

Chapter 01: Test Bank

Student: _____

- The circulatory system of a whale is considered an organ system because it is composed of different
 - cells.
 - tissues.
 - organs.
 - molecules.
 - hearts.
- Which of the following lists the terms from simplest to most complex?
 - cells, organs, tissues, organ systems, organism
 - organs, organ system, organism, cells, tissues
 - tissues, organs, organ systems, organism, cells
 - cells, tissues, organs, organ systems, organism
 - organ systems, tissues, cells, organism, organs
- The smallest unit of life is a(n)
 - tissue.
 - organ.
 - cell.
 - species.
 - organism.
- The process of _____ transforms solar energy into chemical energy.
 - metabolism
 - homeostasis
 - respiration
 - photosynthesis
 - reproduction
- As fall approaches, white-tailed deer begin to accumulate a layer of body fat. This is an example of which characteristic of life?
 - maintaining homeostasis
 - metabolism
 - response to the environment
 - energy regulation
 - organization
- Geese are known to use the magnetic field of the Earth in navigating their twice yearly migrations. This is an example of which characteristic of life?
 - adaptation
 - reproduction and development
 - living things respond to the environment
 - energy regulation
 - maintaining homeostasis
- All of the following are true with respect to DNA except
 - genes are made up of DNA.
 - all of your body cells share the same DNA (with the exception of egg and sperm cells).
 - DNA is a double-helix.
 - all of your body cells share the same DNA.
 - DNA provides instructions for making proteins.
- Which of the following is matched incorrectly?

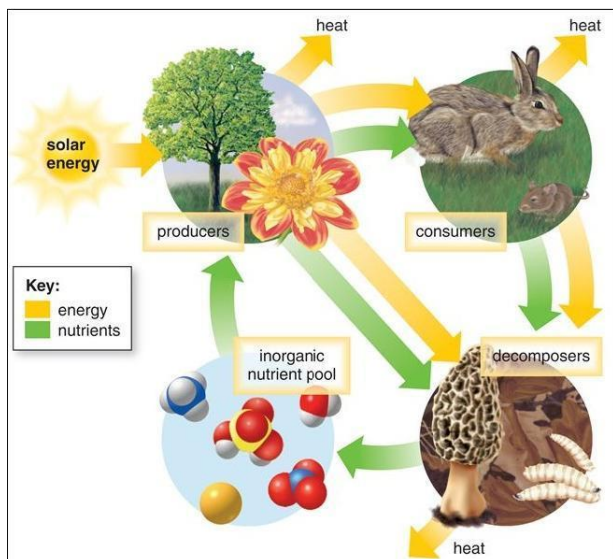
- A. brain - organ
 - B. neuron - cell
 - C. skin - organ
 - D. osteocyte - cell
 - E. gene – organelle
9. Many insects do not see into the red color range, and as a result, many insect-pollinated flowers are colors other than red (e.g., purple and yellow). This flower coloration would be considered a(n)
- A. mutation.
 - B. mistake.
 - C. adaptation.
 - D. selection.
 - E. competition.
10. Richard is an avid gardener who spends a lot of time caring for the plants in his garden. To minimize damage from pests from his garden, Richard uses a pesticide spray. At first the spray is very effective and kills off most of the insects that he sees on his vegetable plants. However, after a few years of using the same pesticide, he notices that some insects are surviving and continuing to eat his plants. This selection for herbicide resistance in the insects is an example of
- A. natural selection.
 - B. mutation.
 - C. an adaptation.
 - D. homeostasis.
 - E. a learned response.
11. Richard is an avid gardener who spends a lot of time caring for the plants in his garden. To minimize damage from pests from his garden, Richard uses a pesticide spray. At first the spray is very effective and kills off most of the insects that he sees on his vegetable plants. However, after a few years of using the same pesticide, he notices that some insects are surviving and continuing to eat his plants. The ability of some of the insects to survive pesticide spraying would be considered
- A. impossible.
 - B. a mutation.
 - C. an adaptation.
 - D. a gene.
 - E. a learned response.
12. Richard is an avid gardener who spends a lot of time caring for the plants in his garden. To minimize damage from pests from his garden, Richard uses a pesticide spray. At first the spray is very effective and kills off most of the insects that he sees on his vegetable plants. However, after a few years of using the same pesticide, he notices that some insects are surviving and continuing to eat his plants. The constant use of pesticides by Richard has led to genetic changes in the population over many generations. This is an example of
- A. homeostasis.
 - B. evolution.
 - C. mutation.
 - D. a gene.
 - E. a behavior.
13. All the chemical reactions that occur in a cell are called
- A. mitosis.
 - B. photosynthesis.
 - C. cellular respiration.
 - D. energy use.
 - E. metabolism.
14. The only single-celled organisms are prokaryotes, such as archaea and bacteria.
- A. True because prokaryotes are the simplest cell form.

- B. True because all eukaryotes are multicellular.
 C. False because some eukaryotes, including protista, are single-celled.
 D. False because some prokaryotes are multicellular.
 E. False because all single-celled organisms are prokaryotes.
15. The various species of honeycreepers have an assortment of different bills, but all honeycreeper species have a similar size and body shape. This is an example of
- A. ascent with new traits.
 B. descent with modification.
 C. taxonomic differentiation.
 D. fixed traits.
 E. modification of adaptations.
16. Based on the evolutionary tree of the three domains, which of the following is true?
- A. All three domains have a common ancestor.
 B. Domain Bacteria and domain Eukarya are more closely related to each other than to domain Archaea.
 C. The Eukarya have remained the same throughout evolutionary time.
 D. All three domains are equally related to one another.
 E. The Eukarya are the common ancestors to the three domains.
17. Prokaryotes belong to _____
- A. Domain Eukarya.
 B. Kingdom Plantae.
 C. Kingdom Protista.
 D. Domain Archaea.
 E. Kingdom Animalia.
18. The mountain zebra (*Equus zebra*) and the donkey (*Equus asinus*) belong to the same species.
- A. True because they both start with *Equus*.
 B. True because they are both related to horses.
 C. False because the specific epithet is different.
 D. False because they have no similarities to each other.
 E. True because they have the same genus.
19. Which of the following correctly lists the classification categories from least to most inclusive?
- A. kingdom, phylum, domain, class, order family, genus, species
 B. domain, kingdom, class, order, family, phylum, genus, species
 C. species, genus, family, class, order, domain, phylum, kingdom
 D. species, genus, family, order, class, phylum, kingdom, domain
 E. phylum, species, genus, kingdom, domain, order, class, family
20. Phylum Arthropoda is broken into subgroups which include both Arachnida (e.g., spiders) and Insecta (e.g., insects). As a result, Arachnida and Insecta most likely belong to which classification category?
- A. class
 B. order
 C. family
 D. kingdom
 E. domain
21. The biological kingdom _____ includes both unicellular and multicellular organisms.
- A. Eukarya
 B. Bacteria
 C. Protista
 D. Fungi
 E. Plantae

