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| **Multiple Choice** |

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| 1. The science of \_\_\_\_ explains the origin and persistence of life, and studies the changes in living things.​   |  |  |  | | --- | --- | --- | |  | a. | ​nanotechnology | |  | b. | ​biology | |  | c. | ​pharmacology | |  | d. | ​mathematics | |  | e. | ​chemistry |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.6 - Illustrate the processes involved in the life cycle of an organism. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 2. The difference between living and nonliving matter depends not only on the kinds of atoms and molecules present, but on their \_\_\_\_ as well.   |  |  |  | | --- | --- | --- | |  | a. | ​chemical complexity | |  | b. | ​electrons | |  | c. | ​organization and interactions | |  | d. | ​atomic profile | |  | e. | ​energy levels |  |  |  | | --- | --- | | *ANSWER:* | c | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.1 - Describe the different levels of hierarchy through which the organization of life extends. | | *KEYWORDS:* | Bloom’s: Understand | |

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| 3. A cell is minimally defined by \_\_\_\_.   |  |  |  | | --- | --- | --- | |  | a. | ​a nucleus that contains DNA | |  | b. | ​an organized chemical system and specialized molecules surrounded by a membrane | |  | c. | ​an organized chemical system for harnessing energy | |  | d. | ​a membrane comprised of phospholipids | |  | e. | ​specialized molecules that respond to their environment |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.1 - Describe the different levels of hierarchy through which the organization of life extends. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 4. The lowest level of biological organization that can survive and reproduce is the \_\_\_\_.   |  |  |  | | --- | --- | --- | |  | a. | ​cell | |  | b. | ​tissue | |  | c. | ​proton | |  | d. | ​nucleus | |  | e. | ​DNA |  |  |  | | --- | --- | | *ANSWER:* | a | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.1 - Describe the different levels of hierarchy through which the organization of life extends. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 5. Emergent properties are \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​characteristics of atoms but not molecules | |  | b. | ​characteristics that depend on the level of organization of matter but do not exist at lower levels of organization | |  | c. | ​characteristics of nonliving matter that depend on the level of organization | |  | d. | ​dependent on higher levels of organization of living and nonliving matter | |  | e. | ​characteristics of all multicellular organisms but not unicellular organisms |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.1 - Describe the different levels of hierarchy through which the organization of life extends. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 6. Bacteria and protozoans \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​can be either unicellular or multicellular organisms | |  | b. | ​reside solely in oceans | |  | c. | ​are multicellular organisms | |  | d. | ​are unicellular organisms | |  | e. | ​are precursors to cells |  |  |  | | --- | --- | | *ANSWER:* | d | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.1 - Describe the different levels of hierarchy through which the organization of life extends. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 7. Every population of animals has an age structure, a graphical representation of the distribution of age groups within the population. While each individual in a population has a specific age, individuals themselves do not have an age structure. Age structure is therefore an example of a(n) \_\_\_\_ property.​   |  |  |  | | --- | --- | --- | |  | a. | ​emergent | |  | b. | ​hierarchical | |  | c. | ​environmental | |  | d. | ​organizational | |  | e. | ​cellular |  |  |  | | --- | --- | | *ANSWER:* | a | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.1 - Describe the different levels of hierarchy through which the organization of life extends. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 8. A group of organisms of the same species that live together in the same place make up a(n) \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​population | |  | b. | ​cell | |  | c. | ​biosphere | |  | d. | ​tissue | |  | e. | ​ecosystem |  |  |  | | --- | --- | | *ANSWER:* | a | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.1 - Describe the different levels of hierarchy through which the organization of life extends. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 9. All the populations of different organisms that live in the same place form a(n) \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​ecosystem | |  | b. | ​community | |  | c. | ​biosphere | |  | d. | sample​ | |  | e. | ​organ |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.1 - Describe the different levels of hierarchy through which the organization of life extends. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 10. The highest level of the hierarchical classification of life is the \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​biosphere | |  | b. | ​domain | |  | c. | ​ecosystem | |  | d. | ​population | |  | e. | cell​ |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.1 - Describe the different levels of hierarchy through which the organization of life extends. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 11. Which term describes a community and the nonliving environmental factors with which it interacts?​   |  |  |  | | --- | --- | --- | |  | a. | ​ecosystem | |  | b. | planet​ | |  | c. | ​multicellular organism | |  | d. | ​biosphere | |  | e. | ​community |  |  |  | | --- | --- | | *ANSWER:* | a | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.1 - Describe the different levels of hierarchy through which the organization of life extends. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 12. Monkeys, trees, snakes, moss, birds, sunlight, rain, rocks and bugs together would be considered a(n) \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | population​ | |  | b. | ​ecosystem | |  | c. | ​biosphere | |  | d. | ​community | |  | e. | ​organism |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.1 - Describe the different levels of hierarchy through which the organization of life extends. | | *KEYWORDS:* | Bloom’s: Analyze | |

