Student name:\_\_\_\_\_\_\_\_\_\_

**1)** A flower on a plant represents which level of organization?

1) \_\_\_\_\_\_

 A) atom
 B) cell
 C) organ
 D) organism
 E) population

 **Question Details**Bloom's : 3. Apply (Socratic Feedback)
Accessibility : Keyboard Navigation
Section : 01.01
Learning Objective : 01.01.01 Explain how life can be viewed at different levels of biological complexity.
Topic : Levels of Biology
Gradable : automatic

**2)** Boa constrictors on an island are an example of a(n)

2) \_\_\_\_\_\_

 A) cell.
 B) organ.
 C) organism.
 D) population.
 E) ecosystem.

 **Question Details**Bloom's : 3. Apply (Socratic Feedback)
Accessibility : Keyboard Navigation
Section : 01.01
Learning Objective : 01.01.01 Explain how life can be viewed at different levels of biological complexity.
Topic : Levels of Biology
Gradable : automatic

**3)** Molecules are made up of

3) \_\_\_\_\_\_

 A) atoms.
 B) cells.
 C) organs.
 D) organisms.
 E) populations.

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.01
Learning Objective : 01.01.01 Explain how life can be viewed at different levels of biological complexity.
Topic : Levels of Biology
Gradable : automatic

**4)** Which is the smallest of all levels of organization?

4) \_\_\_\_\_\_

 A) atom
 B) cell
 C) organ
 D) organism
 E) population

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.01
Learning Objective : 01.01.01 Explain how life can be viewed at different levels of biological complexity.
Topic : Levels of Biology
Gradable : automatic

**5)** A community of organisms interacting with their physical environment is a(n)

5) \_\_\_\_\_\_

 A) population.
 B) organism.
 C) biosphere.
 D) ecosystem.
 E) macromolecular community.

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.01
Learning Objective : 01.01.01 Explain how life can be viewed at different levels of biological complexity.
Topic : Levels of Biology
Gradable : automatic

**6)** In multicellular organisms, cells of the same type can associate with each other to form

6) \_\_\_\_\_\_

 A) atoms.
 B) molecules.
 C) macromolecules.
 D) tissues.
 E) populations.

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.01
Learning Objective : 01.01.01 Explain how life can be viewed at different levels of biological complexity.
Topic : Levels of Biology
Gradable : automatic

**7)** Which level of organization is present in all life forms?

7) \_\_\_\_\_\_

 A) cell
 B) tissue
 C) organ
 D) organelle
 E) colony

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Section : 01.01
Learning Objective : 01.01.01 Explain how life can be viewed at different levels of biological complexity.
Topic : Levels of Biology
Gradable : automatic

**8)** Which level of organization includes all of the others in the list?

8) \_\_\_\_\_\_

 A) cell
 B) tissue
 C) organ
 D) organism
 E) population

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Section : 01.01
Learning Objective : 01.01.01 Explain how life can be viewed at different levels of biological complexity.
Topic : Levels of Biology
Gradable : automatic

**9)** During photosynthesis, plants take in water and carbon dioxide from the environment and use sunlight to fuel a series of chemical reactions that ultimately build small sugar molecules. Which of the core concepts of biology is exemplified by photosynthesis?

9) \_\_\_\_\_\_

 A) Evolution
 B) Structure and function
 C) Information flow, exchange, and storage
 D) Pathways and transformations of energy and matter
 E) Systems

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Section : 01.02
Learning Objective : 01.02.01 Describe the core concepts of biology as advocated by "Vision and Change."
Topic : Core Concepts of Biology
Activity Type : New
Gradable : automatic

**10)** The phenomenon through which populations of organisms change over time due to mutation, natural selection, and genetic exchange is

10) \_\_\_\_\_\_

 A) homeostasis.
 B) growth and development.
 C) reproduction.
 D) biological evolution.
 E) organization.

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.02
Learning Objective : 01.02.01 Describe the core concepts of biology as advocated by "Vision and Change."
Topic : Core Concepts of Biology
Gradable : automatic

**11)** The protein elastin plays an important role in providing elasticity and resilience to many tissues in the body. Elastin has elastic properties because of the way the protein can change shape. In a relaxed condition, the protein has an overall coiled, or looped shape. When stretched, the protein extends into a straighter, more linear form. When the stretching force is removed, elastin recoils back into the relaxed form. Which core concept of biology does the elastin protein exemplify?

11) \_\_\_\_\_\_

 A) Evolution
 B) Structure and function
 C) Information flow, exchange, and storage
 D) Pathways and transformations of energy and matter
 E) Systems

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Section : 01.02
Learning Objective : 01.02.01 Describe the core concepts of biology as advocated by "Vision and Change."
Topic : Core Concepts of Biology
Activity Type : New
Gradable : automatic

**12)** Children often resemble their parents. The transmission of an eye color gene from parent to child is an example of which core concept of biology?

