

Chapter 01

Introduction to Ecology: Historical Foundations and Developing Frontiers

Multiple Choice Questions

1. Which of the following levels of organization is/are correctly ordered?
- A. population, ecosystem, landscape, individual, interaction
 - B. individual, population, interaction, community, ecosystem**
 - C. biosphere, landscape, individual, community, interaction
 - D. ecosystem, landscape, region, interaction, population
 - E. None of the choices are correct.

Bloom's Level: 2. Understand

Learning Outcome: 01.01.01 Describe the levels of ecological organization, for example, population, studied by ecologists.

Section: 01.01

Topic: Biomes and Ecosystems

Topic: Community Ecology

Topic: Population Ecology

2. Robert MacArthur's observations on the Warblers of North America indicate that they
- A. are fiercely competitive.
 - B. cannot coexist.
 - C. reduce competition by feeding during different times of the day.
 - D. reduce competition by feeding in different zones.**
 - E. both are fiercely competitive and cannot coexist.

Bloom's Level: 2. Understand

Learning Outcome: 01.02.01 Describe some emerging frontiers in ecology.

Section: 01.02

Topic: Community Ecology

3. What is ecology?

- A. the study of relationships between organisms and the environment
- B. the study of animal and plant population interactions
- C. the study of the abiotic portion of the environment
- D. the study of the biosphere
- E. the study of environmental change

Bloom's Level: 2. Understand

Learning Outcome: 01.00.01 Define ecology.

Section: 01.00

Topic: Behavioral Ecology

Topic: Community Ecology

Topic: Population Ecology

4. The 'scientific method' includes

- A. observations, experiments, and modeling.
- B. posing questions and formulating testable hypotheses.
- C. statistical analysis.
- D. observations, experiments, and modeling; posing questions and formulating testable hypotheses; and statistical analysis.
- E. both observations, experiments, and modeling, and posing questions and formulating testable hypotheses.

Bloom's Level: 5. Evaluate

Learning Outcome: 01. Investigating the Evidence Analyze and Interpret Data

Section: Investigating the Evidence

Topic: General

5. Nalini Nadkarni's study of tropical and temperate rain forests determined that

- A. rain forests have nutrient rich soils.
- B. the herbaceous layer determines the nutrient balance.
- C. epiphyte mats contain a significant source of nutrients.
- D. as one moves up the canopy, species richness decreases.
- E. None of the choices are correct.

Bloom's Level: 2. Understand

Learning Outcome: 01.02.01 Describe some emerging frontiers in ecology.

Section: 01.02

Topic: Biomes and Ecosystems

6. The highest level of ecological organization focuses on

- A. the gene.
- B. the biosphere.**
- C. warbler use of trees.
- D. forests.
- E. None of the choices are correct.

Bloom's Level: 1. Remember

Learning Outcome: 01.01.01 Describe the levels of ecological organization, for example, population, studied by ecologists.

Section: 01.01

Topic: Biomes and Ecosystems

7. A population can be defined as

- A. a group of individuals of a single species inhabiting a defined area.**
- B. an association of interacting species.
- C. a group of individuals of a single species and all of the physical and chemical factors influencing them.
- D. all of the organisms in a defined area.
- E. None of the choices are correct.

Bloom's Level: 2. Understand

Learning Outcome: 01.01.01 Describe the levels of ecological organization, for example, population, studied by ecologists.

Section: 01.01

Topic: Population Ecology

8. Physiological ecologists study

- A. nutrient cycling and energy flow through ecosystems.
- B. exchanges of materials, energy, and organisms between communities.
- C. physiological and anatomical mechanisms by which organisms deal with variation in their physical and chemical environment.**
- D. physiological and anatomical mechanisms by which organisms deal with variation in their social environment.
- E. None of the choices are correct.

Bloom's Level: 5. Evaluate

Learning Outcome: 01.01.02 Distinguish between the types of questions addressed by ecologists working at different levels of organization.

Section: 01.01

Topic: Behavioral Ecology

9. The pioneering work of Nalini Nadkarni in rain forest ecology revealed that
- A. epiphyte mats in some tropical forests contain nutrient quantities equal to the nutrient content of the canopy foliage.
 - B. the epiphyte mass in temperate rain forests may be four times the mass of leaves on their host tree.
 - C. in both temperate and tropical rain forests, trees obtain nutrients by extending roots into epiphyte mats.
 - D. All of the choices are correct.
 - E. both the epiphyte mass in temperate rain forests may be four times the mass of leaves on their host tree and, in both temperate and tropical rain forests, trees obtain nutrients by extending roots into epiphyte mats.**

Bloom's Level: 5. Evaluate

Learning Outcome: 01.02.01 Describe some emerging frontiers in ecology.

