

CHAPTER 1—INVITATION TO BIOLOGY

MULTIPLE CHOICE

The Secret Life of Earth

1. How many species become extinct each minute in the rainforests alone?
 - a. 1.
 - b. 2
 - c. 5
 - d. 10
 - e. 20

ANS: E PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Knowledge

Life is More Than the Sum of its Parts

2. Which is the smallest unit of life that can exist as a separate entity?
 - a. a cell
 - b. a molecule
 - c. an organ
 - d. a population
 - e. an ecosystem

ANS: A PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Knowledge

Life is More Than the Sum of its Parts

3. The most inclusive level of organization listed here is a(n)
 - a. heart.
 - b. carbon atom.
 - c. DNA.
 - d. a zebra.
 - e. red blood cell.

ANS: D PTS: 1

DIF: Easy

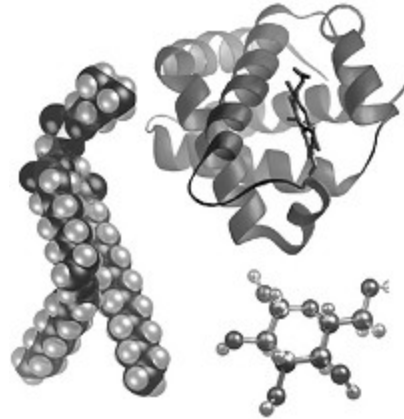
OBJ: Bloom's Taxonomy: Comprehension |
Bloom's Taxonomy: Synthesis

4. In order to survive and reproduce, a cell needs
 - a. an energy source.
 - b. raw materials.
 - c. a suitable environment.
 - d. DNA.
 - e. all of these.

ANS: E PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Knowledge



5. The level of organization represented in the figure is a(n)

- a. atom.
- b. tissue.
- c. molecule.
- d. organ.
- e. cell.

ANS: C PTS: 1

DIF: Easy

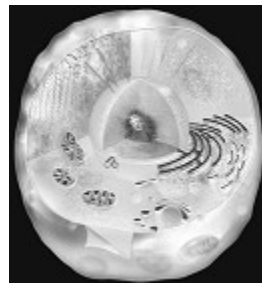
OBJ: Bloom's Taxonomy: Comprehension |
Bloom's Taxonomy: Evaluation

6. A community
 - a. includes all populations of all species in a given area.
 - b. features the living organisms interacting with the physical and chemical environment.
 - c. is the sum of all places in Earth's atmosphere, crust, and waters where organisms live.
 - d. includes members of only one species.
 - e. is at a higher level of organization than an ecosystem.

ANS: A PTS: 1

DIF: Moderate

OBJ: Bloom's Taxonomy: Knowledge |
Bloom's Taxonomy: Evaluation



7. The above figure represents a(n)

- a. atom.
- b. tissue.
- c. molecule.
- d. organ.
- e. cell.

ANS: E PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Comprehension

8. The level of organization where factors such as sunlight, rainfall, and temperature come into play is the

- a. digestive system.
- b. the flow of energy and recycling of nitrogen in a given area.
- c. plants producing oxygen in the Amazon basin is consumed by giraffes on the Serengeti.
- d. glucose.
- e. clown fish, sharks, and coral living together at the Great Barrier reef.

ANS: B PTS: 1

DIF: Moderate

OBJ: Bloom's Taxonomy: Comprehension | Bloom's Taxonomy: Synthesis

9. Living organisms are members of all of the levels listed below; however, rocks are components of

- a. the community.
- b. the population.
- c. the ecosystem.
- d. the biosphere.
- e. both the ecosystem and the biosphere.

ANS: E PTS: 1

DIF: Difficult

OBJ: Bloom's Taxonomy: Comprehension | Bloom's Taxonomy: Synthesis

10. A(n) ____ property is a characteristic of a system that does not appear in any of its component parts.

- a. efferent
- b. emergent
- c. elective
- d. energetic
- e. living

ANS: B PTS: 1

DIF: Difficult

OBJ: Bloom's Taxonomy: Knowledge

11. All organisms are alike in their

- a. requirements for energy.
- b. participation in one or more nutrient cycles.
- c. ultimate dependence on the sun.
- d. interaction with other forms of life.
- e. all of these.