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| 13. Which group would be considered a community?​   |  |  |  | | --- | --- | --- | |  | a. | ​fish, birds, alligators, water | |  | b. | ​a group of alligators | |  | c. | ​polar bears, seals, fish | |  | d. | ​pandas, bamboo and mountains | |  | e. | ​a group of seaweed |  |  |  | | --- | --- | | *ANSWER:* | c | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.1 - Describe the different levels of hierarchy through which the organization of life extends. | | *KEYWORDS:* | Bloom’s: Analyze | |

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| 14. The percentage of African Americans, Hispanics, Caucasians, and Asians in a neighborhood is an emergent property of a(n)\_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​organism | |  | b. | ​community | |  | c. | ​population | |  | d. | ​ecosystem | |  | e. | ​biosphere |  |  |  | | --- | --- | | *ANSWER:* | c | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.1 - Describe the different levels of hierarchy through which the organization of life extends. | | *KEYWORDS:* | Bloom’s: Analyze | |

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| 15. The most fundamental and important molecule that distinguishes living systems from nonliving matter is \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​protein | |  | b. | ​DNA | |  | c. | ​fructose | |  | d. | ​water | |  | e. | ​glucose |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.2 - Explain the importance of deoxyribonucleic acid. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 16. The large, double-stranded, helical molecule that contains instructions for assembling a living organism from simpler molecules is \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​RNA | |  | b. | ​DNA | |  | c. | ​ATP | |  | d. | ​Protein | |  | e. | ​NADPH |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.2 - Explain the importance of deoxyribonucleic acid. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 17. The information in DNA is copied into molecules of \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​RNA | |  | b. | ​carbohydrates | |  | c. | ​lipid | |  | d. | ​oxygen | |  | e. | ​hydrogen peroxide |  |  |  | | --- | --- | | *ANSWER:* | a | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.2 - Explain the importance of deoxyribonucleic acid. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 18. The process by which information in genes guides the production of RNA and proteins is called \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​translation | |  | b. | ​gene expression | |  | c. | ​synthesis | |  | d. | ​cellular respiration | |  | e. | ​transcription |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.2 - Explain the importance of deoxyribonucleic acid. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 19. Photosynthesis and cellular respiration are examples of \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​catabolism | |  | b. | ​cleavage | |  | c. | ​anabolism | |  | d. | ​synthesis | |  | e. | ​metabolism |  |  |  | | --- | --- | | *ANSWER:* | e | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.3 - Describe the metabolic processes of photosynthesis and cellular respiration. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 20. The process by which cells break down complex molecules in the presence of oxygen to release energy is called \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​anabolism | |  | b. | ​photosynthesis | |  | c. | ​metabolism | |  | d. | ​translation | |  | e. | ​cellular respiration |  |  |  | | --- | --- | | *ANSWER:* | e | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.3 - Describe the metabolic processes of photosynthesis and cellular respiration. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 21. Living systems have the capacity to detect environmental changes and compensate for them through controlled responses. This is possible because living systems have \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​sensitivity | |  | b. | ​hormones | |  | c. | ​nerves | |  | d. | ​reflexes | |  | e. | ​receptors |  |  |  | | --- | --- | | *ANSWER:* | e | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.5 - Explain how living organisms detect environmental changes and use compensating responses. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 22. Maintaining your body's internal temperature within narrow tolerable range is one example of \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​perspiration | |  | b. | ​compensation | |  | c. | ​homeostasis | |  | d. | ​respiration | |  | e. | ​hydrolysis |  |  |  | | --- | --- | | *ANSWER:* | c | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.5 - Explain how living organisms detect environmental changes and use compensating responses. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 23. The process by which parents produce offspring is called \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​feeding | |  | b. | ​homeostasis | |  | c. | ​compensation | |  | d. | ​artificial selection | |  | e. | ​reproduction |  |  |  | | --- | --- | | *ANSWER:* | e | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.6 - Illustrate the processes involved in the life cycle of an organism. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 24. Inheritance is the process by which genetic information is \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​transmitted to offspring in the form of RNA | |  | b. | ​transmitted to offspring in the form of DNA | |  | c. | ​transcribed from DNA into RNA | |  | d. | ​transmitted to offspring in the form of proteins | |  | e. | ​translated from RNA into proteins |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.6 - Illustrate the processes involved in the life cycle of an organism. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 25. A series of programmed changes encoded in DNA, through which a fertilized egg divides into many cells that ultimately are transformed into an adult organism, is known as \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​transformation | |  | b. | ​development | |  | c. | ​inheritance | |  | d. | ​homeostasis | |  | e. | ​compensation |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.6 - Illustrate the processes involved in the life cycle of an organism. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 26. The sequential stages through which individuals develop, grow, maintain themselves, and reproduce are collectively known as the \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​central dogma | |  | b. | ​catabolic reactions | |  | c. | ​anabolic reactions | |  | d. | ​transformation | |  | e. | ​life cycle |  |  |  | | --- | --- | | *ANSWER:* | e | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.1.1.6 - Illustrate the processes involved in the life cycle of an organism. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 27. Populations of all organisms change from one generation to the next because their DNA changes over time. This is known as \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​developmental selection | |  | b. | ​cellular respiration | |  | c. | ​experimental variables | |  | d. | ​genomics | |  | e. | ​biological evolution |  |  |  | | --- | --- | | *ANSWER:* | e | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.7 - Explain how populations change with each new generation. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 28. Our understanding of the evolutionary process reveals that \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | favorable traits become less common in future generations​ | |  | b. | ​all populations are related through a shared ancestry | |  | c. | ​evolution has produced the spectacular diversity of life on Earth | |  | d. | ​all organisms change through time | |  | e. | ​development has produced the spectacular diversity of life on Earth |  |  |  | | --- | --- | | *ANSWER:* | c | | *REFERENCES:* | 1.2 Biological Evolution | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.2.3 - Explain how organisms benefit from adaptations. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 29. In the mid-nineteenth century Charles Darwin and Alfred Russel Wallace observed many organisms. Based on these observations, they arrived at an explanation, called \_\_\_\_, for how populations change through time.​   |  |  |  | | --- | --- | --- | |  | a. | ​creationism | |  | b. | ​natural evolution | |  | c. | ​natural selection | |  | d. | ​genetics | |  | e. | ​evolution |  |  |  | | --- | --- | | *ANSWER:* | c | | *REFERENCES:* | 1.2 Biological Evolution | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.2.1 - Outline the conclusions drawn by Darwin and Wallace to explain biological evolution. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 30. Bull dogs have been bred to have such a large head size that they can no longer give birth naturally. The process by which these dogs changed over time is called \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​artificial breeding | |  | b. | ​artificial selection | |  | c. | ​artificial evolution | |  | d. | ​artificial engineering | |  | e. | ​artificial insemination |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.2 Biological Evolution | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.2.1 - Outline the conclusions drawn by Darwin and Wallace to explain biological evolution. | | *KEYWORDS:* | Bloom’s: Analyze | |