22. Which of the following classification categories for humans is not correct?
- A. *Homo sapiens*: binomial name
 - B. *Homo*: genus
 - C. Animalia: kingdom
 - D. *sapiens*: family
 - E. Domain: Eukarya
23. Martin keeps a worm bin in his basement because the worms need cooler temperatures to survive. He feeds them about one pound of kitchen scraps each week. One summer the temperatures rose above the optimal temperature for the red worms (~ 85°F) and many in his colony died. However, those that survive continued to reproduce and within six months his colony was again thriving. The next summer, unusually warm temperatures again cause the basement temperatures to rise above 85°F for two days in a row. Surprisingly, Martin noticed that only a small portion of the worm colony died. What is the best explanation for this?
- A. After the first summer a new species of worm evolved.
 - B. The worms sensed that the temperature was going to be hot in the future and adapted.
 - C. The worms learned how to tolerate higher temperatures.
 - D. The worms surviving the first year had a higher heat tolerance and passed this trait to their offspring.
 - E. Worms are insensitive to heat changes.
24. Which of the following examples is not correctly matched with a correct term?
- A. a herd of bison - population
 - B. a spider - organism
 - C. the flowers and pollinating insects in your garden - community
 - D. a rock garden with various plants and rocks of different sizes - ecosystem
 - E. a desert with little water, high heat, sand, cacti, and some mammals - community
25. A biologist is studying how pollution affects algal growth and snail populations in a portion of Lake Erie. What level of organization is she studying?
- A. population
 - B. community
 - C. ecosystem
 - D. biosphere
 - E. cells
26. *Didinium* are carnivorous protists that prey on other, slower moving protists. A student is studying *Didinium* feeding rates after 1, 3, and 5 days of food deprivation. How should she classify the organism she is studying?
- A. eukaryotic decomposer
 - B. prokaryotic consumer
 - C. bacterial decomposer
 - D. prokaryotic producer
 - E. eukaryotic consumer
27. Linda is studying the interaction between porcupines, piñon pine trees, and pine bark beetles. Over the course of her study in northern Texas, she observes the behaviors of 25 porcupines, records the location of 151 piñon pines, and traps 332 beetles. Her study encompasses _____ population(s) and _____ organisms.
- A. 1; 508
 - B. 3; 3
 - C. 508; 508
 - D. 3; 508
 - E. 508; 3
28. Which of the following is the most encompassing level of organization?
- A. class
 - B. population

- C. ecosystem
- D. species
- E. cells

29. Kevin is studying predator-prey interactions. One day he notices a spider eating a cricket caught in its web. Later that day, a bird eats the spider. How many consumers has Kevin observed directly in this scenario?
ev:
07_17_2014_QC_51325
- A. 0
 - B. 1
 - C. 2
 - D. 3
 - E. 4
30. Kevin is studying predator-prey interactions. One day he notices a spider eating a cricket caught in its web. Later that day, a bird eats the spider. How many producers are there in this scenario?
- A. 0
 - B. 1
 - C. 2
 - D. 3
 - E. 4
31. Kevin is studying predator-prey interactions. One day he notices a spider eating a cricket caught in its web. Later that day, a bird eats the spider. How many populations are involved in his study?
- A. 0
 - B. 1
 - C. 2
 - D. 3
 - E. 4
32. Kevin is studying predator-prey interactions. One day he notices a spider eating a cricket caught in its web. Later that day, a bird eats the spider. Based on the organisms involved in this study, what level of organization is he studying?
- A. population
 - B. community
 - C. ecosystem
 - D. biosphere
 - E. cells
33. Refer to the figure below. How many different kingdoms are represented in this figure?



- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

34. Which of the following is not true about ecosystems?

- A. Energy is constantly recycled.
- B. Nutrients are constantly recycled.
- C. Producers are a food source for both consumers and decomposers.
- D. Solar energy is required for photosynthesis.
- E. Chemicals are constantly recycled.

35. A pond ecosystem includes small water fleas which feed on submerged aquatic plants. When the water fleas die, they sink to the bottom of the pond where they decompose with the help of bacteria. List in order the producer, decomposer, and consumer in this system.

- A. water fleas, bacteria, aquatic plants
- B. aquatic plants, water fleas, bacteria
- C. bacteria, water fleas, aquatic plants
- D. aquatic plants, bacteria, water fleas
- E. bacteria, aquatic plants, water fleas

36. Populations of amphibians, including frogs and toads, have been plagued by disease and high rates of deformity.

A recent study investigated whether problems among the populations have arisen due to poisons from chemicals associated with agriculture. Biologists from the University of Florida collected local adult cane toads (*Bufo marinus*)

from more than 20 different locations. Toads were collected from areas close to agriculture— both large-scale and small-scale farms as well as from suburbs. At collection sites where 50–97% of the adjacent land was farmed,

males showed high levels of feminization. Feminized male toads were similar in color to females and had lower levels of testosterone and often had deformed gonads. These changes can lead to sterile males or changes in

behavior that prevent mating from occurring. Which of the following statements would be considered a hypothesis for this study?

- A. Amphibian populations are facing problems due to agricultural chemicals.
- B. Toxins are capable of causing diseases and deformities within many amphibian populations.
- C. Toads collected from suburbs had fewer deformities compared to toads collected from agricultural areas.
- D. Agricultural chemicals can cause deformities and feminization amongst cane toads.
- E. More male toads from the large-scale agricultural areas showed signs of feminization.

37. Populations of amphibians, including frogs and toads, have been plagued by disease and high rates of deformity.

A recent study investigated whether problems among the populations have arisen due to poisons from chemicals associated with agriculture. Biologists from the University of Florida collected local adult cane toads (*Bufo marinus*) from more than 20 different locations. Toads were collected from areas close to agriculture— both large-scale and small-scale farms as well as from suburbs located far from agricultural sites. At collection sites where 50–97% of the adjacent land was farmed, males showed high levels of feminization. Feminized male toads were similar in color to females and had lower levels of testosterone and often had deformed gonads. These changes can lead to sterile males or changes in behavior that prevent mating from occurring. Based on this study, what is the control group?

- A. male toads collected from the suburbs
- B. male toads collected from areas near large-scale farms
- C. male toads collected from small-scale farms
- D. male toads collected from all the different sites
- E. female toads that were not collected

38. Populations of amphibians, including frogs and toads, have been plagued by disease and high rates of deformity. A recent study investigated whether problems among the populations have arisen due to poisons from chemicals associated with agriculture. Biologists from the University of Florida collected local adult cane toads (*Bufo marinus*) from more than 20 different locations. Toads were collected from areas close to agriculture— both large-scale and small-scale farms as well as from suburbs. At collection sites where 50–97% of the adjacent land was farmed, males showed high levels of feminization. Feminized male toads were similar in color to females and had lower levels of testosterone and often had deformed gonads. These changes can lead to sterile males or changes in behavior that prevent mating from occurring. Based on this study, what is/are the test group(s)?
- male toads collected from the suburbs
 - male toads collected from areas near large-scale and small-scale farms
 - female toads collected from all the different sites
 - male toads collected from all the different sites
 - male and female toads collected from areas near large-scale and small-scale farms
39. Populations of amphibians, including frogs and toads, have been plagued by disease and high rates of deformity. A recent study investigated whether problems among the populations have arisen due to poisons from chemicals associated with agriculture. Biologists from the University of Florida collected local adult cane toads (*Bufo marinus*) from more than 20 different locations. Toads were collected from areas close to agriculture— both large-scale and small-scale farms as well as from suburbs. At collection sites where 50–97% of the adjacent land was farmed, males showed high levels of feminization. Feminized male toads were similar in color to females and had lower levels of testosterone and often had deformed gonads. These changes can lead to sterile males or changes in behavior that prevent mating from occurring. In this study, what is the genus of the study animal?
- Bufo marinus*
 - cane toad
 - amphibian
 - Bufo*
 - marinus*
40. Populations of amphibians, including frogs and toads, have been plagued by disease and high rates of deformity. A recent study investigated whether problems among the populations have arisen due to poisons from chemicals associated with agriculture. Biologists from the University of Florida collected local adult cane toads (*Bufo marinus*) from more than 20 different locations. Toads were collected from areas close to agriculture— both large-scale and small-scale farms as well as from suburbs. At collection sites where 50–97% of the adjacent land was farmed, males showed high levels of feminization. Feminized male toads were similar in color to females and had lower levels of testosterone and often had deformed gonads. These changes can lead to sterile males or changes in behavior that prevent mating from occurring. At the end of their study, scientists stated that they had supported their theory that agricultural chemicals cause deformities.
- True based on the data collected during the study.
 - False because they would need more data to prove a theory.
 - False because they were testing a hypothesis not a theory.
 - True because this was a controlled study.
 - False because this was a controlled study.
41. Which of the following statements is not correctly matched with the given scientific method term?
- Biologists suggested that 2-3 cups of coffee per day can decrease death rates among women. (Hypothesis)
 - Leslie set up mist nets to catch bats flying over a small stream. Each bat that was caught was weighed and sexed. (Experimental design)
 - Bethany watched butterflies feeding in a large field of wild flowers. She noticed that more butterflies approached the yellow and purple flowers than the red flowers. (Observation)
 - A researcher reported that red-foot tortoises preferred red-colored fruits and vegetables to those that were green or white. (Conclusion)
 - All organisms are comprised of cells. (Data collection)