12) \_\_\_\_\_\_

 A) Evolution
 B) Structure and function
 C) Information flow, exchange, and storage
 D) Pathways and transformations of energy and matter
 E) Systems

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Section : 01.02
Learning Objective : 01.02.01 Describe the core concepts of biology as advocated by "Vision and Change."
Topic : Core Concepts of Biology
Activity Type : New
Gradable : automatic

**13)** In the process of biological evolution, new species may evolve through exchange of genes from one species to another. This process is called

13) \_\_\_\_\_\_

 A) proteome transfer.
 B) horizontal gene transfer.
 C) vertical evolution.
 D) vertical descent with mutation.
 E) genomic sciences.

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.03
Learning Objective : 01.03.01 Explain two mechanisms by which evolutionary change occurs: vertical descent with mutat
Topic : Biological Evolution
Gradable : automatic

**14)** How does evolutionary change occur?

14) \_\_\_\_\_\_

 A) Through the modification of characteristics in a preexisting population.
 B) It may involve vertical descent with mutation.
 C) It may involve horizontal gene transfer.
 D) All of these choices are correct.
 E) None of these choices are correct.

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.03
Learning Objective : 01.03.01 Explain two mechanisms by which evolutionary change occurs: vertical descent with mutat
Topic : Biological Evolution
Gradable : automatic

**15)** A variety of finch species within the Hawaiian Islands have acquired different types of beaks needed for utilizing specific food resources. What is the likely process by which these different species of finches came about?

15) \_\_\_\_\_\_

 A) vertical descent with mutation
 B) horizontal gene transfer
 C) an accumulation of harmful genetic mutations

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Section : 01.03
Learning Objective : 01.03.01 Explain two mechanisms by which evolutionary change occurs: vertical descent with mutat
Topic : Biological Evolution
Gradable : automatic

**16)** Changes in\_\_\_\_\_\_\_\_\_blank represent the predominant cause for biological evolution.

16) \_\_\_\_\_\_

 A) homeostasis
 B) growth and development
 C) reproduction
 D) genetic makeup
 E) energy

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Section : 01.03
Learning Objective : 01.03.01 Explain two mechanisms by which evolutionary change occurs: vertical descent with mutat
Topic : Biological Evolution
Gradable : automatic

**17)** If a scientist were studying the role of different proteins in the regulation of insulin secretion from a pancreatic cell, they would be studying

17) \_\_\_\_\_\_

 A) genomics.
 B) proteomics.
 C) cell biology.
 D) both genomics and proteomics.
 E) both proteomics and cell biology.

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Section : 01.03
Learning Objective : 01.03.02 Describe how changes in genomes and proteomes underlie evolutionary changes.
Topic : Biological Evolution
Gradable : automatic

**18)** Which is responsible for encoding the proteins found in a cell?

18) \_\_\_\_\_\_

 A) genome
 B) proteome
 C) cytoskeleton
 D) evolution
 E) extracellular proteins

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.03
Learning Objective : 01.03.02 Describe how changes in genomes and proteomes underlie evolutionary changes.
Topic : Biological Evolution
Gradable : automatic

**19)** The complete genetic composition of an organism is called its

19) \_\_\_\_\_\_

 A) proteome.
 B) genome.
 C) transcriptosome.
 D) phenotype.
 E) None of these choices are correct.

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.03
Learning Objective : 01.03.02 Describe how changes in genomes and proteomes underlie evolutionary changes.
Topic : Biological Evolution
Gradable : automatic

**20)** Proteins are largely responsible for the traits of living organisms, while \_\_\_\_\_\_\_\_ provides the blueprint for the organization, development, and function of living things.

20) \_\_\_\_\_\_

 A) DNA
 B) protein
 C) carbohydrate
 D) lipid
 E) metabolite

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.03
Learning Objective : 01.03.02 Describe how changes in genomes and proteomes underlie evolutionary changes.
Topic : Biological Evolution
Gradable : automatic

**21)** What feature of genetic mutations can eventually lead to the evolution of new species?

21) \_\_\_\_\_\_

 A) Mutations always produce harmful effects.
 B) Mutations never affect protein structure or function.
 C) Mutations are not a mechanism through which biological evolution occurs.
 D) Mutations always produce beneficial effects.
 E) Mutations produce changes in the DNA sequence of a gene.

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Section : 01.03
Learning Objective : 01.03.02 Describe how changes in genomes and proteomes underlie evolutionary changes.
Topic : Biological Evolution
Gradable : automatic

**22)** New species evolve from preexisting species by the accumulation of

22) \_\_\_\_\_\_

 A) metabolic events.
 B) genetic mutations.
 C) proteomes.
 D) reproductive events.
 E) developmental events.

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.03
Learning Objective : 01.03.02 Describe how changes in genomes and proteomes underlie evolutionary changes.
Topic : Biological Evolution
Gradable : automatic

**23)** About 9,000 years ago people generated a new plant species,*Zea mays* (maize/corn), through the domestication of a grass known as teosinte. In comparison to teosinte, modern ears of corn are much larger, have many more rows of corn grains, have softer corn grains, and do not shatter (break apart to scatter the grains). Which of the following most accurately describes the generation of corn?

23) \_\_\_\_\_\_

 A) Corn was generated through artificial selection because people selected traits in teosinte that they deemed desirable.
 B) Corn was generated through natural selection because the teosinte grass naturally evolved into corn.
 C) Corn was generated through natural selection because natural selection is the only mechanism of evolutionary change.
 D) Corn was generated through natural selection because artificial selection requires gene-editing technologies.
 E) Corn was generated through artificial selection because there was a horizontal transfer of genes from one species to another.