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| 31. Mutations are \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​always bad for populations | |  | b. | ​always good for populations | |  | c. | ​always harmful for individuals | |  | d. | ​the basis of homogeneity in a population | |  | e. | ​the basis of variability among individuals |  |  |  | | --- | --- | | *ANSWER:* | e | | *REFERENCES:* | 1.2 Biological Evolution | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.2.2 - Explain the importance of DNA mutations in evolution. | | *KEYWORDS:* | Bloom’s: Understand | |

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| 32. Which mutation is an example of an adaptation?​   |  |  |  | | --- | --- | --- | |  | a. | A mutation results in decreased sperm count in humans.​ | |  | b. | ​A mutation is found to be the cause of Alzheimer's Disease. | |  | c. | ​A mutation results in hairless cats, reducing allergies in humans. | |  | d. | ​A mutation increases the size of tomato plants. | |  | e. | ​A mutation renders an individual immune to HIV infection. |  |  |  | | --- | --- | | *ANSWER:* | e | | *REFERENCES:* | 1.2 Biological Evolution | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.2.3 - Explain how organisms benefit from adaptations. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 33. A group of organisms in which the individuals are so closely related in structure, biochemistry, and behavior that they can successfully interbreed is a(n) \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​class | |  | b. | ​genus | |  | c. | ​order | |  | d. | ​species | |  | e. | ​kingdom |  |  |  | | --- | --- | | *ANSWER:* | d | | *REFERENCES:* | 1.3 Biodiversity and the Tree of Life | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.1 - Compare the hierarchical categories used in traditional classification. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 34. A group of similar species that share recent common ancestry is a(n) \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​class | |  | b. | ​order | |  | c. | ​species | |  | d. | ​kingdom | |  | e. | ​genus |  |  |  | | --- | --- | | *ANSWER:* | e | | *REFERENCES:* | 1.3 Biodiversity and the Tree of Life | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.1 - Compare the hierarchical categories used in traditional classification. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 35. A randomly selected group of organisms from an order would show more genetic and anatomical variability than a similar group randomly picked from a(n) \_\_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​kingdom | |  | b. | ​genus | |  | c. | ​family | |  | d. | ​phylum | |  | e. | ​class |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.3 Biodiversity and the Tree of Life | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.1 - Compare the hierarchical categories used in traditional classification. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 36. The scientific name of an organism is composed of two names. The first part identifies the \_\_\_\_ while the second part designates the \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​family; genus | |  | b. | ​genera; genus | |  | c. | ​genus; species | |  | d. | ​species; genus | |  | e. | ​phylum; species |  |  |  | | --- | --- | | *ANSWER:* | c | | *REFERENCES:* | 1.3 Biodiversity and the Tree of Life | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.1 - Compare the hierarchical categories used in traditional classification. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 37. Which of the following scientific names is written in the correct format?​   |  |  |  | | --- | --- | --- | |  | a. | ​*canis Familiaris* | |  | b. | ​*c. Latrans* | |  | c. | ​*Canis Lupus* | |  | d. | ​*Canis latrans* | |  | e. | ​*Canis Familiaris* |  |  |  | | --- | --- | | *ANSWER:* | d | | *REFERENCES:* | 1.3 Biodiversity and the Tree of Life | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.1 - Compare the hierarchical categories used in traditional classification. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 38. The most fundamental grouping in the classification of living organisms is the \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​family | |  | b. | ​genus | |  | c. | ​order | |  | d. | ​species | |  | e. | ​class |  |  |  | | --- | --- | | *ANSWER:* | d | | *REFERENCES:* | 1.3 Biodiversity and the Tree of Life | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.1 - Compare the hierarchical categories used in traditional classification. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 39. The group that is the most inclusive and has recently been added to the classification scheme is \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​animalia | |  | b. | ​kingdom | |  | c. | ​eukarya | |  | d. | protista​ | |  | e. | ​domain |  |  |  | | --- | --- | | *ANSWER:* | e | | *REFERENCES:* | 1.3 Biodiversity and the Tree of Life | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.1 - Compare the hierarchical categories used in traditional classification. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 40. Which pair of organisms would be classified as prokaryotes?​   |  |  |  | | --- | --- | --- | |  | a. | ​Fungi and Plantae | |  | b. | ​Bacteria, Archaea and Fungi | |  | c. | ​Animalia and Plantae | |  | d. | ​Fungi, Plantae and Animalia | |  | e. | ​Bacteria and Archaea |  |  |  | | --- | --- | | *ANSWER:* | e | | *REFERENCES:* | 1.3 Biodiversity and the Tree of Life | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.3 - Classify the three domains of species identified by biologists. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 41. A cell that is observed under the microscope is found to have its DNA enclosed in a nucleus, and has other specialized internal compartments. The cell is a(n) \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​bacterium | |  | b. | ​*E. coli* | |  | c. | ​prokaryote | |  | d. | ​eukaryote | |  | e. | ​archaean |  |  |  | | --- | --- | | *ANSWER:* | d | | *REFERENCES:* | 1.3 Biodiversity and the Tree of Life | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.3 - Classify the three domains of species identified by biologists. | | *KEYWORDS:* | Bloom’s: Analyze | |

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| 42. A researcher in a lab finds a microscopic organism that has no nucleus, but has distinctive structural molecules and mechanisms of photosynthesis. The organisms are abundant in virtually every habitat on Earth. The researcher has identified this organism as belonging to the domain \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​Bacteria | |  | b. | ​Animalia | |  | c. | ​Eukarya | |  | d. | ​Protist | |  | e. | ​Amoeba |  |  |  | | --- | --- | | *ANSWER:* | a | | *REFERENCES:* | 1.3 Biodiversity and the Tree of Life | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.3 - Classify the three domains of species identified by biologists. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 43. A researcher in a lab finds a microscopic organism that is a producer. Populations of this organism are found in extreme environments (e.g., hot springs). The researcher will correctly identify this organism as belonging to the domain \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​Amoeba | |  | b. | ​Eukarya | |  | c. | ​Archaea | |  | d. | ​Bacteria | |  | e. | ​Animalia |  |  |  | | --- | --- | | *ANSWER:* | c | | *REFERENCES:* | 1.3 Biodiversity and the Tree of Life | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.3 - Classify the three domains of species identified by biologists. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 44. A student encounters an organism that resembles a plant and whose cells contain a nucleus. The organism is most likely classified as a(n) \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​Bacteria | |  | b. | ​Archaea | |  | c. | ​Eukarya | |  | d. | ​Amoeba | |  | e. | ​Animalia |  |  |  | | --- | --- | | *ANSWER:* | c | | *REFERENCES:* | 1.3 Biodiversity and the Tree of Life | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.3 - Classify the three domains of species identified by biologists. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 45. The algae used to make sushi rolls are classified as \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​bacteria | |  | b. | ​animals | |  | c. | ​plants | |  | d. | ​fungi | |  | e. | ​protists |  |  |  | | --- | --- | | *ANSWER:* | e | | *REFERENCES:* | 1.3 Biodiversity and the Tree of Life | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.3 - Classify the three domains of species identified by biologists. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 46. The pages of your textbook consist mainly of material made by multicellular, photosynthetic organisms that function as producers in ecosystems. These organisms belong to the kingdom \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​Fungi | |  | b. | ​Bacteria | |  | c. | ​Protist | |  | d. | ​Plantae | |  | e. | ​Animalia |  |  |  | | --- | --- | | *ANSWER:* | d | | *REFERENCES:* | 1.3 Biodiversity and the Tree of Life | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.3 - Classify the three domains of species identified by biologists. | | *KEYWORDS:* | Bloom’s: Understand | |

