CHAPTER 1—INTRODUCTION TO BIOLOGICAL CONCEPTS AND RESEARCH

MULTIPLE CHOICE

Why It Matters

1. The science of ____ explains the origin of life, the persistence of life, and studies the changes in living things.
   a. nanotechnology
   b. mathematics
   c. biology
   d. chemistry
   e. pharmacology
   ANS: C
   DIF: Easy
   OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

2. It is through ____ that we further our knowledge of living things.
   a. ideologies
   b. biological research
   c. philosophy
   d. ethics
   e. logic
   ANS: B
   DIF: Easy
   OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

What is Life? Characteristics of Living Organisms

3. The difference between living and nonliving matter depends not only on the kinds of atoms and molecules present, it also depends on ____.
   a. their electrons
   b. their chemical interactions
   c. their compounds
   d. their organization and interactions
   e. all of these
   ANS: D
   DIF: Moderate
   OBJ: Bloom's Taxonomy: Comprehension

4. Living organisms must gather energy and materials from their surroundings to ____.
   a. build new biochemicals
   b. grow
   c. maintain and repair their parts
   d. produce offspring
   e. all of these
   ANS: E
   DIF: Moderate
   OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

5. All cell consist of the following:
   a. an organized chemical system.
   b. specialized molecules.
   c. a nucleus.
   d. a membrane.
   e. an organized chemical system, specialized molecules, and a membrane only.
   ANS: E
   DIF: Moderate
   OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

6. The lowest level of biological organization that can survive and reproduce is the ____.
   a. proton
   b. DNA
   c. nucleus
   d. tissue
   e. cell
   ANS: E
   DIF: Moderate
   OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

7. As long as a cell has access to a usable energy source, has the necessary raw materials, and is in appropriate environmental conditions, the cell will:
   a. survive and reproduce.
   b. stay in stasis.
   c. not be in homeostasis.
   d. remain dormant.
   ANS: A
   DIF: Moderate
   OBJ: Bloom's Taxonomy: Comprehension

8. Emergent properties are
   a. characteristics of nonliving matter.
   b. exclusive to atoms but not molecules.
   c. neither exclusive to molecules nor compounds.
   d. characteristics that depend on the level of organization of matter but do not exist at lower levels of organization.
   ANS: D
   DIF: Moderate
   OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

9. Bacteria and protozoans exist as ____.
   a. multicellular organisms
   b. unicellular organisms
   c. both unicellular and multicellular organisms
   d. the sole organisms of the oceans
   e. precursors to cells
   ANS: B
   DIF: Easy
   OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

10. Every population of animals has an age structure. The individuals that make up the population are all of a specific age, but individuals do not have an age structure. Age structure is an example of a(n) _____.
   a. emergent property.
   b. environmental property.
   c. hierarchical property.
   d. organizational property.
   e. none of these.
   NS: A
   DIF: Moderate
   OBJ: Bloom's Taxonomy: Knowledge | Comprehension

11. A group of organisms of the same species that live together in the same place make up a(n) ____.
   a. cell
   b. ecosystem
   c. tissue
   d. population
   e. biosphere
   ANS: D
   DIF: Moderate
   OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

12. All the populations of different organisms that live in the same place form a(n) ____.
   a. ecosystem
   b. community
   c. biosphere
   d. organ
   e. population
   ANS: B
   DIF: Moderate
   OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

13. The highest level of the hierarchy of life is the ____.
   a. population
   b. biosphere
   c. ecosystem
   d. multicellular organism
   e. cell
   ANS: B
   DIF: Easy
   OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

14. Which of the following is NOT a logical hierarchy of biological organization?

   a. cells, tissues, organs, organ systems, organisms
   b. family, order, class, phylum, kingdom
   c. cells, molecules, organelles, tissues, systems
   d. molecules, cells, tissues, organ systems, populations
   e. organisms, populations, communities, ecosystems, biosphere
   ANS: C
   DIF: Moderate
   OBJ: Bloom's Taxonomy: Analysis

15. A(n) ____ includes the community and the nonliving environmental factors with which it interacts.
   a. community
   b. biosphere
   c. ecosystem
   d. multicellular organism
   e. earth
   ANS: C
   DIF: Easy
   OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

