

***Biology: Life on Earth w/ Physiology, 11e (Audesirk/Audesirk/Byers)***  
**Chapter 1 An Introduction to Life on Earth**

1.1 Multiple-Choice Questions

- 1) Scientific inquiry is based on  
A) cultural biases or traditions.  
B) stories that are passed down through generations.  
C) natural causes.  
D) information found in a gossip magazine.

Answer: C

Diff: 1

Chapter Section: 1.1

Skill: Knowledge/Comprehension

Learning Outcome: 1.6

Global L.O.: G1

- 2) Which of the following is an example of a natural cause?  
A) Mice arise from discarded garbage.  
B) Maggots appear spontaneously on rotting meat.  
C) Epilepsy is a disease caused by uncontrolled firing of nerve cells in the brain.  
D) If you sneeze, you will die.

Answer: C

Diff: 1

Chapter Section: 1.1

Skill: Application/Analysis

Learning Outcome: 1.6

Global L.O.: G1

- 3) Science cannot answer certain faith-based questions because  
A) scientists are not able to study human behavior.  
B) faith-based beliefs are impossible to either prove or disprove.  
C) faith requires deductive reasoning.  
D) there aren't enough variables.

Answer: B

Diff: 2

Chapter Section: 1.1

Skill: Application/Analysis

Learning Outcome: 1.6

Global L.O.: G1

4) Which of the following is FALSE about scientific theories?

- A) They have been thoroughly tested.
- B) They are developed by inductive reasoning.
- C) They are used to support observations using deductive reasoning.
- D) They can be either supported or modified by new observations.
- E) They are firmly established and cannot be refuted.

Answer: E

Diff: 1

Chapter Section: 1.1

Skill: Knowledge/Comprehension

Learning Outcome: 1.9

Global L.O.: G1

5) Which of these would be an example of a NON-scientific study?

- A) A study determines differences in the species composition in two parks.
- B) People are immunized with different vaccines to determine their relative effectiveness against the flu virus.
- C) NASA sends tadpoles up in the space shuttle to see how gravity affects their development.
- D) Consumers are asked which tomato variety produces the best-tasting spaghetti sauce.
- E) A company uses different advertising methods for a product to determine which one produces the most sales.

Answer: D

Diff: 3

Chapter Section: 1.1

Skill: Application/Analysis

Learning Outcome: 1.7

Global L.O.: G1

6) The scientific method includes all of the following EXCEPT

- A) experimentation.
- B) a testable theory.
- C) an observation.
- D) a hypothesis.
- E) conclusions.

Answer: B

Diff: 2

Chapter Section: 1.1

Skill: Knowledge/Comprehension

Learning Outcome: 1.7

Global L.O.: G1

7) We use the scientific method every day. Imagine that your car doesn't start one morning before school. Which of these is a reasonable *hypothesis* regarding the problem?

- A) I'm going to be late.
- B) If I put gas in my car, it will start.
- C) I should check whether the lights were left on and drained the battery.
- D) I should change the battery or the starter.
- E) I should add a quart of oil.

Answer: B

Diff: 2

Chapter Section: 1.1

Skill: Application/Analysis

Learning Outcome: 1.7

Global L.O.: G1

8) A scientific theory

- A) is a general explanation for natural phenomena.
- B) is an educated guess.
- C) is less reliable than a hypothesis.
- D) will never be changed.

Answer: A

Diff: 2

Chapter Section: 1.1

Skill: Knowledge/Comprehension

Learning Outcome: 1.9

Global L.O.: G1

9) A scientific explanation that is conditional and requires more investigation is called a(n)

- A) theory.
- B) fact.
- C) control.
- D) hypothesis.
- E) observation.

Answer: D

Diff: 2

Chapter Section: 1.1

Skill: Knowledge/Comprehension

Learning Outcome: 1.7

Global L.O.: G1

10) A carefully formulated scientific explanation that is based on extensive observations and is in accord with scientific principles is called a

- A) hypothesis.
- B) theory.
- C) fact.
- D) control.
- E) postulate.

Answer: B

Diff: 2

Chapter Section: 1.1

Skill: Knowledge/Comprehension

Learning Outcome: 1.7

Global L.O.: G1

11) All of the following are features of the scientific method EXCEPT

- A) hypothesis formulation.
- B) observation and experimentation.
- C) supernatural causes.
- D) deductive reasoning.
- E) repeatable by other scientists.