ANS: E PTS: 1

DIF: Moderate

OBJ: Bloom's Taxonomy: Knowledge

12. Which of the following is NOT a key characteristic of "life"?

- a. organization into cells
- b. response to environmental change
- c. reproduction
- d. inability to change
- e. using energy

ANS: D PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Analysis

13. Living organisms are different from inanimate objects because they

- a. react to environmental stimuli.
- b. exhibit very high levels of complexity.
- c. possess molecules of deoxyribonucleic acid.
- d. exhibit multiple levels of organization.
- e. possess or exhibit all of these

ANS: E PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Analysis | Bloom's Taxonomy: Evaluation

14. The conversion of solar energy to chemical energy is known as

- a. metabolism.
- b. photosynthesis.
- c. chemosynthesis.
- d. catabolism.
- e. anabolism.

ANS: B PTS: 1

DIF: Moderate

OBJ: Bloom's Taxonomy: Knowledge

15. Organisms sense and respond to changes both inside and outside the body by way of

- a. metabolism.
- b. photosynthesis.
- c. receptors.
- d. catabolism.
- e. anabolism.

How Living Things are Alike

ANS: C PTS: 1
 DIF: Moderate
 OBJ: Bloom's Taxonomy: Knowledge

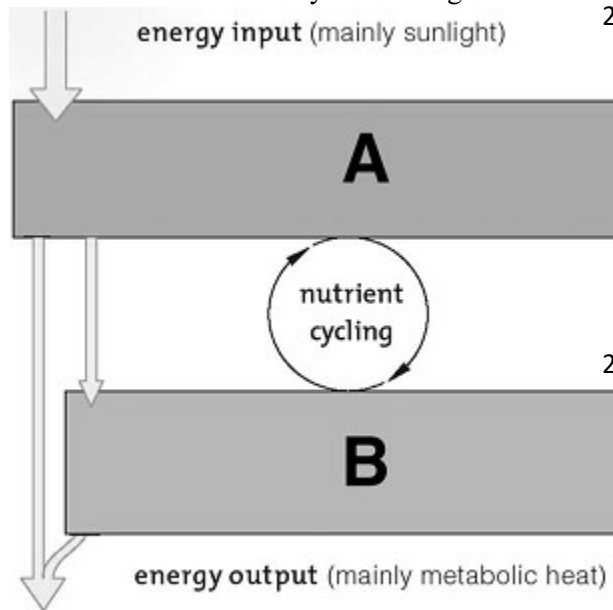
16. DNA codes for the production of
- proteins.
 - minerals.
 - inorganic molecules.
 - vital gasses.
 - water.

ANS: A PTS: 1
 DIF: Moderate
 OBJ: Bloom's Taxonomy: Knowledge

17. Which of the following do not depend directly on sunlight for energy?
- terrestrial producers
 - animal consumers
 - decomposers

- I only
- II and III only
- II only
- III only
- I and III

ANS: B PTS: 1
 DIF: Moderate
 OBJ: Bloom's Taxonomy: Knowledge



18. On the illustration, "A" and "B" should be labeled respectively
- consumers; producers
 - decomposers; producers
 - producers; redistributors
 - producers; consumers
 - consumers; decomposers

ANS: D PTS: 1
 DIF: Easy

OBJ: Bloom's Taxonomy: Comprehension

19. No nonliving entity exhibits or possesses which of the following?
- energetic interactions.
 - DNA.
 - atoms.
 - heat energy
 - complexity

ANS: B PTS: 1
 DIF: Moderate
 OBJ: Bloom's Taxonomy: Knowledge |
 Bloom's Taxonomy: Analysis

20. The flow of nutrients through living organisms is best characterized as
- circular.
 - a ladder.
 - a web.
 - one way.
 - a funnel.

ANS: A PTS: 1
 DIF: Easy
 OBJ: Bloom's Taxonomy: Knowledge |
 Bloom's Taxonomy: Comprehension

21. Homeostasis provides what kind of internal environment?
- positive
 - relatively constant
 - limiting
 - changing
 - chemical and physical

ANS: B PTS: 1
 DIF: Easy
 OBJ: Bloom's Taxonomy: Knowledge

22. Each cell is able to maintain a constant internal environment. This condition is called
- metabolism.
 - homeostasis.
 - physiology.
 - adaptation.
 - evolution.

