CHAPTER 01—INVITATION TO BIOLOGY

Multiple Choice

1. What name is given to the scientific study of life?

a. geography
b. statistics
c. ecology
d. geology
e. biology

ANSWER: e
DIFFICULTY: Bloom's: Remember
REFERENCES: 1.1 The Secret Life of Earth
LEARNING OBJECTIVES: BTAT.STAR.16.01.01 - Describe the study of biology and importance of biodiversity on Earth.

2. The current rate of extinctions is about ____ times faster than normal.

a. 10
b. 100
c. 1000
d. 100,000
e. 1,000,000

ANSWER: c
DIFFICULTY: Bloom's: Remember
REFERENCES: 1.1 The Secret Life of Earth
LEARNING OBJECTIVES: BTAT.STAR.16.01.01 - Describe the study of biology and importance of biodiversity on Earth.

3. The species extinctions taking place today are being caused by ____ activities.

a. human
b. volcanic
c. plate tectonic
d. extraterrestrial
e. geothermal

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 1.1 The Secret Life of Earth
LEARNING OBJECTIVES: BTAT.STAR.16.01.01 - Describe the study of biology and importance of biodiversity on Earth.

4. Which of the following represents the most correct order of the organization of life from the smallest unit to the largest?

a. atoms → molecules → cells → organisms → populations → communities → ecosystems → biosphere
b. atoms → molecules → cells → organisms → communities → populations→ ecosystems → biosphere
c. atoms → molecules → cells → organisms → populations → ecosystems → communities → biosphere
d. communities → biosphere → organisms → ecosystems → populations → cells → molecules → atoms
e. biosphere → organisms → communities → ecosystems → populations → molecules → cells → atoms

ANSWER: a

DIFFICULTY: Bloom's: Understand
REFERENCES: 1.2 Life is More Than the Sum of Its Parts
LEARNING OBJECTIVES: BTAT.STAR.16.01.02 - Summarize the levels of organization in nature.

5. Which of the following organization levels is the least inclusive?

a. population
b. community
c. cell
d. atom
e. molecule

ANSWER: d
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.2 Life is More Than the Sum of Its Parts
LEARNING OBJECTIVES: BTAT.STAR.16.01.02 - Summarize the levels of organization in nature.

6. An ecosystem is made up of ____.

a. only plants, animals and fungi
b. organisms and nonliving things
c. only rocks and minerals
d. only plants, protozoa, and fungi
e. the biosphere of the region

ANSWER: b
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.2 Life is More Than the Sum of Its Parts
LEARNING OBJECTIVES: BTAT.STAR.16.01.02 - Summarize the levels of organization in nature.

7. Lipids, proteins, DNA, RNA, and complex carbohydrates are all ____.

a. minerals
b. atoms
c. cells
d. molecules
e. elements

ANSWER: d
DIFFICULTY: Bloom's: Apply
REFERENCES: 1.2 Life is More Than the Sum of Its Parts
LEARNING OBJECTIVES: BTAT.STAR.16.01.02 - Summarize the levels of organization in nature.

8. The emergent property of "life" appears at the level of the ____, when many molecules become organized.

a. population
b. atom
c. organism
d. cell
e. community

ANSWER: d

DIFFICULTY: Bloom's: Understand
REFERENCES: 1.2 Life is More Than the Sum of Its Parts
LEARNING OBJECTIVES: BTAT.STAR.16.01.02 - Summarize the levels of organization in nature.

9. A population is composed of individuals of ____.
   a. the same species
   b. interacting species of different kinds
   c. interacting species and nonliving things
   d. a single species interacting with nonliving things
   e. all species found in a given area

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.2 Life is More Than the Sum of Its Parts
LEARNING OBJECTIVES: BTAT.STAR.16.01.02 - Summarize the levels of organization in nature.

10. Living organisms are members of all of the levels listed below. However, soil is a component of ___.
   a. the community
   b. the population
   c. the ecosystem
   d. both the population and ecosystem
   e. both the community and the biosphere

ANSWER: c
DIFFICULTY: Bloom's: Apply
REFERENCES: 1.2 Life is More Than the Sum of Its Parts
LEARNING OBJECTIVES: BTAT.STAR.16.01.02 - Summarize the levels of organization in nature.

11. Which of the following is a basic component of all of the others?
   a. cells
   b. organs
   c. tissues
   d. organism
   e. organ systems

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.2 Life is More Than the Sum of Its Parts
LEARNING OBJECTIVES: BTAT.STAR.16.01.02 - Summarize the levels of organization in nature.

12. Which of the following represents an activity within a population?
   a. a fox consuming a rabbit
   b. the absorption of nitrogen by bacteria and converting it to a form useful to plants
   c. a peacock spreading and shaking his feathers to attract a female
   d. moss growing on the north side of a large pine tree
   e. a virus causing rabies in a dog

ANSWER: c

DIFFICULTY: Bloom's: Analyze
REFERENCES: 1.2 Life is More Than the Sum of Its Parts
LEARNING OBJECTIVES: BTAT.STAR.16.01.02 - Summarize the levels of organization in nature.