42. Robert, an aspiring scientist in a biology class, wanted to conduct a study on the effects of cigarette smoke on the web-building ability of spiders. Which of the following statements is an incorrect use of terms pertaining to the scientific method?
- A. Robert wanted to see if his *theory* was true that cigarette smoke will influence web-building in spiders.
 - B. Robert made the *observation* that spiders weave webs.
 - C. As a *control*, Robert had a group of spiders that were never exposed to cigarette smoke.
 - D. Robert examined the webs from both the control group and the test group and the *data* were recorded in a table.
 - E. Robert *concluded* that there was no significant difference in the ability to weave a web under conditions of . cigarette smoke compared to spiders that were not exposed.
43. Scientists were studying temperature selection amongst pregnant big brown bats. What would be the best control group for this study?
- A. pregnant bats
 - B. female bats that were not pregnant
 - C. male bats
 - D. juvenile male bats
 - E. juvenile female bats
44. Scientists were studying temperature selection among pregnant big brown bats. What would the test group be in this experiment?
- A. pregnant bats
 - B. female bats that were not pregnant
 - C. male bats
 - D. juvenile male bats
 - E. juvenile female bats
45. Which of the following statements is not true with respect to scientific theory?
- A. Theories are accepted explanations for how the world works.
 - B. Theories are possible explanations for natural events.
 - C. The theory of evolution is considered the unifying concept in biology.
 - D. Theories can help scientists generate new testable hypotheses.
 - E. Theories are supported by many observations and experiments.
46. Which of the following is not true with regards to extinction?
- A. Extinction of different species can impact humans.
 - B. All extinctions are caused by human activities such as habitat destruction.
 - C. As many as 400 species per day are lost due to human activities.
 - D. Introduction of non-native species to an area can increase the rate of extinction.
 - E. Extinction is the death of a species or a larger taxonomic group.
47. Which of the following is not true about biodiversity?
- A. Biodiversity is defined as variation in life on Earth.
 - B. Beetles have the highest biodiversity of all animals because there are more species of beetle than any other animal.
 - C. The impact of human activities on biodiversity loss is one of the most significant bioethical issues that we face today.
 - D. As extinction rates increase, biodiversity increases.
 - E. The biodiversity that we have on Earth is the result of billions of years of evolution.
48. Living organisms must constantly take in energy in order to power functions necessary to remain alive. The chemical reactions that involve energy conversion are called
- A. evolution.
 - B. respiration.
 - C. photosynthesis.
 - D. metabolism.
 - E. homeostasis.

49. The beaks of birds are well suited to the type of food they eat. This result arises from
- A. organisms changing so that they can do things more efficiently.
 - B. adaptations that occur as part of natural selection leading to a closer and closer fit between organisms and their environment.
 - C. birds eating only what their beaks are well suited to eat.
 - D. adaptations only allowing those organisms that are well suited to a food source to feed on it.
 - E. natural selection causing adaptations to develop in the birds to match the beaks.
50. The metabolic reactions that take place in a cell obey all of the same laws and require the same conditions necessary for any chemical reaction to occur. To make these reactions possible, cells
- A. maintain the correct temperature, moisture level, and acidity as well as other factors.
 - B. rely on the external conditions in the environment.
 - C. are at the mercy of changes that occur as each reaction progresses in the cell.
 - D. rely on external factors that control their internal conditions.
 - E. sidestep the conditions by manipulating the external environment.
51. The process of _____ leads to organisms that are _____ that environment.
- A. natural selection; adapted to
 - B. adaption; evolved for
 - C. homeostasis; suited to
 - D. natural selection; perfect for
 - E. adaptation; only found in
52. Why is evolution an important process for living things?
- A. It gives them more traits.
 - B. It gives them the perfect traits.
 - C. It gives them fewer traits.
 - D. It gives them traits that better match their environment.
 - E. It gives them only the right traits.
53. Evolutionary processes lead to organisms that
- A. are perfect.
 - B. function well in a given environment.
 - C. can only survive in that one environment.
 - D. have a single adaptive trait.
 - E. become extinct.
54. Natural selection is a process in which organisms that are better suited to a certain set of environmental conditions tend to survive and reproduce more often than others. This leads to evolution as
- A. organisms with those traits appear more often in the population.
 - B. the environment changes fast enough to prevent overpopulation.
 - C. the traits mutate into other traits.
 - D. organisms with different traits appear more often.
 - E. organisms with those traits appear less often in the population.
55. In science, a theory
- A. is tested by an experiment.
 - B. is more narrow in scope than a hypothesis.
 - C. encompasses many hypotheses.
 - D. cannot be tested.
 - E. is held to be an absolutely correct answer to a question.
56. The purpose of a control group in an experiment is
- A. to prove the hypothesis.
 - B. for comparison to the other test groups.
 - C. for comparison to the results of other experiments.

- D. to prove the prediction.
- E. to control the dependent variable.

57. Which answer choice lists the steps of the scientific method in the correct order?

- A. observation, hypothesis, experiment, conclusion, scientific theory
- B. hypothesis, observation, experiment, conclusion, scientific theory
- C. conclusion, hypothesis, observation, experiment, scientific theory
- D. observation, experiment, hypothesis, conclusion, scientific theory
- E. scientific theory, conclusion, hypothesis, experiment, observation

58. Which statement regarding the scientific method is false?

- A. Original hypotheses are formed after an experiment.
- B. Inductive reasoning is used to form a hypothesis.
- C. Observations are used to form a hypothesis.
- D. Experiments need to be repeatable.
- E. The control and experimental group are identical except for one variable.

59. Managing emerging diseases such as SARS is just one of the many challenges facing science today.

True False

60. The development of new technologies is based on science.

True False

Chapter 01: Test Bank Key

1. The circulatory system of a whale is considered an organ system because it is composed of different
- A. cells.
 - B. tissues.
 - C. organs.**
 - D. molecules.
 - E. hearts.

Organ systems are made up of organs that work together.

Blooms Level: 2. Understand
Learning Outcome: 01.01.02 Distinguish between the levels of biological organization.
Section: 01.01
Topic: Levels of Biological Organization

2. Which of the following lists the terms from simplest to most complex?
- A. cells, organs, tissues, organ systems, organism
 - B. organs, organ system, organism, cells, tissues
 - C. tissues, organs, organ systems, organism, cells
 - D. cells, tissues, organs, organ systems, organism**
 - E. organ systems, tissues, cells, organism, organs

Organisms are composed of organ systems, which are composed of organs, which are composed of tissues, which are composed of cells.

Blooms Level: 1. Remember
Learning Outcome: 01.01.02 Distinguish between the levels of biological organization.
Section: 01.01
Topic: Levels of Biological Organization

3. The smallest unit of life is a(n)
- A. tissue.
 - B. organ.
 - C. cell.**
 - D. species.
 - E. organism.

The smallest, most basic form of life is a single cell; either a prokaryote or a eukaryote.

Blooms Level: 1. Remember
Learning Outcome: 01.01.01 Explain the basic characteristics that are common to all living organisms.
Section: 01.01
Topic: Levels of Biological Organization

4. The process of _____ transforms solar energy into chemical energy.
- A. metabolism
 - B. homeostasis
 - C. respiration
 - D. photosynthesis**
 - E. reproduction

Plants and some bacteria and algae are able to capture energy from the sun and transform it into chemical energy.