16. Destruction of forest ecosystems in Brazil affects the amount of CO_2 taken up from the atmosphere and altered levels of atmospheric CO_2 may affect the climate in the American midwest. A person who studies these types of interactions would probably be called a(n) _____.
   a. biosphere biologist
   b. community biologist
   c. ecosystem biologist
   d. physiological ecologist
   e. population biologist
   ANS: A
   DIF: Moderate
   OBJ: Bloom's Taxonomy: Knowledge/Comprehension

17. The most fundamental and important molecule that distinguishes living systems from nonliving matter is ____.
    a. DNA
    b. deoxyribonucleic acid
    c. glucose
    d. fructose
    e. a and b only
    ANS: E
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

18. ____ is a large, double stranded, helical molecule that contains instructions for assembling a living organism from simpler molecules.
    a. RNA
    b. DNA
    c. ATP
    d. NADPH
    e. Protein
    ANS: B
    DIF: Easy
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

19. ____ contain DNA, but are not considered to be alive because they cannot reproduce independently of their host.
    a. Prions
    b. Eukaryotes
    c. Prokaryotes
    d. Viruses
    e. Cells
    ANS: D
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

20. The information in DNA is copied into molecules of ____.
    a. lipid
    b. carbohydrates
    c. hydrogen peroxide
    d. oxygen
    e. RNA
    ANS: E
    DIF: Easy
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

21. What molecule carries out most of the activities of life, including the synthesis of all other biological molecules?
    a. carbohydrate
    b. lipid
    c. protein
    d. nucleid acid
    e. none of these
    ANS: C
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

22. Metabolism describes the ability of a cell or organism to:
    a. extract energy from its surroundings.
    b. maintain itself.
    c. grow.
    d. reproduce.
    e. all of these
    ANS: E
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

23. Photosynthesis and cellular respiration are examples of ____.
    a. anabolism
    b. catabolism
    c. synthesis
    d. metabolism
    e. cleavage
    ANS: D
    DIF: Difficult
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

24. Living systems have the capacity to detect environmental changes and compensate for them through controlled responses. This is possible because living systems have ____.
    a. diverse and varied receptors
    b. nerves
    c. photorecptors
    d. hormones
    e. sensitivity
    ANS: A
    DIF: Difficult
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

25. Maintaining your body's internal temperature within narrow tolerable range is one example of:
    a. sebaceous glands working to lower your body temperature.
    b. stasis.
    c. homeostasis.
    d. compensation.
    e. hydrolysis.
    ANS: C
    DIF: Difficult
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

26. The process by which parents produce offspring is called:
    a. reproduction.
    b. homeostasis.
    c. compensation.
    d. feeding.
    e. artificial selection.
    ANS: A
    DIF: Easy
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

27. While running on a treadmill, your heart rate will increase, your breathing will be deeper and more rapid. Among other things, this helps ensure that your muscles get adequate supplies of O_2 as you exercise. These changes are the result of _____.
    a. compensatory mechanisms
    b. developmental mechanisms
    c. emergent properties
    d. homeostatic mechanisms
    e. multicellularity
    ANS: D
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Knowledge/Comprehension

28. Inheritance
    a. is the process by which genetic information is transmitted to offspring.
    b. occurs only in animals.
    c. is a process by which proteins are transmitted to offspring.
    d. is not a biological process.
    e. is the process by which genetic information is transmitted to offspring and occurs only in animals
    ANS: A
    DIF: Easy
    OBJ: Bloom's Taxonomy: Knowledge

29. A series of programmed changes encoded in DNA, through which a fertilized egg divides into many cells that ultimately are transformed into an adult organism, is known as ____.
    a. inheritance
    b. compensation
    c. homeostasis
    d. transformation
    e. development
    ANS: E
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Knowledge

30. The sequential stages through which individuals develop, grow, maintain themselves, and reproduce are known as the ____.
    a. life cycle
    b. transformation
    c. catabolic reactions
    d. anabolic reactions
    e. central dogma
    ANS: A
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Knowledge

31. Populations of all organisms change from one generation to the next because their DNA changes over time. This is known as:
    a. artificial selection.
    b. biological evolution.
    c. natural selection.
    d. artificial selection and natural selection only
    e. none of these
    ANS: B
    DIF: Difficult
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

Biological Evolution

32. Our understanding of the evolutionary process reveals:
    a. all populations change through time.
    b. all organisms are related through a shared ancestry.
    c. evolution has produced the spectacular diversity of life that we see around us.
    d. all of these
    e. all populations change through time and all organisms are related through a shared ancestry
    ANS: D
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Knowledge

