

TEST BANK

Campbell Biology

Jane B. Reece, Lisa A. Urry, Michael L. Cain, Steven A. Wasserman,
Peter V. Minorsky, Robert B. Jackson

9th Edition

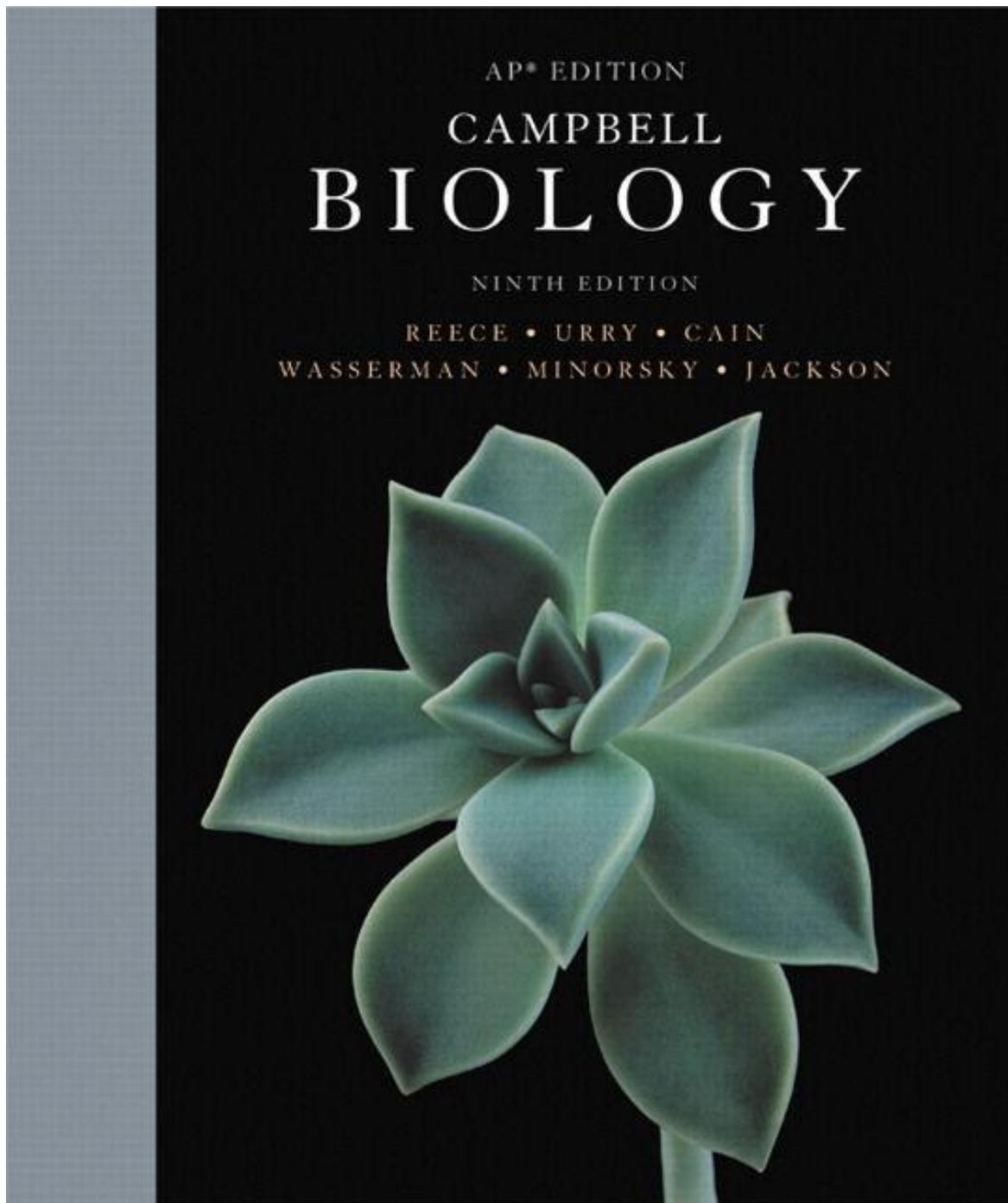


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Chapter 1 Introduction: Themes in the Study of Life

This introductory chapter explores the basic themes and concepts of biology, with emphasis on the core theme of evolution. It also introduces students to the thinking of scientists. Questions are therefore general; however, an effort has been made to include some from each skill level. As in the rest of this test bank, questions that feature art or those for which several questions follow upon some data or a scenario are placed together at the end of the chapter.