Section: 01.02

Topic: Biomes and Ecosystems

10. Population ecologists do **not** study
- A. reproductive ecology.
 - B. distribution and abundance.
 - C. energy flow.**
 - D. extinction.
 - E. adaptation.

Bloom's Level: 2. Understand

Learning Outcome: 01.01.02 Distinguish between the types of questions addressed by ecologists working at different levels of organization.

Section: 01.01

Topic: Population Ecology

11. Ecologists study
- A. communities.
 - B. ecosystems.
 - C. individual organisms.
 - D. populations.
 - E. All of the choices are correct.**

Bloom's Level: 2. Understand

Learning Outcome: 01.01.01 Describe the levels of ecological organization, for example, population, studied by ecologists.

Section: 01.01

Topic: Biomes and Ecosystems

Topic: Community Ecology

Topic: Population Ecology

12. An ecosystem is defined as

- A. all the organisms that live in an area.
- B. the physical environment with which organisms interact.
- C. an association of interacting species.
- D.** all of the organisms that live in an area and the physical environment with which they interact.
- E. all of the individuals of a single species that live in an area and the physical environment with which they interact.

Bloom's Level: 2. Understand

Learning Outcome: 01.01.01 Describe the levels of ecological organization, for example, population, studied by ecologists.

Section: 01.01

Topic: Biomes and Ecosystems

13. According to Margaret Davis, who studied pollen contained within lake sediments, the vegetation landscape of the Appalachian Mountains from 12,000 years ago until approximately 100 years ago changed as follows:

- A. spruce→chestnut→beech.
- B. chestnut→spruce→beech.
- C. beech→spruce→chestnut.
- D.** spruce→beech→chestnut.
- E. chestnut→beech→spruce.

Bloom's Level: 2. Understand

Learning Outcome: 01.02.01 Describe some emerging frontiers in ecology.

Section: 01.02

Topic: Community Ecology

True / False Questions

14. Norris and colleagues found that warblers using different habitats did not have different carbon isotopes in the tissues.

FALSE

Bloom's Level: 2. Understand

Learning Outcome: 01.02.02 Explain how the use of stable isotopes has extended what it is possible to know about the ecology of warblers.

Section: 01.02

Topic: Community Ecology

15. Field studies and laboratory studies are mutually exclusive.

FALSE

Bloom's Level: 2. Understand
Learning Outcome: 01. Investigating the Evidence Analyze and Interpret Data
Section: Investigating the Evidence
Topic: General

16. Temperate and tropical rain forest trees extract nutrients from epiphytic mats.

TRUE

Bloom's Level: 2. Understand
Learning Outcome: 01.02.01 Describe some emerging frontiers in ecology.
Section: 01.02
Topic: Biomes and Ecosystems

17. Stable isotope analysis uses variation in element masses to better understand ecological phenomena.

TRUE

Bloom's Level: 2. Understand
Learning Outcome: 01.02.02 Explain how the use of stable isotopes has extended what it is possible to know about the ecology of warblers.
Section: 01.02
Topic: Community Ecology
Topic: General

18. Margaret Davis' studies on lake pollen sediments indicate that the forests of eastern North America did not change with the changing climate.

FALSE

Bloom's Level: 2. Understand
Learning Outcome: 01.02.01 Describe some emerging frontiers in ecology.
Section: 01.02
Topic: Community Ecology

19. The scientific method deals with absolute truths.

FALSE

*Bloom's Level: 2. Understand
Learning Outcome: 01. Investigating the Evidence Analyze and Interpret Data
Section: Investigating the Evidence
Topic: General*

20. Ecology can be defined as the study of the impact of human activity on the environment.

FALSE

*Bloom's Level: 2. Understand
Learning Outcome: 01.00.01 Define ecology.
Section: 01.00
Topic: General*

21. Ecology is a modern science of which ancient man had no knowledge.

FALSE

*Bloom's Level: 2. Understand
Learning Outcome: 01.00.01 Define ecology.
Section: 01.00
Topic: General*

Fill in the Blank Questions

22. _____ are aerial plants obtaining nutrient from trapped organic matter.

Epiphytes

*Bloom's Level: 2. Understand
Learning Outcome: 01.02.01 Describe some emerging frontiers in ecology.
Section: 01.02
Topic: Biomes and Ecosystems*

23. Populations changing genetically over time in response to variation in its environment is termed _____.

Evolution

Bloom's Level: 2. Understand

Learning Outcome: 01.01.01 Describe the levels of ecological organization, for example, population, studied by ecologists.

Section: 01.01

Topic: Population Ecology