



Advanced Placement Environmental Science
West Mecklenburg High School
S. Ramsey
831

Course Description

Advanced Placement Environmental Science is designed to be equivalent to an introductory Environmental Science or Ecology college course. Major areas studied include: Ecosystems, Human Population, Energy Resources, Mineral Resources, Preserving Biodiversity, Food Resources and Pest Control, Air Pollution and Global Atmospheric Change, and Solid and Hazardous Waste. This class will provide you with an opportunity to receive credit for college-level course work while still in high school.

Class size is held at 24 students as so laboratory activities can be safely monitored. The class will meet every other day for 90 minutes. **[SC-17]** This is a yearlong course.

Course Prerequisites **[SC11]**

Biology (Honors)
Chemistry (Honors)
Algebra I
Geometry
Enrollment in Algebra II or high math

Text(s)

Pearson's Environment: The Science Behind the Stories 4th Edition; Withgott & Brennan

Supplemental Text Resources

1. Miller, G. Tyler. (2000). *Living in the Environment: Principles, Connections, and Solutions*. 11th edition. Pacific Grove, CA: Brooks/Cole Publishing Company.
2. Molnar, W. (2005). *Laboratory Investigations for AP Environmental Science*. Saddle Brook, NJ: Peoples Publishing Group.
3. Project Wild K-12 Curriculum and Activity Guide, (2004). Houston, TX: Council for Environmental Education.
4. Holt Environmental Science Laboratory Guide (1999). Austin, TX: Holt, Rinehart and Winston.
5. Environmental Science Laboratory Manual (1999). Menlo Park, CA: Addison Wesley Longman, Inc.
6. Exploring Earth Science (1999). Upper Saddle River, NJ: Prentice Hall Simon & Schuster Education Group.
7. Larson, Gary. (1998) *There's a Hair in My Dirt, A Worm's Story*, New York, NY: HarperCollins Publishers
8. Carson, Rachel. (1962) *Silent Springs*, New York, NY: Houghton Mifflin Company

Classroom Expectations/ Responsibilities

1. Students are expected to be prepared for class. This includes a text book (Books must come to school EVERYDAY), pen or a pencil, notebook or paper, and their homework.
2. Students are expected to be on time to class. Frequent tardiness hinders both the student's ability to master this course, and his classmates' abilities, since late entrance is a distraction. Excessive tardiness will result in disciplinary action. Refer to the Student Rights and Responsibilities handbook for disciplinary measures (Rule 1).
3. Students are expected to be respectful to the teacher and other students. Students are expected to actively participate in class.
4. School rules will apply and consequences will be given for failure to follow these rules. See *Student Rights and Responsibilities handbook*.
5. Student must complete assignments on time. Work handed in late will receive only partial credit.
6. Students are expected to take tests with the rest of the class. If you know that you will be absent on a test day, you may take the test before the rest of the class. If you miss a test, you have five school days to make

it up. It is the responsibility of the student to make arrangements with the teacher before the five-school-day deadline. If you do not make it up within five days, a zero will be averaged in for that test. You may also make up assignments missed due to absence within the same 5 school day window.

7. Academic dishonesty, whether cheating during in-class assignments, quizzes, tests, and/or exams or plagiarism of written assignments, projects, or extra-credit work, is contrary to the CMS Student Rights and Responsibilities. The consequence for academic dishonesty will be a zero grade averaged in for assignment the student cheated on or plagiarized.

Class Requirements

1. *Exams and Quizzes:* You will have frequent announced and unannounced content and reading quizzes. Unit exams will consist on 50 AP-level multiple choice and 1 essay.
2. *Laboratory Reports:* You will be completing a number of formal and informal laboratory reports. These reports will be counted as an exam grade.
3. *Homework:* Assigned homework will include a variety of questions over readings, previously presented lecture materials, and laboratories.
4. *Notes:* The Science Notebook will be collected and graded randomly throughout the year for an exam grade. Your notebook should be set up according to my specifications; ALL NOTES MUST BE TAKEN IN CORNELL NOTE FORMATE ALONG WIITH SUMMARRIES AND ANNOTATIONS FOR ALL NOTES. The outline that you will receive and place into your science notebook will be collected after every unit. There should be a summary under each topic in the course outline.
5. *Book Study:* You will read an Environmental Book and write a formal book report.
6. *Research Paper:* You will write an individual research paper using MLA format.