Blooms Level: 1. Remember
Learning Outcome: 01.01.01 Explain the basic characteristics that are common to all living organisms.
Section: 01.01
Topic: Energy

5. As fall approaches, white-tailed deer begin to accumulate a layer of body fat. This is an example of which characteristic of life?
- A. maintaining homeostasis
 - B. metabolism
 - C. response to the environment**
 - D. energy regulation
 - E. organization

The accumulation of body fat is the deer's response to the change in temperature.

Blooms Level: 4. Analyze
Learning Outcome: 01.01.01 Explain the basic characteristics that are common to all living organisms.
Section: 01.01
Topic: Characteristics of Life

6. Geese are known to use the magnetic field of the Earth in navigating their twice yearly migrations. This is an example of which characteristic of life?
- A. adaptation
 - B. reproduction and development
 - C. living things respond to the environment**
 - D. energy regulation
 - E. maintaining homeostasis

Organisms respond to cues within the environment.

Blooms Level: 4. Analyze
Learning Outcome: 01.01.01 Explain the basic characteristics that are common to all living organisms.
Section: 01.01
Topic: Characteristics of Life

7. All of the following are true with respect to DNA except
- A. genes are made up of DNA.
 - B. all of your body cells share the same DNA (with the exception of egg and sperm cells).
 - C. DNA is a double-helix.
 - D. all of your body cells share the same DNA.**
 - E. DNA provides instructions for making proteins.

In asexual reproduction, all offspring have identical DNA.

Blooms Level: 2. Understand
Learning Outcome: 01.01.01 Explain the basic characteristics that are common to all living organisms.
Section: 01.01
Topic: Characteristics of Life

8. Which of the following is matched incorrectly?
- A. brain - organ
 - B. neuron - cell
 - C. skin - organ
 - D. osteocyte - cell
 - E. gene - organelle**

Living organisms are made of atoms, which arrange to form molecules, which arrange to form organelles, which arrange to form organs, which arrange to form systems, which arrange to form an entire living organism.

Blooms Level: 1. Remember
Learning Outcome: 01.01.02 Distinguish between the levels of biological organization.
Section: 01.01
Topic: Levels of Biological Organization

9. Many insects do not see into the red color range, and as a result, many insect-pollinated flowers are colors other than red (e.g., purple and yellow). This flower coloration would be considered a(n)
- A. mutation.**

- B. mistake.
- C. adaptation.**
- D. selection.
- E. competition.

Because of their color, flowers are likely to be pollinated and thus pass on their genes. The color trait thus confers an advantage and is an adaptation. There may be more than one gene that codes for this trait.

Blooms Level: 3. Apply
Learning Outcome: 01.01.01 Explain the basic characteristics that are common to all living organisms.
Section: 01.01
Topic: Characteristics of Life

10. Richard is an avid gardener who spends a lot of time caring for the plants in his garden. To minimize damage from pests from his garden, Richard uses a pesticide spray. At first the spray is very effective and kills off most of the insects that he sees on his vegetable plants. However, after a few years of using the same pesticide, he notices that some insects are surviving and continuing to eat his plants. This selection for herbicide resistance in the insects is an example of

- A. natural selection.**
- B. mutation.
- C. an adaptation.
- D. homeostasis.
- E. a learned response.

Natural selection is a process that can lead to changes in the population over time or evolution.

Blooms Level: 5. Evaluate
Learning Outcome: 01.02.02 Explain the process of natural selection and its relationship to evolutionary processes.
Section: 01.02
Topic: Natural Selection

11. Richard is an avid gardener who spends a lot of time caring for the plants in his garden. To minimize damage from pests from his garden, Richard uses a pesticide spray. At first the spray is very effective and kills off most of the insects that he sees on his vegetable plants. However, after a few years of using the same pesticide, he notices that some insects are surviving and continuing to eat his plants. The ability of some of the insects to survive pesticide spraying would be considered

- A. impossible.
- B. a mutation.
- C. an adaptation.**
- D. a gene.
- E. a learned response.

An adaptation is a trait that enhances the survival of an individual in a certain environment.

Blooms Level: 1. Remember
Learning Outcome: 01.02.02 Explain the process of natural selection and its relationship to evolutionary processes.
Section: 01.02
Topic: Natural Selection

12. Richard is an avid gardener who spends a lot of time caring for the plants in his garden. To minimize damage from pests from his garden, Richard uses a pesticide spray. At first the spray is very effective and kills off most of the insects that he sees on his vegetable plants. However, after a few years of using the same pesticide, he notices that some insects are surviving and continuing to eat his plants. The constant use of pesticides by Richard has led to genetic changes in the population over many generations. This is an example of

- A. homeostasis.
- B. evolution.**
- C. mutation.
- D. a gene.
- E. a behavior.

Evolution is the genetic change in species over time and usually occurs due to the process of natural selection whereby organisms with specific adaptations will have enhanced survival and reproductive success.

13. All the chemical reactions that occur in a cell are called

- A. mitosis.
- B. photosynthesis.
- C. cellular respiration.
- D. energy use.
- E. metabolism.

Food provides nutrient molecules to living things. When cells use these molecules to make their parts and products, they carry out a sequence of chemical reactions, which are collectively known as the organism's metabolism.

Blooms Level: 1. Remember
Learning Outcome: 01.01.03 Summarize how the terms homeostasis, metabolism, and adaptation relate to all living organisms.
Section: 01.01
Topic: Energy

14. The only single-celled organisms are prokaryotes, such as archaea and bacteria.

- A. True because prokaryotes are the simplest cell form.
- B. True because all eukaryotes are multicellular.
- C. False because some eukaryotes, including protista, are single-celled.
- D. False because some prokaryotes are multicellular.
- E. False because all single-celled organisms are prokaryotes.

Prokaryotes are all unicellular, but eukaryotes can be either unicellular or multicellular.

Blooms Level: 1. Remember
Learning Outcome: 01.02.03 Summarize the general characteristics of the domains and major kingdoms of life.
Section: 01.02
Topic: Levels of Biological Organization

15. The various species of honeycreepers have an assortment of different bills, but all honeycreeper species have a similar size and body shape. This is an example of

- A. ascent with new traits.
- B. descent with modification.
- C. taxonomic differentiation.
- D. fixed traits.
- E. modification of adaptations.

Evolution or descent with modification explains how one species can be a common ancestor to several different species.

Blooms Level: 2. Understand
Learning Outcome: 01.02.02 Explain the process of natural selection and its relationship to evolutionary processes.
Section: 01.02
Topic: Macroevolution

16. Based on the evolutionary tree of the three domains, which of the following is true?

- A. All three domains have a common ancestor.
- B. Domain Bacteria and domain Eukarya are more closely related to each other than to domain Archaea.
- C. The Eukarya have remained the same throughout evolutionary time.
- D. All three domains are equally related to one another.
- E. The Eukarya are the common ancestors to the three domains.

All three domains have a common ancestor.

Blooms Level: 1. Remember
Learning Outcome: 01.02.03 Summarize the general characteristics of the domains and major kingdoms of life.
Section: 01.02
Topic: Macroevolution

17. Prokaryotes belong to _____

- A. Domain Eukarya.
- B. Kingdom Plantae.
- C. Kingdom Protista.
- D. Domain Archaea.**
- E. Kingdom Animalia.

Prokaryotic cells are found in two domains, Bacteria and Archaea.

Blooms Level: 1. Remember
Learning Outcome: 01.02.03 Summarize the general characteristics of the domains and major kingdoms of life.
Section: 01.02
Topic: Macroevolution

18. The mountain zebra (*Equus zebra*) and the donkey (*Equus asinus*) belong to the same species.

- A. True because they both start with *Equus*.
- B. True because they are both related to horses.
- C. False because the specific epithet is different.**
- D. False because they have no similarities to each other.
- E. True because they have the same genus.

The second part of the binomial or the specific epithet refers to the species. Because each is different, this indicates different species.