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Section : 01.03
Topic : Biological Evolution
Activity Type : New
Learning Objective : 01.03.03 Explain how a population can change from generation to generation via artificial selec
Gradable : automatic

**24)** The grouping or classification of species is termed

24) \_\_\_\_\_\_

 A) genus.
 B) kingdom.
 C) taxonomy.
 D) biology.
 E) physiology.

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.04
Learning Objective : 01.04.01 Outline how organisms are classified.
Topic : Classification of Living Things
Gradable : automatic

**25)** When grouping organisms, which classification is most general for a particular type of organism?

25) \_\_\_\_\_\_

 A) Kingdom
 B) Phylum
 C) Order
 D) Family
 E) Species

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.04
Learning Objective : 01.04.01 Outline how organisms are classified.
Topic : Classification of Living Things
Gradable : automatic

**26)** All organisms in the Kingdom \_\_\_\_ can perform photosynthesis.

26) \_\_\_\_\_\_

 A) Animalia
 B) Protista
 C) Fungi
 D) Plantae
 E) Bacteria

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.04
Learning Objective : 01.04.01 Outline how organisms are classified.
Topic : Classification of Living Things
Gradable : automatic

**27)** Our species is called *Homo sapiens*. The first word refers to which taxonomical grouping?

27) \_\_\_\_\_\_

 A) Kingdom
 B) Phylum
 C) Order
 D) Genus
 E) Species

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.04
Learning Objective : 01.04.01 Outline how organisms are classified.
Topic : Classification of Living Things
Gradable : automatic

**28)** When considering nomenclature for scientific names, what is the difference between the two primates, *Homo sapiens* and *Homo erectus*?

28) \_\_\_\_\_\_

 A) One is a primate but the other is not.
 B) They are animals of a different kingdom.
 C) They are animals of a different order.
 D) They are animals of a different species.
 E) They are animals of a different genus.

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Section : 01.04
Learning Objective : 01.04.01 Outline how organisms are classified.
Topic : Classification of Living Things
Gradable : automatic

**29)** A scientist isolates a single-celled organism from the bottom of a sulfur hot spring. When examined under the microscope, it is clear that the cell is very small and contains no nucleus. Based on this evidence alone, in what domain of life is this organism?

29) \_\_\_\_\_\_

 A) Eukarya
 B) Bacteria
 C) Archaea
 D) Either bacteria or archaea
 E) It is impossible to determine anything based on this evidence alone

 **Question Details**Bloom's : 3. Apply (Socratic Feedback)
Accessibility : Keyboard Navigation
Section : 01.04
Learning Objective : 01.04.01 Outline how organisms are classified.
Topic : Classification of Living Things
Gradable : automatic

**30)** Which domain of life contains the most multicellular organisms?

30) \_\_\_\_\_\_

 A) Archaea
 B) Bacteria
 C) Prokarya
 D) Eukarya
 E) microorganisms

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.04
Learning Objective : 01.04.01 Outline how organisms are classified.
Topic : Classification of Living Things
Gradable : automatic

**31)** An explanation for a biological process that is substantiated by a large body of evidence is called a

31) \_\_\_\_\_\_

 A) hypothesis.
 B) theory.
 C) system.
 D) reductionist approach.
 E) prediction.

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Topic : Biology as a Scientific Discipline
Section : 01.05
Learning Objective : 01.05.02 CoreSKILLS Distinguish between discovery-based science and hypothesis testing, and desc
Gradable : automatic

**32)** Collecting data without a specific hypothesis in mind is called

32) \_\_\_\_\_\_

 A) reductionism.
 B) hypothesis testing.
 C) discovery-based science.
 D) theoretical.
 E) All of the choices are correct.

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Topic : Biology as a Scientific Discipline
Section : 01.05
Learning Objective : 01.05.02 CoreSKILLS Distinguish between discovery-based science and hypothesis testing, and desc
Gradable : automatic

**33)** What is the appropriate order of the stages of investigating whether maple trees drop their leaves in the autumn because of colder days?
 (1) Maple trees are grown in two greenhouses where the only variable is temperature (15°C vs. 10°C).
 (2) The hypothesis is rejected.
 (3) There is no statistical difference in the number of leaves dropped at 10°C as compared to 15°C.
 (4) The observation is that maple trees drop their leaves in autumn.
 (5) The hypothesis is that maple trees drop their leaves because of colder temperatures.

33) \_\_\_\_\_\_

 A) 1, 2, 3, 4, 5.
 B) 3, 4, 5, 1, 2.
 C) 5, 4, 3, 1, 2.
 D) 4, 5, 1, 3, 2.
 E) 3, 4, 2, 1, 5.