Class Attendance Policy

Please attend school daily. If you are absent, follow the Charlotte-Mecklenburg School Attendance policy. This states that any student who has missed more than 10 days will **fail** the course unless he/she makes up the absence by attending after-school tutorials to make up time and missed assignments.

Makeup Work Policy

All students have to ability to make up any missed work due to an absence. Students are responsible for contacting their teacher and collecting all missed assignments. All make up work is due to the student's respective teacher within 5 business days of their absence!

If assignment is not completed and turned in their teacher, those missed assignments turn into a **zero**.

Grading Criteria

All work will be graded on the following scale:

- A 93 - 100%
- B 85 - 92%
- C 77 - 84%
- D 70 - 76%
- F Below 70%

Grading Scale (School Wide)

Tests/Quiz: 70%

Classwork: 20%

Homework: 10% [*Just because an assignment is done at home, does NOT mean it is counted as a homework grade*]

Semester Mid-Term Exam will be counted as 20% of Mid-Term Grade!

Final Exam will be counted as 25% of your Final Grade!

Homework Policy

Homework will be assigned on a regular basis. Students are to turn in homework to the designated area on the assigned due date. **NO LATE HOMEWORK WILL BE ACCEPTED**

Retake Policy

This is a college level course, absolutely NO RETAKES OR LATE WORK WILL BE ACCEPTED.

Required Materials

1.5 Inch Binder
Black or Blue Pens
Highlighters or Markers to highlight
4G NEW Flashdrive

Tutorials & Parent/Teacher Conferences:

*Tutorials will be offered starting September 9, 2014 ending January 8, 2015 (1st Semester Only) and January 27, 2015 to May 21, 2015 (2nd Semester Only). All tutorials will start at 2:30pm and end at 4:30pm. In order to qualify to be allowed to come to tutorials the student must NOT have any behavior problems.

Parent conferences may be scheduled at the convenience of the parent and teacher. Conferences can be scheduled by contacting the teacher and/or guidance counselor.

Teachers can be reached through the West Mecklenburg office at (980) 343-6080 or by e-mail.

PowerSchool

Parents are able to access their child's grades with a password. The link is on the West Mecklenburg Website. Forms can be picked up from the guidance office. For more information, please contact a guidance counselor. It is highly recommended that parent check their child's grades on a regular basis.

Web Resources

www.ramseyees.weebly.com my website with assignments and other resources

www.edmodo.com you will complete assignments and turn them in electronically through this website.

<http://drive.google.com> you will complete assignments and share them with me through this website (**when sharing files with me you need to be sure to share as *can comment and unclick "Notify people via email"***) ******Points will be taken off your assignment for every email sent due to you not following these directions.******

<http://j.mp/cmsgaggle> Your personal email through CMS

www.epa.gov

www.scorecard.org

www.energy.gov

www.census.gov

<http://www.dlese.org/resources/index.html> DLESE is made up of a wide variety of resources, collections, and services. DLESE's educational resources include lesson plans, scientific data, visualizations, interactive computer models, and virtual field trips. All resources in DLESE have been contributed by community members, are relevant to Earth system science education, and are checked periodically for technical stability.

www.powerschool.com online access to your grades

www.tinyurl.com/massramsclass

www.sasinschools.com Interactive Virtual Labs

Video (DVD)/ Other Media Resources (YouTube Included) [Please note that other visual media are subject to be added and some are subject to be dropped]

The Lorax

Affluenza

Plate Tectonics

Cane Toad

World Population

Acid Rain: The Invisible Threat

Finite Oceans

The Inconvenient Truth

Essential Questions:

- *What makes finding solutions to environmental problems so challenging?*
- *Ecosystems: What are they? How do they work? And how do we study them?*
- *How has the human population changed over time? How has this change affected food availability?*
- *How do humans impact terrestrial ecosystems? How can this impact be reduced?*
- *How has human use of energy altered our planet? What types of energy are most and least harmful?*
- *How do we dispose of our solid and hazardous wastes? What are the impacts of this disposal?*
- *What are the major resources found in ground? How does our use of these affect the environment?*

Students with Disabilities

The Reauthorization of the Individuals with Disabilities Education Act (IDEA) and the implementation of No Child left Behind (NCLB) require that schools use more inclusive practices across CMS has created an environment where schools can successfully provide academic instruction and improve achievement for students and disabilities. The Exceptional Children's Department will continue to provide increased access to the general curriculum with continued support from EC modifications/accommodations and EC Study Skills classes for these students with disabilities.