Blooms Level: 2. Understand
Learning Outcome: 01.02.03 Summarize the general characteristics of the domains and major kingdoms of life.
Section: 01.02
Topic: Macroevolution

19. Which of the following correctly lists the classification categories from least to most inclusive?

- A. kingdom, phylum, domain, class, order family, genus, species
- B. domain, kingdom, class, order, family, phylum, genus, species
- C. species, genus, family, class, order, domain, phylum, kingdom
- D. species, genus, family, order, class, phylum, kingdom, domain**
- E. phylum, species, genus, kingdom, domain, order, class, family

There are various acronyms for remembering the correct order for these classification categories (e.g., King Phillip Came Over For Ginger Snaps). Remember that subgroups within phyla are called classes.

Blooms Level: 1. Remember
Learning Outcome: 01.02.03 Summarize the general characteristics of the domains and major kingdoms of life.
Section: 01.02
Topic: Macroevolution

20. Phylum Arthropoda is broken into subgroups which include both Arachnida (e.g., spiders) and Insecta (e.g., insects). As a result, Arachnida and Insecta most likely belong to which classification category?

- A. class**
- B. order
- C. family
- D. kingdom
- E. domain

Phylum Arthropoda includes many invertebrate classes including Arachnida and Insecta.

Blooms Level: 2. Understand
Learning Outcome: 01.02.03 Summarize the general characteristics of the domains and major kingdoms of life.
Section: 01.02
Topic: Macroevolution

21. The biological kingdom _____ includes both unicellular and multicellular organisms.

- A. Eukarya
- B. Bacteria**

- C. Protista
- D. Fungi
- E. Plantae

Protists range from unicellular to multicellular organisms.

Blooms Level: 1. Remember
Learning Outcome: 01.02.03 Summarize the general characteristics of the domains and major kingdoms of life.
Section: 01.02
Topic: Macroevolution

22. Which of the following classification categories for humans is not correct?

- A. *Homo sapiens*: binomial name
- B. *Homo*: genus
- C. Animalia: kingdom
- D. *sapiens*: family
- E. Domain: Eukarya

Humans are members of the Domain Eukarya, Kingdom Animalia, Genus *Homo*, Species *sapiens*, and have the scientific binomial name *Homo sapiens*.

Blooms Level: 2. Understand
Learning Outcome: 01.02.03 Summarize the general characteristics of the domains and major kingdoms of life.
Section: 01.02
Topic: Macroevolution

23. Martin keeps a worm bin in his basement because the worms need cooler temperatures to survive. He feeds them about one pound of kitchen scraps each week. One summer the temperatures rose above the optimal temperature for the red worms (~ 85°F) and many in his colony died. However, those that survive continued to reproduce and within six months his colony was again thriving. The next summer, unusually warm temperatures again cause the basement temperatures to rise above 85°F for two days in a row. Surprisingly, Martin noticed that only a small portion of the worm colony died. What is the best explanation for this?

- A. After the first summer a new species of worm evolved.
- B. The worms sensed that the temperature was going to be hot in the future and adapted.
- C. The worms learned how to tolerate higher temperatures.
- D. The worms surviving the first year had a higher heat tolerance and passed this trait to their offspring.
- E. Worms are insensitive to heat changes.

Animals with favorable traits will survive and pass those traits to their offspring.

Blooms Level: 3. Apply
Learning Outcome: 01.02.02 Explain the process of natural selection and its relationship to evolutionary processes.
Section: 01.02
Topic: Natural Selection

24. Which of the following examples is not correctly matched with a correct term?

- A. a herd of bison - population
- B. a spider - organism
- C. the flowers and pollinating insects in your garden - community
- D. a rock garden with various plants and rocks of different sizes - ecosystem
- E. a desert with little water, high heat, sand, cacti, and some mammals - community

A desert is an ecosystem as it involves both the living organisms and the physical environment (soil, atmosphere, etc.).

Blooms Level: 2. Understand
Learning Outcome: 01.01.02 Distinguish between the levels of biological organization.
Section: 01.01
Topic: Levels of Biological Organization

25. A biologist is studying how pollution affects algal growth and snail populations in a portion of Lake Erie. What level of organization is she studying?

- A. population

- B. community
- C. ecosystem**
- D. biosphere
- E. cells

Ecosystems incorporate both biotic (snails and algae) and abiotic (pollution) factors.

Blooms Level: 3. Apply
Learning Outcome: 01.01.02 Distinguish between the levels of biological organization.
Section: 01.01
Topic: Ecosystem Ecology
Topic: Levels of Biological Organization

26. *Didinium* are carnivorous protists that prey on other, slower moving protists. A student is studying *Didinium* feeding rates after 1, 3, and 5 days of food deprivation. How should she classify the organism she is studying?
- A. eukaryotic decomposer
 - B. prokaryotic consumer
 - C. bacterial decomposer
 - D. prokaryotic producer
 - E. eukaryotic consumer**

Protista are eukaryotes and carnivores are consumers.

Blooms Level: 3. Apply
Learning Outcome: 01.01.04 Contrast chemical cycling and energy flow within an ecosystem.
Section: 01.01
Topic: Ecosystem Ecology
Topic: Levels of Biological Organization

27. Linda is studying the interaction between porcupines, piñon pine trees, and pine bark beetles. Over the course of her study in northern Texas, she observes the behaviors of 25 porcupines, records the location of 151 piñon pines, and traps 332 beetles. Her study encompasses _____ population(s) and _____ organisms.
- A. 1; 508
 - B. 3; 3
 - C. 508; 508
 - D. 3; 508**
 - E. 508; 3

A population is all members of a species in a particular area. There are 3 different species, thus 3 populations. Each individual is an organism so there are a total of 508 organisms.

Blooms Level: 4. Analyze
Learning Outcome: 01.01.02 Distinguish between the levels of biological organization.
Section: 01.01
Topic: Ecosystem Ecology
Topic: Levels of Biological Organization

28. Which of the following is the most encompassing level of organization?
- A. class
 - B. population
 - C. ecosystem**
 - D. species
 - E. cells

The ecosystem includes both abiotic and biotic factors. Communities and populations include only the living components. Cells are the building block for all living things.

Blooms Level: 2. Understand
Learning Outcome: 01.01.02 Distinguish between the levels of biological organization.
Section: 01.01
Topic: Levels of Biological Organization

29. Kevin is studying predator-prey interactions. One day he notices a spider eating a cricket caught in its web. Later that day, a bird eats the spider. How many consumers has Kevin observed directly in this scenario?

- A. 0
- B. 1
- C. 2**
- D. 3
- E. 4

Only organisms that consume other organisms for food (spider, bird) are consumers.

Blooms Level: 2. Understand
Learning Outcome: 01.01.04 Contrast chemical cycling and energy flow within an ecosystem.
Section: 01.01
Topic: Ecosystem Ecology
Topic: Levels of Biological Organization

30. Kevin is studying predator-prey interactions. One day he notices a spider eating a cricket caught in its web. Later that day, a bird eats the spider. How many producers are there in this scenario?

- A. 0**
- B. 1
- C. 2
- D. 3
- E. 4

Only organisms that produce food (e.g., plants) are producers. None are mentioned in the paragraph.

Blooms Level: 2. Understand
Learning Outcome: 01.01.04 Contrast chemical cycling and energy flow within an ecosystem.
Section: 01.01
Topic: Ecosystem Ecology
Topic: Levels of Biological Organization

31. Kevin is studying predator-prey interactions. One day he notices a spider eating a cricket caught in its web. Later that day, a bird eats the spider. How many populations are involved in his study?

- A. 0
- B. 1
- C. 2
- D. 3**
- E. 4

Populations include all members of the same species. This study includes a spider, a cricket, and a bird, all of which are different species.