 **Question Details**Bloom's : 3. Apply (Socratic Feedback)
Accessibility : Keyboard Navigation
Section : 01.06
Learning Objective : 01.06.02 CoreSKILLS Explain the process of science.
Topic : Core Skills of Biology
Gradable : automatic

**34)** “All living organisms are composed of cells” is an example of what type of scientific statement?

34) \_\_\_\_\_\_

 A) a hypothesis
 B) a theory
 C) a discovery
 D) a prediction
 E) a fact

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Topic : Biology as a Scientific Discipline
Section : 01.05
Learning Objective : 01.05.02 CoreSKILLS Distinguish between discovery-based science and hypothesis testing, and desc
Gradable : automatic

**35)** A wristwatch suddenly stops working. After replacing the battery, the watch starts working again. Which of the following statements correctly describes the situation from the perspective of the scientific method?

35) \_\_\_\_\_\_

 A) This proves that a dead battery was the reason the wristwatch stopped working.
 B) This substantiates the theory that all wristwatches require functional batteries.
 C) This is consistent with the hypothesis that a dead battery caused the wristwatch to stop working.
 D) This leads to the prediction that a battery is required for wristwatch operation.

 **Question Details**Bloom's : 3. Apply (Socratic Feedback)
Accessibility : Keyboard Navigation
Section : 01.06
Learning Objective : 01.06.02 CoreSKILLS Explain the process of science.
Topic : Core Skills of Biology
Gradable : automatic

**36)** A researcher decides to test the scientific validity of the common phrase “An apple a day keeps the doctor away.” What would be a valid hypothesis to investigate this specific question?

36) \_\_\_\_\_\_

 A) Eating apples decreases the frequency of contracting a cold.
 B) The daily consumption of a single apple does not change the number of visits to the doctor.
 C) Eating one apple every day is good for you.
 D) Apples are high in vitamin C.
 E) Those who consume apples have longer lifespans than those who do not consume apples.

 **Question Details**Bloom's : 3. Apply (Socratic Feedback)
Accessibility : Keyboard Navigation
Topic : Biology as a Scientific Discipline
Section : 01.05
Learning Objective : 01.05.02 CoreSKILLS Distinguish between discovery-based science and hypothesis testing, and desc
Gradable : automatic

**37)** A researcher tests the hypothesis that large, daily doses of vitamin C help protect against catching the common cold. What would be the best experimental and control group to test this hypothesis?

37) \_\_\_\_\_\_

 A) *Experimental group*: takes a large dose of vitamin C daily;
 *Control group*: takes nothing.
 B) *Experimental group*: people with a cold are administered vitamin C daily;
 *Control group*: people without a cold are not administered vitamin C.
 C) *Experimental group*: takes a large dose of vitamin C daily;
 *Control group*: takes a large weekly dose of vitamin C.
 D) *Experimental group*: takes a large, daily dose of vitamin C;
 *Control group*: takes a daily dose of a sugar pill disguised as vitamin C.

 **Question Details**Bloom's : 3. Apply (Socratic Feedback)
Accessibility : Keyboard Navigation
Topic : Biology as a Scientific Discipline
Section : 01.05
Learning Objective : 01.05.02 CoreSKILLS Distinguish between discovery-based science and hypothesis testing, and desc
Gradable : automatic

**38)** A researcher hypothesizes that crocodile gender is determined by the incubation temperature of the egg. The hypothesis states that an average nest temperature of 32–33°C results in the birth of male crocodiles while cooler and warmer incubation temperatures result in female crocodiles. What is a valid, testable prediction based on this hypothesis?

38) \_\_\_\_\_\_

 A) Male crocodiles will prefer temperatures of 32–33°C.
 B) Incubation of any crocodile egg at 32°C will result in a male crocodile.
 C) Male eggs will hatch at 32°C, while female eggs will not hatch at 32°C.
 D) Male eggs will be more fragile than female eggs.
 E) Crocodiles arrange the gender of offspring by manipulating incubation temperatures.

 **Question Details**Bloom's : 3. Apply (Socratic Feedback)
Accessibility : Keyboard Navigation
Topic : Biology as a Scientific Discipline
Section : 01.05
Learning Objective : 01.05.02 CoreSKILLS Distinguish between discovery-based science and hypothesis testing, and desc
Gradable : automatic

**39)** A researcher hypothesizes that crocodile gender is determined by the incubation temperature of the egg. The hypothesis states that an average nest temperature of 32–33°C results in the birth of male crocodiles while cooler and warmer incubation temperatures result in female crocodiles.
The researcher determines that an average nest incubation temperature of 32–33°C results in the birth of male crocodiles, while higher and lower incubation temperatures result in female crocodiles. What is the most likely explanation for this phenomenon?

39) \_\_\_\_\_\_

 A) Incubation temperature results in a change in the crocodilian genome.
 B) Incubation temperature results in a change in the crocodilian proteome.
 C) Incubation temperature changes both the crocodilian genome and proteome.
 D) Since this phenomenon is influenced by an external stimuli (temperature), it cannot be attributed to changes in either the genome or the proteome.

 **Question Details**Bloom's : 5. Evaluate (Socratic Feedback)
Accessibility : Keyboard Navigation
Section : 01.06
Learning Objective : 01.06.01 CoreSKILLS Describe the core skills of biology as identified by "Vision and Change
Topic : Core Skills of Biology
Gradable : automatic

**40)** A researcher hypothesizes that crocodile gender is determined by the incubation temperature of the egg. The hypothesis states that an average nest temperature of 32–33°C results in the birth of male crocodiles while cooler and warmer incubation temperatures result in female crocodiles.
Researchers find a group of crocodiles in which an expanded incubation temperature gives rise to male crocodiles. This particular group of crocodiles hatch male crocodiles even with incubation temperatures as low as 29°C. What type of scientific approach has led to this observation?