Multiple-Choice Questions

- 1) A localized group of organisms that belong to the same species is called a
- A) biosystem.
 - B) community.
 - C) population.
 - D) ecosystem.
 - E) family.

Answer: C

Topic: Concept 1.1

Skill: Knowledge/Comprehension

- 2) Organisms interact with their environments, exchanging matter and energy. For example, plant chloroplasts convert the energy of sunlight into
- A) the energy of motion.
 - B) carbon dioxide and water.
 - C) the potential energy of chemical bonds.
 - D) oxygen.
 - E) kinetic energy.

Answer: C

Topic: Concept 1.1

Skill: Knowledge/Comprehension

- 3) The main source of energy for producers in an ecosystem is
- A) light energy.
 - B) kinetic energy.
 - C) thermal energy.
 - D) chemical energy.
 - E) ATP.

Answer: A

Topic: Concept 1.1

Skill: Knowledge/Comprehension

4) Which of the following types of cells utilize deoxyribonucleic acid (DNA) as their genetic material but do not have their DNA encased within a nuclear envelope?

- A) animal
- B) plant
- C) archaea
- D) fungi
- E) protists

Answer: C

Topic: Concept 1.1

Skill: Application/Analysis

5) To understand the chemical basis of inheritance, we must understand the molecular structure of DNA. This is an example of the application of which concept to the study of biology?

- A) evolution
- B) emergent properties
- C) reductionism
- D) the cell theory
- E) feedback regulation

Answer: C

Topic: Concept 1.1

Skill: Application/Analysis

6) Once labor begins in childbirth, contractions increase in intensity and frequency until delivery. The increasing labor contractions of childbirth are an example of which type of regulation?

- A) a bioinformatic system
- B) positive feedback
- C) negative feedback
- D) feedback inhibition
- E) enzymatic catalysis

Answer: B

Topic: Concept 1.1

Skill: Application/Analysis

7) When the body's blood glucose level rises, the pancreas secretes insulin and, as a result, the blood glucose level declines. When the blood glucose level is low, the pancreas secretes glucagon and, as a result, the blood glucose level rises. Such regulation of the blood glucose level is the result of

- A) catalytic feedback.
- B) positive feedback.
- C) negative feedback.
- D) bioinformatic regulation.
- E) protein-protein interactions.

Answer: C

Topic: Concept 1.1

Skill: Application/Analysis

- 8) Which branch of biology is concerned with the naming and classifying of organisms?
- A) informatics
 - B) schematic biology
 - C) taxonomy
 - D) genomics
 - E) evolution

Answer: C

Topic: Concept 1.1

Skill: Knowledge/Comprehension

- 9) Prokaryotic and eukaryotic cells generally have which of the following features in common?
- A) a membrane-bounded nucleus
 - B) a cell wall made of cellulose
 - C) ribosomes
 - D) flagella or cilia that contain microtubules
 - E) linear chromosomes made of DNA and protein

Answer: C

Topic: Concept 1.1

Skill: Knowledge/Comprehension

- 10) Prokaryotes are classified as belonging to two different domains. What are the domains?
- A) Bacteria and Eukarya
 - B) Archaea and Monera
 - C) Eukarya and Monera
 - D) Bacteria and Protista
 - E) Bacteria and Archaea

Answer: E

Topic: Concept 1.1

Skill: Knowledge/Comprehension

- 11) Global warming, as demonstrated by observations such as melting of glaciers, increasing CO₂ levels, and increasing average ambient temperatures, has already had many effects on living organisms. Which of the following might best offer a solution to this problem?
- A) Continue to measure these and other parameters of the problem.
 - B) Increase the abilities of animals to migrate to more suitable habitats.
 - C) Do nothing; nature will attain its own balance.
 - D) Limit the burning of fossil fuels and regulate our loss of forested areas.
 - E) Recycle as much as possible.