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| 47. Shitake mushrooms are decomposers that break down biological molecules from dead organisms. These organisms belong to the \_\_\_\_ kingdom.​   |  |  |  | | --- | --- | --- | |  | a. | ​Protist | |  | b. | ​Animalia | |  | c. | Bacteria​ | |  | d. | ​Fungi | |  | e. | ​Plantae |  |  |  | | --- | --- | | *ANSWER:* | d | | *REFERENCES:* | 1.3 Biodiversity and the Tree of Life | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.3 - Classify the three domains of species identified by biologists. | | *KEYWORDS:* | Bloom’s: Understand | |

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| 48. Cats, dogs, and fish are consumers that have the ability to move actively from one place to another. These organisms belong to the \_\_\_\_ kingdom.​   |  |  |  | | --- | --- | --- | |  | a. | ​Animalia | |  | b. | ​Bacteria | |  | c. | ​Protist | |  | d. | ​Fungi | |  | e. | ​Plantae |  |  |  | | --- | --- | | *ANSWER:* | a | | *REFERENCES:* | 1.3 Biodiversity and the Tree of Life | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.3 - Classify the three domains of species identified by biologists. | | *KEYWORDS:* | Bloom’s: Understand | |

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| 49. It is through \_\_\_\_ that we further our knowledge of living things.​   |  |  |  | | --- | --- | --- | |  | a. | ​ideologies | |  | b. | ​biological research | |  | c. | ​logic | |  | d. | ​ethics | |  | e. | ​philosophy |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.1 - Discuss the importance of basic research and applied research. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 50. The observations you make and experimental data you collect in your biology laboratory class are examples of \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​biological research | |  | b. | ​statistical analysis | |  | c. | ​hypothesis building | |  | d. | ​biological dogma | |  | e. | ​model systems |  |  |  | | --- | --- | | *ANSWER:* | a | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.1 - Discuss the importance of basic research and applied research. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 51. A biologist who searches for explanations about natural phenomena solely to satisfy her curiosity and advance our collective knowledge of living systems practices \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​artificial science | |  | b. | ​basic research | |  | c. | ​general research | |  | d. | ​applied research | |  | e. | ​simple research |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.1 - Discuss the importance of basic research and applied research. | | *KEYWORDS:* | Bloom’s: Understand | |

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| 52. Applied researchers conduct their work to \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​answer all questions | |  | b. | ​prove hypotheses | |  | c. | ​solve any problem they face | |  | d. | ​solve specific practical problems | |  | e. | ​advance our collective knowledge of living systems |  |  |  | | --- | --- | | *ANSWER:* | d | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.1 - Discuss the importance of basic research and applied research. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 53. When conducting descriptive research, a scientist primarily uses \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​experiments | |  | b. | ​experimental data | |  | c. | ​control data | |  | d. | ​observational data | |  | e. | ​speculation |  |  |  | | --- | --- | | *ANSWER:* | d | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.1 - Discuss the importance of basic research and applied research. | | *KEYWORDS:* | Bloom’s: Understand | |

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| 54. An experimental approach in which scientists make observations about the natural world, develop tentative explanations about what they observe, and then test those explanations by collecting more information, is referred to as \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​science | |  | b. | ​the biological method | |  | c. | ​education | |  | d. | ​the scientific method | |  | e. | ​biology |  |  |  | | --- | --- | | *ANSWER:* | d | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.2 - Summarize the scientific method. | | *KEYWORDS:* | Bloom’s: Understand | |

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| 55. You are studying an ecosystem on your campus. After a solid base of carefully observed and described facts, your next step would be to \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​make more observations | |  | b. | ​make a hypothesis | |  | c. | ​share your data with others | |  | d. | ​wait for instructions | |  | e. | ​design an experiment |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.2 - Summarize the scientific method. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 56. What are the correct order of the basic steps of the scientific method?​   |  |  |  | | --- | --- | --- | |  | a. | ​observe --> hypothesize--> predict --> experiment --> interpret | |  | b. | ​predict --> hypothesize --> experiment --> observe --> interpret | |  | c. | ​hypothesize --> observe --> predict --> experiment --> interpret | |  | d. | ​observe --> predict --> hypothesize --> experiment --> interpret | |  | e. | ​hypothesize --> predict --> experiment --> observe --> interpret |  |  |  | | --- | --- | | *ANSWER:* | a | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.2 - Summarize the scientific method. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 57. Statements about what a researcher expects to happen to one variable if another variable changes are called \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​predictions | |  | b. | ​hypotheses | |  | c. | ​experimental variables | |  | d. | ​theories | |  | e. | ​scientific research |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.2 - Summarize the scientific method. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 58. When a student manipulates a system under study, he or she is collecting \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​factual data | |  | b. | ​analytical data | |  | c. | ​experimental data | |  | d. | ​empirical data | |  | e. | ​observational data |  |  |  | | --- | --- | | *ANSWER:* | c | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.3 - Differentiate between observational data and experimental data. | | *KEYWORDS:* | Bloom’s: Understand | |