Blooms Level: 2. Understand
Learning Outcome: 01.01.02 Distinguish between the levels of biological organization.
Section: 01.01
Topic: Ecosystem Ecology
Topic: Levels of Biological Organization

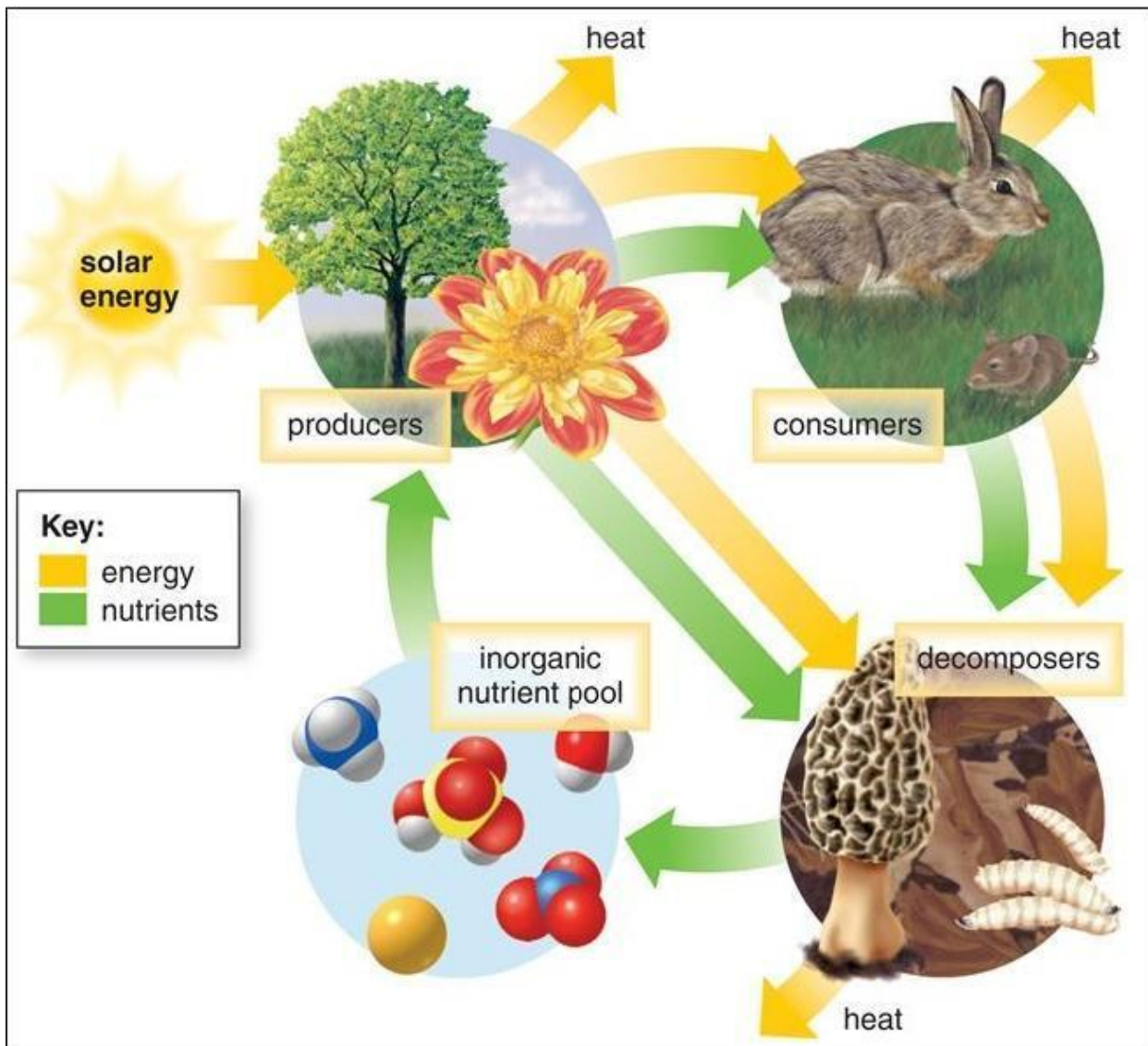
32. Kevin is studying predator-prey interactions. One day he notices a spider eating a cricket caught in its web. Later that day, a bird eats the spider. Based on the organisms involved in this study, what level of organization is he studying?

- A. population
- B. community**
- C. ecosystem
- D. biosphere
- E. cells

Communities include more than one population. There are three populations in this study. All of the organisms in his study are comprised of cells.

Blooms Level: 2. Understand
Learning Outcome: 01.01.02 Distinguish between the levels of biological organization.
Section: 01.01
Topic: Ecosystem Ecology
Topic: Levels of Biological Organization

33. Refer to the figure below. How many different kingdoms are represented in this figure?



- A. 1
- B. 2
- C. 3
- D. 4
- E. 5

The figure clearly shows animals, plants, and fungi.

Blooms Level: 2. Understand
Learning Outcome: 01.02.03 Summarize the general characteristics of the domains and major kingdoms of life.
Section: 01.02
Topic: Ecosystem Ecology
Topic: Macroevolution

34. Which of the following is not true about ecosystems?

- A. Energy is constantly recycled.
- B. Nutrients are constantly recycled.
- C. Producers are a food source for both consumers and decomposers.
- D. Solar energy is required for photosynthesis.
- E. Chemicals are constantly recycled.

Energy does not cycle but is lost at every step usually in the form of heat.

Blooms Level: 1. Remember

35. A pond ecosystem includes small water fleas which feed on submerged aquatic plants. When the water fleas die, they sink to the bottom of the pond where they decompose with the help of bacteria. List in order the producer, decomposer, and consumer in this system.

- A. water fleas, bacteria, aquatic plants
- B. aquatic plants, water fleas, bacteria
- C. bacteria, water fleas, aquatic plants
- D. aquatic plants, bacteria, water fleas
- E. bacteria, aquatic plants, water fleas

Plants are producers, water fleas are consumers because they eat other organisms, and decomposers break down dead and decaying matter.

Blooms Level: 3. Apply

Learning Outcome: 01.01.04 Contrast chemical cycling and energy flow within an ecosystem.

Section: 01.01

Topic: Characteristics of Life

Topic: Ecosystem Ecology

36. Populations of amphibians, including frogs and toads, have been plagued by disease and high rates of deformity. A recent study investigated whether problems among the populations have arisen due to poisons from chemicals associated with agriculture. Biologists from the University of Florida collected local adult cane toads (*Bufo marinus*) from more than 20 different locations. Toads were collected from areas close to agriculture— both large-scale and small-scale farms as well as from suburbs. At collection sites where 50–97% of the adjacent land was farmed, males showed high levels of feminization. Feminized male toads were similar in color to females and had lower levels of testosterone and often had deformed gonads. These changes can lead to sterile males or changes in behavior that prevent mating from occurring. Which of the following statements would be considered a hypothesis for this study?

- A. Amphibian populations are facing problems due to agricultural chemicals.
- B. Toxins are capable of causing diseases and deformities within many amphibian populations.
- C. Toads collected from suburbs had fewer deformities compared to toads collected from agricultural areas.
- D. Agricultural chemicals can cause deformities and feminization amongst cane toads.
- E. More male toads from the large-scale agricultural areas showed signs of feminization.

A hypothesis is a testable explanation for a natural phenomenon.

Blooms Level: 5. Evaluate

Learning Outcome: 01.03.03 Distinguish between a theory and a hypothesis.

Section: 01.03

Topic: Experimental Design

Topic: Human Environmental Impacts

Topic: Scientific Method

37. Populations of amphibians, including frogs and toads, have been plagued by disease and high rates of deformity. A recent study investigated whether problems among the populations have arisen due to poisons from chemicals associated with agriculture. Biologists from the University of Florida collected local adult cane toads (*Bufo marinus*) from more than 20 different locations. Toads were collected from areas close to agriculture— both large-scale and small-scale farms as well as from suburbs located far from agricultural sites. At collection sites where 50–97% of the adjacent land was farmed, males showed high levels of feminization. Feminized male toads were similar in color to females and had lower levels of testosterone and often had deformed gonads. These changes can lead to sterile males or changes in behavior that prevent mating from occurring. Based on this study, what is the control group?