Answer: C

Diff: 2

Chapter Section: 1.1

Skill: Knowledge/Comprehension

Learning Outcome: 1.7

Global L.O.: G1

12) Suppose you are testing a treatment for AIDS patients and find that 75% respond well, whereas 25% show no improvement or a decline in health. You should

- A) conclude that you have proven the effectiveness of the drug.
- B) conclude that only 75% of AIDS patients should be treated.
- C) review the results, modify the drug or the dosage, and repeat the experiment.
- D) discontinue experimentation with this treatment because 25% of patients did not improve.
- E) begin work on developing a new drug.

Answer: C

Diff: 3

Chapter Section: 1.1

Skill: Application/Analysis

Learning Outcome: 1.7

Global L.O.: G1; G2; G4

13) Alexander Fleming observed a colony of mold that inhibited the growth of nearby bacteria. What was the hypothesis proposed by Fleming to explain this result?

- A) The mold used all of the nutrients so that the bacteria couldn't grow.
- B) The mold produced a substance that killed nearby bacteria.
- C) The bacteria changed their DNA when growing near the mold.
- D) The mold was dead.

Answer: B

Diff: 2

Chapter Section: 1.1

Skill: Synthesis/Evaluation

Learning Outcome: 1.7

Global L.O.: G1

14) Imagine that 1 milliliter of an experimental drug diluted in a saline solution is injected into 20 pregnant mice to determine possible side effects. Which of the following is a suitable control for this experiment?

- A) 20 male mice injected with 1 milliliter of saline
- B) 20 male mice injected with 1 milliliter of the drug
- C) 20 pregnant mice injected with 2 milliliters of the drug
- D) 20 non-pregnant mice injected with 1 milliliter of the drug
- E) 20 pregnant mice injected with 1 milliliter of saline

Answer: E

Diff: 2

Chapter Section: 1.1

Skill: Application/Analysis

Learning Outcome: 1.7

Global L.O.: G1

15) Which of the following statements is a hypothesis rather than a theory?

- A) Matter is composed of atoms.
- B) Living things are made of cells.
- C) Modern organisms descended from preexisting life-forms.
- D) Female birds prefer to mate with male birds that have longer tails.

Answer: D

Diff: 2

Chapter Section: 1.1

Skill: Application/Analysis

Learning Outcome: 1.9

Global L.O.: G1

16) Which of the following is TRUE regarding faith-based beliefs and scientific theories?

- A) Both faith-based beliefs and scientific theories can be proven.
- B) Any and all faith-based beliefs can be disproven, but scientific theories cannot.
- C) Any and all scientific theories can be disproven, but faith-based beliefs cannot.
- D) Scientific theories are not modifiable, but faith-based beliefs are.
- E) Faith-based beliefs can become scientific theories.

Answer: C

Diff: 1

Chapter Section: 1.1

Skill: Knowledge/Comprehension

Learning Outcome: 1.9

Global L.O.: G1

17) Which is the correct sequence of increasing organization?

- A) Molecule, cell, organelle, organ
- B) Organelle, tissue, cell, organ
- C) Atom, molecule, tissue, cell
- D) Organ, tissue, cell, molecule
- E) Cell, tissue, organ, organ system

Answer: E

Diff: 1

Chapter Section: 1.1

Skill: Knowledge/Comprehension

Learning Outcome: 1.3

Global L.O.: G1

18) Which of the following levels of organization is the most inclusive (i.e., includes the most life-forms)?

- A) Species
- B) Population
- C) Biosphere
- D) Community
- E) Ecosystem

Answer: C

Diff: 1

Chapter Section: 1.1

Skill: Knowledge/Comprehension

Learning Outcome: 1.3

Global L.O.: G1

19) The smallest units that still retain the characteristics of an element are called

- A) molecules.
- B) cells.
- C) atoms.
- D) tissues.
- E) organic molecules.

Answer: C

Diff: 1

Chapter Section: 1.1

Skill: Knowledge/Comprehension

Learning Outcome: 1.1

Global L.O.: G1

20) Which of the following is an example of deductive reasoning?

- A) All objects on Earth will fall down when dropped, and none will "fall up."
- B) Living objects are composed of cells.
- C) Atoms make up molecules, which make up cells, which make up tissues.
- D) If an object exhibits all the characteristics of life, it must be living.

Answer: D

Diff: 1

Chapter Section: 1.1

Skill: Application/Analysis

Learning Outcome: 1.7

Global L.O.: G1

21) The experiments of Francesco Redi

- A) disproved that maggots and flies were related.
- B) disproved the idea of spontaneous generation.
- C) disproved the scientific method.
- D) used the scientific method to prove the idea of spontaneous generation.
- E) determined that fly larvae were present in raw meat, and when left on the counter they turned into flies.