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| 59. In order to determine where a protein is expressed within a cell, a researcher tags the protein with a fluorescent label, and then views the cell using a fluorescent microscope. The location of the protein within the cell as determined by the researcher is considered the \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​experimental data | |  | b. | ​predicted data | |  | c. | ​observed data | |  | d. | ​replicate data | |  | e. | ​experimental variable |  |  |  | | --- | --- | | *ANSWER:* | c | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.3 - Differentiate between observational data and experimental data. | | *KEYWORDS:* | Bloom’s: Analyze | |

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| 60. Scientists want to determine whether chemical X, a component of fertilizer, is harmful to fish.  They treat fish in the laboratory with increasing amounts of the chemical for one week and then measure their viability. Fish that are not treated with chemical X are considered \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​experimental data | |  | b. | ​controls | |  | c. | ​replicates | |  | d. | ​experimental variables | |  | e. | ​the null hypothesis |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.4 - Demonstrate the use of hypotheses, controls, and experimental variables. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 61. Scientists want to determine whether chemical X, a component of fertilizer, is harmful to fish.  They treat fish in the laboratory with increasing amounts of the chemical for one week and then measure their viability. What is the experimental variable for this experiment?​   |  |  |  | | --- | --- | --- | |  | a. | ​chemical X | |  | b. | fish​ | |  | c. | ​river | |  | d. | ​farming | |  | e. | ​water |  |  |  | | --- | --- | | *ANSWER:* | a | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.4 - Demonstrate the use of hypotheses, controls, and experimental variables. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 62. Scientists want to determine whether chemical X, a component of fertilizer, is harmful to fish.  They treat fish in the laboratory with increasing amounts of the chemical for one week and then measure their viability. When researchers designed this experiment, they wrote "chemical X is toxic to fish" in their lab notebook. This statement is a(n) \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​interpretation | |  | b. | ​prediction | |  | c. | ​hypothesis | |  | d. | ​result | |  | e. | ​theory |  |  |  | | --- | --- | | *ANSWER:* | c | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.4 - Demonstrate the use of hypotheses, controls, and experimental variables. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 63. Scientists want to determine whether chemical X, a component of fertilizer, is harmful to fish.  They treat fish in the laboratory with increasing amounts of the chemical for one week and then measure their viability. When researchers designed this experiment, they wrote "If chemical X is toxic, the fish will begin to look sick and die." This statement is a(n) \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​interpretation | |  | b. | ​theory | |  | c. | ​hypothesis | |  | d. | ​result | |  | e. | ​prediction |  |  |  | | --- | --- | | *ANSWER:* | e | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.4 - Demonstrate the use of hypotheses, controls, and experimental variables. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 64. Scientists structure hypotheses in such a way that if they are wrong, they will be able to demonstrate it is wrong. This is the principle of \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​falsifiability | |  | b. | ​the null hypothesis | |  | c. | ​fallibility | |  | d. | ​hierarchy | |  | e. | ​errors |  |  |  | | --- | --- | | *ANSWER:* | a | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.5 - Illustrate how researchers use null hypotheses. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 65. In the field of \_\_\_\_, researchers determine how multiple proteins interact with each other.​   |  |  |  | | --- | --- | --- | |  | a. | ​systematics | |  | b. | ​genomics | |  | c. | ​proteomics | |  | d. | ​microbiology | |  | e. | ​bioinformatics |  |  |  | | --- | --- | | *ANSWER:* | c | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.1.4.6 - Describe how molecular techniques have revolutionized biological research. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 66. Scientists that focus on small individual parts of a living system are using a(n) \_\_\_\_ approach.​   |  |  |  | | --- | --- | --- | |  | a. | ​systemic | |  | b. | ​microbiological | |  | c. | ​reductionist | |  | d. | ​molecular | |  | e. | ​bioinformatics |  |  |  | | --- | --- | | *ANSWER:* | c | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.1.4.6 - Describe how molecular techniques have revolutionized biological research. | | *KEYWORDS:* | Bloom’s: Understand | |

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| 67. Within an organism, all cells have the same \_\_\_\_, whereas different cell types contain different \_\_\_\_.​   |  |  |  | | --- | --- | --- | |  | a. | ​RNA; genes | |  | b. | ​protein; RNA | |  | c. | ​genes; proteins | |  | d. | ​RNA; protein | |  | e. | ​proteins; genes |  |  |  | | --- | --- | | *ANSWER:* | c | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.1.4.6 - Describe how molecular techniques have revolutionized biological research. | | *KEYWORDS:* | Bloom’s: Understand | |