Teaching Strategies [SC-17]

Teaching strategies will include but are not limited to the following:

Lecture

Class Discussion and Debate

Demonstrations

Socratic Seminar

In-class Assignments and Homework

Research Projects

Hands on Labs

Fieldwork

Videos

Advanced Placement Environmental Science 2014-2015 Timeline

Topic	Title	Unit	Chapters	Activities/ Resources	Time (Days)	SC
Introduction to APES, Environmental Issues, History, Legislation	Cultural and Aesthetic Considerations	I	1, 6, 7	<ul style="list-style-type: none"> • Salinization Lab • SAS Curriculum Pathways How Population Growth and Energy Consumption Affect An Ecosystem Web Lesson • Campus Environmental Inventory (Research Project) • What Can We Do About Environmental Racism? Article and Analysis • Case Study: The Mirarr Clan Confronts the Jabiluka Uranium Mine 	6	<i>SC-13, 15, 16</i>
	Environmental Ethics					
	Environmental Law and Regulations (International, National and Regional)					
	Issues and Options (Conservation, Preservation, Restoration, Remediation, Sustainability and Mitigation)					
	Economic Forces <ul style="list-style-type: none"> a. Cost-Benefit Analysis b. Marginal Cost c. Ownership and Externalized Cost 					
Ecosystems	The Flow of Energy <ul style="list-style-type: none"> a. Forms and quality of energy b. Energy units and measurement c. Sources and sinks, conversions 	II	2, 4, 5, 7	<ul style="list-style-type: none"> • Invasive Species Project • Biogeochemical Cycles Project • Geologic Time • SAS Curriculum Pathways Earth's Geological & Biological History Web Lesson • Food Chains and Biological Magnification • Energy Flow in Ecosystems Virtual Lab • Natural Variation within a Species • School Bacterial Survey 	9	<i>SC- 1, 2, 3, 5, 12-14,</i>
	The Cycling of Matter <ul style="list-style-type: none"> a. Water b. Carbon c. Major Nutrients <ul style="list-style-type: none"> 1. Nitrogen 2. Phosphorous d. Differences between cycling of major and trace elements. 					
	The Solid Earth <ul style="list-style-type: none"> a. Earth History and the Geologic Time Scale b. Earth dynamics: plate tectonics, volcanism, the rock cycle and soil formation 					
	The Biosphere <ul style="list-style-type: none"> a. Organism: Adaptations to their environments b. Populations and Communities: exponential growth and Carrying Capacity c. Ecosystems and Change: Biomass, 					

	Energy Transfer, Succession d. Evolution of Life: Natural Selection, Extinction					
Earth Biomes		III		<ul style="list-style-type: none"> • Biome Project (Electronic) 	1	<i>SC-3</i>
Human Populations	History and Global Distribution a. Numbers b. Demographics [birth and death rates] c. Patterns of Resource Utilization	IV	8 14	<ul style="list-style-type: none"> • “How to feed 9 billion people, and feed them well” (theconversation.com) Article • Tragedy of the Commons Article, Movie and Analysis Questions • Power of the Pyramids • Graphing Human Population Growth • SAS Curriculum Pathways Human Population Growth Web Lesson • 1918 Pandemic: Global Reach of the “Spanish” Influenza • Carolina’s Predator-Prey Populations • Biodiversity at the Grocery Store • Inter and Intraspecific Competition Lab • Something Fishy Paper • Country Analysis Webquest • How to Make the Food System More Energy Efficient Article 	8	<i>SC- , 12-15, 12-17</i>
	Carrying Capacity [Local, Regional and Global]					
	Cultural and Economic Influences					
Renewable & Nonrenewable Resources	Water a. Fresh: Agricultural, Industrial and Domestic b. Oceans: Fisheries and Industrial	V	12 19 20 21 24	<ul style="list-style-type: none"> • The Lorax Movie and Analysis • SAS Curriculum Pathways Nuclear Power: Pro’s and Con’s Web Lesson • SAS Curriculum Pathways Analyzing Carbon-Based & Alternative Fuels • Home Energy Audit • “Watts” the Cost? • Conserve a “Watt” • Energy Contractors • Effects of Radiation on the germination / growth of Radish seeds Lab • Siemens Field Trip • After the Apocalypse Article 	9	<i>SC- 2, 5, 6, 7, 8, 12- 14, 16- 17</i>
	Soils a. Soil Types b. Erosion and Conservation					
	Biological a. Natural Areas b. Genetic Diversity c. Food and other Agricultural products					
	Energy a. Conventional Sources (Nuclear, Fossil Fuels) b. Alternative Sources					
	Land a. Residential and Commercial					

