

CHAPTER
1

BIOLOGY IN THE 21ST CENTURY

Chapter Test A

Multiple Choice

Choose the letter of the best answer. (15 credits)

- _____ 1. Scientists use observations and data to form and test
- constants.
 - hypotheses.
 - theories.
 - conclusions.
- _____ 2. During an experiment, which factors are observed and measured?
- dependent variables
 - independent variables
 - constants
 - hypotheses
- _____ 3. At which stage of scientific thinking are scientists most likely to consider the data and conclusions of other scientists to propose new experiments?

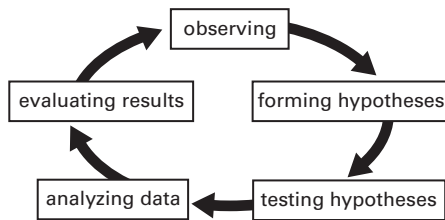


FIG. 1.1

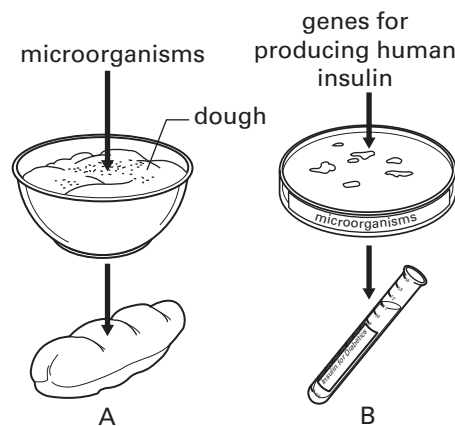
- observing
 - testing hypotheses
 - analyzing data
 - forming hypotheses
- _____ 4. Which phrase best describes scientific theories?
- explain few observations
 - serve as speculations
 - are never proven
 - cannot be replaced

- _____ 5. The various parts of Earth's biosphere are connected and
- similar.
 - nonliving.
 - diverse.
 - aquatic.
- _____ 6. The variety of life across the biosphere is called
- biodiversity.
 - genomics.
 - homeostasis.
 - ecology.
- _____ 7. Similar organisms that can reproduce by interbreeding belong to the same
- ecosystem.
 - environment.
 - habitat.
 - species.
- _____ 8. All the chemical processes used to build up or break down materials are called an organism's
- metabolism.
 - homeostasis.
 - adaptations.
 - stimuli.

CHAPTER TEST A, CONTINUED

- _____ **9.** What is the name given for genetic changes in living things over time?
- adaptation
 - homeostasis
 - evolution
 - negative feedback
- _____ **10.** A physical environment with different species that interact with one another and with nonliving things is called a(n)
- biosphere.
 - ecosystem.
 - habitat.
 - adaptation.
- _____ **11.** Organisms rely on both negative feedback processes and behavior to maintain
- homeostasis.
 - adaptations.
 - ecosystems.
 - evolution.
- _____ **12.** How have computer models expanded biological research?
- They help scientists design better experiments.
 - They simulate complex biological systems that cannot be studied directly.
 - They give scientists the ability to observe molecules directly.
 - They allow the use of human experimental subjects.

- _____ **13.** The study and manipulation of DNA on a molecular level is known as
- biochemistry.
 - genomes.
 - molecular genetics.
 - evolution.
- _____ **14.** Both of the processes shown in Figure 1.2 use and apply biological processes. Both processes are examples of

**FIG. 1.2**

- biotechnology.
 - genomics.
 - imaging technology.
 - transgenic organisms.
- _____ **15.** Exploring how indoor air pollutants lead to respiratory problems is an example of using biology to
- develop biotechnology.
 - monitor global change.
 - improve human health.
 - make ethical decisions.

CHAPTER TEST A, CONTINUED

Short Answer Use the diagram below to answer items 16–20.
(5 credits)

FIG. 1.3

Seedling	Soil	Soil Appearance	Plant Height at 10 Days
1	potting soil	damp, light	
2	sand	dry, coarse	
3	clay	wet, heavy	

- 16.** In the experiment outlined in the table, three identical tomato seedlings are planted in three identical pots, placed in the same location, and watered on identical schedules. According to the table in Figure 1.3, what conditions differ for each seedling?

- 17.** Identify each of the following as independent variable, dependent variable, or constant: type of soil used, type of seedling used, and height of plant.

- 18.** Is soil appearance an example of qualitative (descriptive) or quantitative (numerical) data?

- 19.** Write a possible hypothesis for this experiment.

- 20.** Describe how this experiment would let you test this hypothesis.

CHAPTER TEST A, CONTINUED

Use the diagram below to answer items 21–25. (5 credits)

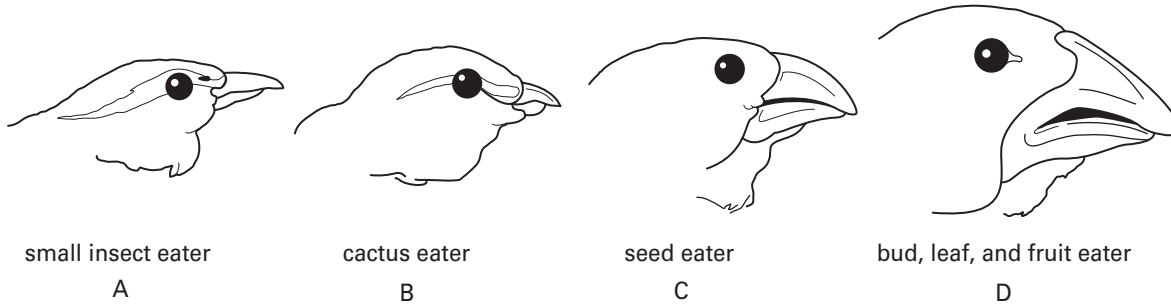


FIG. 1.4

- 21.** Figure 1.4 shows a small sample of different species of finches that evolved across the Galápagos Islands. One difference among the finches is the size and shape of their beaks, which changed over a long period of time in response to their different environments. What term best describes the differences in beak size and shape?

- 22.** If the birds' beak differences mean that each eats different foods, how did the trait become more common in the finches on different islands?

- 23.** Which of these birds most likely inherited the best trait for life in a dry, desert environment? Why?

- 24.** In an environment in which insect populations are decreasing, which bird population might also decrease over time? Why?

- 25.** If populations of finches A, C, and D were placed together on the same island, do you think they would compete for the same foods? Why or why not?