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| 68. Which research topic would fall within the area of systems biology?​   |  |  |  | | --- | --- | --- | |  | a. | ​looking at the interaction of Gene X and Gene Y in cancer cells | |  | b. | ​understanding how stress hormones affect the organs in the human body | |  | c. | ​designing a new valve for a heart | |  | d. | ​finding a novel receptor for a known hormone | |  | e. | ​determining the bacteria levels in Lake Michigan before and after a rainfall |  |  |  | | --- | --- | | *ANSWER:* | b | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Multiple Choice | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.1.4.6 - Describe how molecular techniques have revolutionized biological research. | | *KEYWORDS:* | Bloom’s: Analyze | |

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| **Matching** |

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| *Match the statement highlighting research on an emergent property to the biological organization level to which it applies.*​   |  |  | | --- | --- | | a. | ​biosphere | | b. | ​community | | c. | ​ecosystem | | d. | ​multicellular organism | | e. | ​population |  |  |  | | --- | --- | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Matching | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.1 - Describe the different levels of hierarchy through which the organization of life extends. | | *KEYWORDS:* | Bloom’s: Evaluate | |

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| 69. ​determining the percentage of mosquitoes living in the forest as compared to other insect types   |  |  | | --- | --- | | *ANSWER:* | b | |

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| 70. ​understanding how the conversion of farmland into suburbs affects animal behavior   |  |  | | --- | --- | | *ANSWER:* | c | |

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| 71. ​determining the mortality rate of women with breast cancer   |  |  | | --- | --- | | *ANSWER:* | e | |

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| 72. ​determining how human and animal behaviors affect greenhouse gases   |  |  | | --- | --- | | *ANSWER:* | a | |

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| 73. ​understanding the mechanisms involved in human learning   |  |  | | --- | --- | | *ANSWER:* | d | |

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| Match the descriptions of the organisms with the appropriate hierarchical category.​   |  |  | | --- | --- | | a. | ​Domain Bacteria | | b. | ​Domain Archaea | | c. | ​Domain Eukarya | | d. | ​Protist | | e. | ​Kingdom Plantae | | f. | ​Kingdom Fungi | | g. | ​Kingdom Animalia |  |  |  | | --- | --- | | *REFERENCES:* | 1.3 Biodiversity and the Tree of Life | | *QUESTION TYPE:* | Matching | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.1 - Compare the hierarchical categories used in traditional classification. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 74. ​one of the three highest levels of organization, comprised of unicellular and multicellular organisms that contain a nucleus   |  |  | | --- | --- | | *ANSWER:* | c | |

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| 75. ​eukaryotic, multicellular, organisms that function as producers   |  |  | | --- | --- | | *ANSWER:* | e | |

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| 76. ​prokaryotic, unicellular organisms with unique structural molecules and mechanisms of photosynthesis   |  |  | | --- | --- | | *ANSWER:* | a | |

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| 77. ​eukaryotic, multicellular, organisms that function as consumers and have the ability to move   |  |  | | --- | --- | | *ANSWER:* | g | |

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| 78. ​both unicellular and multicellular species that can be producers, consumers and decomposers   |  |  | | --- | --- | | *ANSWER:* | d | |

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| 79. ​prokaryotic, unicellular organisms that inhabit extreme environments   |  |  | | --- | --- | | *ANSWER:* | b | |

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| 80. ​both unicellular and multicellular species that live as decomposers but do not carry out photosynthesis   |  |  | | --- | --- | | *ANSWER:* | f | |

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| ​*Read the description of an experiment below, then match the appropriate term to the relevant part of the experiment.*  ​  Previously, an anticholesterol drug was reported by a few patients as potentially alleviating the symptoms of Alzheimer's disease.  Hypothesis: Drug X will alleviate signs of Alzheimer's disease.  Experimental design: Patients with Alzheimer's disease are split into two groups: one group will receive Drug X and the other will receive a placebo (sugar pill).  Patients: 400 patients with Alzheimer's disease were recruited for this study and arbitrarily assigned to a treatment group.  Treatment: Patients were treated for 90 days with either Drug X or placebo.  Study measurements: Patients were assessed using a memory test before and after the treatment period.  Results: Patients given Drug X scored higher on the memory test.  Conclusions: Drug X can enhance memory in patients suffering from Alzheimer's disease.   |  |  | | --- | --- | | a. | ​experimental variable | | b. | ​control | | c. | ​replicates | | d. | ​observed data | | e. | ​experimental data |  |  |  | | --- | --- | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Matching | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.4 - Demonstrate the use of hypotheses, controls, and experimental variables. | | *KEYWORDS:* | Bloom’s: Evaluate | |

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| 81. ​400 patients with Alzheimer's disease   |  |  | | --- | --- | | *ANSWER:* | c | |