13. The level of organization that encompasses all regions of Earth's crust, waters, and atmosphere in which organisms live is known as ____.

a. the biosphere
b. a community
c. an ecosystem
d. a population
e. an organism's habitat

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.2 Life is More Than the Sum of Its Parts
LEARNING OBJECTIVES: BTAT.STAR.16.01.02 - Summarize the levels of organization in nature.

14. Which of the following characteristics are shared by all living organisms?

I. hereditary information is passed to offspring
II. adaptation to environmental change
III. requirement for nutrients
IV. DNA housed in a nucleus

a. I and II
b. I and III
c. II and III
d. I, II, and III
e. I, II, III, and IV

ANSWER: d
DIFFICULTY: Bloom's: Analyze
REFERENCES: 1.3 How Living Things Are Alike
LEARNING OBJECTIVES: BTAT.STAR.16.01.03 - List the important factors that distinguish living organisms from non-living organisms.

15. A substance that an organism needs for growth and survival but cannot make for itself is referred to as a(n) ____.

a. chemical
b. nutrient
c. atom
d. DNA molecule
e. carbohydrate

ANSWER: b
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.3 How Living Things Are Alike
LEARNING OBJECTIVES: BTAT.STAR.16.01.03 - List the important factors that distinguish living organisms from non-living organisms.

16. All organisms fit into one of the two following categories. What two categories are these?

a. consumers and decomposers

b. producers and decomposers
c. producers and consumers
d. scavengers and detritivores
e. consumers and scavengers

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.3 How Living Things Are Alike
LEARNING OBJECTIVES: BTAT.STAR.16.01.03 - List the important factors that distinguish living organisms from non-living organisms.

17. The dynamics of an ecosystem depends on two main processes, which are ____.
a. the cycling of energy and the unidirectional flow of nutrients
b. the unidirectional flow of energy and the cycling of nutrients
c. the multidirectional flow of both energy and nutrients
d. the unidirectional flow of both energy and nutrients
e. the cycling of both energy and nutrients

ANSWER: b
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.3 How Living Things Are Alike
LEARNING OBJECTIVES: BTAT.STAR.16.01.03 - List the important factors that distinguish living organisms from non-living organisms.

18. On a very hot summer day and a few months later on a very cold winter day, you go outside and take your temperature. Each time your body temperature is 37 degrees Celsius. This example illustrates ____.
a. adaptation
b. cellular reproduction
c. respiration
d. homeostasis
e. digestion

ANSWER: d
DIFFICULTY: Bloom's: Apply
REFERENCES: 1.3 How Living Things Are Alike
LEARNING OBJECTIVES: BTAT.STAR.16.01.03 - List the important factors that distinguish living organisms from non-living organisms.

19. The DNA molecule is most similar functionally to a ____.
a. pair of scissors
b. flash light battery
c. Cookbook
d. ballpoint pen
e. craft kit of ceramic tiles

ANSWER: c
DIFFICULTY: Bloom's: Analyze
REFERENCES: 1.3 How Living Things Are Alike
LEARNING OBJECTIVES: BTAT.STAR.16.01.03 - List the important factors that distinguish living organisms from non-

ES: living organisms.

20. The process by which the first cell of a new individual becomes a multicelled adult is called ____.

a. homeostasis
b. inheritance
c. reproduction
d. growth
e. development

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.3 How Living Things Are Alike
LEARNING OBJECTIVES: BTAT.STAR.16.01.03 - List the important factors that distinguish living organisms from non-living organisms.

21. Energy flow is one-way because ____.

a. all of the energy in an ecosystem stays constant
b. the amount of energy a producer harvests is equal to the amount of energy consumers consume
c. with each energy transfer, some energy escapes as heat
d. energy cannot be created but it can be destroyed
e. there is only one form of energy

ANSWER: c
DIFFICULTY: Bloom's: Analyze
REFERENCES: 1.3 How Living Things Are Alike
LEARNING OBJECTIVES: BTAT.STAR.16.01.03 - List the important factors that distinguish living organisms from non-living organisms.

22. Homeostasis is ____.

a. the ability to sense and respond to change
b. maintaining the external environment to favor survival
c. essential for nonliving things
d. unique to consumers
e. unique to producers

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.3 How Living Things Are Alike
LEARNING OBJECTIVES: BTAT.STAR.16.01.03 - List the important factors that distinguish living organisms from non-living organisms.

23. The transmission of DNA to offspring is referred to as ____.

a. homeostasis
b. development
c. growth
d. reproduction
e. inheritance

ANSWER: e

DIFFICULTY: Bloom's: Understand
REFERENCES: 1.3 How Living Things Are Alike
LEARNING OBJECTIVES: BTAT.STAR.16.01.03 - List the important factors that distinguish living organisms from non-living organisms.