	<ul style="list-style-type: none"> b. Agricultural and Forestry c. Recreational and Wilderness 					
Water and Soils	Air/ Water/ Soil <ul style="list-style-type: none"> a. Major Pollutants <ul style="list-style-type: none"> 1. Types [SO₂, NO_x Pesticides] 2. Thermal Pollution 3. Measurement and Units of measure [ppm, pH, µg/L] b. Effects of Pollution on <ul style="list-style-type: none"> 1. Aquatic Systems 2. Vegetation 3. Natural features, Buildings, Structures 4. Wildlife c. Pollution reduction, remediation and control 	VI	9 10 15 16	<ul style="list-style-type: none"> • SAS Curriculum Pathways Crop Recommendation Web Lesson • Water Budgets: Calculations & Graphs • Primary Productivity • Water Quality Testing Lab • Biological Analysis Lab • Waste Water Treatment Plant Field Trip • Water Treatment Plant • FLOW (For the Love Of Water) YouTube 	9	SC-5-6 12-17
Mineral Resources	Mining <ul style="list-style-type: none"> a. Mineral formation b. Extraction c. Global Reserves d. Laws and Treaties 	VII	23	<ul style="list-style-type: none"> • Cookie Mining Lab • Reed's Gold Mine 	2	SC-1, 2, 17
Preserving Biodiversity		VIII	11	<ul style="list-style-type: none"> • Endangered Species Public Service Announcement (Electronic) • Cane Toad Video/ Essay • American Bison Video/ Essay • Exotic Species Report • Saving the Amazon Article • Biodiversity Leaf Litter Lab 	9	SC-10, 12,15
Food Resources, Pest Control	Agriculture <ul style="list-style-type: none"> a. Feeding a growing population; Human nutritional requirements b. Types of agriculture: Green revolution, genetic engineering and crop production, deforestation, irrigation, sustainable agriculture. Forestry <ul style="list-style-type: none"> a. Tree plantations b. Old growth forest Aquaculture <ul style="list-style-type: none"> a. Fishing Techniques 	IX	9 10	<ul style="list-style-type: none"> • The Cultivation of Bananas Activity • Estimating Carrying Capacity Activity • Home Pesticide Inventory and Profile Activity 	6	SC-5,6, 12-15

	b. Overfishing Pest Control a. Types of Pesticides b. Cost and Benefits of pesticide use c. Integrated pest management					
Air Pollution & Global Atmospheric Change	The Atmosphere a. Atmospheric history: Origin, evolution, composition and structure b. Atmospheric dynamics: Weather and Climate	X	17 18	<ul style="list-style-type: none"> • SAS Curriculum Pathways Forecasting Earth's Future Web Lesson • Air Pollution Allowance • Methane Matter Activity • Field Testing Ozone Lab • Airborne Particulates Sampling Lab • Air Quality Analysis • Global Warming Lab • Generation of NO_x and SO_x 	8	SC-9,10,12-17
	First-Order Effects (Changes) a. Atmosphere: CO ₂ , CH ₄ , Stratospheric O ₃ b. Oceans: Surface Temperatures and Currents c. Biota: Habitat destruction, Introduced Exotics, Overharvesting					
	Higher-Order Interactions (Consequences) a. Atmosphere: Global Warming and increased UV radiation b. Oceans: Increasing Sea-Level, Long-Term Climate Changes, Impact of El Niño c. Biota: Biodiversity Loss					
Solid & Hazardous Waste	Solid Waste a. Types, Sources and Amounts b. Current disposal methods and their limitations c. Alternative practices in solid waste management	XI	22	<ul style="list-style-type: none"> • Recycling Center • Solid Waste Inventory • Recycling Project (Electronic) • Toxic Testing Using Brine Shrimp Lab 	7	SC-9,12-14
	Impact on Human Health a. Agents: Chemical and Biological b. Effects: Acute and Chronic, Dose-Response Relationships c. Relative Risks: Evaluation and Response					