Answer: D

Topic: Concept 1.1

Skill: Synthesis/Evaluation

12) A water sample from a hot thermal vent contained a single-celled organism that had a cell wall but lacked a nucleus. What is its most likely classification?

- A) Eukarya
- B) Archaea
- C) Animalia
- D) Protista
- E) Fungi

Answer: B

Topic: Concept 1.2

Skill: Application/Analysis

13) A filamentous organism has been isolated from decomposing organic matter. This organism has a cell wall but no chloroplasts. How would you classify this organism?

- A) domain Bacteria, kingdom Prokaryota
- B) domain Archaea, kingdom Bacteria
- C) domain Eukarya, kingdom Plantae
- D) domain Eukarya, kingdom Protista
- E) domain Eukarya, kingdom Fungi

Answer: E

Topic: Concept 1.2

Skill: Application/Analysis

14) Which of these provides evidence of the common ancestry of all life?

- A) ubiquitous use of catalysts by living systems
- B) near universality of the genetic code
- C) structure of the nucleus
- D) structure of cilia
- E) structure of chloroplasts

Answer: B

Topic: Concept 1.2

Skill: Application/Analysis

15) Which of the following is (are) true of natural selection?

- A) It requires genetic variation.
- B) It results in descent with modification.
- C) It involves differential reproductive success.
- D) It results in descent with modification and involves differential reproductive success.
- E) It requires genetic variation, results in descent with modification, and involves differential reproductive success.

Answer: E

Topic: Concept 1.2

Skill: Knowledge/Comprehension

- 16) Charles Darwin proposed a mechanism for descent with modification that stated that organisms of a particular species are adapted to their environment when they possess
- A) non-inheritable traits that enhance their survival in the local environment.
 - B) non-inheritable traits that enhance their reproductive success in the local environment.
 - C) non-inheritable traits that enhance their survival and reproductive success in the local environment.
 - D) inheritable traits that enhance their survival and reproductive success in the local environment.
 - E) inheritable traits that decrease their survival and reproductive success in the local environment.

Answer: D

Topic: Concept 1.2

Skill: Knowledge/Comprehension

- 17) Which of these individuals is likely to be most successful in an evolutionary sense?
- A) a reproductively sterile individual who never falls ill
 - B) an organism that dies after five days of life but leaves 10 offspring, all of whom survive to reproduce
 - C) a male who mates with 20 females and fathers one offspring
 - D) an organism that lives 100 years and leaves two offspring, both of whom survive to reproduce
 - E) a female who mates with 20 males and produces one offspring that lives to reproduce

Answer: B

Topic: Concept 1.2

Skill: Application/Analysis

- 18) In a hypothetical world, every 50 years people over 6 feet tall are eliminated from the population before they reproduce. Based on your knowledge of natural selection, you would predict that the average height of the human population will
- A) remain unchanged.
 - B) gradually decline.
 - C) rapidly decline.
 - D) gradually increase.
 - E) rapidly increase.

Answer: B

Topic: Concept 1.2

Skill: Application/Analysis

- 19) Through time, the lineage that led to modern whales shows a change from four-limbed land animals to aquatic animals with two limbs that function as flippers. This change is best explained by
- A) natural philosophy.
 - B) creationism.
 - C) the hierarchy of the biological organization of life.
 - D) natural selection.
 - E) feedback inhibition.

Answer: D

Topic: Concept 1.2

Skill: Application/Analysis

- 20) What is the major difference between a kingdom and a domain?
- A) A kingdom can include several subgroups known as domains.
 - B) All eukarya belong to one domain.
 - C) All prokaryotes belong to one domain.
 - D) The importance of fungi has led scientists to make them the whole of one domain.
 - E) Only organisms that produce their own food belong to one of the domains.

Answer: B

Topic: Concept 1.2

Skill: Knowledge/Comprehension

- 21) Which of the following best describes what occurred after the publication of Charles Darwin's *On the Origin of Species*?
- A) The book received little attention except from a small scientific community.
 - B) The book was banned from schools.
 - C) The book was widely discussed and disseminated.
 - D) The book's authorship was disputed.
 - E) The book was discredited by most scientists.