24. What is the process by which a producer uses light energy to make sugars from carbon dioxide and water?

a. respiration
b. photosynthesis
c. homeostasis
d. development
e. reproduction

ANSWER: b
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.3 How Living Things Are Alike
LEARNING OBJECTIVES: BTAT.STAR.16.01.03 - List the important factors that distinguish living organisms from non-living organisms.

25. The category of organisms that get their energy and nutrients by feeding on the tissues, wastes, or remains of other organisms are generally called ____.

a. producers
b. prokaryotes
c. consumers
d. archaea
e. plants

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.3 How Living Things Are Alike
LEARNING OBJECTIVES: BTAT.STAR.16.01.03 - List the important factors that distinguish living organisms from non-living organisms.

26. The scope of variation among living organisms is referred to as ____.

a. heritability
b. the biosphere
c. biodiversity
d. taxonomy
e. the ecosystem

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.4 How Living Things Differ
LEARNING OBJECTIVES: BTAT.STAR.16.01.04 - Describe the features of the six major categories of living organisms and how they are classified.

27. Which organisms are single-celled and lack a nucleus?

a. bacteria and archaea
b. fungi and bacteria

c. archaea and protists
d. fungi and archaea
e. bacteria and protists

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.4 How Living Things Differ
LEARNING OBJECTIVES: BTAT.STAR.16.01.04 - Describe the features of the six major categories of living organisms and how they are classified.

28. All known species belong to one of three domains. What are these domains?
a. Prokarya, Bacteria, and Eukarya
b. Prokarya, Archaea, and Eukarya
c. Plantae, Bacteria, and Animalia
d. Bacteria, Archaea, and Eukarya
e. Bacteria, Archaea, and Protista

ANSWER: d
DIFFICULTY: Bloom's: Apply
REFERENCES: 1.4 How Living Things Differ
LEARNING OBJECTIVES: BTAT.STAR.16.01.04 - Describe the features of the six major categories of living organisms and how they are classified.

29. Members of which group(s) can be single-celled producers?
a. plants
b. protists
c. bacteria
d. bacteria and protists
e. bacteria and plants

ANSWER: d
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.4 How Living Things Differ
LEARNING OBJECTIVES: BTAT.STAR.16.01.04 - Describe the features of the six major categories of living organisms and how they are classified.

30. What are the simplest types of eukaryotes?
a. plants
b. protists
c. fungi
d. bacteria
e. archaea

ANSWER: b
DIFFICULTY: Bloom's: Remember
REFERENCES: 1.4 How Living Things Differ
LEARNING OBJECTIVES: BTAT.STAR.16.01.04 - Describe the features of the six major categories of living organisms and how they are classified.

31. Collectively, which group of organisms are the most diverse representatives of life?

a. plants and animals
b. protists and fungi
c. bacteria and archaea
d. bacteria and protists
e. archaea and plants

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.4 How Living Things Differ
LEARNING OBJECTIVES: BTAT.STAR.16.01.04 - Describe the features of the six major categories of living organisms and how they are classified.

32. What organism is defined as a multicelled organism that develops through a series of stages and moves about during part or all of its life?

a. archaea
b. bacteria
c. fungi
d. animals
e. plants

ANSWER: d
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.4 How Living Things Differ
LEARNING OBJECTIVES: BTAT.STAR.16.01.04 - Describe the features of the six major categories of living organisms and how they are classified.

33. What is a characteristic of eukaryotes?

a. All are multicelled organisms
b. Their cells are typically smaller than bacteria.
c. They are more like bacteria than archaea.
d. Their cells are less complex than bacteria or archaea.
e. Their DNA is contained in a nucleus.

ANSWER: a
DIFFICULTY: Bloom's: Apply
REFERENCES: 1.4 How Living Things Differ
LEARNING OBJECTIVES: BTAT.STAR.16.01.04 - Describe the features of the six major categories of living organisms and how they are classified.

34. Which of the following organisms is a multi-celled producer?

a. an oak tree
b. *Candida*, a pathogenic fungus
c. *E. coli*, a common intestinal bacterium
d. a Siberian tiger
e. an archaeon on the seafloor

ANSWER: a
DIFFICULTY: Bloom's: Apply

REFERENCES: 1.4 How Living Things Differ

LEARNING OBJECTIVES: BTAT.STAR.16.01.04 - Describe the features of the six major categories of living organisms and how they are classified.

35. Which of the following is a characteristic of all fungi?
    a. They are prokaryotic consumers.
    b. They break down food externally.
    c. They actively move during part of their lives.
    d. They make their own food.
    e. They are multicelled.

ANSWER: b

DIFFICULTY: Bloom's: Understand

REFERENCES: 1.4 How Living Things Differ

LEARNING OBJECTIVES: BTAT.STAR.16.01.04 - Describe the features of the six major categories of living organisms and how they are classified.

