

Name Droppers: Individual Contributions to Environmental Science

Introduction:

The study of environmental Science is not just about terms, principles & facts. It is a social cause close to the hearts of many world citizens. The accumulation and quantity of knowledge today is due to the perseverant pursuits of many scientists, authors, politicians, and environmentalists. Each has had an impact, be it ever-so-large or ever-so-humble, both on the study of environmental science and the general environmental awareness of the world's citizens.

Procedure:

1. Research the person assigned to you and answer the following questions:
 - A. What was his / her occupation?
 - B. What contributions has he / she made to our modern study, understanding, and/ or management of the environment? (NOTE: be specific! If there are multiple contributions, mention the 3 most significant. Be sure to explain WHY they are considered significant).
 - C. Where does this individual fit in to **OUR** study of AP Environmental Science? (NOTE: Study the outline below to find where your individual fits and justify your choices. If there are multiple places where he / she fits, identify the 3 strongest connections. Be specific: note the roman numeral and capital letter.)
2. Create a vehicle to share your information with the class. You will present your findings to the class in a 3-5 minute block of time. Be creative in your methods. Some possible ideas include a short powerpoint presentation, a home-made video, character re-enactment, artistic rendering (collage, model, etc). You will submit a proposal to me regarding your presentation ideas no later than Friday, Sept. 3rd. We will start presentations (by random selection) on Monday, Sept. 6th.

Outline of Topics for AP Environmental Science (with percentages relative to exam q's)

I. Interdependence of Earth's Systems: Fundamental Principles and Concepts (25%)

- A. The Flow of Energy
 1. forms and quality of energy
 2. energy units and measurement
 3. sources and sinks, conversions
- B. The Cycling of Matter
 1. water
 2. carbon
 3. major nutrients
 - a. nitrogen
 - b. phosphorus
 4. differences between cycling of major and trace elements

- C. The Solid Earth
 - 1. Earth history and the geologic time scale
 - 2. Earth dynamics: plate tectonics, volcanism, the rock cycle, soil formation
- D. The Atmosphere
 - 1. atmospheric history: origin, evolution, composition, structure
 - 2. atmospheric dynamics: weather, climate
- E. The Biosphere
 - 1. organisms: adaptations to their environments
 - 2. populations and communities: exponential growth, carrying capacity
 - 3. ecosystems and change: biomass, energy transfer, succession
 - 4. evolution of life: natural selection, extinction

II. Human Population Dynamics (10%)

- A. History and Global Distribution
 - 1. numbers
 - 2. demographics, such as birth rates and death rates
 - 3. patterns of resource utilization
- B. Carrying Capacity -- Local, Regional, Global
- C. Cultural and Economic Influences

III. Renewable and Nonrenewable Resources: Distribution, Ownership, Use, Degradation (15%)

- A. Water
 - 1. fresh: agricultural, industrial, domestic
 - 2. oceans: fisheries, industrial
- B. Minerals
- C. Soils
 - 1. soil types
 - 2. erosion and conservation
- D. Biological
 - 1. natural areas
 - 2. genetic diversity
 - 3. food and other agricultural products
- E. Energy
 - 1. conventional sources
 - 2. alternative sources
- F. Land
 - 1. residential and commercial
 - 2. agricultural and forestry
 - 3. recreational and wilderness

IV. Environmental Quality (20-25%)

A. Air/Water/Soil

1. major pollutants
 - a. types, such as SO₂, NO_x, and pesticides
 - b. measurement and units of measure such as ppm, pH, micrograms
 - c. point and nonpoint sources (domestic, industrial, agricultural)
2. effects of pollutants on:
 - a. aquatic systems
 - b. vegetation
 - c. natural features, buildings and structures
 - d. wildlife
3. pollution reduction, remediation, and control

B. Solid Waste

1. types, sources, and amounts
2. current disposal methods and their limitations
3. alternatives

C. Impact on Human Health

1. agents: chemical and biological
2. effects: acute and chronic, dose-response relationships
3. relative risks: evaluation and response

V. Global Changes and Their Consequences (15-20%)

A. First-order Effects (changes)

1. atmosphere: CO₂, CH₄, stratospheric O₃
2. oceans: surface temperatures, currents, sea level
3. biota: habitat destruction, loss of biodiversity, introduced exotics

B. Higher-Order Interactions (consequences)

1. atmosphere: global warming, increasing ultraviolet radiation
2. oceans: increasing sea level, long term climate change, impact on El Nino
3. biota: loss of biodiversity

VI. Environment and Society: Trade-Offs and Decision Making (10%)

A. Economic Forces

1. cost-benefit analysis
2. marginal costs
3. ownership and externalized costs

B. Cultural and Aesthetic Considerations

C. Environmental Ethics

D. Environmental Laws and Regulations (International, National, and Regional)