40) \_\_\_\_\_\_

 A) discovery-based science
 B) hypothesis testing

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Topic : Biology as a Scientific Discipline
Section : 01.05
Learning Objective : 01.05.02 CoreSKILLS Distinguish between discovery-based science and hypothesis testing, and desc
Gradable : automatic

**41)** A researcher hypothesizes that crocodile gender is determined by the incubation temperature of the egg. The hypothesis states that an average nest temperature of 32–33°C results in the birth of male crocodiles while cooler and warmer incubation temperatures result in female crocodiles.
What is the most likely explanation for how a group of crocodiles acquired the trait in which lower incubation temperatures give rise to male crocodiles?

41) \_\_\_\_\_\_

 A) Horizontal gene transfer from a related species has introduced changes in this group’s genome.
 B) Horizontal gene transfer from a related species has introduced changes in this group’s proteome.
 C) One or more mutations in the genome have been passed through the group by vertical descent.
 D) One or more mutations in the proteome have been passed through the group by vertical descent.

 **Question Details**Bloom's : 5. Evaluate (Socratic Feedback)
Accessibility : Keyboard Navigation
Section : 01.03
Learning Objective : 01.03.01 Explain two mechanisms by which evolutionary change occurs: vertical descent with mutat
Topic : Biological Evolution
Gradable : automatic

**42)** You collect data on the population size of finches on an island in the Galapagos and correlate that with the amount of rainfall. You find that finch population tends to be correlated with increased rainfall. To predict the population size with different rainfall levels you would create which type of model?

42) \_\_\_\_\_\_

 A) mathematical model
 B) temporal model
 C) hierarchical model
 D) structural model
 E) mechanistic model

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Section : 01.06
Learning Objective : 01.06.03 CoreSKILLS Describe what a model is in biology, and explain why models are useful.
Topic : Core Skills of Biology
Gradable : automatic

**43)** You wish to study how a protein binds to DNA, and which specific amino acids are involved. To do this you would create which type of model?

43) \_\_\_\_\_\_

 A) mathematical model
 B) temporal model
 C) hierarchical model
 D) structural model
 E) mechanistic model

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Section : 01.06
Learning Objective : 01.06.03 CoreSKILLS Describe what a model is in biology, and explain why models are useful.
Topic : Core Skills of Biology
Gradable : automatic

**44)** Kai is a biology graduate student who is investigating how different species of bacteria move through their environment. The experiment is conducted using fluorescent labels and a special type of microscope to examine motility structures that extend out from the membrane. Which level of study best describes her investigation?

44) \_\_\_\_\_\_

 A) Population ecology
 B) Community ecology
 C) Anatomy and physiology
 D) Molecular biology
 E) Cell biology

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Topic : Biology as a Scientific Discipline
Section : 01.05
Learning Objective : 01.05.01 Explain how researchers study biology at different levels, ranging from molecules to ec
Activity Type : New
Gradable : automatic

**45)** Kamal is an undergraduate researcher working in a marine biology laboratory. His project involves documenting changes in the plant species, coral species, and fish species living in a coral reef habitat. In addition to surveying the species diversity, he also takes weekly measurements of water temperature, pH, salinity, and dissolved oxygen levels. Which level of study best describes his investigation?

45) \_\_\_\_\_\_

 A) Ecosystem ecology
 B) Population ecology
 C) Cell biology
 D) Molecular biology
 E) Anatomy and physiology

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Topic : Biology as a Scientific Discipline
Section : 01.05
Learning Objective : 01.05.01 Explain how researchers study biology at different levels, ranging from molecules to ec
Activity Type : New
Gradable : automatic

**46)** A community is composed of different populations of animals and plants.

46) \_\_\_\_\_\_

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.01
Learning Objective : 01.01.01 Explain how life can be viewed at different levels of biological complexity.
Topic : Levels of Biology
Gradable : automatic

**47)** All tissues are composed of cells.

47) \_\_\_\_\_\_

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.01
Learning Objective : 01.01.01 Explain how life can be viewed at different levels of biological complexity.
Topic : Levels of Biology
Gradable : automatic

**48)** Vertical evolution, whereby living organisms evolve from a common ancestor ("tree of life"), is the only mechanism of evolution on Earth.

48) \_\_\_\_\_\_

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.03
Learning Objective : 01.03.01 Explain two mechanisms by which evolutionary change occurs: vertical descent with mutat
Topic : Biological Evolution
Gradable : automatic

**49)** All genetic mutations are harmful to an organism.

49) \_\_\_\_\_\_

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.03
Learning Objective : 01.03.01 Explain two mechanisms by which evolutionary change occurs: vertical descent with mutat
Topic : Biological Evolution
Gradable : automatic

**50)** The proteome, rather than genome, is most directly responsible for the structure, function, and appearance of organisms.