36. In which of the following groups does seaweed belong?
    a. protists
    b. plants
    c. fungi
    d. archaea
    e. bacteria

ANSWER: a

DIFFICULTY: Bloom’s: Remember

REFERENCES: 1.4 How Living Things Differ

LEARNING OBJECTIVES: BTAT.STAR.16.01.04 - Describe the features of the six major categories of living organisms and how they are classified.

37. In the scientific name, *Pan paniscus*, *Pan* represents the name of the ____ while *paniscus* represents the name of the ____.
    a. family; species
    b. family; genus
    c. genus; species
    d. species; genus
    e. genus; family

ANSWER: c

DIFFICULTY: Bloom’s: Understand

REFERENCES: 1.4 How Living Things Differ

LEARNING OBJECTIVES: BTAT.STAR.16.01.04 - Describe the features of the six major categories of living organisms and how they are classified.

38. Who developed the two-part naming system scientists use today to classify newly found organisms?
    a. Charles Darwin
    b. Carolus Linnaeus
    c. Aristotle

d. Alexander von Humboldt
e. Ernst Mayer

ANSWER: b
DIFFICULTY: Bloom's: Remember
REFERENCES: 1.4 How Living Things Differ
LEARNING OBJECTIVES: BTAT.STAR.16.01.04 - Describe the features of the six major categories of living organisms and how they are classified.

39. Which of the following is the correct order of taxa from most inclusive to least inclusive?
a. domain, kingdom, phylum, class, order, family, genus, species
b. domain, kingdom, phylum, order, class, family, genus, species
c. domain, kingdom, phylum, family, order, class, genus, species
d. domain, phylum, kingdom, class, order, family, genus, species
e. domain, kingdom, order, class, phylum, family, genus, species

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.4 How Living Things Differ
LEARNING OBJECTIVES: BTAT.STAR.16.01.04 - Describe the features of the six major categories of living organisms and how they are classified.

40. Taxonomists today tend to group organisms into the same category based on similar ____.
a. morphology
b. behavior
c. geographic distributions
d. biochemical traits
e. eating habits

ANSWER: d
DIFFICULTY: Bloom's: Apply
REFERENCES: 1.4 How Living Things Differ
LEARNING OBJECTIVES: BTAT.STAR.16.01.04 - Describe the features of the six major categories of living organisms and how they are classified.

41. Ernst Mayr was responsible for ____.
a. discovering new species atop New Guinea's Foja Mountains
b. standardizing a two-part naming system
c. explaining the theory of natural selection
d. describing the biological species concept
e. identifying that all organisms contain DNA

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 1.4 How Living Things Differ
LEARNING OBJECTIVES: BTAT.STAR.16.01.04 - Describe the features of the six major categories of living organisms and how they are classified.

42. Which level of taxonomy encompasses all of the others?

a. family
b. class
c. order
d. species
e. genus

ANSWER: b
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.4 How Living Things Differ
LEARNING OBJECTIVES: BTAT.STAR.16.01.04 - Describe the features of the six major categories of living organisms and how they are classified.

43. Which of the following words describes a tentative explanation to a given question?

a. law
b. theory
c. hypothesis
d. fact
e. principle

ANSWER: c
DIFFICULTY: Bloom's: Remember
REFERENCES: 1.5 The Science of Nature
LEARNING OBJECTIVES: BTAT.STAR.16.01.05 - Outline the hierarchical stages of a scientific method.

44. In order to verify a hypothesis, scientists ____.

a. perform experiments and/or make observations
b. consider facts
c. establish law
d. develop theories
e. make predictions

ANSWER: a
DIFFICULTY: Bloom's: Remember
REFERENCES: 1.5 The Science of Nature
LEARNING OBJECTIVES: BTAT.STAR.16.01.05 - Outline the hierarchical stages of a scientific method.

45. What is the right sequence of events applied in the scientific method?

a. hypothesis; initial observation; data analysis; test; conclusion
b. initial observation; data analysis; hypothesis; test; conclusion
c. initial observation; hypothesis; data analysis; test; conclusion
d. initial observation; hypothesis; test; data analysis; conclusion
e. hypothesis; data analysis; initial observation; test; conclusion

ANSWER: d
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.5 The Science of Nature
LEARNING OBJECTIVES: BTAT.STAR.16.01.05 - Outline the hierarchical stages of a scientific method.

46. An experimenter wanted to test the effects of cigarette smoking on rats. She infused the cages of 50 rats with cigarette

smoke and the cages of another 50 rats with pure, clean air. The rats that received the clean air were the ____.

a. experimental group
b. control group
c. model group
d. predictive group
e. independent group

ANSWER: b
DIFFICULTY: Bloom's: Analyze
REFERENCES: 1.5 The Science of Nature
LEARNING OBJECTIVES: BTAT.STAR.16.01.05 - Outline the hierarchical stages of a scientific method.