ANS: B PTS: 1
 DIF: Easy
 OBJ: Bloom's Taxonomy: Knowledge |
 Bloom's Taxonomy: Comprehension

23. About twelve to twenty-four hours after the previous meal, a person's blood-sugar level normally varies from 60 to 90 milligrams per 100 milliliters of blood, though it may rise to 130 mg/100 ml after meals high in carbohydrates. That the blood-sugar level is maintained within a fairly narrow range despite uneven intake of sugar is due to the body's ability to carry out
- adaptation.
 - inheritance.
 - metabolism.
 - homeostasis.
 - all of these processes.

ANS: D PTS: 1

DIF: Moderate

OBJ: Bloom's Taxonomy: Knowledge |
Bloom's Taxonomy: Application | Bloom's
Taxonomy: Evaluation

24. Which of the following phrases would most likely be used in a discussion of homeostasis?
- respond to environmental stimuli
 - limited range of variation
 - rapid energy turnover
 - cycle of elements
 - structural and functional units of life

ANS: B PTS: 1

DIF: Difficult

OBJ: Bloom's Taxonomy: Knowledge

25. The DNA molecule is most similar functionally to a
- pair of scissors.
 - flashlight battery.
 - computer memory chip.
 - ballpoint pen.
 - craft kit of ceramic tiles.

ANS: C PTS: 1

DIF: Moderate

OBJ: Bloom's Taxonomy: Knowledge

26. Energy sources are needed for which of the following processes?
- reproduction
 - growth
 - development

- I and II
- I and III
- II only
- II and III
- I, II, and III

ANS: E PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Knowledge

How Living Things Differ

27. Which of the following lacks a nucleus?

- bacterial cell.
- fungus cell.
- animal cell.
- protist cell.
- all of these have a nucleus.

ANS: A PTS: 1

DIF: Moderate

OBJ: Bloom's Taxonomy: Knowledge

28. Members of what domain are evolutionarily closest to eukaryotes?

- Animalia
- Protista
- Fungi
- Bacteria
- Archaea

ANS: E PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Comprehension |
Bloom's Taxonomy: Analysis

29. All of the following are domains of life except?

- Animalia
- Bacteria
- Archaea
- Eukarya
- none of these are domains of life

ANS: A PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Comprehension |
Bloom's Taxonomy: Analysis

30. Members of what group are multicellular producers?

- Animalia
- Protista
- Fungi
- Plantae
- none of these are multicellular producers

ANS: D PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Knowledge

31. Which of the following groups are made up of almost exclusively decomposers?

- Plantae
- Fungi
- Animalia

- d. Monera
- e. Protista

ANS: B PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Knowledge |
Bloom's Taxonomy: Comprehension

32. Which of the following are NOT eukaryotes?

- a. fungi
- b. bacteria
- c. plants
- d. animals
- e. protistans

ANS: B PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Knowledge

Organizing Information About Species

33. A scientific name consists of which of the following?

- I. family name
- II. genus name
- III. species name

- a. I only
- b. II only
- c. III only
- d. I and II
- e. II and III

ANS: E PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Knowledge |
Bloom's Taxonomy: Synthesis

34. The plural for genus is

- a. genus.
- b. geni.
- c. genera.
- d. gena.
- e. genae.

ANS: C PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Knowledge

35. The least inclusive of the taxonomic categories listed here is

- a. family.
- b. phylum.
- c. class.
- d. order.
- e. genus.

ANS: E PTS: 1

DIF: Moderate

OBJ: Bloom's Taxonomy: Knowledge

36. Which group includes all of the other groups?

- a. domain
- b. order
- c. family
- d. genus
- e. species

ANS: A PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Knowledge

37. The hierarchical system of nomenclature

- a. allows diversity to be catalogued.
- b. organizes knowledge about species relationships.
- c. permits organisms to be identified.
- d. sorts organisms into groups.
- e. includes all of these.