50) \_\_\_\_\_\_

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Section : 01.03
Learning Objective : 01.03.02 Describe how changes in genomes and proteomes underlie evolutionary changes.
Topic : Biological Evolution
Gradable : automatic

**51)** The modification of a limb that was used for walking in a preexisting ancestor to one that is used as a wing for a species today is called proteomics.

51) \_\_\_\_\_\_

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.03
Learning Objective : 01.03.02 Describe how changes in genomes and proteomes underlie evolutionary changes.
Topic : Biological Evolution
Gradable : automatic

**52)** A defining characteristic that distinguishes prokaryotic and eukaryotic organisms is the lack of a cell membrane in prokaryotes.

52) \_\_\_\_\_\_

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.04
Learning Objective : 01.04.01 Outline how organisms are classified.
Topic : Classification of Living Things
Gradable : automatic

**53)** A bacterial infection such as pneumonia is most likely caused by organisms derived from the kingdom fungi.

53) \_\_\_\_\_\_

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 3. Apply (Socratic Feedback)
Accessibility : Keyboard Navigation
Section : 01.04
Learning Objective : 01.04.01 Outline how organisms are classified.
Topic : Classification of Living Things
Gradable : automatic

**54)** Little scientific evidence is necessary when formulating a theory.

54) \_\_\_\_\_\_

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 2. Understand
Accessibility : Keyboard Navigation
Topic : Biology as a Scientific Discipline
Section : 01.05
Learning Objective : 01.05.02 CoreSKILLS Distinguish between discovery-based science and hypothesis testing, and desc
Gradable : automatic

**55)** Discovery-based science and hypothesis testing are the two major scientific approaches that help us understand biology.

55) \_\_\_\_\_\_

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Topic : Biology as a Scientific Discipline
Section : 01.05
Learning Objective : 01.05.02 CoreSKILLS Distinguish between discovery-based science and hypothesis testing, and desc
Gradable : automatic

**56)** BioTIPS encourages memorization of facts to understand science.

56) \_\_\_\_\_\_

 ⊚ true
 ⊚ false

 **Question Details**Bloom's : 1. Remember
Accessibility : Keyboard Navigation
Section : 01.06
Learning Objective : 01.06.04 CoreSKILLS List the types of problem-solving skills you will develop by completing BioT
Topic : Core Skills of Biology
Gradable : automatic

**Answer Key**Test name: chapter 1

1) C

**Clarify Question**
● *What is the key concept addressed by the question?*● The question asks about levels of organization.

● *What type of thinking is required?*● You are being asked to apply your knowledge of levels of organization to classify a flower.

**Gather Content**
● *What do you know about levels of organization? What other information is related to the question?*● A flower is made up of atoms and cells. The flower cannot grow on its own.

**Choose Answer**
● *Given what you now know, what information is most likely to produce the correct answer?*● A flower is an organ that is part of a larger organism that would be part of a population.

**Reflect on Process**
● *Did your problem-solving process lead you to the correct answer? If not, where did the process break down or lead you astray? How can you revise your approach to produce a more desirable result?*● This question asked you to apply your understanding of organization to explain where a flower would be classified. If you got the correct answer, great job! If you got an incorrect answer, where did the process break down? Did you recall that a flower is made up of cells and atoms? Did you think that the flower was not an organ but was an organism? Did you think that a population was made up of a single organ?

2) D

**Clarify Question**
●  *What is the key concept addressed by the question?*● The question asks about levels of organization.

●  *What type of thinking is required?*● You are being asked to apply your knowledge of organization to identify where a group of boa constrictors would fit.

**Gather Content**
● *What do you know about the organization of living things? What other information is related to the question?*● A boa constrictor is an organism, so it is made up of smaller levels like a cell and an organ. An ecosystem includes living and non-living substances.

**Choose Answer**
●  *Given what you now know, what information is most likely to produce the correct answer?*● A population is a group of organisms. Because the question looks at multiple boa constrictors, this is a population made up of multiple organisms.

**Reflect on Process**
●  *Did your problem-solving process lead you to the correct answer? If not, where did the process break down or lead you astray? How can you revise your approach to produce a more desirable result?*● This question asked you to apply your understanding of organization to classify a population. If you got the correct answer, great job! If you got an incorrect answer, where did the process break down? Did you think that an organ or cell were made up of multiple organisms? Did you think that an ecosystem was just made up of a single species of organisms?

3) A

4) A

5) D

6) D

7) A

8) E

9) D

10) D

11) B

12) C

13) B

14) D

15) A

16) D

17) E

18) A

19) B

20) A

21) E

22) B

23) A

24) C

25) A

26) D

27) D

28) D

29) D

**Clarify Question**
● *What is the key concept addressed by the question?*● The question asks about different domains.

●  *What type of thinking is required?*● You are being asked to apply your knowledge of domains to classify a single celled organism with no nucleus.

**Gather Content**
● *What do you know about the different domains? What other information is related to the question?*● Eukarya do contain some single celled organisms, but all have a nucleus. Both bacteria and archaea are single celled and have no nucleus.

**Choose Answer**
●  *Given what you now know, what information is most likely to produce the correct answer?*● Both bacteria and archaea have no nucleus and are single celled, so the organism could be from either domain.

