

Environmental Education (0830)

Test at a Glance

Test Name	Environmental Education		
Test Code	0830		
Time	2 hours		
Number of Questions	120		
Format	Multiple-choice questions		
	Content Categories	Approximate Number of Questions	Approximate Percentage of Questions
	I. Principles of Ecology: Free of Human Influences	22	18%
	II. Relevant Principles from the Social Sciences	11	9%
	III. Human-Ecological Interactions: Influences on Decisions	17	14%
	IV. Human-Ecological Interactions: Consequences of Decisions	44	37%
	V. Appropriate Methodologies	26	22%

About This Test

The Environmental Education test is designed for prospective teachers of environmental education for kindergarten through twelfth-grade levels in schools in the state of Pennsylvania. The 120 multiple-choice questions cover knowledge of facts and concepts and the ability to apply those concepts in specific situations across the content areas of the principles of ecology, relevant principles from the social sciences, the influences on decisions in human-ecological interactions, the consequences of decisions in human-ecological interactions, and appropriate methodologies.

Examinees have typically completed a bachelor's degree program in education, with appropriate coursework in environmental education.

This test may contain some questions that do not count toward your score.

Topics Covered

Representative descriptions of topics covered in each category are provided below.

I. Principles of Ecology:

Free of Human Influences

- Principles related to populations and individuals
- Interactions and interdependence among organisms
- Environmental influences and limiting factors
- Energy flow and materials cycled within ecosystems
- Homeostasis
- Succession

II. Relevant Principles from the Social Sciences

- Principles related to organization
- Philosophical and ethical aspects
- Special interests
- Group dynamics
- Economic aspects
- Political aspects
- Legal aspects
- Cultural influences
- Public relations methods
- Values as an influence on decisions
- Attitudes toward new technology

III. Human-Ecological Interactions:

Influences on Decisions

- Factors that influence human decisions concerning the environment

IV. Human-Ecological Interactions:

Consequences of Decisions

- Consequences of decisions, including the awareness that consequences may, and are likely to, be delayed

V. Appropriate Methodologies

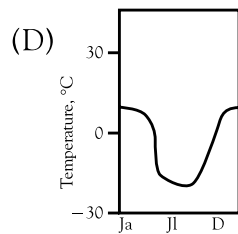
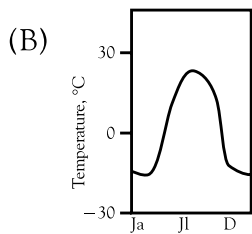
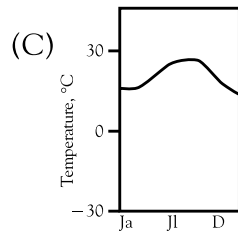
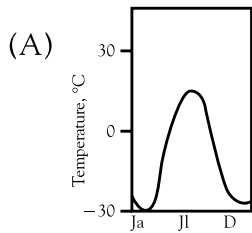
- Knowledge and application of resources related to:
 - community resources
 - current environmental programs
 - useful locations, such as nature centers and zoos
 - valuable agencies and organizations
- Skills:
 - problem-solving skills
 - organization and implementation of activities in the outdoors
 - safety and liability
 - appropriateness of the laboratory and field methods and equipment
 - history of environmental education

Sample Test Questions

The sample questions that follow illustrate the kinds of questions in the test. They are not, however, representative of the entire scope of the test in either content or difficulty. Answers with explanations follow the questions.

Questions 1–2

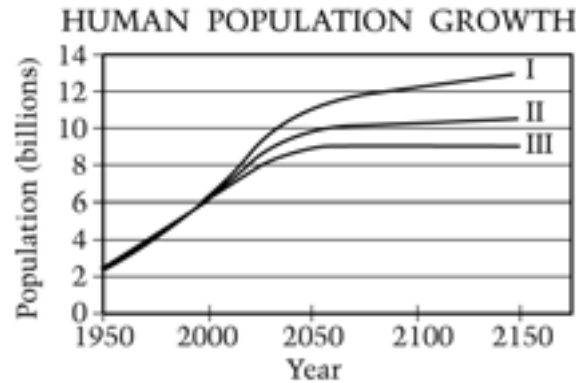
Directions: The group of questions below consists of four lettered diagrams followed by a list of numbered questions. For each numbered question select the one heading that is most closely related to it. One heading may be used once, more than once, or not at all.



- Which diagram best represents the average monthly temperature changes during a year for a tundra in the Northern Hemisphere?
- Which diagram best represents the average monthly temperature changes during a year for a location in the great plains of the United States?

Questions 3–4

The graph below shows three different predictions regarding future human populations of Earth.



