bureau of Land Management's role in the management of federally owned rangeland in the United States |
| | | 4c | Recognize negative impacts of poorly managed livestock such as overgrazing, deforestation, and desertification |
| | | 4d1, 4d2 | Describe the scale and trends related to urbanization |
| | | 4d1, 4d5 | Assess suburban and urban sprawl and the pursuit of sustainable cities |
| | | 4d2 | Outline city and regional land use strategies, including those related to transportation infrastructure, effects and control measures |
| | | 6a1, 6a2 | Discuss the light, noise, and heat pollution, including the heat island effect related to urban areas |
| | | | LABS |
| | | | Old Growth and New Growth Forests Field Activity |
| | | | **Agriculture and Feeding a Growing Human Population** |
| | | | **Cookie Mining Lab** |
| | | | Urban Sprawl and Zoning Lab |
| | | | INSTRUCTIONAL ACTIVIES |
| | | | Film- Yellowstone Aflame |
| | | | Film- The Greening of a Southie |
| | | | Online Discussions |
| | | | Subsidies, Soils, and Wetlands |
| | | | Smart Growth and New Urbanization |
| 10 | Chapters 4, 9, 11, & | | **Unit Six: Water Use and Pollution** |
| | | | Objectives |
| | | 1c | Delineate the distribution of freshwater on Earth |

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| | | 2a | Describe the major types of freshwater and marine ecosystems |
| | | 1c | Discuss how we use water for agricultural, industrial and domestic purposes and alter freshwater systems |
| | | 1c | Assess problems of both surface and groundwater water supplies worldwide and propose solutions to address the depletion of fresh water |
| | | 6a3 | Assess problems of water quality, including water pollution types, sources, causes and effects |
| | | 6a3 | Propose solutions to address water pollution and promote conservation and cite legislation used to encourage such efforts including the Clean Water Act |
| | | 6a3 | Explain the processes of water purification and wastewater treatment |
| | | 2a, 6a3 | Marine and Coastal Systems: Resources, Impacts and Conservation |
| | | 1c | Identify physical, geographical, chemical, and biological aspects of marine environments and describe global ocean circulation |
| | | 4f | State popular aquaculture and fishing practices and review the current state of ocean fisheries and the reason for their decline |
| | | 6a3 | Relate cultural eutrophication and oxygen sag to excessive nutrient concentration caused by anthropogenic sources |
| | | 6a3 | Assess human impacts on marine environments and legislation designed to regulate these impacts |
| | | 6a3 | Evaluate marine protected areas and reserves as innovative solutions along with other relevant laws and treaties designed to protect these ecosystems |
| | | | LABS |
| | | | **Quality of Natural Waters: Biological Factors** |
| | | | **Quality of Natural Waters: Physical and Chemical Factors** |
| | | | **Wastewater Treatment** |
| | | | INSTRUCTIONAL ACTIVIES |
| | | | Marine and Coastal Systems Topics Presentations |
| | | | Online Discussions |
| | | | Aging Dams |
| | | | Coastal Development |
| 7 | Chapters 3, 4, 15, 18, & 19 | | **Unit Seven: Atmospheric Science, Air Pollution, and Global Change** |
| | | | Objectives |
| | | 1b | Describe the composition, structure and function of the Earth's atmosphere |
| | | 6a1 | Outline the scope of outdoor air pollution and relate its causes to natural sources and human-emitted pollutants including primary and secondary pollutants from point and non-point sources |
| | | 6a1 | Discuss the processes carried out by the U.S. EPA to monitor air quality using criteria pollutants, VOC's and toxic air pollutants and describe major air pollutants and measurement units |
| | | 6a1 | Relate the Clean Air Act to air quality improvements and reduced emissions and discuss other remediation and reduction strategies |
| | | 6a1 | Compare and contrast the causes, formation, and consequences of industrial and photochemical smog |