Answer: B

Diff: 2

Chapter Section: 1.1

Skill: Knowledge/Comprehension

Learning Outcome: 1.6; 1.7

Global L.O.: G1

22) Francesco Redi designed an experiment to test the notion of spontaneous generation. He left the first jar of meat open to the air and covered the second jar. The first jar would be called the \_\_\_\_\_ jar.

- A) experimental
- B) control
- C) conclusive
- D) hypothetical

Answer: B

Diff: 2

Chapter Section: 1.1

Skill: Application/Analysis

Learning Outcome: 1.6; 1.7

Global L.O.: G1

23) To test the effect of vitamin D on growth, two groups of rats were raised under identical conditions and fed the same diet. One of the groups received daily injections of vitamin D. The other group received injections of saline, which did not contain vitamin D. All the rats were weighed weekly for 2 months. In this experiment, the control was the

- A) group receiving vitamin D.
- B) group receiving saline.
- C) average weight gain of the rats.
- D) 2-month period of time.

Answer: B

Diff: 2

Chapter Section: 1.1

Skill: Application/Analysis

Learning Outcome: 1.7; 1.8

Global L.O.: G1

24) Evolution is sometimes described as the change from preexisting life-forms to modern-day organisms. What actually changes, in every case of evolution, is the

- A) rate of reproduction.
- B) ability of organisms to respond to external stimuli.
- C) energy and nutritional demands of the organism.
- D) genetic makeup of the species, due to mutations.
- E) species' physical appearance.

Answer: D

Diff: 2

Chapter Section: 1.2

Skill: Synthesis/Evaluation

Learning Outcome: 1.2

Global L.O.: G1



25) All of the following are important to the theory of evolution EXCEPT

- A) environmental change.
- B) variation in traits within an entire population.
- C) mutations.
- D) inheritance of traits.
- E) changes in individuals within their lifetimes.

Answer: E

Diff: 2

Chapter Section: 1.2

Skill: Knowledge/Comprehension

Learning Outcome: 1.2

Global L.O.: G1

26) Which is NOT an example of evolution?

- A) The development of antibiotic-resistant bacteria
- B) Flightless birds living on islands without predators
- C) Annual changes in the flu virus due to mutations
- D) A dog learning how to open the cabinet where its food is kept
- E) The 2- to 3-year effectiveness of most commercial pesticides in killing insects

Answer: D

Diff: 3

Chapter Section: 1.2

Skill: Application/Analysis

Learning Outcome: 1.2

Global L.O.: G1

27) A mutation can be the cause for

- A) environmental change.
- B) natural selection.
- C) sexual reproduction.
- D) growth and development.
- E) sperm and egg formation.

Answer: B

Diff: 2

Chapter Section: 1.2

Skill: Application/Analysis

Learning Outcome: 1.2

Global L.O.: G1

- 28) A mutation is a
- A) physical deformity, such as the loss of a limb.
  - B) change in the DNA sequence.
  - C) dose of radiation.
  - D) defective egg or sperm cell.

Answer: B

Diff: 1

Chapter Section: 1.2

Skill: Knowledge/Comprehension

Learning Outcome: 1.2

Global L.O.: G1

- 29) In a word, "evolution" means

- A) selection.
- B) improvement.
- C) nature.
- D) change.

Answer: D

Diff: 1

Chapter Section: 1.2

Skill: Application/Analysis

Learning Outcome: 1.2

Global L.O.: G1

- 30) The concept of evolution is based on

- A) any type of genetic variation within a population.
- B) parents with variations that pass these variations on to their offspring.
- C) survival and successful reproduction in organisms with favorable variations.
- D) all genetic variation in a population being equally successful in the same environment.

Answer: C

Diff: 2

Chapter Section: 1.2

Skill: Knowledge/Comprehension

Learning Outcome: 1.2

Global L.O.: G1

31) All of the following are examples of adaptations EXCEPT

- A) mice learning a maze to get food.
- B) larger teeth in beavers for gnawing wood.
- C) different beak shapes for birds that eat seeds or insects.
- D) insects that resemble twigs.
- E) flower coloration that attracts pollinators.

Answer: A

Diff: 2

Chapter Section: 1.2

Skill: Application/Analysis

Learning Outcome: 1.2

Global L.O.: G1

32) Suppose an organism has an enzyme that repairs changes in its DNA. The result is a decrease in mutations. This trait would definitely influence the organism's ability to

- A) obtain energy.
- B) evolve.
- C) move.
- D) maintain homeostasis.