47. In the Olestra experiment conducted by researchers at the Johns Hopkins University School of Medicine, the people who ate the Olestra potato chips were the ____.

a. experimental group
b. control group
c. research group
d. hypothetical group
e. independent group

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.5 The Science of Nature
LEARNING OBJECTIVES: BTAT.STAR.16.01.05 - Outline the hierarchical stages of a scientific method.

48. In the Olestra potato chip experiment, the report published in the *Journal of the American Medical Association* in January 1998 indicated that ____.

a. Olestra potato chips cause cramping
b. potato chips without Olestra cause cramping
c. there was no evidence that Olestra caused cramping
d. watching movies cause cramping
e. people should not eat potato chips

ANSWER: c
DIFFICULTY: Bloom's: Analyze
REFERENCES: 1.5 The Science of Nature
LEARNING OBJECTIVES: BTAT.STAR.16.01.05 - Outline the hierarchical stages of a scientific method.

49. In the 2005 peacock butterfly experiment, what was the conclusion?

a. Predatory birds are not deterred from eating peacock butterflies with spots.
b. Predatory birds are deterred by peacock butterfly clicking sounds.
c. Peacock butterflies with spots mated more often than those without spots.
d. Predatory birds are deterred by the dark color of the peacock butterfly.
e. Peacock butterflies that made clicking sounds attracted more predatory birds.

ANSWER: b
DIFFICULTY: Bloom's: Analyze
REFERENCES: 1.5 The Science of Nature
LEARNING OBJECTIVES: BTAT.STAR.16.01.05 - Outline the hierarchical stages of a scientific method.

50. The final step in the scientific method for a scientist is ____.
    a. devising an experiment
    b. collecting data
    c. making observations
    d. report his or her results
    e. researching the literature for similar investigations

ANSWER: d
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.5 The Science of Nature
LEARNING OBJECTIVES: BTAT.STAR.16.01.05 - Outline the hierarchical stages of a scientific method.

51. Scientists perform ____ in order to ____ a given ____.
    a. experiments; test; hypothesis
    b. tests; experiment; law
    c. tests; experiment; variable
    d. facts; test; variable
    e. hypotheses; try; experiment

ANSWER: a
DIFFICULTY: Bloom's: Apply
REFERENCES: 1.5 The Science of Nature
LEARNING OBJECTIVES: BTAT.STAR.16.01.05 - Outline the hierarchical stages of a scientific method.

52. A control group ____.
    a. receives the same treatment as the experimental group
    b. is an untreated group of individuals or subjects
    c. is sometimes exposed to harsh conditions
    d. is often an unnecessary waste of material
    e. is not subjected to experimental error

ANSWER: b
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.5 The Science of Nature
LEARNING OBJECTIVES: BTAT.STAR.16.01.05 - Outline the hierarchical stages of a scientific method.

53. The control in an experiment ____.
    a. contains excess test subjects in case some die
    b. is an additional replicate for statistical purposes
    c. reduces the experimental errors
    d. minimizes experimental inaccuracy
    e. allows for comparisons with the experimental group

ANSWER: e
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.5 The Science of Nature
LEARNING OBJECTIVES: BTAT.STAR.16.01.05 - Outline the hierarchical stages of a scientific method.

54. In the experiment with peacock butterflies the working hypothesis is that ____.
    a. mimicry confuses both predator and prey
    b. mimicry protects butterflies from being eaten by predatory birds
    c. birds are capable of learning
    d. birds are agents of evolution
    e. unpalatable species display distinctive wings

ANSWER: b
DIFFICULTY: Bloom's: Apply
REFERENCES: 1.5 The Science of Nature
LEARNING OBJECTIVES: BTAT.STAR.16.01.05 - Outline the hierarchical stages of a scientific method.

55. The variable(s) in the 2005 peacock butterfly experiment is(are) the ____.
    a. butterfly wings pattern color
    b. butterfly species
    c. butterfly wings pattern color and sounds emitted
    d. rainforest region used
    e. percentage of survivors

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.5 The Science of Nature
LEARNING OBJECTIVES: BTAT.STAR.16.01.05 - Outline the hierarchical stages of a scientific method.

56. How did the experimental group differ from the control group in the 2005 peacock butterfly experiment?
    a. They were different species.
    b. Their native habitat of the forest differed.
    c. They were spotless and soundless.
    d. They tasted worse.
    e. They preferred different flowers species.

ANSWER: c
DIFFICULTY: Bloom's: Analyze
REFERENCES: 1.5 The Science of Nature
LEARNING OBJECTIVES: BTAT.STAR.16.01.05 - Outline the hierarchical stages of a scientific method.

57. A scientific theory ____.
    a. is widely accepted and supported by several evidences
    b. is widely accepted but not necessarily supported by several evidences
    c. is sometimes accepted and supported by several evidences
    d. is sometimes accepted and not necessarily supported by several evidences
    e. is always a "truth"

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: REF: 1.6 The Nature of Science
LEARNING OBJECTIVES: BTAT.STAR.16.01.06 - Summarize the process and scope of scientific experimentation.