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| | | 7a | Explain the formation stratospheric ozone, it protective functions regarding ultraviolet radiation, causes and effects of its depletion and identify actions such as the Montreal Protocol taken to address it |
| | | 6a1 | Define acidic deposition and explain its causes and effects |
| | | 6a1 | Characterize the scope of indoor air pollution and assess potential solutions |
| | | 1b | Describe Earth's climate system and explain the many factors influencing global climate |
| | | 1b | Recognize that the sun's energy heats the atmosphere; drives air circulation; and helps determine weather, climate and seasons |
| | | 1b | Relate global wind patterns to the interactions between convection cells and the Coriolis effect |
| | | 1b | Analyze interactions between the atmosphere and the ocean that influence climate such as ENSO events |
| | | 7b | Characterize human influences on the atmosphere and global climate such as increased greenhouse gas emissions' enhancement of the greenhouse effect |
| | | 7b, 7c | Outline current and future trends and impacts of global warming including effects on wildlife |
| | | 7b | Suggest ways we may respond to climate change and cite efforts that have already been made such as the Kyoto Protocol |
| | | | LABS |
| | | | **Air Pollution and Vehicle Emissions** |
| | | | **Acid Deposition** |
| | | | Calculating Specific Heat Lab |
| | | | INSTRUCTIONAL ACTIVIES |
| | | | Video- Earth: The Biography Atmosphere Episode |
| | | | Dance of the Planet- Seasons Activity |
| | | | Coriolis Effect Demonstration |
| | | | Global Wind Belts, Convections Cells, and Pressure Cells Investigation |
| | | | Criteria Pollutants Chart |
| | | | Kinesthetic Activity- Formation of Smog and Depletion of Stratospheric Ozone |
| | | | Greenhouse Effect Demonstration |
| | | | El Nino Demonstration and Investigation |
| | | | Film- HEAT |
| | | | Online Discussions |
| | | | Montreal Versus Kyoto Protocols Discussion |
| | | | Climate Change and Human Rights Discussion |
| 7 | Chapters 12 & 13 | | **Unit Eight: Energy Resources and Consumption** |
| | | | Objectives |
| | | CT2, 5a | Perform energy and power calculations and conversions using appropriate units |

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| | | 5b | Identify the energy sources that we use and examine critical past events such as the Industrial revolution, human population growth, improvements in standards of living and energy crises |
| | | 5b | Analyze historical energy consumption, present global energy use, and future energy needs |
| | | 5c | Compare and contrast the nature, origin, extraction and use of coal, oil, natural gas and synfuels |
| | | 5c | Describe the relative abundances, reserves, and consumer demands of different fossil fuels |
| | | 5f | Specify strategies for conserving energy and enhancing efficiency to lengthen our access to fossil fuels and reduce our environmental impact including CAFE standards, hybrid vehicles, and mass transit |
| | | 5d | Compare and contrast nuclear fission and fusion |
| | | 5d | Discuss the societal debate over nuclear power including issues related to safety, radiation and human health, and radioactive wastes |
| | | 5d | Describe nuclear energy and the processes by which it can be converted into electricity |
| | | 5e | Describe the scale, methods, and impacts of hydroelectric power |
| | | 5g | Outline major sources of renewable energy and assess their potential for growth |
| | | 5g | Compare and contrast the harnessing and use of biomass, solar, wind, geothermal, and ocean energy sources |
| | | 5g | Explain hydrogen fuel cells and assess future options for energy sources and transportation |
| | | 5c-g | Evaluate the economic and environmental advantages and disadvantages of fossil fuels, nuclear energy, hydroelectric power and various other renewable energy resources |
| | | | LABS |
| | | | Field Trip- Plant Bowen (coal-burning power plant) |
| | | | Virtual Lab from Hippocampus- Nuclear Power Plant |
| | | | Solar Absorption Lab |
| | | | INSTRUCTIONAL ACTIVIES |
| | | | Energy Infobooks Presentations/Centers |
| | | | Video- 30 Days Coal Mining Episode |
| | | | Discussion of Articles- “Green Dreams” and “Grassoline at the Pump” |
| | | | Energy Calculations and Conversions Practice |
| | | | Online Discussions |
| | | | CAFE Standards |
| | | | Three-Mile Island Versus Chernobyl |
| 7 | Chapters 16 & 17 | | **Unit Nine: Environmental Hazards and Waste Management** |
| | | | Objectives |
| | | 6b1 | Identify environmental hazards related to human health such as smoking and air pollutants and categorize them as either physical, chemical, biological or cultural |