Answer: B

Diff: 3

Chapter Section: 1.2

Skill: Application/Analysis

Learning Outcome: 1.2

Global L.O.: G1

33) The variation among individuals, on which natural selection acts, describes

- A) physical training and exercise.
- B) genetic differences.
- C) random occurrences in the lifetimes of individuals.
- D) nutritional differences.

Answer: B

Diff: 1

Chapter Section: 1.2

Skill: Application/Analysis

Learning Outcome: 1.2

Global L.O.: G1

34) Chromosomes are made of

- A) cells.
- B) carbohydrates.
- C) DNA.
- D) DNA and proteins.
- E) proteins.

Answer: D

Diff: 1

Chapter Section: 1.2

Skill: Knowledge/Comprehension

Learning Outcome: 1.2; 1.3

Global L.O.: G1

35) A change in the genetic makeup of a species over time is called

- A) adaptation.
- B) evolution.
- C) mutation.
- D) natural causality.

Answer: B

Diff: 2

Chapter Section: 1.2

Skill: Knowledge/Comprehension

Learning Outcome: 1.2

Global L.O.: G1

36) Adaptations include all of the following EXCEPT

- A) inborn migratory behavior of young birds born in the Arctic.
- B) reduced heart rate and oxygen consumption in seals that dive deep for long periods of time.
- C) larger body size in male gorillas, which fight over females.
- D) teaching a pet parrot to talk.

Answer: D

Diff: 1

Chapter Section: 1.2

Skill: Synthesis/Evaluation

Learning Outcome: 1.2

Global L.O.: G1

37) Dinosaurs are not alive today because they

- A) evolved too quickly in response to a changing environment.
- B) evolved adaptations that were beneficial in their constant, unchanging environment.
- C) did not evolve fast enough to keep up with rapid environmental change.
- D) did not possess the genetic material that beneficial mutations act on.

Answer: C

Diff: 1

Chapter Section: 1.2

Skill: Application/Analysis

Learning Outcome: 1.2

Global L.O.: G1; G2

38) Which of the following is a characteristic of living organisms?

- A) Ability to produce energy
- B) Eat other organisms
- C) Maintenance and regulation of internal conditions
- D) Have a nucleus
- E) Have membrane-bound organelles

Answer: C

Diff: 2

Chapter Section: 1.3

Skill: Knowledge/Comprehension

Learning Outcome: 1.1

Global L.O.: G1

39) All of the following are true of all living organisms EXCEPT that they

- A) are made of cells.
- B) can grow.
- C) can reproduce themselves.
- D) respond to stimuli.
- E) possess either DNA or RNA.

Answer: E

Diff: 2

Chapter Section: 1.3

Skill: Knowledge/Comprehension

Learning Outcome: 1.1

Global L.O.: G1

40) After you drink a glass of acidic lemonade, your body's pH does not change. This is an example of how humans and other organisms

- A) maintain precise internal conditions through homeostasis.
- B) maintain cellular organization.
- C) evolve in response to the environment.
- D) are immune to weak acids.

Answer: A

Diff: 2

Chapter Section: 1.3

Skill: Application/Analysis

Learning Outcome: 1.1

Global L.O.: G1

41) Why do humans born without sweat glands usually not survive?

- A) Sweating is an important mechanism for maintaining the correct body temperature.
- B) Sweat glands create openings in the skin where gas exchange occurs.
- C) Sweating is the only way the body eliminates excess water.
- D) Sweating is important for eliminating impurities from the body.

Answer: A

Diff: 2

Chapter Section: 1.3

Skill: Application/Analysis

Learning Outcome: 1.1; 1.2

Global L.O.: G1; G2

42) An organism's ability to detect stimuli from either the internal or external environment is called

- A) natural selection.
- B) mutation.
- C) responsiveness.
- D) DNA.
- E) evolution.

Answer: C

Diff: 1

Chapter Section: 1.3

Skill: Knowledge/Comprehension

Learning Outcome: 1.1

Global L.O.: G1

43) You observe a plant on your windowsill that is growing at an angle toward the outside. This is an example of a living thing

- A) maintaining precise internal conditions.
- B) responding to stimuli.
- C) reproducing.
- D) evolving.

Answer: B

Diff: 1

Chapter Section: 1.3

Skill: Application/Analysis

Learning Outcome: 1.1

Global L.O.: G1

44) Using its antennae, the male moth finds female moths by following a trail of airborne chemicals, called *pheromones*, upwind from the female producing them. This is an example of how living things

- A) acquire nutrients.
- B) grow.
- C) reproduce.
- D) detect and respond to stimuli.
- E) maintain precise internal conditions.