58. Evolution has been tested in various ways. Genetic, fossil, anatomical, physiological and behavioral studies all

confirm that evolution is the mechanism of the origin of species. Thus, in science evolution is considered a scientific ____.

a. fact
b. hypothesis
c. law
d. theory
e. guess

ANSWER: d
DIFFICULTY: Bloom's: Apply
REFERENCES: 1.6 The Nature of Science
LEARNING OBJECTIVES: BTAT.STAR.16.01.06 - Summarize the process and scope of scientific experimentation.

59. In science, a theory is defined as ____.

a. a speculative guess
b. a hypothesis
c. an explanation that is well documented and consistent with the evidence
d. a description of a phenomenon for which there is no explanation
e. a personal conviction

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.6 The Nature of Science
LEARNING OBJECTIVES: BTAT.STAR.16.01.06 - Summarize the process and scope of scientific experimentation.

60. A result is statistically significant if ____.

a. it is unlikely to have occurred by chance
b. it is likely to have occurred by chance
c. it is likely to have occurred in 50% of the cases
d. it is consistent with predictions
e. it is widely accepted

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.6 The Nature of Science
LEARNING OBJECTIVES: BTAT.STAR.16.01.06 - Summarize the process and scope of scientific experimentation.

61. In science, all results ____.

a. are accepted as fact
b. are only hypotheses
c. have a probability of being incorrect
d. must be consistent with previous knowledge
e. are uncritically accepted by other scientists

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.6 The Nature of Science
LEARNING OBJECTIVES: BTAT.STAR.16.01.06 - Summarize the process and scope of scientific experimentation.

62. Sampling error can be minimized by which one of the following?
    a. using a large sample size
    b. conducting the experiment or observation only once
    c. throwing out data that does not fit the conclusion
    d. using a small subset of a larger population
    e. carefully selecting samples to match the prediction

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.6 The Nature of Science
LEARNING OBJECTIVES: BTAT.STAR.16.01.06 - Summarize the process and scope of scientific experimentation.

63. In science, if a result is deemed statistically significant, that means ____.
    a. it is a very important result
    b. it has a high probability of being incorrect.
    c. it has a low probability of being skewed by sampling error
    d. there is very little variation in the data
    e. there is no doubt of the result being true

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.6 The Nature of Science
LEARNING OBJECTIVES: BTAT.STAR.16.01.06 - Summarize the process and scope of scientific experimentation.

64. Error bars on a graph indicate ____.
    a. places where the data is likely wrong
    b. places where the researcher is unsure of her results
    c. variation in results that cannot be accounted for.
    d. variation in a set of data around the average
    e. poor experimental technique on the part of the researcher

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 1.6 The Nature of Science
LEARNING OBJECTIVES: BTAT.STAR.16.01.06 - Summarize the process and scope of scientific experimentation.

65. What practice helps scientists avoid bias in their findings?
    a. designing experiments that other researchers will find difficult to replicate
    b. performing experiments testing all circumstances
    c. reaching conclusions based on personal conviction
    d. avoiding questions that may be at odds with society's moral standards
    e. publicly publishing their results

ANSWER: a
DIFFICULTY: Bloom's: Analyze
REFERENCES: 1.6 The Nature of Science
LEARNING OBJECTIVES: BTAT.STAR.16.01.06 - Summarize the process and scope of scientific experimentation.

66. Why do scientists typically design experiments that will yield quantitative results?

a. Scientists are unable to perform qualitative studies.
b. Quantitative results minimize the potential for bias.
c. To prevent other scientists from repeating their experiments.
d. Scientists cannot always observe all individuals of a group.
e. Quantitative results increase desirable bias.

ANSWER: b
DIFFICULTY: Bloom's: Apply
REFERENCES: 1.6 The Nature of Science
LEARNING OBJECTIVES: BTAT.STAR.16.01.06 - Summarize the process and scope of scientific experimentation.

67. The difference between results obtained from a subset and results obtained from the whole is known as the ____.

a. sampling error
b. probability
c. statistically significant
d. sample size
e. controlled variable

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.6 The Nature of Science
LEARNING OBJECTIVES: BTAT.STAR.16.01.06 - Summarize the process and scope of scientific experimentation.

68. After rigorous statistical analyses have shown a very low likelihood (usually 5% or less) of a result having occurred by chance alone, the result is said to be ____.

a. quantitatively probable
b. probably random
c. statistically significant
d. due to sampling error
e. statistically probable

ANSWER: c
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.6 The Nature of Science
LEARNING OBJECTIVES: BTAT.STAR.16.01.06 - Summarize the process and scope of scientific experimentation.

