

# Redan High School

## Advanced Placement Environmental Science (APES)

**Teacher:** Mrs. Ross

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**Room:** C121

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**Semester:** Spring 2016

**Tutorial:** by appointment

**Textbook:** Environmental Science: Earth as a Living Planet 6th Edition (Botkin & Keller)

**Textbook cost:** 114.74

**Department Philosophy:** To provide an enriched environment where students can achieve their academic goals with appreciation for the applications of science in their lives.

**Course Description:** AP Environmental Science (APES) is a laboratory and field-based course designed to provide students with the content and skills needed to understand the various interrelationships in the natural world, to identify and analyze environmental problems and to propose and examine solutions to these problems. The course will include lectures, field investigations, scientific journal article reviews, and laboratory exercises paralleling those in a first year college Environmental Science course. The following themes provide a foundation for the AP Environmental Science course:

- Science as a process
- Energy conversions underlie all ecological processes
- The Earth itself is one interconnected system
- Humans alter natural systems
- Environmental problems have a cultural and social context
- Human survival depends on developing practices that will achieve sustainable systems

**Course Prerequisites:** General Biology, Physical Science

**GPS Standards/QCC Objectives:** Refer to Georgia State Performance Standards published online at [www.gadoe.gov](http://www.gadoe.gov)

### Course Outline:

#### Unit 1. Introduction to Environmental Science – 2 weeks

The first unit of AP Environmental Science (APES) acquaints students with environmental science. It introduces the theory, philosophy, rhetoric, and terminology that will be used throughout the course.

##### Textbook Reference and Other Resources

Botkin and Keller, *Environmental Science*, Chapter 1–3

Gonick and Outwater, *The Cartoon Guide to the Environment*, Chapter 1

Race to Save the Planet video series, *The Environmental Revolution*

##### Labs and Activities

Ecological Footprint Webquest

Tragedy of the Commons Simulation

Dilution Lab

Video: *The Lorax*

##### Unit Exam

#### Unit 2. Life on Earth, Part I - 2 weeks

The second unit of APES is an introduction to two of the fundamental underpinnings of environmental science: basic ecology **and** the study of human populations.

##### Textbook Reference and Other Resources

Botkin and Keller, *Environmental Science*, Chapter 4–6

Gonick and Outwater, *The Cartoon Guide to the Environment*, Chapters 2 and 8

T.C. Boyle, Top of the Food Chain

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Gonick and Outwater, *The Cartoon Guide to the Environment*, Chapters 2 and 8  
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**Labs and Activities**

Ecocolumn Lab  
Food Webbing Activity  
Human Population Dynamics  
Oh Deer! *Project WILD* Activity  
Owl Pellet Dissection

**Unit Exam**

**Unit 3. Life on Earth, Part II—2 to 3 weeks**

This unit completes the study of basic ecology.

**Textbook Reference and Other Resources**

Botkin and Keller, *Environmental Science*, Chapters 7–9 and Earth’s Biomes  
Gonick and Outwater, *The Cartoon Guide to the Environment*, Chapters 3–5

**Labs and Activities**

Biological Sampling Activity  
Estimating Population Size  
Biodiversity in Leaf Litter  
Ecosystems Project

**Unit Exam**

**Unit 4. Food and Agriculture - 1 week**

In this unit, students study the basic nutritional needs of human beings, what happens when these needs are not met, and what is being done in an attempt to make certain these needs are met for all people.

Students also study agriculture, including the various methods of growing crops, the history of agriculture, and the “green revolution.”

**Textbook Reference and Other Resources**

Botkin and Keller, *Environmental Science*, Chapters 10–11  
Race to Save the Planet video series, *Save the Earth—Feed the World*  
Diamond, “The Worst Mistake in the History of the Human Race,” *Discover*. May, 1987.

**Labs and Activities**

Ecocolumn Water Quality Testing  
Sanitation lab

**Unit Exam**

**Unit 5. Land Use and Biodiversity - 1 week**

This is a transition from the study of ideal ecosystems and ecology to the study of human impact on the environment. Students study the roles of wildlife management, land use, species protection, conservation, and preservation in determining how “natural” the Earth will remain.

**Textbook Reference and Other Resources**

Botkin and Keller, *Environmental Science*, Chapters 12–13  
Race to Save the Planet video series, *Remnants of Eden*  
*Cane Toads: An Unnatural History*

**Labs and Activities**

Habitat Loss Lab  
A Quandary in Ponder

**Unit Exam**

**Unit 6. Health, Risk, and Toxicology – 1 week**

This unit includes the effects that environmental hazards have on human health, as well as on the health of the environment, and an examination of the risks we face in our environment.