Answer: D

Diff: 2

Chapter Section: 1.3

Skill: Application/Analysis

Learning Outcome: 1.1

Global L.O.: G1

45) An organism in the domain Eukarya is characterized by all of the following EXCEPT

- A) being composed of prokaryotic cells.
- B) ingestion of organic matter to acquire nutrients.
- C) the potential to grow and reproduce.
- D) the ability to maintain precise internal conditions.

Answer: A

Diff: 2

Chapter Section: 1.4

Skill: Application/Analysis

Learning Outcome: 1.5

Global L.O.: G1

46) Why do heterotrophs require "food" for survival?

- A) Food is an alternative source of energy for heterotrophs when sunlight is unavailable.
- B) Food provides the organic chemicals needed by heterotrophs.
- C) Food provides at least half of the water required by heterotrophs.
- D) Heterotrophs cannot photosynthesize without the chemicals provided by food.

Answer: B

Diff: 2

Chapter Section: 1.4

Skill: Synthesis/Evaluation

Learning Outcome: 1.1; 1.4

Global L.O.: G1; G2

47) The main difference between an autotroph and a heterotroph is

- A) how they reproduce.
- B) how they respond to stimuli.
- C) their ability to move.
- D) how they obtain energy.

Answer: D

Diff: 1

Chapter Section: 1.4

Skill: Knowledge/Comprehension

Learning Outcome: 1.4; 1.5

Global L.O.: G1



For the following question(s), choose the characteristic of a living organism that best corresponds to each statement. Selections may be used once, more than once, or not at all.

- A) Growth
- B) Reproduction
- C) Evolution
- D) Response to stimuli

48) A sunflower follows the sun as it moves across the sky during the period of a single day.

Diff: 2

Chapter Section: 1.3

Skill: Application/Analysis

Learning Outcome: 1.1

Global L.O.: G1

49) A puppy is born weighing 5 pounds and eventually becomes a 75-pound golden retriever.

Diff: 2

Chapter Section: 1.3

Skill: Application/Analysis

Learning Outcome: 1.1

Global L.O.: G1

50) At the beginning of the week, a plant is 3 inches tall and at the end of the week, it is 4 inches tall.

Diff: 2

Chapter Section: 1.3

Skill: Application/Analysis

Learning Outcome: 1.1

Global L.O.: G1

51) A paramecium moves from direct light toward the dark.

Diff: 2

Chapter Section: 1.3

Skill: Application/Analysis

Learning Outcome: 1.1

Global L.O.: G1

52) A bacterium divides into two bacteria that are identical to, but smaller than, the original bacterium.

Diff: 2

Chapter Section: 1.3

Skill: Application/Analysis

Learning Outcome: 1.1

Global L.O.: G1

53) Over time, the average neck length of giraffes has increased. Only those giraffes with longer necks survived by eating the leaves high up on the trees, and they were able to reproduce and pass those long-neck genes on to the next generation.

Diff: 2

Chapter Section: 1.3

Skill: Application/Analysis

Learning Outcome: 1.1; 1.2

Global L.O.: G1

Answers: 48) D 49) A 50) A 51) D 52) B 53) C

54) Of the following levels of organization, Archaea have

A) atoms only.

B) molecules only.

C) organs only.

D) atoms and molecules.

E) atoms, molecules, and organs.

Answer: D

Diff: 2

Chapter Section: 1.4

Skill: Application/Analysis

Learning Outcome: 1.3

Global L.O.: G1

55) In evolutionary terms, which of the following cells is considered to be the most primitive?

A) Eukaryote

B) Prokaryote

C) Autotroph

D) Heterotroph

Answer: B

Diff: 2

Chapter Section: 1.4

Skill: Knowledge/Comprehension

Learning Outcome: 1.4

Global L.O.: G1

56) In which kingdom does a multicellular, eukaryotic, photosynthetic organism belong?

A) Protists

B) Fungi

C) Plantae

D) Animalia

Answer: C

Diff: 2

Chapter Section: 1.4

Skill: Knowledge/Comprehension

Learning Outcome: 1.4; 1.5

Global L.O.: G1

- 57) A basic difference between a prokaryotic cell and a eukaryotic cell is that the prokaryotic cell
- A) possesses membrane-bound organelles.
  - B) lacks DNA.
  - C) lacks a nucleus.
  - D) is considerably larger.
  - E) is structurally more complex.

Answer: C

Diff: 2

Chapter Section: 1.4

Skill: Knowledge/Comprehension

Learning Outcome: 1.4

Global L.O.: G1

- 58) Which of the following statements about the Bacteria and Eukarya domains is TRUE?
- A) All members of Bacteria are single-celled and all members of Eukarya are multicellular.
  - B) All members of Bacteria acquire nutrients via ingestion and all members of Eukarya acquire nutrients by photosynthesis.
  - C) Only members of Eukarya have the ability to grow and reproduce.
  - D) All members of Bacteria are prokaryotic cells and all members of Eukarya are eukaryotic cells.