69. If 10 million people enter a drawing, what is each person's probability of winning?

a. 10%
b. 1%
c. 0.1%
d. 0.001%
e. 0.00001%

ANSWER: a
DIFFICULTY: Bloom's: Analyze
REFERENCES: 1.6 The Nature of Science
LEARNING OBJECTIVES: BTAT.STAR.16.01.06 - Summarize the process and scope of scientific experimentation.

70. If a hypothesis stands after years of repeated testing, is consistent with all data gathered, and helps make successful

predictions about other phenomena, it is considered to be a ____.

a. speculative idea
b. proven theory
c. proven hypothesis
d. law of nature
e. scientific theory

ANSWER: a
DIFFICULTY: Bloom's: Understand
REFERENCES: 1.6 The Nature of Science
LEARNING OBJECTIVES: BTAT.STAR.16.01.06 - Summarize the process and scope of scientific experimentation.

71. Why are the laws of thermodynamics considered laws of nature and not scientific theories?

a. We do not understand how or why energy behaves the way it does.
b. We understand why energy behaves the way it does, but not exactly how it behaves.
c. We understand how energy behaves, but not exactly why it behaves the way it does.
d. We cannot be absolutely sure that energy will behave the same under all conditions.
e. We have a complete scientific explanation of energy behavior.

ANSWER: c
DIFFICULTY: Bloom's: Apply
REFERENCES: 1.6 The Nature of Science
LEARNING OBJECTIVES: BTAT.STAR.16.01.06 - Summarize the process and scope of scientific experimentation.

72. The idea that Earth orbits the sun is referred to as ____ of the solar system, because of the scientist who first proposed it.

a. the Galilean theory
b. Newton's model
c. Einstein's theory
d. the Copernican model
e. Darwin's theory

ANSWER: d
DIFFICULTY: Bloom's: Remember
REFERENCES: 1.6 The Nature of Science
LEARNING OBJECTIVES: BTAT.STAR.16.01.06 - Summarize the process and scope of scientific experimentation.

73. In 1610, which scientist was imprisoned for publishing evidence that the Earth orbits the sun?

a. Aristotle
b. Copernicus
c. Galileo
d. Darwin
e. Newton

ANSWER: c
DIFFICULTY: Bloom's: Remember
REFERENCES: 1.6 The Nature of Science
LEARNING OBJECTIVES: BTAT.STAR.16.01.06 - Summarize the process and scope of scientific experimentation.

Matching

Based on the Olestra potato chip experiment conducted by researchers at the Johns Hopkins University School of Medicine, match the following letters to the number with which they best correspond.

a. Observation
b. Hypothesis
c. Prediction
d. Experiment
e. Control group
f. Experimental group
g. The variable
h. Results
i. Conclusion

DIFFICULTY: Bloom's: Apply
REFERENCES: 1.5 The Science of Nature
LEARNING OBJECTIVES: BTAT.STAR.16.01.05 - Outline the hierarchical stages of a scientific method.

74. People who eat potato chips with Olestra will be more likely to get intestinal cramps than those who eat potato chips made without Olestra.
ANSWER: c

75. Olestra.
ANSWER: g

76. Percentages are about equal. Therefore, Olestra is not the cause of intestinal cramps observed in some people who have ingested Olestra-containing food.
ANSWER: i

