Test Prep Pretest

1. c
2. d
3. b
4. e
5. a
6. metric system, SI
7. Biology
8. microbiology, sterile technique
9. Zoology, remotely
10. cell, microscope
11. metabolism
12. homeostasis
13. c
14. d
15. b
16. b
17. b
18. a
19. a
20. d
21. If a scientist makes misleading or false claims about findings, other scientists may waste time and money conducting investigations based on the misinformation. False claims related to health issues can prevent people from getting good medical treatment and even put people in danger. Scientists must treat live subjects of science investigations ethically for the same reasons related to health issues.
22. Understanding science can help people take good care of their health and be wise consumers and can aid people in solving community, national, and international problems.
23. Controlled experiments test one factor at a time. Studies involve the collection of data without the use of an experiment; they are used when running an experiment would be either unethical or impossible.
24. In everyday use, the word *theory* suggests that an idea has not been tested very well, if at all. In science, the word *theory* refers to a principle that has been highly tested and is supported by a large body of evidence gathered through scientific investigation.
25. Students can list any three of the following rules: Listen carefully to your teacher and follow the instructions; read the lab procedure carefully before beginning the lab; do not take any shortcuts in the lab procedure; wear safety goggles and other needed safety equipment when working in a lab; measure chemicals precisely; never taste or smell any materials in a lab unless instructed by a teacher; do not use any damaged or defective equipment; keep the lab clean and free of clutter; make sure that lab equipment will not tip over; walk or move carefully in the lab; be aware of your surroundings; avoid poisonous plants and animals; wear sunscreen and protect your neck and ears from the sun with a hat. Accept all sensible explanations students give for choosing each rule as most important.
26. Reproduction and heredity are similar in that each involves parents and offspring. Reproduction involves the process of parents producing offspring. Heredity helps explain why offspring are either identical or similar to their parents.

Quiz

SECTION: THE NATURE OF SCIENCE

1. b
2. a
3. e
4. c
5. d
6. d
7. b
8. a
9. c
10. b

SECTION: SCIENTIFIC METHODS

1. d
2. e
3. a
4. c
5. b
6. d
7. c
8. b
9. a

SECTION: TOOLS AND TECHNIQUES

1. c
2. d
3. e
4. a
5. b
6. d
7. c
8. c
9. b
10. a

SECTION: WHAT IS BIOLOGY?

1. b
2. d
3. e
4. a
5. c
6. a
7. c
8. b
9. c

Chapter Test (Basic)

1. scientific thought
2. universal laws

3. ethics
4. c
5. a
6. b
7. c
8. SI
9. microscope
10. instructions
11. biology
12. evolution
13. metabolism
14. T
15. T
16. F
17. T

Chapter Test (General)

1. 6
2. 2
3. 5
4. 4
5. 1
6. 3
7. 2, 0.01 of a liter
8. 4, 1,000 liters
9. 3, base unit
10. 1, 0.001 of a liter
11. a
12. e
13. d
14. b
15. c
16. d
17. d
18. b
19. a
20. c
21. c
22. b
23. c
24. d
25. a
26. b
27. a
28. c
29. b
30. d

Chapter Test (Advanced)

1. d
2. c
3. a
4. b
5. e
6. 1,000,000
7. *milli-*
8. 1,000
9. milligrams
10. 0.01
11. 100
12. centiliters
13. 10
14. deciliters
15. *kilo-*
16. 1,000
17. gram
18. Biology, cell, membrane
19. experiment, hypothesis
20. universal laws, (the following can occur in any order) gravity, conservation of energy, planetary motion
21. control group, experiment, experimental group, experimental
22. independent, experiment, dependent, independent, independent, experiment
23. ethics, studies, controlled experiments
24. organization (the following can occur in any order) metabolism, homeostasis, responsiveness, heredity
25. genetics, evolutionary theory, heredity, reproduction (in either order), generation
26. ecology
27. metabolism, biochemistry
28. The four steps are: making observations, using evidence to draw conclusions, being skeptical about ideas, and being open to changing ideas when new discoveries are made. The first step involves careful examination of the natural world; the last three steps all involve critical thinking, careful examination of ideas and evidence, and open-mindedness about information. Accept answers that refer to some or all of these features.
29. An understanding of science can help people take better care of their health; this generally involves an understanding of science content, although it can involve an understanding of scientific methods if analyses of studies or experiments or running one's own scientific experiment are involved. An understanding of science can help people be wise

consumers; this generally involves a good understanding of scientific thought (including being skeptical), but it also may involve a knowledge of scientific content and a knowledge of how to employ scientific methods for the same reasons these can be important in relationship to improving health. An understanding of science can help people become better citizens; this generally involves an understanding of science methods, especially critical thinking and drawing conclusions, although it sometimes might also involve an understanding of science content.

30. Scientific methods generally begin with making observations, which leads to asking questions, which often leads to making more observations. Scientists examine their observations about a particular topic, hone their questions, and come up with a hypothesis to try to address a specific question or observation. Then, they may run a controlled experiment to test the hypothesis or do a detailed study related to the hypothesis. They analyze their results, draw a conclusion related to whether their hypothesis was or was not supported, and often begin the round of observations, questions, hypotheses, and experiments again. They may do this if their study or experiment fails to confirm a hypothesis, if they learn something new from the study or experiment that prompts them to use scientific methods to learn more, or if they find new information from other scientists related to their topic of study about which they want to learn more.
31. A hypothesis is a specific, testable prediction for a limited set of conditions. A theory is a general explanation for a broad range of data. In common usage, the word *theory* is an untested idea that is not generally accepted. But in a scientific context, a theory is a highly tested, generally accepted principle.
32. Students should list or paraphrase any twelve of the following instructions. Make sure students include at least one of the last five instructions related to outdoor work: Listen carefully to your teacher and follow the instructions; read the lab procedure carefully before beginning the lab; do not take any shortcuts in the lab procedure; wear safety goggles and other needed safety equipment when working in a lab; measure chemicals precisely; never taste or smell any materials in a lab unless instructed by a teacher; do not use any damaged or defective equipment; keep the lab clean and free of clutter; make sure that lab equipment will not tip over; pay attention to where you are walking; be aware of your surroundings outside; avoid poisonous plants and animals; wear sunscreen and protect your neck and ears from the sun with a hat