Answer: D

Diff: 2

Chapter Section: 1.4

Skill: Knowledge/Comprehension

Learning Outcome: 1.4

Global L.O.: G1

- 59) Which group has prokaryotic individuals?
- A) Protist kingdoms
  - B) Kingdom Fungi
  - C) Kingdom Plantae
  - D) Kingdom Animalia
  - E) Domain Archaea

Answer: E

Diff: 2

Chapter Section: 1.4

Skill: Knowledge/Comprehension

Learning Outcome: 1.4; 1.5

Global L.O.: G1

60) Which kingdom possesses unicellular animal-like species and unicellular plantlike species?

- A) Fungi
- B) Animalia
- C) Protista
- D) Plantae

Answer: C

Diff: 2

Chapter Section: 1.4

Skill: Knowledge/Comprehension

Learning Outcome: 1.5

Global L.O.: G1

61) A cell that lacks organelles is a(n)

- A) member of the Kingdom Plantae.
- B) animal cell.
- C) prokaryotic cell.
- D) eukaryotic cell.

Answer: C

Diff: 2

Chapter Section: 1.4

Skill: Knowledge/Comprehension

Learning Outcome: 1.4

Global L.O.: G1

## 1.2 True/False Questions

1) Scientific theories are the same in any part of the world (meaning they do not vary by location).

Answer: FALSE

Diff: 1

Chapter Section: 1.1

Skill: Knowledge/Comprehension

Learning Outcome: 1.9

Global L.O.: G1

2) Scientific experimentation generally leads to more questions.

Answer: TRUE

Diff: 1

Chapter Section: 1.1

Skill: Knowledge/Comprehension

Learning Outcome: 1.7

Global L.O.: G1

3) A good experiment should include as many variables as possible at the same time.

Answer: FALSE

Diff: 2

Chapter Section: 1.1

Skill: Application/Analysis

Learning Outcome: 1.7

Global L.O.: G1

4) A hypothesis is typically stated as an "If . . . then" statement.

Answer: FALSE

Diff: 2

Chapter Section: 1.1

Skill: Application/Analysis

Learning Outcome: 1.7

Global L.O.: G1

5) Variation among organisms is due to mutations.

Answer: TRUE

Diff: 2

Chapter Section: 1.2

Skill: Knowledge/Comprehension

Learning Outcome: 1.2

Global L.O.: G1

6) Adaptations aid in the survival and reproduction of an organism in a particular environment.

Answer: TRUE

Diff: 1

Chapter Section: 1.2

Skill: Knowledge/Comprehension

Learning Outcome: 1.2

Global L.O.: G1

7) The energy that sustains life ultimately comes from sunlight.

Answer: TRUE

Diff: 1

Chapter Section: 1.3

Skill: Knowledge/Comprehension

Learning Outcome: 1.1

Global L.O.: G1

8) Photosynthetic bacteria are examples of autotrophs.

Answer: TRUE

Diff: 2

Chapter Section: 1.4

Skill: Knowledge/Comprehension

Learning Outcome: 1.4

Global L.O.: G1

9) Prokaryotic cells have a true nucleus and eukaryotic cells do not.

Answer: FALSE

Diff: 1

Chapter Section: 1.4

Skill: Knowledge/Comprehension

Learning Outcome: 1.4

Global L.O.: G1

10) Biodiversity is the total number of organisms in an ecosystem.

Answer: FALSE

Diff: 1

Chapter Section: 1.4

Skill: Knowledge/Comprehension

Learning Outcome: 1.3

Global L.O.: G1

### 1.3 Fill-in-the-Blank Questions

1) All scientific study begins with \_\_\_\_\_ and the formation of testable hypotheses.

Answer: observations

Diff: 2

Chapter Section: 1.1

Skill: Application/Analysis

Learning Outcome: 1.7

Global L.O.: G1

2) A group of individuals who are able to interbreed, regardless of their geographical location, is defined as a(n) \_\_\_\_\_.

Answer: species

Diff: 1

Chapter Section: 1.1

Skill: Knowledge/Comprehension

Learning Outcome: 1.3

Global L.O.: G1

3) A group of similar, interbreeding individuals that live in the same area is a(n) \_\_\_\_\_.

