

## CHAPTER 1—BIOLOGY: THE SCIENCE OF LIFE

### MULTIPLE CHOICE

- The theme that reflects the idea that there has been a gradual change in the characteristics of species over time is \_\_\_\_\_.
  - energy
  - unity within diversity
  - reproduction
  - evolution

ANS: D    DIF: B    OBJ: 1-5
- Ideas that link the facts and concepts about biology are \_\_\_\_\_.
  - themes
  - principles
  - views
  - perceptions

ANS: A    DIF: B    OBJ: 1-5
- Living things adjust to a stimulus by a reaction called a(n) \_\_\_\_\_.
  - environment
  - growth spurt
  - homeostasis
  - response

ANS: D    DIF: B    OBJ: 1-2
- Living things change during their lives through \_\_\_\_\_.
  - reproduction
  - growth and development
  - making responses
  - adaptation and organization

ANS: B    DIF: B    OBJ: 1-2
- All living things \_\_\_\_\_ to make more living things.
  - reproduce
  - develop
  - grow
  - adapt

ANS: A    DIF: B    OBJ: 1-2
- Which of the following are likely topics for a course in biology?
  - Why does the Texas horned lizard squirt blood out of its eyes?
  - How is a banded pipefish able to hide in its environment of seaweeds?
  - What chemicals cause plant stems to lengthen or flowers to bloom?
  - All of these.

ANS: D    DIF: B    OBJ: 1-1

- Questions about living things that can be answered by biologists are \_\_\_\_\_.
  - what
  - why
  - how
  - all of these

ANS: D    DIF: B    OBJ: 1-1

- Key to the study of biology is learning about the \_\_\_\_\_.
  - rocks
  - life around us
  - chemicals
  - all of these

ANS: B    DIF: B    OBJ: 1-1

- Living things do not adapt to their surroundings by \_\_\_\_\_.
  - making adjustments to nonliving factors around them
  - maintaining a steady internal environment
  - responding to other organisms
  - building on previous knowledge

ANS: D    DIF: B    OBJ: 1-3

- Which statement is incorrect? As an organism develops, \_\_\_\_\_.
  - it produces more of its own kind
  - it takes on the characteristics that identify it as a member of a particular species
  - its amount of living material increases
  - different parts grow at different rates

ANS: A    DIF: B    OBJ: 1-4

### MATCHING

Match each item with the correct statement below. Write the answer in the space provided.

- development
  - adaptation
  - homeostasis
  - evolution
  - reproduction
  - environment
- \_\_\_\_\_ The gradual change in the characteristics of a species over time
  - \_\_\_\_\_ The living and nonliving factors in an organism's surroundings
  - \_\_\_\_\_ Any structure, behavior, or internal process that enables an organism to better survive in an environment
  - \_\_\_\_\_ An organism's tendency to maintain a stable internal environment
  - \_\_\_\_\_ The series of changes that an organism undergoes during its lifetime
  - \_\_\_\_\_ The process whereby an organism produces more of its own kind

1. ANS: d            DIF: B            OBJ: 1-5
2. ANS: f            DIF: B            OBJ: 1-1
3. ANS: b            DIF: B            OBJ: 1-3
4. ANS: c            DIF: B            OBJ: 1-3
5. ANS: a            DIF: B            OBJ: 1-3
6. ANS: e            DIF: B            OBJ: 1-3

Match each item with the correct statement below. Write the answer in the space provided.

- a. energy
  - b. systems and interactions
  - c. nature of science
  - d. homeostasis
  - e. unity within diversity
  - f. evolution
7. \_\_\_\_\_ Its flow through ecosystems determines how organisms interact and powers all life processes.
  8. \_\_\_\_\_ A variety of structural and behavioral adaptations help organisms regulate their internal environment.
  9. \_\_\_\_\_ Organisms depend on internal and external systems that interact in complex ways to help them perform their life functions.
  10. \_\_\_\_\_ Over time, gradual changes in structures, behaviors, and internal processes of organisms result in diversity of species.
  11. \_\_\_\_\_ Although different organisms interact within ecosystems to form a stable system, all living things share the same characteristics of life.
  12. \_\_\_\_\_ Biology is a continuous search for information about the natural world.

7. ANS: a            DIF: B            OBJ: 1-5
8. ANS: d            DIF: B            OBJ: 1-5
9. ANS: b            DIF: B            OBJ: 1-5
10. ANS: f            DIF: B            OBJ: 1-5
11. ANS: e            DIF: B            OBJ: 1-5
12. ANS: c            DIF: B            OBJ: 1-5

### SHORT ANSWER

1. Compare and contrast *organism* and *species*.  
ANS: An organism is anything that possesses all the characteristics of life; a species is a group of similar organisms that are capable of interbreeding and producing fertile offspring.  
DIF: A            OBJ: 1-4
2. Compare and contrast *growth* and *development*.  
ANS: Growth is an increase in the living matter of an organism, including the formation of new structures; development is the sum total of the changes that take place in an organism over the course of its life.  
DIF: A            OBJ: 1-4

1-3

3. Compare and contrast *stimulus* and *response*.

ANS: A stimulus is a condition in the environment that requires the organism to adjust to it; a response is the organism's reaction to a stimulus.

DIF: A            OBJ: 1-4

4. Identify six important themes of biology, and discuss how facts and ideas in biology are linked to them.

ANS: Answers will vary. Energy, systems and interactions, unity within diversity, homeostasis, evolution, and the nature of science should be identified. Students should indicate that these themes incorporate individual facts into concepts to organize all knowledge of biology.

DIF: A            OBJ: 1-5

5. List and explain the four main characteristics used to identify oak trees or hummingbirds as living things.

ANS: Students should state that all living things, whether plant or animal, are organized, make more living things, change during their lives, and adjust to their surroundings. At a minimum, the terms reproduction, growth and development, stimulus and response, and homeostasis should be used correctly in their explanations.

DIF: A            OBJ: 1-3

6. Describe some of the benefits that can be obtained from a study of biology.

ANS: Answers will vary. Possible answers may include: for the pleasure of learning, finding treatments and cures for new diseases, discovering how organisms live in their environments so that their extinction may be prevented or their numbers may be controlled, or solving problems that may occur in the future.

DIF: A            OBJ: 1-2

7. An important theme in the study of biology is how living things depend upon other living things. Discuss how humans depend upon other living things and how living things depend upon humans.

ANS: Answers will vary. Possible answers will state that humans depend on living things for food, shelter, and clothing. Many living things depend on humans to provide habitats, protection, and food.

DIF: A            OBJ: 1-1

8. Give two ways that humans are organized to carry out their life functions and explain how each is vital to the survival of humans.

ANS: Answers may vary. The digestive system processes the food humans eat so that the body can obtain the energy it needs to live. Sweat glands and blood vessels near the skin cool the body when the external temperature increases, thus helping to regulate and maintain the proper internal temperature.

DIF: A            OBJ: 1-4

1-4