ANS: E PTS: 1

DIF: Difficult

OBJ: Bloom's Taxonomy: Knowledge

The Science of Nature

38. Of the following, which term means the judging of information before accepting it as fact?

- a. Critical thinking
- b. Law
- c. Theory
- d. Fact
- e. Hypothesis

ANS: A PTS: 1

DIF: Moderate

OBJ: Bloom's Taxonomy: Knowledge

39. Of the following, which is the first explanation of a problem? (It is sometimes called an "educated guess.")

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

ANS: E PTS: 1

DIF: Moderate

OBJ: Bloom's Taxonomy: Knowledge

40. Hypotheses are

- a. often in the form of a statement.
- b. often expressed negatively.
- c. sometimes crude attempts to offer a possible explanation for observations.
- d. testable predictions.

e. all of these.

ANS: E PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Knowledge |
Bloom's Taxonomy: Comprehension

41. Which represents the lowest degree of certainty?

- a. hypothesis
- b. conclusion
- c. fact
- d. principle
- e. theory

ANS: A PTS: 1

DIF: Moderate

OBJ: Bloom's Taxonomy: Knowledge

42. Which represents the highest degree of certainty?

- a. hypothesis
- b. deduction
- c. assumption
- d. theory
- e. prediction

ANS: D PTS: 1

DIF: Moderate

OBJ: Bloom's Taxonomy: Knowledge

43. The control in an experiment

- a. makes the experiment valid.
- b. is an additional replicate for statistical purposes.
- c. reduces the experimental errors.
- d. minimizes experimental inaccuracy.
- e. allows for comparison to the experimental group.

ANS: E PTS: 1

DIF: Moderate

OBJ: Bloom's Taxonomy: Knowledge |
Bloom's Taxonomy: Comprehension

44. As a result of experimentation,

- a. more hypotheses may be developed.
- b. more questions may be asked.
- c. a new biological principle could emerge.
- d. entire theories may be modified.
- e. all of these can occur.

ANS: E PTS: 1

DIF: Moderate

OBJ: Bloom's Taxonomy: Comprehension |
Bloom's Taxonomy: Application

45. In an experiment, the control group is

- a. not subjected to experimental error.
- b. exposed to experimental treatments.
- c. maintained under strict laboratory conditions.
- d. treated exactly the same as the experimental group, except for one variable.
- e. statistically the most important part of the experiment.

ANS: D PTS: 1

DIF: Moderate

OBJ: Bloom's Taxonomy: Knowledge |
Bloom's Taxonomy: Comprehension

46. The choice of whether a particular organism belongs to the experimental group or the control group should be based on

- a. age.
- b. size.
- c. chance.
- d. designation by the experimenter.
- e. sex.

ANS: C PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Knowledge |
Bloom's Taxonomy: Application

Examples of Experiments in Biology

47. Scientists are always thinking about ways to improve experimental design. In the text's potato chip experiment, which of these might do so?

- a. show a different movie
- b. exclude teenagers as group members
- c. collect uneaten chip remains and weigh them for both groups
- d. provide free drinks
- e. use a smaller theater

ANS: C PTS: 1

DIF: Difficult

OBJ: Bloom's Taxonomy: Comprehension |
Bloom's Taxonomy: Application | Bloom's
Taxonomy: Analysis

48. Olestra chips did not cause cramps at a higher rate than normal chips. That was the _____ of this experiment

- a. Hypothesis
- b. Prediction
- c. Control
- d. Conclusion

ANS: D PTS: 1
DIF: MODERATE
OBJ: Bloom's Taxonomy: Comprehension

49. In the experiment with Peacock butterflies, the working hypothesis is that
- mimicry confuses both predator and prey.
 - mimicry conveys a selective advantage to the prey.
 - birds are capable of learning.
 - birds are agents of evolution.
 - unpalatable species display distinctive wings.

ANS: B PTS: 1
DIF: Difficult
OBJ: Bloom's Taxonomy: Comprehension |
Bloom's Taxonomy: Application

50. The variable in the butterfly experiment is
- butterfly wing pattern color.
 - butterfly species.
 - bird predator species.
 - rainforest region used.
 - percentage of survivors.

ANS: A PTS: 1
DIF: Easy
OBJ: Bloom's Taxonomy: Knowledge |
Bloom's Taxonomy: Comprehension

51. How did the control group differ from the experimental group in the butterfly experiment?
- They were different species.
 - Their native habitat area of the forest differed.
 - They tasted worse.
 - They were white-patterned.
 - They preferred different flower species.