33. In the mid-nineteenth century Charles Darwin and Alfred Russel Wallace observed many organisms. Based on these observations they arrived to an explanation on how populations change through time. They termed it:
    a. evolution.
    b. natural selection.
    c. creationism.
    d. natural evolution.
    e. genetics.
    ANS: B
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

34. Biological evolution according to Darwin and Wallace states that
    a. organisms produce numerous offspring, but environmental factors limit the number of reproducing survivors.
    b. heritable variations allow some individuals to out compete others.
    c. the offspring of successful individuals inherit the favorable characteristics of their parents.
    d. a, b, and c
    e. none of the above
    ANS: D
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Comprehension

35. DNA is
    a. composed of protein and lipid subunits.
    b. organized into functional units called genes.
    c. organized into functional units called chromosomes.
    d. organized into functional units called ribosomes.
    e. organized from information contained in proteins.
    ANS: B
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Knowledge

36. Mutations
    a. are the basis of variability among individuals.
    b. are the basis of homogeneity in a population.
    c. are always bad for populations.
    d. are always good for populations.
    e. none of these
    ANS: A
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

37. Mutations
    a. can be beneficial.
    b. can be harmful.
    c. can be neutral.
    d. all of these
    e. none of these
    ANS: D
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

38. Adaptations
    a. are characteristics that arise during an organism's lifetime and that help an organism survive longer or reproduce more.
    b. occur primarily in the form of useful molecules.
    c. are characteristics that arise via natural selection and that help an organism survive longer or reproduce more.
    d. are characteristics that mainly enhance feeding.
    e. are characteristics that arise during an organism's lifetime and that help an organism survive longer or reproduce more and are characteristics that arise via natural selection and that help an organism survive longer or reproduce more.
    ANS: C
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

39. Cryptic coloration means
    a. males and females look different.
    b. blending with the background.
    c. camouflage.
    d. standing out against a background.
    e. blending with the background and camouflage
    ANS: E
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

Biodiversity and the Tree of Life

40. Why have scientists developed classification systems?
    a. To arrange living and dead organisms into groups that reflect their relationships and evolutionary origins.
    b. To make sense of the past and present diversity of life on Earth.
    c. To help scientists distinguish two different groups of organisms with the same common name.
    d. To arrange living and dead organisms into groups that reflect their relationships and evolutionary origins and to make sense of the past and present diversity of life on Earth.
    e. To arrange living and dead organisms into groups that reflect their relationships and evolutionary origins, to make sense of the past and present diversity of life on Earth, and to help scientists distinguish two different groups of organisms with the same common name.
    ANS: A
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

41. A group of organisms in which the individuals are so closely related in structure, biochemistry, and behavior that they can successfully interbreed is a(n) ____.
    a. kingdom
    b. class
    c. order
    d. species
    e. genus
    ANS: D
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