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| | | 6b2 | Describe the types, abundance, distribution, and movement of toxicants in the environment including the process of biomagnification |
| | | 6b1 | Discuss the study of hazards and their effects, including case histories, epidemiology, animal testing, and dose-response analysis |
| | | 6b1 | Compare and contrast effects due to acute and chronic exposure to hazards |
| | | 6b1 | Assess the process of risk analysis and risk management |
| | | 6b2 | Describe policy and regulation of environmental hazards in the United States and worldwide |
| | | 6a3, 6a4, 6b2 | Summarize and compare the types of waste we generate including municipal and industrial solid waste, hazardous waste, and wastewater |
| | | 6a4 | Describe the conventional waste disposal methods of landfills and incineration |
| | | 6a4 | List the major approaches to managing waste such as source reduction, recovery and disposal |
| | | 6b2 | Identify hazardous waste as ignitable, corrosive, reactive or toxic |
| | | 6b2 | Assess issues in managing hazardous waste including methods of disposal |
| | | 6b2 | Relate the cleanup of sites contaminated with hazardous waste to CERLA and the Superfund program |
| | | | LABS |
| | | | Toxicity Lab- Calculating the LC50 and LD50 with Lettuce Seeds |
| | | | Bioremediation Lab |
| | | | Field Trip- Landfill and Recycling Center |
| | | | INSTRUCTIONAL ACTIVIES |
| | | | Minamata Investigation and Discussion |
| | | | Cost and Benefit Analysis of Chlorine Use |
| | | | Article- “The Chemicals Within” |
| | | | Video Clip- “The Story of Stuff” |
| | | | E-Waste Investigation using http://michaelzhao.net/eDump/ |
| | | | Film- Trashed |
| | | | Online Discussions |
| | | | Toxic Computers |
| | | | Superfund Sites |

**Guaranteed Laboratory Investigations**

- Quality of Natural Waters: Biological Factors
- Quality of Natural Waters: Physical and Chemical Factors
- Soil Formation and Properties
- Soil Productivity
- Population Growth with Lemna minor
- Primary Consumer Energy Flow
- Air Pollution and Vehicle Emissions
- Acid Deposition
- Agriculture and Feeding a Growing Human Population
- Wastewater Treatment

**Behavioral Expectations, etc…**

**Missed work:**

Your work is your responsibility!

- □ If you miss a day of class, you must plan for how you will recover the lost time.

- □ Due to the pacing discussed above, you may not be working on the same standard as your classmates.
- □ You are responsible for keeping up with your timeline and meeting your goals.

**Conduct & Work Habit Expectations:** Rules will be gone over in class. This will include procedures and consequences on tardiness, bathroom passes, and behavior expectations. All school policies in the student handbook will be followed, as well as all lab safety rules.

- □ COME TO CLASS PREPARED:
- □ Read the text and participate in online activities associated with text readings
- □ Students must wear closed toed shoes and goggles during labs as directed by the teacher. Students not prepared for labs will receive a zero for the lab assignment. Lab days will be announced.

**Academic Integrity:**
All work (homework, tests, papers, projects, labs, etc.) must be your own. Cheating includes, but is not limited to

- □ Submitting work copied from a friend or other outside source
- □ Giving work to a friend or giving/receiving excessive assistance from someone
- □ Accepting or giving help during a test or quiz.
- □ Using notes stored on a calculator without expressed permission of the teacher
- □ Using a cell phone or other electronic device during a summative exam. All cell phones will be stowed during exams.
- □ Plagiarism, a form of cheating, involves presenting someone else's ideas or words, without giving credit!

**Plagiarism/Cheating Policy:** Cheating and/or plagiarism are regarded as very serious offenses. Copying or paraphrasing material/text from the work of another student, from published sources (i.e.: Spark Notes, magazines, newspapers, etc.) and/or from the internet without proper citation constitutes academic theft which will result in a family contact, a zero on the assignment, and an administrative referral (if the incident involves a summative assignment).

**Cell Phones:** The school cell phone policy will be enforced in this classroom.

- Use of electronic devices and headphones is only allowed before school, after school, and during lunch. Headphones during class time and class changes (in the hallway) are not permitted. Headphones worn in the hallway will result in administrative referral.
- Electronic device use in the classroom is not permitted unless indicated expressly by the teacher for academic purposes such as research or review games.

**Tutoring and Recovery**:
If you need extra help mastering a standard, attend tutoring in room 504 at the times below:

- Monday afternoon 3:30 – 4:00
- Thursday morning 8:00 – 8:30

Other times may be available by appointment. Ask your teacher.
Always confirm that your teacher is available for the scheduled times before attending tutoring.

**Review**
There will be 4 mandatory after-school (3:30 – 4:30) review sessions on April 9, 16, 23, and 30. Add these dates to your calendar and plan to attend.