ANS: D PTS: 1
DIF: Moderate
OBJ: Bloom's Taxonomy: Comprehension |
Bloom's Taxonomy: Analysis

52. The data from the butterfly experiment reflected which of the following?
- natural selection
 - food choices by predators
 - the ability of birds to find the prey
 - the role of mimicry
 - all of these

ANS: E PTS: 1
DIF: Difficult
OBJ: Bloom's Taxonomy: Comprehension |
Bloom's Taxonomy: Analysis

53. The results of the butterfly experiment
- supported the hypothesis.
 - provided valuable quantitative data.
 - confirmed the prediction.
 - provided evidence of natural selection in action.
 - are consistent with all of these.

ANS: E PTS: 1
DIF: Moderate
OBJ: Bloom's Taxonomy: Comprehension |
Bloom's Taxonomy: Application

54. Which of the following might be a possible follow-up experiment?
- Repeat in a forest area totally devoid of native butterflies.
 - Repeat in a wildlife sanctuary aviary after giving birds a chance to learn about yellow *H. eleuchia*.
 - Repeat using young, inexperienced birds.
 - Repeat, but count survivors for three weeks.
 - Conduct all of these.

ANS: B PTS: 1
DIF: Difficult
OBJ: Bloom's Taxonomy: Comprehension |
Bloom's Taxonomy: Application

Analyzing Experimental Results

55. Randomly selecting samples of experimental units from an environment can result in
- sampling error.
 - blind testing.
 - evidence.
 - experimental design.
 - consensus.
56. What is an acceptable probability of sampling error that may have skewed the results in most scientific studies?
- | | |
|--------|--------|
| a. 80% | d. 10% |
| b. 50% | e. 5% |
| c. 25% | |

ANS: E PTS: 1

DIF: EASY
OBJ: Blooms Taxonomy: Knowledge

The Nature of Science

57. Science is based on
a. faith.
b. authority.
c. evidence.
d. force.
e. facts.

ANS: C PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Knowledge

58. Which of the following can be changed based on new evidence?
a. hypothesis
b. theory
c. prediction
d. experiment
e. all of these

ANS: E PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Comprehension

59. Which of the following should NOT be used in the development of science?
a. evaluation of data
b. personal conviction
c. prediction
d. systematic observation
e. sharing ideas

ANS: B PTS: 1

DIF: Moderate

OBJ: Bloom's Taxonomy: Comprehension |

Bloom's Taxonomy: Analysis

60. All of the following can strengthen a theory EXCEPT
a. repetitions of experiments.
b. increased observations.
c. time.
d. faith.
e. confirmation by many scientists.

ANS: D PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Comprehension |
Bloom's Taxonomy: Analysis

61. The validity of scientific discoveries is not based on
a. morality.
b. aesthetics.
c. philosophy.
d. economics.
e. any of these.

ANS: E PTS: 1

DIF: Easy

OBJ: Bloom's Taxonomy: Knowledge

62. Copernicus, Galileo, and Darwin found that _____ caused their science to be controversial.
a. prevailing belief
b. objective data
c. astronomy
d. the supernatural
e. experimental design

ANS: A PTS: 1

DIF: Moderate

OBJ: Bloom's Taxonomy: Knowledge

MATCHING

Matching. Match the following letters to the number with which they best correspond.

- | | |
|----------------|-----------------------------|
| a. Observation | e. Observational experiment |
| b. Question | f. Laboratory experiment |
| c. Hypothesis | g. Assessment |
| d. Prediction | h. Report |

63. Conduct a survey of individuals who smoke and individuals who do not smoke. Determine which group has the highest incidence of cancers.
64. If smoking causes cancer, then individuals who smoke will get cancer more often than those who do not.
65. Submit the results and the conclusions to the scientific community.
66. Establish identical groups of laboratory rats. Expose one group (the model system) to cigarette smoke and compare the incidence of new cancers (if any) with the incidence in the control group.
67. Compile test results and draw conclusions from them.
68. Smoking cigarettes causes cancer.

