

Ecology, 8e (Molles)

Chapter 1 Introduction to Ecology: Historical Foundations and Developing Frontiers

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.

Answer: B

Section: 01.01

Topic: Overview of Ecology

Bloom's: 2. Understand

Learning Outcome: 01.02 Describe the levels of ecological organization, for example, population, studied by ecologists.

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.

Answer: D

Section: 01.02

Topic: Sampling Ecological Research

Bloom's: 2. Understand

Learning Outcome: 01.07 Compare the spatial and temporal scales addressed by the research of Robert MacArthur, Nalini Nadkarni, and Margaret Davis.

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

Answer: A

Section: 01.00

Topic: Introductory Ecology

Bloom's: 2. Understand

Learning Outcome: 01.01 Discuss the concept of environment as it pertains to the science of ecology.

- 4) 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.

Answer: C

Section: 01.02

Topic: Sampling Ecological Research

Bloom's: 3. Apply

Learning Outcome: 01.07 Compare the spatial and temporal scales addressed by the research of Robert MacArthur, Nalini Nadkarni, and Margaret Davis.

- 5) 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.

Answer: B

Section: 01.01

Topic: Overview of Ecology

Bloom's: 1. Remember

Learning Outcome: 01.02 Describe the levels of ecological organization, for example, population, studied by ecologists.

- 6) 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.

Answer: A

Section: 01.01

Topic: Overview of Ecology

Bloom's: 2. Understand

Learning Outcome: 01.02 Describe the levels of ecological organization, for example, population, studied by ecologists.

- 7) 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.

Answer: C

Section: 01.01

Topic: Overview of Ecology

Bloom's: 3. Apply

Learning Outcome: 01.03 Distinguish between the types of questions addressed by ecologists working at different levels of organization.

- 8) 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) 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.
 - E) All of the choices are correct.

Answer: D

Section: 01.02

Topic: Sampling Ecological Research

Bloom's: 3. Apply

Learning Outcome: 01.07 Compare the spatial and temporal scales addressed by the research of Robert MacArthur, Nalini Nadkarni, and Margaret Davis.

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

Answer: C

Section: 01.01

Topic: Overview of Ecology

Bloom's: 3. Apply

Learning Outcome: 01.03 Distinguish between the types of questions addressed by ecologists working at different levels of organization.

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

Answer: E

Section: 01.01

Topic: Overview of Ecology

Bloom's: 2. Understand

Learning Outcome: 01.02 Describe the levels of ecological organization, for example, population, studied by ecologists.

- 11) 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.

Answer: D

Section: 01.01

Topic: Overview of Ecology

Bloom's: 2. Understand

Learning Outcome: 01.02 Describe the levels of ecological organization, for example, population, studied by ecologists.

12) 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 from

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

Answer: D

Section: 01.02

Topic: Sampling Ecological Research

Bloom's: 2. Understand

Learning Outcome: 01.07 Compare the spatial and temporal scales addressed by the research of Robert MacArthur, Nalini Nadkarni, and Margaret Davis.

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

Answer: FALSE

Section: 01.02

Topic: Sampling Ecological Research

Bloom's: 2. Understand

Learning Outcome: 01.06 Explain how the use of stable isotopes has extended what it is possible to know about the ecology of warblers.

14) Field studies and laboratory studies are mutually exclusive.

Answer: FALSE

Section: 01.00

Topic: Introductory Ecology

Bloom's: 2. Understand

Learning Outcome: 01.01 Discuss the concept of environment as it pertains to the science of ecology.

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

Answer: TRUE

Section: 01.02

Topic: Sampling Ecological Research

Bloom's: 2. Understand

Learning Outcome: 01.05 Describe some emerging frontiers in ecology.

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

Answer: TRUE

Section: 01.02

Topic: Sampling Ecological Research

Bloom's: 2. Understand

Learning Outcome: 01.06 Explain how the use of stable isotopes has extended what it is possible to know about the ecology of warblers.

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

Answer: FALSE

Section: 01.02

Topic: Sampling Ecological Research

Bloom's: 2. Understand

Learning Outcome: 01.07 Compare the spatial and temporal scales addressed by the research of Robert MacArthur, Nalini Nadkarni, and Margaret Davis.

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

Answer: FALSE

Section: 01.00

Topic: Introductory Ecology

Bloom's: 2. Understand

Learning Outcome: 01.01 Discuss the concept of environment as it pertains to the science of ecology.

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

Answer: FALSE

Section: 01.00

Topic: Introductory Ecology

Bloom's: 2. Understand

Learning Outcome: 01.01 Discuss the concept of environment as it pertains to the science of ecology.

20) _____ are aerial plants that obtain nutrients from trapped organic matter.

Answer: Epiphytes

Section: 01.02

Topic: Sampling Ecological Research

Bloom's: 2. Understand

Learning Outcome: 01.05 Describe some emerging frontiers in ecology.

21) Populations changing genetically over time in response to variation in their environments is termed _____.

Answer: Evolution

Section: 01.01

Topic: Overview of Ecology

Bloom's: 2. Understand

Learning Outcome: 01.02 Describe the levels of ecological organization, for example, population, studied by ecologists.

22) Which of the following statements below demonstrates the interactions between ecological areas and processes?

A) The smallest level, the biosphere, is where we can see exchanges of materials, energy, and organisms.

B) Landscape ecology, the largest level of organization, has all of the areas on Earth that support life.

C) Exchanges between ecosystems leads to the level of landscape ecology.

D) Geographic ecology includes the exchanges between ecosystems leading to the level of landscape ecology.

Answer: C

Explanation: Communities and ecosystems have exchanges between them that lead to landscape ecology, which feeds into the regional processes of geographic ecology, leading finally to the biosphere.

Section: 01.01

Topic: Overview of Ecology

Bloom's: 2. Understand

Learning Outcome: 01.04 Explain how knowledge of one level of ecological organization can help guide research at another level of organization.

23) Even though ecologists would like to study isolated levels of the environment, that would be difficult since all levels are interconnected.

Answer: TRUE

Explanation: The biosphere contains many interconnected levels.

Section: 01.01

Topic: Overview of Ecology

Bloom's: 2. Understand

Learning Outcome: 01.04 Explain how knowledge of one level of ecological organization can help guide research at another level of organization.

24) Which U.S. law protects endangered species?

- A) Convention on International Trade in Endangered Species
- B) The Endangered Species Act
- C) The Species Protection Act
- D) The Protection and Care of Species Act

Answer: B

Explanation: The Endangered Species Act is the U.S. law that protects endangered species.

Section: Applications

Topic: Application, Ecology Can Inform Environmental Law and Policy

Bloom's: 1. Remember

Learning Outcome: Describe the purposes of the Convention on International Trade in Endangered Species of Wild Fauna and Flora (CITES) and the U.S. Endangered Species Act.

25) Critical habitat protection for endangered species brings together the studies of adaptations of species, community through geographic levels of ecology, and global ecology.

Answer: TRUE

Explanation: This is a true statement.

Section: Applications

Topic: Application, Ecology Can Inform Environmental Law and Policy

Bloom's: 2. Understand

Learning Outcome: Discuss how subject areas covered in this text are applicable to identifying and managing endangered species.