- A. male toads collected from the suburbs
- B. male toads collected from areas near large-scale farms
- C. male toads collected from small-scale farms
- D. male toads collected from all the different sites
- E. female toads that were not collected

The control group is the one group that is not exposed to the experimental variable. If biologists are investigating the role of agricultural chemicals, toads from nonagricultural areas would be the control.

38. Populations of amphibians, including frogs and toads, have been plagued by disease and high rates of deformity. A recent study investigated whether problems among the populations have arisen due to poisons from chemicals associated with agriculture. Biologists from the University of Florida collected local adult cane toads (*Bufo marinus*) from more than 20 different locations. Toads were collected from areas close to agriculture— both large-scale and small-scale farms as well as from suburbs. At collection sites where 50–97% of the adjacent land was farmed, males showed high levels of feminization. Feminized male toads were similar in color to females and had lower levels of testosterone and often had deformed gonads. These changes can lead to sterile males or changes in behavior that prevent mating from occurring. Based on this study, what is/ are the test group(s)?
- A. male toads collected from the suburbs
 - B. male toads collected from areas near large-scale and small-scale farms**
 - C. female toads collected from all the different sites
 - D. male toads collected from all the different sites
 - E. male and female toads collected from areas near large-scale and small-scale farms

The test groups are exposed to the experimental variable, which is the agricultural chemicals associated with farms.

39. Populations of amphibians, including frogs and toads, have been plagued by disease and high rates of deformity. A recent study investigated whether problems among the populations have arisen due to poisons from chemicals associated with agriculture. Biologists from the University of Florida collected local adult cane toads (*Bufo marinus*) from more than 20 different locations. Toads were collected from areas close to agriculture— both large-scale and small-scale farms as well as from suburbs. At collection sites where 50–97% of the adjacent land was farmed, males showed high levels of feminization. Feminized male toads were similar in color to females and had lower levels of testosterone and often had deformed gonads. These changes can lead to sterile males or changes in behavior that prevent mating from occurring. In this study, what is the genus of the study animal?
- A. *Bufo marinus*
 - B. cane toad
 - C. amphibian
 - D. *Bufo***
 - E. *marinus*

Genus is the first part of the two-part binomial name.

40. Populations of amphibians, including frogs and toads, have been plagued by disease and high rates of deformity. A recent study investigated whether problems among the populations have arisen due to poisons from chemicals associated with agriculture. Biologists from the University of Florida collected local adult cane toads (*Bufo marinus*) from more than 20 different locations. Toads were collected from areas close to agriculture— both large-scale and small-scale farms as well as from suburbs. At collection sites where 50–97% of the adjacent land was farmed, males showed high levels of feminization. Feminized male toads were similar in color to females and had lower levels of testosterone and often had deformed gonads. These changes can lead to sterile males or changes in behavior that prevent mating from occurring. At the end of their study, scientists stated that they had supported their theory that agricultural chemicals cause deformities.

- A. True based on the data collected during the study.
- B. False because they would need more data to prove a theory.
- C. False because they were testing a hypothesis not a theory.
- D. True because this was a controlled study.
- E. False because this was a controlled study.

Theories are accepted explanations of how the world works and are usually supported by many years of observations and experiments.

Blooms Level: 2. Understand
Learning Outcome: 01.03.03 Distinguish between a theory and a hypothesis.
Section: 01.03
Topic: Experimental Design
Topic: Scientific Method

41. Which of the following statements is not correctly matched with the given scientific method term?
- A. Biologists suggested that 2-3 cups of coffee per day can decrease death rates among women. (Hypothesis)
 - B. Leslie set up mist nets to catch bats flying over a small stream. Each bat that was caught was weighed and sexed. (Experimental design)
 - C. Bethany watched butterflies feeding in a large field of wild flowers. She noticed that more butterflies approached the yellow and purple flowers than the red flowers. (Observation)
 - D. A researcher reported that red-foot tortoises preferred red-colored fruits and vegetables to those that were green or white. (Conclusion)
 - E. All organisms are comprised of cells. (Data collection)

Results of an experiment are referred to as data. The statement that all organisms are comprised of cells is an accepted biological theory.

Blooms Level: 4. Analyze
Learning Outcome: 01.03.02 Describe the basic requirements for a controlled experiment.
Section: 01.03
Topic: Experimental Design
Topic: Scientific Method

42. Robert, an aspiring scientist in a biology class, wanted to conduct a study on the effects of cigarette smoke on the web-building ability of spiders. Which of the following statements is an incorrect use of terms pertaining to the scientific method?
- A. Robert wanted to see if his *theory* was true that cigarette smoke will influence web-building in spiders.
 - B. Robert made the *observation* that spiders weave webs.
 - C. As a *control*, Robert had a group of spiders that were never exposed to cigarette smoke.
 - D. Robert examined the webs from both the control group and the test group and the *data* were recorded in a table.
 - E. Robert *concluded* that there was no significant difference in the ability to weave a web under conditions of cigarette smoke compared to spiders that were not exposed.

Robert wanted to see if his hypothesis was true that cigarette smoke will influence web-building in spiders. A theory would need the support of many repeated experiments of this study by a large number of scientists.

Blooms Level: 5. Evaluate
Learning Outcome: 01.03.01 Identify the steps of the scientific method.
Section: 01.03
Topic: Experimental Design
Topic: Scientific Method

43. Scientists were studying temperature selection amongst pregnant big brown bats. What would be the best control group for this study?
- A. pregnant bats
 - B. female bats that were not pregnant
 - C. male bats
 - D. juvenile male bats
 - E. juvenile female bats

Scientists try to vary just one experimental variable between the control and treatment group.

44. Scientists were studying temperature selection among pregnant big brown bats. What would the test group be in this experiment?
- A. pregnant bats
 - B. female bats that were not pregnant
 - C. male bats
 - D. juvenile male bats
 - E. juvenile female bats

The subjects of this study are pregnant big brown bats so they would form the experimental group.

45. Which of the following statements is not true with respect to scientific theory?
- A. Theories are accepted explanations for how the world works.
 - B. Theories are possible explanations for natural events.**
 - C. The theory of evolution is considered the unifying concept in biology.
 - D. Theories can help scientists generate new testable hypotheses.
 - E. Theories are supported by many observations and experiments.

A possible explanation for natural events is known as a hypothesis.

46. Which of the following is not true with regards to extinction?
- A. Extinction of different species can impact humans.
 - B. All extinctions are caused by human activities such as habitat destruction.**
 - C. As many as 400 species per day are lost due to human activities.
 - D. Introduction of non-native species to an area can increase the rate of extinction.
 - E. Extinction is the death of a species or a larger taxonomic group.

Extinction is a naturally occurring event, but human activities often speed up the process.

47. Which of the following is not true about biodiversity?
- A. Biodiversity is defined as variation in life on Earth.
 - B. Beetles have the highest biodiversity of all animals because there are more species of beetle than any other animal.
 - C. The impact of human activities on biodiversity loss is one of the most significant bioethical issues that we face today.
 - D. As extinction rates increase, biodiversity increases.**
 - E. The biodiversity that we have on Earth is the result of billions of years of evolution.

As rates of extinction increase, biodiversity decreases.

48. Living organisms must constantly take in energy in order to power functions necessary to remain alive. The chemical reactions that involve energy conversion are called
- A. evolution.
 - B. respiration.
 - C. photosynthesis.
 - D. metabolism.
 - E. homeostasis.

Energy conversions, like all other chemical reactions in a cell, are part of a cell's metabolism.