69. Why do people get cancer?
 70. People get cancer.
63. ANS: E PTS: 1 DIF: Difficult
 OBJ: Bloom's Taxonomy: Application | Bloom's Taxonomy: Synthesis
 TOP: THE SCIENCE OF NATURE MSC: Multiple Choice
64. ANS: D PTS: 1 DIF: Difficult
 OBJ: Bloom's Taxonomy: Application | Bloom's Taxonomy: Synthesis
 TOP: THE SCIENCE OF NATURE MSC: Multiple Choice
65. ANS: H PTS: 1 DIF: Difficult
 OBJ: Bloom's Taxonomy: Application | Bloom's Taxonomy: Synthesis
 TOP: THE SCIENCE OF NATURE MSC: Multiple Choice
66. ANS: F PTS: 1 DIF: Difficult
 OBJ: Bloom's Taxonomy: Application | Bloom's Taxonomy: Synthesis
 TOP: THE SCIENCE OF NATURE MSC: Multiple Choice
67. ANS: G PTS: 1 DIF: Difficult
 OBJ: Bloom's Taxonomy: Application | Bloom's Taxonomy: Synthesis
 TOP: THE SCIENCE OF NATURE MSC: Multiple Choice
68. ANS: C PTS: 1 DIF: Difficult
 OBJ: Bloom's Taxonomy: Application | Bloom's Taxonomy: Synthesis
 TOP: THE SCIENCE OF NATURE MSC: Multiple Choice
69. ANS: B PTS: 1 DIF: Difficult
 OBJ: Bloom's Taxonomy: Application | Bloom's Taxonomy: Synthesis
 TOP: THE SCIENCE OF NATURE MSC: Multiple Choice
70. ANS: A PTS: 1 DIF: Difficult
 OBJ: Bloom's Taxonomy: Application | Bloom's Taxonomy: Synthesis
 TOP: THE SCIENCE OF NATURE MSC: Multiple Choice

Classification. Match the following descriptions to the most appropriate function, process, or trait listed below.

- a. inheritance b. reproduction c. photosynthesis d. growth e. homeostasis

71. a process found only in plants, some bacteria and some protists
 72. a characteristic most organisms exhibit that tends to buffer the effects of environmental change
 73. the passage of DNA from parent to offspring
 74. process in which one generation replaces another
71. ANS: C PTS: 1 DIF: Moderate
 OBJ: Bloom's Taxonomy: Knowledge TOP: HOW LIVING THINGS ARE ALIKE
 MSC: Classification
72. ANS: E PTS: 1 DIF: Easy
 OBJ: Bloom's Taxonomy: Knowledge TOP: HOW LIVING THINGS ARE ALIKE
 MSC: Classification
73. ANS: A PTS: 1 DIF: Moderate
 OBJ: Bloom's Taxonomy: Knowledge TOP: HOW LIVING THINGS ARE ALIKE
 MSC: Classification
74. ANS: B PTS: 1 DIF: Easy
 OBJ: Bloom's Taxonomy: Knowledge TOP: HOW LIVING THINGS ARE ALIKE
 MSC: Classification

Classification. Match the following descriptions with the most appropriate group listed below.

- a. Bacteria b. Protista c. Plantae d. Fungi e. Animalia

75. multicellular producers
 76. prokaryotic
 77. unicellular organisms of considerable internal complexity

78. multicellular motile consumers
79. based on fossils, oldest, still living organisms
80. unicellular eukaryotic producers
81. most common multicellular decomposers
75. ANS: C PTS: 1 DIF: Easy
 OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension
 TOP: HOW LIVING THINGS DIFFER MSC: Classification
76. ANS: A PTS: 1 DIF: Easy
 OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension
 TOP: HOW LIVING THINGS DIFFER MSC: Classification
77. ANS: B PTS: 1 DIF: Moderate
 OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension
 TOP: HOW LIVING THINGS DIFFER MSC: Classification
78. ANS: E PTS: 1 DIF: Moderate
 OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension
 TOP: HOW LIVING THINGS DIFFER MSC: Classification
79. ANS: A PTS: 1 DIF: Easy
 OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension
 TOP: HOW LIVING THINGS DIFFER MSC: Classification
80. ANS: B PTS: 1 DIF: Moderate
 OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension
 TOP: HOW LIVING THINGS DIFFER MSC: Classification
81. ANS: D PTS: 1 DIF: Moderate
 OBJ: Bloom's Taxonomy: Knowledge | Bloom's Taxonomy: Comprehension
 TOP: HOW LIVING THINGS DIFFER MSC: Classification