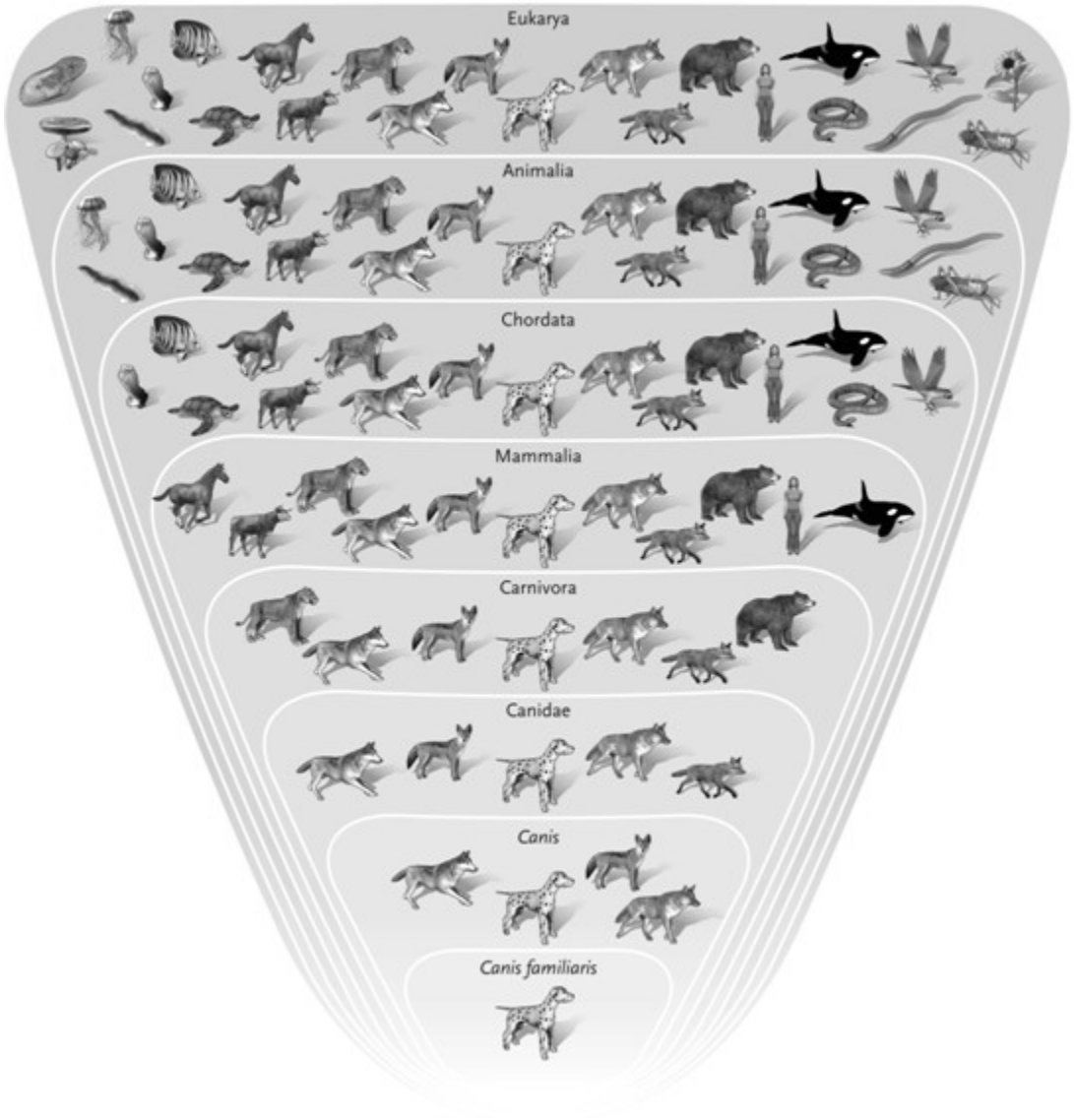
42. A group of similar species that share the most recent common ancestry is a(n) ____.
    a. kingdom
    b. class
    c. order
    d. genus
    e. species
    ANS: D
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

43. A randomly selected group of organisms from a family would show more genetic and anatomical variability than a similar group randomly picked from a _____.
    a. class
    b. genus
    c. order
    d. phlyum
    e. kingdom
    ANS: B
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Analysis

44. The scientific name of an organism is composed of two names. The first part identifies the ____ while the second part designates the ____.
    a. genus; species
    b. species; genus
    c. genera; genus
    d. phylum; species
    e. family; genus
    ANS: A
    DIF: Easy
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

45. Scientific names
    a. are always written in all capital letters and in italics.
    b. are always written in italics in lower case.
    c. are always written in lower case and underlined.
    d. are always written in italics with both genus and species capitalized.
    e. are always written in italics with only the genus capitalized.
    ANS: E
    DIF: Easy
    OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension

46. Which of the following scientific names is written in the correct format?
    a. *Canis Familiaris*
    b. *Canis Lupus*
    c. *Canis latrans*
    d. *canis Familiaris*
    e. *c. Latrans*
    ANS: C
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Synthesis



Use the figure above for the following question(s).