Learning Outcome: 01.01.03 Summarize how the terms homeostasis, metabolism, and adaptation relate to all living organisms.
Blooms Level: 2. Understand
Section: 01.01
Topic: Energy

49. The beaks of birds are well suited to the type of food they eat. This result arises from
- A. organisms changing so that they can do things more efficiently.
 - B. adaptations that occur as part of natural selection leading to a closer and closer fit between organisms and their environment.**
 - C. birds eating only what their beaks are well suited to eat.
 - D. adaptations only allowing those organisms that are well suited to a food source to feed on it.
 - E. natural selection causing adaptations to develop in the birds to match the beaks.

Natural selection leads to adaptations, or modifications that make organisms better and better suited to the environment in which they live.

Learning Outcome: 01.02.02 Explain the process of natural selection and its relationship to evolutionary processes.
Blooms Level: 5. Evaluate
Section: 01.02
Topic: Macroevolution
Topic: Natural Selection

50. The metabolic reactions that take place in a cell obey all of the same laws and require the same conditions necessary for any chemical reaction to occur. To make these reactions possible, cells
- A. maintain the correct temperature, moisture level, and acidity as well as other factors.**
 - B. rely on the external conditions in the environment.
 - C. are at the mercy of changes that occur as each reaction progresses in the cell.
 - D. rely on external factors that control their internal conditions.
 - E. sidestep the conditions by manipulating the external environment.

Since the reactions in a cell require all of the same conditions that any chemical reaction require, the cell must maintain those conditions through homeostasis.

Learning Outcome: 01.01.03 Summarize how the terms homeostasis, metabolism, and adaptation relate to all living organisms.
Blooms Level: 2. Understand
Section: 01.01
Topic: Energy

51. The process of _____ leads to organisms that are _____ that environment.
- A. natural selection; adapted to**
 - B. adaption; evolved for
 - C. homeostasis; suited to
 - D. natural selection; perfect for
 - E. adaptation; only found in

Natural selection leads to organisms that are better suited to the environment, surviving to reproduce.

Learning Outcome: 01.02.02 Explain the process of natural selection and its relationship to evolutionary processes.
Blooms Level: 1. Remember
Section: 01.02
Topic: Natural Selection

52. Why is evolution an important process for living things?

- A. It gives them more traits.
- B. It gives them the perfect traits.
- C. It gives them fewer traits.
- D. It gives them traits that better match their environment.**
- E. It gives them only the right traits.

As natural selection leads to the differential survival and reproduction of organisms, only those that have traits that allow them to more efficiently use resources pass their traits on to the next generation.

Blooms Level: 2. Understand
Learning Outcome: 01.02.02 Explain the process of natural selection and its relationship to evolutionary processes.
Section: 01.02
Topic: Macroevolution

53. Evolutionary processes lead to organisms that

- A. are perfect.
- B. function well in a given environment.**
- C. can only survive in that one environment.
- D. have a single adaptive trait.
- E. become extinct.

Natural selection leads to organisms that have groups of traits that function well in a given environment, but there will never be a perfect organism.

Blooms Level: 2. Understand
Learning Outcome: 01.02.01 Define the term evolution.
Section: 01.02
Topic: Macroevolution

54. Natural selection is a process in which organisms that are better suited to a certain set of environmental conditions tend to survive and reproduce more often than others. This leads to evolution as

- A. organisms with those traits appear more often in the population.**
- B. the environment changes fast enough to prevent overpopulation.
- C. the traits mutate into other traits.
- D. organisms with different traits appear more often.
- E. organisms with those traits appear less often in the population.

As some organisms survive and reproduce better than others, their genes will be passed on to the next generation thus changing how frequently those traits are seen.

Blooms Level: 2. Understand
Learning Outcome: 01.02.02 Explain the process of natural selection and its relationship to evolutionary processes.
Section: 01.02
Topic: Macroevolution
Topic: Natural Selection

55. In science, a theory

- A. is tested by an experiment.
- B. is more narrow in scope than a hypothesis.
- C. encompasses many hypotheses.**
- D. cannot be tested.
- E. is held to be an absolutely correct answer to a question.

A theory is tested and supported by many hypotheses. It is held to be the best explanation, not a perfect or absolute one.

Blooms Level: 2. Understand
Learning Outcome: 01.03.03 Distinguish between a theory and a hypothesis.
Section: 01.03
Topic: Scientific Method

56. The purpose of a control group in an experiment is

- A. to prove the hypothesis.
- B. for comparison to the other test groups.**
- C. for comparison to the results of other experiments.
- D. to prove the prediction.
- E. to control the dependent variable.

A control group is used as a baseline comparison group for the test groups.

Blooms Level: 2. Understand
Learning Outcome: 01.03.02 Describe the basic requirements for a controlled experiment.
Section: 01.03
Topic: Experimental Design

57. Which answer choice lists the steps of the scientific method in the correct order?

- A. observation, hypothesis, experiment, conclusion, scientific theory**
- B. hypothesis, observation, experiment, conclusion, scientific theory
- C. conclusion, hypothesis, observation, experiment, scientific theory
- D. observation, experiment, hypothesis, conclusion, scientific theory
- E. scientific theory, conclusion, hypothesis, experiment, observation

In a typical application of the scientific method, observations are used to formulate a hypothesis. The hypothesis may then be tested, as in an experiment. Based on the results of the hypothesis testing, a conclusion is made. If a hypothesis stands up to repeated testing and explains many observations, it may be elevated to a scientific theory.

Blooms Level: 1. Remember
Learning Outcome: 01.03.01 Identify the steps of the scientific method.
Section: 01.03
Topic: Scientific Method

58. Which statement regarding the scientific method is false?

- A. Original hypotheses are formed after an experiment.**
- B. Inductive reasoning is used to form a hypothesis.
- C. Observations are used to form a hypothesis.
- D. Experiments need to be repeatable.
- E. The control and experimental group are identical except for one variable.

Original hypotheses are formed prior to an experiment, through inductive reasoning based on observations. Inductive reasoning is the process of taking individual observations and weaving them into a cohesive explanation. In a controlled experiment, the control and experimental groups should be the same except for a single factor, called a variable. Experiments should be repeatable, even by different individuals in different places.

Blooms Level: 2. Understand
Learning Outcome: 01.03.01 Identify the steps of the scientific method.
Section: 01.03
Topic: Scientific Method

59. Managing emerging diseases such as SARS is just one of the many challenges facing science today.

TRUE

In the past several years, avian influenza (H5N1), swine flu (H1N1), and severe acute respiratory syndrome (SARS) have generated a lot of press. These are considered new, or emerging, diseases. Scientists don't know the full extent of how deadly these diseases are going to be.

Blooms Level: 1. Remember
Learning Outcome: 01.04.02 Summarize some of the major challenges currently facing science.
Section: 01.04
Topic: Human Environmental Impacts

60. The development of new technologies is based on science.

TRUE

Technology is the application of scientific knowledge to the interests of humans. Scientific investigations are the basis for the majority of our technological advances. As is often the case, a new technology, such as your cell phone or a new drug, is based on years of scientific investigations.

Blooms Level: 1. Remember

Learning Outcome: 01.04.01 Distinguish between science and technology.

Section: 01.04

Topic: Human Environmental Impacts

Chapter 01: Test Bank Summary

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Learning Outcome: 01.01.02 Distinguish between the levels of biological organization.	9
Learning Outcome: 01.01.03 Summarize how the terms homeostasis, metabolism, and adaptation relate to all living organisms.	3
Learning Outcome: 01.01.04 Contrast chemical cycling and energy flow within an ecosystem.	5
Learning Outcome: 01.02.01 Define the term evolution.	2
Learning Outcome: 01.02.02 Explain the process of natural selection and its relationship to evolutionary processes.	8
Learning Outcome: 01.02.03 Summarize the general characteristics of the domains and major kingdoms of life.	10
Learning Outcome: 01.03.01 Identify the steps of the scientific method.	3
Learning Outcome: 01.03.02 Describe the basic requirements for a controlled experiment.	5
Learning Outcome: 01.03.03 Distinguish between a theory and a hypothesis.	5
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