**Reflect on Process**
●  *Did your problem-solving process lead you to the correct answer? If not, where did the process break down or lead you astray? How can you revise your approach to produce a more desirable result?*● This question asked you to apply your understanding of domains to classify an organism. If you got the correct answer, great job! If you got an incorrect answer, where did the process break down? Did you think that eukaryotes did not have a nucleus? Did you think that only archaea or bacteria were single celled or had no nucleus?

30) D

31) B

32) C

33) D

**Clarify Question**
●  *What is the key concept addressed by the question?*● The question asks about the steps in the scientific method.

●  *What type of thinking is required?*● You are being asked to apply your knowledge of the scientific method to order the steps in the process.

**Gather Content**
●  *What do you know about the scientific method? What other information is related to the question?*● There are five steps to the scientific method
 1. Observations are made regarding natural phenomena.
 2. These observations lead to a hypothesis that tries to explain the phenomena. A useful hypothesis is one that is testable because it makes specific predictions.
 3. Experimentation is conducted to determine if the predictions are correct.
 4. The data from the experiment are analyzed.
 5. The hypothesis is considered to be consistent with the data, or it is rejected.

**Choose Answer**
●  *Given what you now know, what information is most likely to produce the correct answer?*● Using this ordering, you would first need to observe that trees drop their leaves in the fall, then propose a hypothesis that this is because it is colder in the fall. Next you would set up the experiment with trees at different temperatures, collect and analyze the data, and then reject or accept the hypothesis based on the results.

**Reflect on Process**
●  *Did your problem-solving process lead you to the correct answer? If not, where did the process break down or lead you astray? How can you revise your approach to produce a more desirable result?*● This question asked you to apply you knowledge of the scientific method to order events. If you got the correct answer, great job! If you got an incorrect answer, where did the process break down? Did you recall that an observation needs to be made before a hypothesis can be formed? Did you think that the statistics can be run on an experiment before it is performed?

34) B

35) C

**Clarify Question**
● *What is the key concept addressed by the question?*● The question asks about interpreting the results of an experiment.

● *What type of thinking is required?*● You are being asked to apply your knowledge of experiments to choose the correct way to state the results.

**Gather Content**
● *What do you know about a hypothesis? What other information is related to the question?*● You cannot prove a hypothesis; you can reject it or say that the results of an experiment are consistent with the hypothesis. You cannot take the results from fixing one watch and expand them to all other watches, some of which may not use a battery.

**Choose Answer**
●  *Given what you now know, what information is most likely to produce the correct answer?*● You can say that the watch you put the battery into probably had a dead battery, but you cannot make the other conclusions in the list.

**Reflect on Process**
● *Did your problem-solving process lead you to the correct answer? If not, where did the process break down or lead you astray? How can you revise your approach to produce a more desirable result?*● This question asked you to apply your understanding of a hypothesis to draw a conclusion. If you got the correct answer, great job! If you got an incorrect answer, where did the process break down? Did you think that you could prove a hypothesis? Did you think that the results from one watch could be applied to all watches?

36) B

**Clarify Question**
●  *What is the key concept addressed by the question?*● The question asks about writing a hypothesis.

●  *What type of thinking is required?*● You are being asked to apply your knowledge of hypotheses to identify one to test a statement.

**Gather Content**
●  *What do you know about hypotheses? What other information is related to the question?*● The statement links apples and seeing a doctor. Apples being good for you or containing vitamin C do not address visiting a doctor. Similarly not contracting a cold or living longer do not necessarily correlate with not seeing a doctor.

**Choose Answer**
●  *Given what you now know, what information is most likely to produce the correct answer?*● The best answer is that consuming an apple does not change the number of visits to a doctor. If this statement is not shown to be true in an experiment, then the null hypothesis that an apple a day reduces visits to the doctors would be supported.

**Reflect on Process**
●  *Did your problem-solving process lead you to the correct answer? If not, where did the process break down or lead you astray? How can you revise your approach to produce a more desirable result?*● This question asked you to apply your understanding of hypotheses to pick the best one to test a statement. If you got the correct answer, great job! If you got an incorrect answer, where did the process break down? Did you think that showing that apples were healthy would correlate with decreased doctors visits? Did you think that reduced colds or increased life span necessarily means fewer doctors visits?

37) D

**Clarify Question**
● *What is the key concept addressed by the question?*● The question asks about experimental design.

●  *What type of thinking is required?*● You are being asked to apply your knowledge of experimental design to pick the best experimental and control groups.

**Gather Content**
● *What do you know about experimental and control groups? What other information is related to the question?*● The experimental group in this case should see if large daily doses of vitamin C prevents a cold in someone who does not have a cold already.
● The control group should not receive any vitamin C, should not already have a cold, and should be given some kind of pill to take so they don’t know that they are in the control group. This is called a placebo.

**Choose Answer**
●  *Given what you now know, what information is most likely to produce the correct answer?*● The best answer would be to have the experimental group receive a large daily dose while the control group receives a sugar pill. Neither group should already have a cold at the start of the experiment.