47. Which of the following represents a kingdom?
    a. Animalia
    b. Chordata
    c. Canis
    d. Canidae
    ANS: A
    DIF: Moderate
    REF: Figure 1.11
    OBJ: Bloom's Taxonomy: Synthesis | Bloom's Taxonomy: Application

48. In the illustration, which group is the most inclusive group?
    a. *Canis familiaris*
    b. Animalia
    c. Chordata
    d. Mammalia
    e. Eukarya
    ANS: E
    DIF: Moderate
    REF: Figure 1.11
    OBJ: Bloom's Taxonomy: Analysis

49. In the illustration, which group is the least inclusive?
    a. *Canis familiaris*
    b. Animalia
    c. Chordata
    d. Mammalia
    e. Chordata
    ANS: A
    DIF: Moderate
    REF: Figure 1.11
    OBJ: Bloom's Taxonomy: Analysis

50. The group that is the most inclusive and has been recently been added to the classification scheme is the ____.
    a. kingdom
    b. protista
    c. eukarya
    d. domain
    e. eukarya and domain
    ANS: D
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Application

51. Which of the following pairs would be classified as prokaryotes?
    a. Animalia and Plantae
    b. Bacteria and Archaea
    c. Fungi and Plantae
    d. all of these
    e. none of these
    ANS: B
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Application

52. A cell that is observed under the microscope is found to have its DNA enclosed in a nucleus, and has other specialized internal compartments. The cell is a(n) ____.
    a. prokaryote
    b. bacterium
    c. eukaryote
    d. *E. coli*
    e. *S. aureus*
    ANS: C
    DIF: Easy
    OBJ: Bloom's Taxonomy: Application

53. A researcher in a lab finds a microscopic organism that has no nucleus, but has distinctive structural molecules and mechanisms of photosynthesis. The organisms are abundant in vitually every habibtat on Earth. The researcher has identified an organism belonging to the domain ____.
    a. Bacteria
    b. Protoctista
    c. Eukarya
    d. Animalia
    e. Amoeba
    ANS: A
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Analysis

54. A researcher in a lab finds a microscopic organism that is a producer. The organisms are found in extreme environments (i.e., hot springs). The researcher has identified an organism belonging to the domain ____.
    a. Bacteria
    b. Archaea
    c. Eukarya
    d. Animalia
    e. Amoeba
    ANS: B
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Analysis

55. A student encounters an organism which resembles a plant and whose cells contain a nucleus. The organism is most likely classified as a(n) ____.
    a. Bacteria
    b. Archaea
    c. Eukarya
    d. Animalia
    e. Amoeba
    ANS: C
    DIF: Easy
    OBJ: Bloom's Taxonomy: Analysis

56. This kingdom includes the algae that are used to make sushi rolls.
    a. Plantae
    b. Fungi
    c. Animalia
    d. Protoctista
    e. Bacteria
    ANS: D
    DIF: Difficult
    OBJ: Bloom's Taxonomy: Analysis | Bloom's Taxonomy: Application

57. The pages of your textbook consist mainly of material made by multicellular, photosynthetic organisms that function as producers in ecosystems. These organisms belong to the kingdom ____.
    a. Plantae
    b. Fungi
    c. Animalia
    d. Protoctista
    e. Bacteria
    ANS: A
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Analysis | Bloom's Taxonomy: Application

58. Shitake mushrooms are decomposers that break down biological molecules from dead organisms. These organisms belong to the ____ kingdom.
    a. Plantae
    b. Fungi
    c. Animalia
    d. Protoctista
    e. Bacteria
    ANS: B
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Analysis | Bloom's Taxonomy: Application

59. Cats, dogs, and fish are consumers that have the ability to move actively from one place to another. These organisms belong to the ____ kingdom.
    a. Plantae
    b. Fungi
    c. Animalia
    d. Protoctista
    e. Bacteria
    ANS: C
    DIF: Easy
    OBJ: Bloom's Taxonomy: Analysis | Bloom's Taxonomy: Application

60. The most fundamental grouping in the classification of living organisms is the _____.
    a. class
    b. genus
    c. family
    d. order
    e. species
    ANS: E
    DIF: Easy
    OBJ: Bloom's Taxonomy: Knowledge

Biological Research

61. The observations you make and experimental data you collect in your biology laboratory class are examples of:
    a. statistical analysis.
    b. hypothesis building.
    c. biological dogma.
    d. model systems.
    e. biological research.
    ANS: E
    DIF: Easy
    OBJ: Bloom's Taxonomy: Analysis | Bloom's Taxonomy: Application

62. An approach in which scientists make observations about the natural world, develop tentative explanations about what they observe, and then test those explanations by collecting more information is referred to as ____.
    a. science
    b. education
    c. the scientific method
    d. the method
    e. none of these
    ANS: C
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Comprehension