Answer: C

Topic: Concept 1.2

Skill: Knowledge/Comprehension

- 22) Why is Darwin considered original in his thinking?
- A) He provided examples of organisms that had evolved over time.
 - B) He demonstrated that evolution is continuing to occur now.
 - C) He described the relationship between genes and evolution.
 - D) He proposed the mechanism that explained how evolution takes place.
 - E) He observed that organisms produce large numbers of offspring.

Answer: D

Topic: Concept 1.2

Skill: Knowledge/Comprehension

- 23) Darwin's finches, collected from the Galápagos Islands, illustrate which of the following?
- A) mutation frequency
 - B) ancestors from different regions
 - C) adaptive radiation
 - D) vestigial anatomic structures
 - E) the accuracy of the fossil record

Answer: C

Topic: Concept 1.2

Skill: Knowledge/Comprehension

- 24) Which of the following categories of organisms is least likely to be revised?
- A) kingdom
 - B) class
 - C) order
 - D) phylum
 - E) species

Answer: E

Topic: Concept 1.2

Skill: Synthesis/Evaluation

25) What is the major distinguishing characteristic of fungi?

- A) gaining nutrition through ingestion
- B) being sedentary
- C) being prokaryotic
- D) absorbing dissolved nutrients
- E) being decomposers of dead organisms

Answer: D

Topic: Concept 1.2

Skill: Knowledge/Comprehension

26) What are archaea?

- A) Prokaryotes characterized as extremophiles that share some bacterial and some eukaryotic traits.
- B) Organisms that are adapted to high temperature environments, such as in volcanic springs.
- C) Single-celled organisms that are killed by the application of antibiotics at certain concentrations.
- D) Bacteria-like organisms that can live only in extreme salt environments.
- E) Primitive protist-like creatures possessing fewer than two chromosomes per cell.

Answer: A

Topic: Concept 1.2

Skill: Knowledge/Comprehension

27) According to Darwinian theory, which of the following exhibits the greatest fitness for evolutionary success?

- A) the species with the longest life
- B) the individuals within a population that have the greatest reproductive success
- C) the phylum with members that occupy the greatest number of habitats
- D) the community of organisms that is capable of living in the most nutrient-poor biome
- E) the organism that produces its own nutrients most efficiently

Answer: B

Topic: Concept 1.2

Skill: Knowledge/Comprehension

28) Similarities and differences among/between life-forms over time are most efficiently recorded by scientists in which field(s) of study?

- A) paleontology
- B) paleontology and anatomy
- C) paleontology, anatomy, and taxonomy
- D) paleontology, anatomy, taxonomy, and genetics
- E) paleontology, anatomy, taxonomy, genetics, and ecology

Answer: E

Topic: Concept 1.2

Skill: Synthesis/Evaluation

- 29) Why is the theme of evolution considered to be the core theme of biology by biologists?
- A) It provides a framework within which all biological investigation makes sense.
 - B) It is recognized as the core theme of biology by organizations such as the National Science Foundation.
 - C) Controversy about this theory provides a basis for a great deal of experimental research.
 - D) Since it cannot be proven, biologists will be able to study evolutionary possibilities for many years.
 - E) Biologists do not subscribe to alternative models.

Answer: A

Topic: Concept 1.2

Skill: Synthesis/Evaluation

- 30) The method of scientific inquiry that describes natural structures and processes as accurately as possible through careful observation and the analysis of data is known as
- A) hypothesis-based science.
 - B) discovery science.
 - C) experimental science.
 - D) quantitative science.
 - E) qualitative science.

Answer: B

Topic: Concept 1.3

Skill: Knowledge/Comprehension

- 31) Collecting data based on observation is an example of _____; analyzing this data to reach a conclusion is an example of _____ reasoning.
- A) hypothesis-based science; inductive
 - B) the process of science; deductive
 - C) discovery science; inductive
 - D) descriptive science; deductive
 - E) hypothesis-based science; deductive

Answer: C

Topic: Concept 1.3

Skill: Application/Analysis

- 32) When applying the process of science, which of these is tested?
- A) a question
 - B) a result
 - C) an observation
 - D) a prediction
 - E) a hypothesis

Answer: D

Topic: Concept 1.3

Skill: Knowledge/Comprehension