- If world birth rate becomes equal to world death rate between the years 2020 and 2070, the graph indicates that the world population will stabilize at about
 - 34.0 billion
 - 13.5 billion
 - 10.7 billion
 - 8.9 billion
- For the time period between the years 2010 and 2050, which of the curves represents the population growth with the LEAST difference between annual birth rates and death rates?
 - I
 - II
 - III
 - Curves II and III show equal differences.

Directions: Each of the questions or statements below is followed by four suggested answers or completions. Select the one that is best in each case.

5. If a human population with a pyramidal structure has shown zero growth for some time, in what stage of the demographic transition is that population?
 - (A) Preindustrial
 - (B) Transitional
 - (C) Industrial
 - (D) Postindustrial
6. A lichen is best characterized as a symbiosis between which of the following?
 - (A) A liverwort and a fungus
 - (B) A moss and a liverwort
 - (C) An alga and a moss
 - (D) An alga and a fungus
7. Continued high agricultural production by farms in the United States depends most on which of the following natural resources?
 - (A) Coal
 - (B) Limestone
 - (C) Gypsum
 - (D) Petroleum
8. Of the following, the major cause of infant mortality worldwide is
 - (A) starvation
 - (B) waterborne diseases
 - (C) toxic chemicals
 - (D) nuclear radiation
9. All of the following are likely to increase after large areas of tropical rain forests are cut down EXCEPT the
 - (A) species diversity of the areas
 - (B) erosion by rivers flowing through the areas
 - (C) rate of nutrient loss from the areas
 - (D) average surface temperature of the soil in the areas
10. What group sponsors National Wildlife Week and provides teaching materials and posters to use in schools during the week?
 - (A) National Audubon Society
 - (B) National Wildlife Federation
 - (C) World Wildlife Fund
 - (D) Defenders of Wildlife
11. All of the following represent primary consumers feeding on first-trophic-level organisms EXCEPT
 - (A) paramecia feeding on green algae
 - (B) mice feeding on dead grass
 - (C) deer feeding on branches of trees
 - (D) slugs feeding on mushrooms
12. Observations from lakes in areas with granitic bedrock indicate that lakes are becoming depleted of living organisms. The primary cause is considered to be
 - (A) nuclear waste
 - (B) lowered water levels
 - (C) acid rain
 - (D) garbage dumping
13. Which of the following is a true statement about the flow of energy in an ecosystem?
 - (A) Smaller organisms need less energy per gram of body weight than do larger organisms.
 - (B) Energy transfer between organisms normally involves conservation of heat energy.
 - (C) Energy flow between trophic levels is inefficient.
 - (D) Chemical energy is converted into radiant energy, which is then converted into chemical energy at the next trophic level.

Answers

1. A is the correct answer. A tundra is a level or undulating treeless plain characteristic of arctic and subarctic regions with long cold winters and short cool summers.

2. B is the correct answer. Continental interiors are characterized by hot summers and cold winters.

3. The correct answer is D. As can be seen from the graph, curve III is the only curve that reaches a level population (8.9 billion) by 2070.

4. C is the correct answer. Least difference between birth rate and death rate is the same as lowest net rate of population growth, that is, III.

5. A is the correct answer. In his theory of Demographic Transition, Frank Notestein stated that when birth rates and death rates are both high there is very little opportunity for growth. Zero population growth is characteristic of a preindustrial state.

6. The correct answer is D. A lichen results from a symbiotic relationship between an alga and a fungus.

7. Choice D is the best answer. The United States agricultural system is based on energy derived from petroleum products: first, the fuels for mechanization; second, the petroleum-based pesticides and herbicides; and third, the dependence on petroleum-based products for fertilizers.

8. B is the correct answer. Water is used for sewage systems, for drinking, for washing activities, and for food production. Cross-contamination of drinking and washing water with sewage is a

serious problem worldwide that leads to the spread of waterborne diseases and infant mortality.

9. Choice A is the exception. The continuing loss of the diverse habitats found in tropical rain forests will cause a decrease in species diversity, not an increase. Thus, A is the correct answer.

10. The correct answer is B. The National Wildlife Federation is the source of the educational materials sent to state affiliates each year.

11. The correct answer is D. The first trophic level consists of producers. Neither slugs nor mushrooms are producers. In choices A, B, and C, the producers are green algae, dead grass, and tree branches, and the primary consumers are paramecia, mice, and deer.

12. Rain combines with various types of air pollution, forming acid rain. Lakes formed in limestone bedrock can neutralize the acidity of the rain, but lakes with granitic bedrock have limited capacity to neutralize the acid rain. The increasing acidity of these lakes has had a negative impact on the organisms normally inhabiting these lakes. Thus, C is the correct answer.

13. The correct answer is C. Biologists estimate that 90 percent of the energy is lost between levels of an energy pyramid. Thus, it is true that energy is transferred between trophic levels inefficiently.



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