Answer: population

Diff: 1

Chapter Section: 1.1

Skill: Knowledge/Comprehension

Learning Outcome: 1.3

Global L.O.: G1

4) The basic unit of life is the \_\_\_\_\_.

Answer: cell

Diff: 1

Chapter Section: 1.1

Skill: Knowledge/Comprehension

Learning Outcome: 1.3

Global L.O.: G1

5) Errors or changes in the DNA of an organism are called \_\_\_\_\_.

Answer: mutations

Diff: 2

Chapter Section: 1.2

Skill: Knowledge/Comprehension

Learning Outcome: 1.2

Global L.O.: G1

6) The three natural processes that underlie evolution are genetic variation, inheritance, and \_\_\_\_\_.

Answer: natural selection

Diff: 1

Chapter Section: 1.2

Skill: Knowledge/Comprehension

Learning Outcome: 1.2

Global L.O.: G1

7) Single-celled organisms that lack a nucleus belong to the domains Bacteria and \_\_\_\_\_.

Answer: Archaea

Diff: 2

Chapter Section: 1.4

Skill: Knowledge/Comprehension

Learning Outcome: 1.4

Global L.O.: G1

8) Cells that contain a nucleus are eukaryotic, and cells without a nucleus are \_\_\_\_\_.

Answer: prokaryotic

Diff: 2

Chapter Section: 1.4

Skill: Knowledge/Comprehension

Learning Outcome: 1.4

Global L.O.: G1

9) Photosynthetic plants are considered "self-feeders," or \_\_\_\_\_.

Answer: autotrophs

Diff: 2

Chapter Section: 1.4

Skill: Knowledge/Comprehension

Learning Outcome: 1.5

Global L.O.: G1

#### 1.4 Short Answer Questions

1) Consider the observation that people taking Drug X for headaches also seem to have low blood pressure. Design a simple experiment based on this observation, and include a hypothesis statement and your actual experimental design for the study.

Answer: Answers should include a controlled variable, repetition, and a hypothesis statement.

Diff: 3

Chapter Section: 1.1

Skill: Application/Analysis

Learning Outcome: 1.7

Global L.O.: G1; G8

2) The instructions for producing and maintaining life are contained in what molecule?

Answer: DNA

Diff: 1

Chapter Section: 1.2

Skill: Knowledge/Comprehension

Learning Outcome: 1.1

Global L.O.: G1; G8

3) Evolution is based on adaptations that aid in the survival and reproduction of a species. List three different adaptations.

Answer: There are many correct answers. Some acceptable answers are roots of plants that help land plants gain water, fleshy fish fins that allow for movement across a surface, and wings of eagles that aid in hunting.

Diff: 3

Chapter Section: 1.2

Skill: Application/Analysis

Learning Outcome: 1.2

Global L.O.: G1; G8



4) Imagine that in 2020 you are the top biologist at a research station studying biodiversity in Costa Rica. A young scientist brings you a sample from a previously unexplored site. She asks you to look at the sample and determine whether it indeed contains microscopic, living organisms. As you begin your investigations, you must first decide what characteristics distinguish life from nonlife. How would you differentiate a living organism from nonliving matter (including viruses and prions)?

Answer: Answers should describe several characteristics of a living organism.

Diff: 2

Chapter Section: 1.3

Skill: Application/Analysis

Learning Outcome: 1.1

Global L.O.: G1; G8

5) Define *biodiversity*.

Answer: Biodiversity is the number of species in a given geographic region.

Diff: 1

Chapter Section: 1.3

Skill: Knowledge/Comprehension

Learning Outcome: 1.3

Global L.O.: G1; G8

6) List four characteristics of living things, and give an example to illustrate each.

Answer: There are many correct answers. Some acceptable answers are: Living things are both complex and organized (cells have organelles with specific organization); living things respond to stimuli (plants grow toward light); living things maintain homeostasis (the human body maintains its body temperature); living things acquire and use energy (plants use photosynthesis); living things grow (animals grow during their lifetime); living things reproduce (organisms produce offspring); living things have the capacity to evolve (bacteria have evolved antibiotic resistance).

Diff: 2

Chapter Section: 1.3

Skill: Application/Analysis

Learning Outcome: 1.1

Global L.O.: G1; G8

7) Describe at least two cellular-level differences between a photosynthetic prokaryote and a plant.

Answer: The prokaryote does not have any membrane-bound organelles (including a nucleus), but the plant (being a eukaryote) does. The prokaryote is unicellular, whereas the plant is multicellular.

Diff: 2

Chapter Section: 1.4




Skill: Application/Analysis

Learning Outcome: 1.4

Global L.O.: G1; G8

## 1.5 Art Questions

1) Which of the following is NOT a part of the community shown in this figure?

