

# AP Environmental Science ~ Summer Work

## CURRENT EVENTS PROJECT

### Introduction:

Environmental issues are referenced many times in newspapers, magazines, and on the internet every day in the United States. These articles may be about obvious environmental issues such as endangered species, oil spills, or climate change or Earth processes such as plate tectonics, volcanic eruptions or changing weather patterns. Yet, the scope of environmental science is even larger than these fundamental parts—it is social, political, technological, and economic. Articles about environmental action groups or new global technologies can also be considered related to environmental science. Most articles tend to have some bias. As a matter of fact, bias is implied just by the choice to include an article for publication. Though terms such as “like” and “dislike” may not be present in the article, as a surveyor of environmental publications and information, it is one’s job to read for terms and ideas that may be controversial or express a simple opinion, be it ever so subtle.

### Procedure:

- 1) Locate **three** articles in a newspaper or recent (**less than six months old**) periodical (such as Time magazine or National Geographic) that relate to environmental science. You can also search the internet for your articles but be sure to locate reputable news outlets that are trusted for accuracy. You are looking for **current events**, not just descriptions of a problem, but an actual event that has occurred. Include the links or print your articles and include or attach them to your article summary and reflection as described below.
- 2) Compose a short **summary** (2 paragraphs) of the article. Be sure to identify the ‘W’s’ (Who, What, Where, When, and Why).
- 3) Identify the name of the magazine, newspaper, or website and the date.
- 4) Evaluate the article for **bias**. Are there opinions offered? Is the source automatically biased? (i.e. a publication of the Nature Conservancy) In what direction is the bias? Is it pro or con environmentalist? Explain your reasoning.
- 5) Finally, reference the topic list that follows and find at least **two** places where your article is applicable to our study of environmental science. Use the attached outline to note the environmental topics that are discussed in your chosen article and identify the Roman numeral (Category) and capital letter (Sub-category) in the outline where your article applies. ***In addition to identifying the connection of your article to our curriculum, please explain (in three to five sentences) your reason for making the connection to that section of the AP ES curriculum.***

# Outline of Topics for AP Environmental Science

(with associated percentages relative to exam questions)

## **UNIT I AND II: The Living World (12-16%)**

### A. Ecosystem Structure

(Biological population and communities, ecological niches, interactions among species, keystone species, species diversity and edge effects, major terrestrial and aquatic biomes)

### B. Energy Flow

(Photosynthesis and cellular respiration, food webs and trophic levels, ecological pyramids)

### C. Ecosystem Diversity

(Biodiversity, natural selection, evolution, ecosystem services)

### D. Natural Ecosystem Change

(Climate shifts, species movement, ecological succession)

### E. Natural Biogeochemical Cycles

(Carbon, nitrogen, phosphorus, sulfur, water, conservation of matter)

### F. Loss of Biodiversity

1. Habitat loss, overuse, pollution, introduced species, endangered and extinct species
2. Maintenance through conservation
3. Relevant laws and treaties

## **UNIT III: Population (10-15%)**

### A. Population Biology Concepts

(Population ecology, carrying capacity, reproductive strategies, survivorship)

### B. Human Population

#### 1. Human population dynamics

(Historical population sizes, distribution, fertility rates, growth rates and doubling times, demographic transition, age-structure diagrams)

#### 2. Population size

(Strategies for sustainability, case studies, national policies)

#### 3. Impacts of population growth

(Hunger, disease, economic effects, resource use, habitat destruction)

## **UNIT IV: Earth Systems and Resources (10-15%)**

### **A. Earth Science Concepts**

1. (Geologic time scale, plate tectonics, earthquakes, volcanism, seasons, solar intensity, and latitude.)

### **B. The Atmosphere**

1. (Composition, structure, weather and climate, atmospheric circulations and the Coriolis Effect, atmosphere-ocean interactions, ENSO)

### **C. Global Water Resources and Use**

1. (Freshwater/saltwater, ocean circulation, agricultural, industrial, and domestic use, surface and groundwater issues, global problems, conservation)

### **D. Soil and Soil Dynamics**

1. (Rock cycle, formation, composition, physical and chemical properties, main soil types, erosion and other soil problems, soil conservation)

## **UNIT V: Land and Water Use (10-15%)**

### **A. Agriculture**

1. Feeding a growing population

(Human nutritional requirements, types of agriculture, Green Revolution, genetic engineering and crop production, deforestations, irrigation, sustainable agriculture)

2. Controlling Pests

(Types of pesticides, costs and benefits of pesticide use, integrated pest management, relevant laws)

### **B. Forestry**

(Tree plantations, old growth forests, forest fires, forest management, national forests)

### **C. Rangelands**

(Overgrazing, deforestation, desertification, rangeland management, federal rangelands)

### **D. Other Land Use**

1. Urban Land Development

(Planned development, suburban sprawl, urbanization)

2. Transportation infrastructure

(Federal highway system, canals and channels, roadless areas, ecosystem impacts)

3. Public and federal lands

(Management, wilderness areas, national parks, wildlife refuges, forests, wetlands)

4. Land conservation options

(Preservation, remediation, mitigation, restoration)

5. Sustainable land use strategies

- E. Mining  
(Mineral formation, extraction, global reserves, relevant laws and treaties)
- F. Fishing  
(Fishing techniques, overfishing, aquaculture, relevant laws and treaties)
- G. Global Economics  
(Globalization, World Bank, Tragedy of the Commons, relevant laws and treaties)

## **UNIT VI: Energy Resources and Consumption (10-15%)**

- A. Energy Concepts  
(Energy forms, power, units, conversions, Laws of Thermodynamics)
- B. Energy Consumption
  - 1. History  
(Industrial Revolutions, exponential growth, energy crisis)
  - 2. Present global energy use
  - 3. Future energy needs
- 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)
- 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)
- E. Hydroelectric Power  
(Dams, flood control, salmon, silting, other impacts)
- F. Energy Conservation  
(Energy efficiency, CAFÉ standards, hybrid electric vehicles, mass transit)
- 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)

## **UNIT VII AND VIII: Pollution (14-20%)**

### **A. Pollution Types**

#### **1. Air pollution**

(sources – primary and secondary, major air pollutants measurement units, smog, acid deposition, causes and effects, heat islands and temperature inversions, indoor air pollution, remediation and reduction strategies, Clean Air Act and other relevant laws)

#### **2. Noise pollution**

(Sources, effects, control measures)

#### **3. Water Pollution**

(Types, sources, causes, and effects, cultural eutrophication, groundwater pollution, maintaining water quality, water purification, sewage treatment/septic systems, Clean Water Act and other relevant laws)

#### **4. Solid Waste**

(Types, disposal, reduction)

### **B. Impacts on the Environment and Human Health**

#### **1. Hazards to human health**

(Environmental risk analysis, acute and chronic effects, dos-response relationships, air pollutants, smoking and other risks)

#### **2. Hazardous chemicals in the environment**

(Types of hazardous waste, treatment/disposal of hazardous waste, cleanup of contaminated sites, biomagnification, relevant laws)

### **C. Economic Impacts**

(Cost-benefit analysis, externalities, marginal costs, sustainability)

## **UNIT IX: Global Change (15-20%)**

### **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)

### **B. Global Warming**

(Greenhouse gases and the greenhouse effect, impacts and consequences of global warming, reducing climate change, relevant laws and treaties)