**Textbook Reference and Other Resources**

Botkin and Keller, *Environmental Science*, Chapter 14  
*Erin Brochovich*

**Labs and Activities**

Risk Assessment Lab  
LD-50 Lab

**Unit Exam**

**Unit 7. Energy Resources and Energy Use - 2 weeks**

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#### **Textbook Reference and Other Resources**

Botkin and Keller, *Environmental Science*, Chapters 15–18

Race to Save the Planet video series, *More for Less*

#### **Labs and Activities**

Home Energy Audit

Solar Water Heater

Ecodome Project

#### **Unit Exam**

### **Unit 8. Water - 1 week**

This is perhaps the most relevant unit of study for environmental science students in our area of the world. The world's best examples of water development are in our backyards, and we focus on these local examples throughout the unit.

#### **Textbook Reference and Other Resources**

Botkin and Keller, *Environmental Science*, Chapters 19–20

Cadillac Desert video series, excerpts from episodes 1–4: *Mulholland's Dream*, *An American Nile*, *The Mercy of Nature*, and *The Last Oasis*

#### **Labs and Activities**

Home Water Use Audit

Investigation – Dissolved oxygen and Aquatic Primary Productivity

Water Quality and Pollution Lab

#### **Unit Exam**

### **Unit 9. Atmospheric Dynamics, Air Pollution, Ozone Depletion, and Global Warming - 2 weeks**

Following a brief introduction to the structure and characteristics of the Earth's atmosphere is a survey of several air pollution problems. This unit includes the study of some of the most serious global environmental problems we face.

#### **Textbook Reference and Other Resources**

Botkin and Keller, *Environmental Science*, Chapters 21–24

Race to Save the Planet video series, *Do We Really Want to Live This Way?* and *Only One Atmosphere*

#### **Labs and Activities**

Airborne Particulate Lab

Ozone lab

Air Quality Lab

#### **Unit Exam**

### **Unit 10. Soil, Minerals, and Mining - 2 weeks**

An introduction to earth science, which includes hands-on activities designed to introduce rock, mineral, and soil identification.

#### **Textbook Reference and Other Resources**

Botkin and Keller, *Environmental Science*, Chapters 27–28

Race to Save the Planet video series, *Waste Not, Want Not*

#### **Labs and Activities**

Cookie Mining Activity

Packaging Lab

Soil Lab

#### **Unit Exam**

### **APES Review—1 week**

Students review and practice taking the AP Environmental Science Exam. They use all of the outlines and lists of vocabulary terms they completed throughout the school year. During the review unit, students complete and grade all of the released free-response and multiple-choice questions, and multiple-choice questions that are designed to simulate the multiple-choice section of the AP Environmental Science Exam.

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**Grading Protocol (DeKalb County)**

**Formative Assessments, Pre-Assessments, Assessment Prior to Learning** **0%**  
Formal or Informal Assessments

**Assessment During Learning** **25%**  
Skills Assessment, Quizzes, Projects (in class)

**Guided, Independent, Group Practice** **45%**  
Classwork, Homework, Projects (outside of class), Performance / Labs

**Summative Assessments, Post- Assessments to Validate Learning** **30%**

**Materials:** binder, lab notebook

**AP Exam:**

The A.P. Environmental Science Exam created by the College Board and Educational Testing Service will be administered in May. This exam is three hours in length and consists of two parts: a multiple-choice section comprised of 100 questions and forming 60% of the grade, and a free response section comprised of four free-response questions and forming 40% of the grade. The multiple choice section is designed to cover the breadth of your knowledge and understanding of environmental science and includes thought provoking problems and questions based on fundamental ideas from environmental science as well as questions based on the recall of basic facts and major concepts. The free-response section emphasizes the application of principles in greater depth; you will need to organize answers to broad questions, demonstrating reasoning and analytical skills, as well as the ability to synthesize material from several sources into a coherent essay. There are three types of free response questions: data analysis, document based, and synthesis and evaluation.

**Expectations/ General Policies:**

As a student in this advanced course of study you are expected to be polite to and courteous to those around you; be prepared for class every day. Attend class daily. Show academic integrity.

Please register for the Parent Assistant Gradebook at <http://www.dekalb.k12.ga.us/parentassistant/>  
It allows 24 hour access to student grades. School progress reports will be issued to students every 4 1/2 weeks. Teacher issued reports will be considered parent contacts.

Student Signature: \_\_\_\_\_

Date: \_\_\_\_\_

Parent/Guardian Signature: \_\_\_\_\_

Date: \_\_\_\_\_

**Teacher reserves the right to modify this syllabus.**