**Reflect on Process**
●  *Did your problem-solving process lead you to the correct answer? If not, where did the process break down or lead you astray? How can you revise your approach to produce a more desirable result?*● This question asked you to apply your knowledge of experimental design to choose the correct experimental and control groups. If you got the correct answer, great job! If you got an incorrect answer, where did the process break down? Did you think that the control group could receive small doses of vitamin C or already have a cold? Did you think that the experimental group could already have a cold?

38) B

**Clarify Question**
●  *What is the key concept addressed by the question?*● The question asks about the best hypothesis for an observation.

●  *What type of thinking is required?*● You are being asked to apply your knowledge of hypotheses to choose the best one for an observation.

**Gather Content**
●  *What do you know about observations and hypotheses? What other information is related to the question?*● Any egg can become male or female depending on the temperature of incubation, so there are no female or male eggs. You also cannot infer anything about the preferences or behaviors of crocodiles from this observation.

**Choose Answer**
●  *Given what you now know, what information is most likely to produce the correct answer?*● The best answer is that if you incubate a crocodile egg at 32°C, it will hatch as a male crocodile.

**Reflect on Process**
●  *Did your problem-solving process lead you to the correct answer? If not, where did the process break down or lead you astray? How can you revise your approach to produce a more desirable result?*● This question asked you to apply your understanding of observations and hypotheses to make a good match. If you got the correct answer, great job! If you got an incorrect answer, where did the process break down? Did you think that the eggs were either male or female to start with? Did you think that after hatching the males preferred 32°C?

39) B

**Clarify Question**
●  *What is the key concept addressed by the question?*● The question asks about genomes and proteomes.

● *What type of thinking is required?*● You are being asked to evaluate different statements about how temperature could affect the gender of a crocodile.

**Gather Content**
●  *What do you know about genomes and proteomes? What other information is related to the question?*● The genome consists of the DNA of a cell and does not change readily. The proteome of a cell represents all of the proteins made in a cell. This can change as different genes are expressed.

**Choose Answer**
●  *Given what you now know, what information is most likely to produce the correct answer?*● The best answer is that the genome will not change between males and females, while the proteome will. The difference in temperature could cause different genes to be expressed, producing different proteins that make a crocodile male or female.

**Reflect on Process**
●  *Did your problem-solving process lead you to the correct answer? If not, where did the process break down or lead you astray? How can you revise your approach to produce a more desirable result?*● This question asked you to evaluate different statements about how the genome and proteome could be affected by temperature to change the gender of a crocodile. If you got the correct answer, great job! If you got an incorrect answer, where did the process break down? Did you recall that the genome of a cell is not easy to change? Did you forget that the proteome of a cell can change with external stimuli such as temperature?

40) A

41) C

**Clarify Question**
●  *What is the key concept addressed by the question?*● The question asks about acquiring mutations in a crocodile.

●  *What type of thinking is required?*● You are being asked to evaluate statements about how mutations could occur in a crocodile.

**Gather Content**
●  *What do you know about mutations? What other information is related to the question?*● Horizontal gene transfer is the transfer of genes from one individual to another, often across species and occurs mostly in bacteria. In eukaryotes and especially animals, this is very rare. Heritable mutations also occur in the genome, and not in the proteome as proteins are made from the instructions carried in the DNA.

**Choose Answer**
●  *Given what you now know, what information is most likely to produce the correct answer?*● The best answer is that mutations occur in the genome. These are then passed on through the generations by vertical transfer.

**Reflect on Process**
●  *Did your problem-solving process lead you to the correct answer? If not, where did the process break down or lead you astray? How can you revise your approach to produce a more desirable result?*● This question asked you to evaluate different statements about how mutations could occur in crocodiles. If you got the correct answer, great job! If you got an incorrect answer, where did the process break down? Did you think that horizontal gene transfer could occur from an animal closely related to a crocodile? Did you think that mutations in the proteome could be inherited?

42) A

Review section 1.6.

43) D

Review section 1.6.

44) E

45) A

46) TRUE

47) TRUE

48) FALSE

49) FALSE

50) TRUE

51) FALSE

52) FALSE

53) FALSE

**Clarify Question**
●  *What is the key concept addressed by the question?*● The question asks about classifying bacteria and fungi.

●  *What type of thinking is required?*● You are being asked to apply your knowledge of bacteria and fungi to explain the cause of an infection.

**Gather Content**
●  *What do you know about the kingdoms of life? What other information is related to the question?*● There are two domains of prokaryotes, the eubacteria and archeabacteria. Within eukaryotes there are four kingdoms; protists, fungi, plants and animals.

**Choose Answer**
●  *Given what you now know, what information is most likely to produce the correct answer?*● Bacteria are not in the kingdom fungi, so the statement is false. Bacteria are also prokaryotes, while fungi are eukaryotes.

**Reflect on Process**
●  *Did your problem-solving process lead you to the correct answer? If not, where did the process break down or lead you astray? How can you revise your approach to produce a more desirable result?*● This question asked you to apply your understanding of classifying organisms. If you got the correct answer, great job! If you got an incorrect answer, where did the process break down? Did you think that bacteria and fungi were both prokaryotes? Did you think that bacteria were a type of fungi?

54) FALSE

55) TRUE

56) FALSE

Review section 1.6.