63. If a biologist searches for explanations about the natural phenomena solely to satisfy his or her curiosity and advance our collective knowledge of living systems, then, this researcher is a(n):
    a. applied researcher.
    b. basic researcher.
    c. general researcher.
    d. simple researcher.
    e. scientist.
    ANS: B
    DIF: Easy
    OBJ: Bloom's Taxonomy: Analysis

64. Applied researchers conduct their work to:
    a. solve specific practical problems.
    b. solve any problem they face.
    c. answer all questions.
    d. advance our collective knowledge of living systems.
    e. none of these
    ANS: A
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Analysis | Bloom's Taxonomy: Application

65. If a researcher collects basic information on biological structures or the details of biological processes, then the researcher's approach is considered to be:
    a. science.
    b. scientific.
    c. descriptive science.
    d. not scientific.
    e. science and scientific only
    ANS: C
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Analysis | Bloom's Taxonomy: Application

66. When conducting descriptive research, a scientist primarily uses:
    a. control data.
    b. data.
    c. experiments.
    d. observational data.
    e. experimental data.
    ANS: D
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Analysis | Bloom's Taxonomy: Application

67. When a student manipulates a system under study, he or she is collecting:
    a. empirical data.
    b. experimental data.
    c. observational data.
    d. data.
    e. none of these.
    ANS: B
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Analysis | Bloom's Taxonomy: Application

68. You are studying an ecosystem in your campus; after a solid base of carefully observed and described facts, your next step would be to:
    a. make more observations.
    b. share your data with others.
    c. design an experiment.
    d. wait for instructions.
    e. make a hypothesis.
    ANS: E
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Analysis | Bloom's Taxonomy: Application

69. While conducting an experiment in the lab, you collect data that help you demonstrate that your hypothesis is wrong. In other words, you have falsified your hypothesis. Your results are acclaimed by
    a. the ecclesiastic community.
    b. the Pope.
    c. the scientific community.
    d. the student community.
    e. no one.
    ANS: C
    DIF: Moderate
    OBJ: Bloom's Taxonomy: Analysis | Bloom's Taxonomy: Application

70. Hypotheses that are falsifiable fall within the realm of:
    a. science.
    b. history.
    c. not science.
    d. philosophy.
    e. English.
    ANS: A
    DIF: Easy
    OBJ: Bloom's Taxonomy: Knowledge

SHORT ANSWER

71. You are at a stage in your research in which you must design an experiment to test your hypothesis. What factors must you include to insure that your experimental data is good valid data?

    ANS:
    Any experimental design must include a control group, an experimental group or variable, and must include replicates to validate data.

    DIF: Moderate REF: Section 1.4
    OBJ: Bloom's Taxonomy: Analysis | Bloom's Taxonomy: Application

72. Explain the need for a null hypothesis, especially in ecology and evolution. What does a null hypothesis accomplish?

ANS:
A null hypothesis is a statement of what a researcher would see if the hypothesis being tested is wrong. Ecologists usually tackle systems that are too complex to control, so a null hypothesis anticipates, or provides alternative hypothesis to answer questions.

DIF: Moderate REF: Section 1.4
OBJ: Bloom's Taxonomy: Analysis | Bloom's Taxonomy: Application

73. Why do scientists use model organisms?

ANS:
Model organisms have rapid development, short life cycles, and small adult sizes, making them ideal to work with in the laboratory setting.

DIF: Moderate REF: Section 1.4
OBJ: Bloom's Taxonomy: Analysis | Bloom's Taxonomy: Application

74. What are the contributions of Beadle, Tatum, Watson, and Crick to biology? What techniques did they use to revolutionize biological science?

ANS:
Beadle and Tatum demonstrated that genes provide cells with instructions needed for the production of proteins, whereas Watson and Crick determined the structure of DNA. Molecular technologies have transformed biology.

DIF: Moderate REF: Section 1.4
OBJ: Bloom's Taxonomy: Analysis | Bloom's Taxonomy: Application

75. Scientific theories are of fundamental importance in science. Explain the difference between the term "theory" as employed in science versus "theory" as employed in everyday language.

ANS:
Scientific theories have withstood the test of time and have been extensively confirmed by repeated experiments. The term as used in science has validity whereas in everyday context it takes the form of an opinion or a guess.

DIF: Moderate REF: Section 1.4
OBJ: Bloom's Taxonomy: Analysis | Bloom's Taxonomy: Application