Contents

1.1 Life and Its Designer

Read 1.1 (pp. 2–6).

Exercises

Circle the letter of the best answer.

1. Which subject would a biologist be most likely to study?
   - **a.** nutrient content of treated wastewater
   - **b.** effects of an antibiotic on bacterial cells
   - **c.** movement of water around a streamlined object
   - **d.** long-term temperature change in the atmosphere
2. Which statement about cells is *not* true?
   - **a.** They are typically microscopic.
   - **b.** They are always filled with activity.
   - **c.** They are simple and easy to understand.
   - **d.** They hold the information that determines what you look like.
3. Why is the natural world marked by disease and death?
   - **a.** Disease and death were designed by God at Creation.
   - **b.** Disease and death resulted from man's sin in the Garden of Eden.
   - **c.** Disease and death have always existed to keep populations in check.
   - **d.** Disease and death are the result of the second law of thermodynamics.
4. Many tasks that were once performed by humans are now being done by robots made of plastic or metal. What characteristic do living things have that these robots do *not* have?
   - **a.** grow, mature, and die
   - **b.** need energy to function
   - **c.** are created by preexisting life
   - **d.** sense and respond to changes around them
5. Which characteristic do all living things have?
   - **a.** DNA
   - **b.** tissues
   - **c.** vessel cells
   - **d.** nervous system

6. Why is it doubtful that scientists will ever be able to manufacture a simple living cell?
   - **a.** They cannot change DNA.
   - **b.** They cannot bring the cell to life.
   - **c.** They do not understand how cells work.
   - **d.** They do not have the materials they need.

Circle *T* if the statement is true or *F* if it is false.

7. **T F** Life thrives most places on Earth except in the ice near the poles.
8. **T F** Studying living organisms distracts from focusing on the Creator.
9. **T F** Numerous specialized traits work together to suit living things for their unique lifestyles.
10. **T F** Living things are designed to function independently of each other.
11. **T F** The natural world was beautiful but flawed in its original state.
12. **T F** Every living organism can react to conditions in its environment.
13. **T F** Single-celled organisms are extremely complex.

Complete these exercises.

14. What is the most significant difference between Earth and other known bodies in space?

    _____

15. Biology is the study of what part of creation? _____

16. Why is life found practically everywhere on Earth?

    _____

17. Modern secular science says that living things were originally produced by chance. List three ways that living things show evidence of being created by a Designer instead of by chance.

    _____

    _____

    _____

    _____

    _____

    _____

18. Name one form of imperfection in the natural world.

    _____

19. List the seven characteristics of living things.

20. Why is a bristlecone pine tree considered to be alive even though it hasn't moved for thousands of years?

21. A virus is a tiny noncellular particle that consists of a bit of genetic material (DNA or a similar molecule) surrounded by a protein shell. Viruses cannot reproduce on their own; instead, they reproduce by entering a host cell and using the host cell's molecular machinery to make more viruses. Based on the characteristics that living things must have, are viruses alive? Why or why not?

22. In what way is life more than just a collection of chemicals and information?

☆ **Complete this exercise.**

23. What are some ways in which you can see the attributes of the Creator revealed in nature? Write a paragraph on this subject using examples that are not given in the textbook.

1.2 Characteristics of Living Things

Read 1.2 (pp. 6–11).

Exercises

Circle the letter of the correct answer(s). One question has multiple answers.

1. Which statement describes the theory of spontaneous generation?
- **a.** Life can spontaneously develop from life.
- **b.** Simple organisms spontaneously develop from single cells.
- **c.** Simple life can spontaneously develop from nonliving things.
- **d.** Complex life forms spontaneously develop from simple life forms.

2. Which statement best states the cell theory?
- **a.** All living things are made up of cells.
- **b.** All bacteria are unicellular organisms.
- **c.** A coral shell is not composed of cells because it is no longer alive.
- **d.** Multicellular organisms are more complex than unicellular organisms.

3. What functions do cells perform by using energy?
- **a.** storing DNA
- **b.** producing more cells
- **c.** expelling waste products
- **d.** creating more energy for themselves

4. Which example best represents an organism responding to changes in its surroundings?
- **a.** a chicken egg hatching
- **b.** a wolf pack hunting for prey
- **c.** a person breathing heavily after running a race
- **d.** leaves opening their pores in the morning sunlight

5. Which of the following statements does *not* describe DNA?
- **a.** DNA directs the construction of proteins.
- **b.** DNA stores genetic information for the cell.
- **c.** DNA is a complex molecule found primarily in reproductive cells.
- **d.** DNA produces the distinctive characteristics of each kind of living thing.

Write *H* for *heterotroph* or *A* for *autotroph*.

6. ____ squirrel

7. ____ squash

8. ____ centipede

9. ____ mosquito

10. ____ sunflower

11. ____ spider

12. ____ mushroom

Complete these exercises.

13. How did Francesco Redi's experiment disprove spontaneous generation?

14. How does the characteristic "comes from preexisting life" point toward a Creator God?

15. Where do the following types of cells get their energy?

a. Autotrophs

b. Heterotrophs

16. What is the function of deoxyribonucleic acid in the cell?

17. Contrast sexual and asexual reproduction.

Read the text and answer the questions.

In January of 2020, a team of American scientists announced that they had developed a new type of biological robot, which they called the *xenobot*. To create xenobots, the team first collected living cells from the embryos of African clawed frogs (*Xenopus laevis*). The scientists then assembled the cells into structures that had been predesigned by computer algorithms to excel at basic tasks such as moving around or carrying materials. The finished xenobots consisted of two cell types: skin cells, which provided structure; and contracting heart cells, which provided movement. Each xenobot was just under a millimeter across.

The finished xenobots behaved much as they were supposed to, scooting around their environment, changing directions, and herding tiny crumbs of debris into piles. When one of the scientists pulled a xenobot nearly in half, it repaired itself and kept moving as if nothing had happened. The xenobots could not eat, but they moved around for over a week using energy from nutrients stored in each cell. They kept functioning until the cells had exhausted their stored food.

No one knows yet whether xenobots will ever be used to do beneficial tasks. The possibility seems far-fetched, but scientists are already dreaming of

using these little clumps of cells to deliver medicines inside the body or clean up wastes. Xenobots offer some advantages over normal mechanical robots. For example, after a xenobot quits functioning, it is just a biodegradable blob of dead cells. However, like any technology, xenobots could cause harm if they were misused. Responsible scientists must consider not only the benefits, but also the potential problems with new developments such as xenobots.

18. Which characteristic of living things do xenobots lack?
- **a.** come from preexisting life
- **b.** grow, mature, and die
- **c.** are made of cells
- **d.** contain DNA

19. Which statement correctly describes the cellular composition of xenobots?
- **a.** They are unicellular because they are composed entirely of cells.
- **b.** They are unicellular because their cells are separated by cell walls.
- **c.** They are multicellular because they are composed of numerous cells.
- **d.** They are multicellular because their cells perform different functions.

20. Why do xenobot cells die when they run out of nutrients?

_____

_____

21. Do you think xenobots should be considered living organisms? Why or why not?

_____

_____

Review

Circle the letter of the best answer. 1.1

22. Which subject would biologists study?
- **a.** rock layers
- **b.** food chains
- **c.** circular motion
- **d.** precipitation cycles

23. Which of the following was *not* originally part of life?
- **a.** DNA
- **b.** disease
- **c.** reproduction
- **d.** cellular structure