<b>Ecosystem</b>	A community together with its nonliving surroundings	 snake, antelope, hawk, bushes, grass, rocks, stream
<b>Community</b>	Populations of different species that live in the same area and interact with one another	 snake, antelope, hawk, bushes, grass
<b>Species</b>	All organisms that are similar enough to interbreed	 herd of pronghorn antelope
<b>Population</b>	All the members of a species living in the same area	

- A) Pronghorn antelope
- B) Stream
- C) Snake
- D) Grass
- E) Hawk

Answer: B

Diff: 1

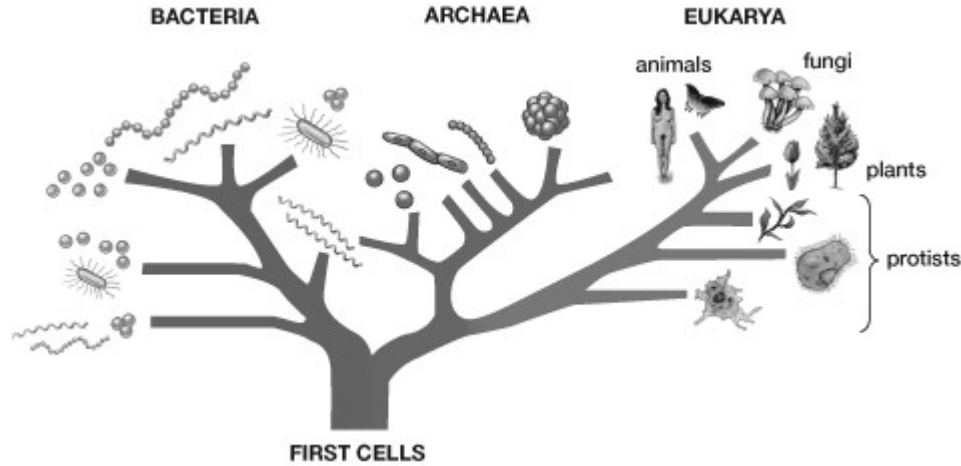
Chapter Section: 1.1

Skill: Application/Analysis

Learning Outcome: 1.3

Global L.O.: G1; G8

2) The "first cells" shown at the bottom of this illustration were most likely



- A) prokaryotes.
- B) animals.
- C) plants.
- D) fungi.
- E) protists.

Answer: A

Diff: 1

Chapter Section: 1.1

Skill: Application/Analysis

Learning Outcome: 1.4

Global L.O.: G1; G8

### 1.6 Scenario Questions

1) A 57-year-old woman was admitted to a hospital with an infected toe, and the infection was spreading rapidly. The damage was being caused by an unknown microorganism that could not be cultured in the lab. Doctors observed that antibiotics, which kill only prokaryotes, were ineffective. They suspected that the microbe was a fungus, so they tried the drug Amphotericin, which targets the ergosterols in fungal cells. Because animal cells contain cholesterol, not ergosterols, they are unaffected by the drug. Shortly after receiving Amphotericin, the patient improved, her infection ceased, and she was released from the hospital.

In this scenario, what was the hypothesis?

- A) The infection will spread rapidly.
- B) Antibiotics will not kill the microbe because it is a fungal species.
- C) If the infection is caused by an animal, then Amphotericin will cure the patient.
- D) A microbe that has cholesterol is causing the infection.
- E) Why didn't the antibiotics kill the microbe that caused the infection?

Answer: B

Diff: 3

Chapter Section: 1.1

Skill: Application/Analysis

Learning Outcome: 1.7

Global L.O.: G1; G2

2) Suppose that a meteorite crashes into Earth and a sample of it is taken to a local research lab for analysis. Embedded several inches within the rocky structure, a microscopic cluster of dormant, spore-like structures is found. The scientists culture some of this material in a standard microbiological nutrient broth, and they are surprised to find many single-celled "organisms" moving around, growing, and reproducing in the broth. The "organisms" behave the same in both daylight and dark conditions, do not require oxygen, and thrive under a wide range of temperatures and pH levels. They stop moving, growing, and reproducing, however, when fewer nutrients are available in the medium.

In this scenario, the "organisms" most closely resemble a(n)

- A) autotrophic species of Eukarya.
- B) photosynthetic species of Bacteria.
- C) heterotrophic species of Archaea.
- D) nonliving virus.
- E) heterotrophic species of Eukarya.

Answer: C

Diff: 2

Chapter Section: 1.4

Skill: Application/Analysis

Learning Outcome: 1.4

Global L.O.: G1; G2