77. Olestra causes intestinal cramps.
ANSWER: b

78. A set of people got regular potato chips.
ANSWER: e

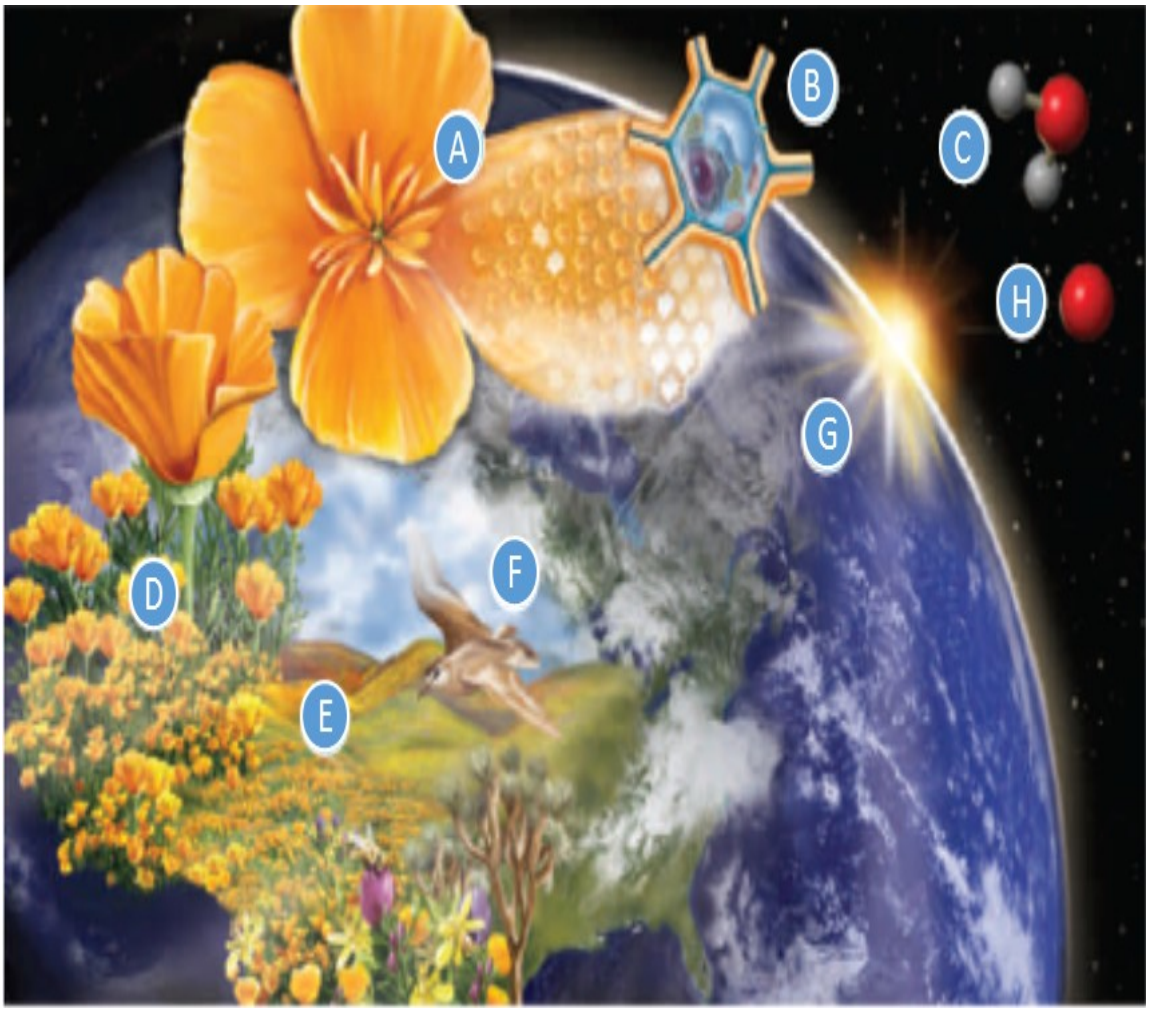
79. 1,100 people between the ages of thirteen and thirty-eight were asked to watch a movie and eat potato chips.
ANSWER: d

80. Some people complained of intestinal problems after eating chips containing Olestra.
ANSWER: a

81. A subset of people got Olestra-containing chips.
ANSWER: f

82. In the control group, 17.6% of people reported having cramps later, while in the experimental group, 15.8% of people had cramps later.
ANSWER: h

Match the term with its definition.



a. atom
b. organism
c. biosphere
d. molecule
e. population
f. ecosystem
g. cell
h. community

DIFFICULTY: Bloom's: Understand
REFERENCES: 1.2 Life Is More Than the Sum of Its Parts
LEARNING OBJECTIVES: BTAT.STAR.16.01.02 - Summarize the levels of organization in nature.

83. All populations of all species in a given area
ANSWER: h

84. Fundamental building block of all matter
ANSWER: a

85. Smallest unit of life
ANSWER: g

86. All regions of Earth where organisms live
ANSWER: c

87. Two or more atoms bonded together
ANSWER: d

88. A community interacting with its environment
ANSWER: f

89. Individual that consists of one or more cells
ANSWER: b

90. Group of interbreeding individuals of the same species that live in a given area
ANSWER: e

Classification. Answer the following questions in reference to life's diversity. Choose only the most correct answer.

a. archaea
b. bacteria
c. Eukarya
d. Plantae
e. fungi
f. animals
g. protists

DIFFICULTY: Bloom's: Apply
REFERENCES: 1.4 How Living Things Differ
LEARNING OBJECTIVES: BTAT.STAR.16.01.04 - Describe the features of the six major categories of living organisms and how they are classified.

91. Often found in extreme environments while having no nucleus, these organisms are closer genetically to eukaryotes.
ANSWER: a

92. In this eukaryotic group, members range from single-celled consumers to giant, multi-celled producers.
ANSWER: g

93. Multi-celled consumers that actively move about during at least part of their lives.
ANSWER: f

94. They have no nucleus and are the most numerous organisms on Earth.
ANSWER: b

95. Yeasts belong to this group.
ANSWER: e

96. Members of this domain have a nucleus and numerous membrane-bound organelles.
ANSWER: c

97. These prokaryotes are able to colonize extreme environments such as hydrothermal vents on the seafloor.
ANSWER: a

98. Besides feeding themselves, these multi-celled organisms, serve as food for most other organisms.
ANSWER: d

99. These multi-celled consumers include herbivores and carnivores.
ANSWER: f

100. This single-celled or multicelled eukaryotic consumer breaks down material outside itself, then absorbs nutrients released from the breakdown.
ANSWER: e