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| 82. ​patients treated with placebo   |  |  | | --- | --- | | *ANSWER:* | b | |

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| 83. ​memory test scores   |  |  | | --- | --- | | *ANSWER:* | e | |

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| 84. ​Drug X   |  |  | | --- | --- | | *ANSWER:* | a | |

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| 85. ​patients on anticholesterol drug   |  |  | | --- | --- | | *ANSWER:* | d | |

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| **Subjective Short Answer** |

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| 86. You are at a stage in your research in which you must design an experiment to test your hypothesis. Which factors must you include to ensure that you obtain valid data?​   |  |  | | --- | --- | | *ANSWER:* | Any experimental design must include a control group, an experimental group or variable, and must include replicates to validate data. | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Subjective Short Answer | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.4 - Demonstrate the use of hypotheses, controls, and experimental variables. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 87. Explain the need for a null hypothesis, especially in ecology and evolution. What does a null hypothesis accomplish?   |  |  | | --- | --- | | *ANSWER:* | A null hypothesis is a statement of what a researcher would see if the hypothesis being tested is wrong. Ecologists usually tackle systems that are too complex to control, so a null hypothesis anticipates, or provides, an alternative hypothesis to answer questions. | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Subjective Short Answer | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01. 4.5 - Illustrate how researchers use null hypotheses. | | *KEYWORDS:* | Bloom’s: Apply | |

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| 88. Why do scientists use model organisms?   |  |  | | --- | --- | | *ANSWER:* | Model organisms have rapid development, short life cycles, and small adult sizes, making them ideal to work with in the laboratory setting. Many forms of life share similar molecules, structures, and processes; thus, research on these small and often simple organisms provides insights into biological processes that operate in larger and more complex ones.​ | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Subjective Short Answer | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.4 - Discuss the importance of model organisms in research. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 89. List one Darwin and Wallace's observations and conclusions explaining biological evolution.   |  |  | | --- | --- | | *ANSWER:* | 1. Most organisms can produce numerous offspring, but environmental factors limit the number that actually survive and reproduce.  2. Heritable variations allow some individuals to compete more successfully for space, food, and mates.  3. These successful individuals somehow pass the favorable characteristics to their offspring.  4. As a result, the favorable traits become more common in the next generation, and less successful traits become less common. | | *REFERENCES:* | 1.2 Biological Evolution | | *QUESTION TYPE:* | Subjective Short Answer | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.2.1 - Outline the conclusions drawn by Darwin and Wallace to explain biological evolution. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 90. Scientific theories are of fundamental importance in science. Explain the difference between the term "theory" as employed in science versus "theory" as employed in everyday language.   |  |  | | --- | --- | | *ANSWER:* | Scientific theories have withstood the test of time and have been extensively confirmed by repeated experiments. The term as used in science has validity whereas in everyday context it takes the form of an opinion or a guess. | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Subjective Short Answer | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.7 - Explain the meaning of a scientific theory. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 91. Populations can be described in terms of their diversity and stability.​   |  |  | | --- | --- | | *ANSWER:* | False - Communities | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Modified True / False | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.1 - Describe the different levels of hierarchy through which the organization of life extends. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 92. The process by which RNA is converted into protein is called transcription.   |  |  | | --- | --- | | *ANSWER:* | False - translation | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Modified True / False | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.2 - Explain the importance of deoxyribonucleic acid. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 93. The process by which producers harness electromagnetic energy and convert it into chemical energy is cellular respiration.   |  |  | | --- | --- | | *ANSWER:* | False - photosynthesis | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Modified True / False | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.1.3 - Describe the metabolic processes of photosynthesis and cellular respiration. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 94. Although Darwin and Wallace understood the central importance of heritability among organisms to the process of evolution, they could not explain how new variations arose or how they were passed to the next generation.   |  |  | | --- | --- | | *ANSWER:* | False - variability | | *REFERENCES:* | 1.2 Biological Evolution | | *QUESTION TYPE:* | Modified True / False | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.2.1 - Outline the conclusions drawn by Darwin and Wallace to explain biological evolution. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 95. The example of an adaptation provided by the rock pocket mice illustrates the observation that genetic differences often develop between individuals.   |  |  | | --- | --- | | *ANSWER:* | False - populations | | *REFERENCES:* | 1.2 Biological Evolution | | *QUESTION TYPE:* | Modified True / False | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.2.3 - Explain how organisms benefit from adaptations. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 96. Internal body temperature in humans is regulated primarily by behavioral mechanisms.   |  |  | | --- | --- | | *ANSWER:* | False - homeostatic | | *REFERENCES:* | 1.2 Biological Evolution | | *QUESTION TYPE:* | Modified True / False | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.2.3 - Explain how organisms benefit from adaptations. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 97. Favorable mutations may produce adaptations.   |  |  | | --- | --- | | *ANSWER:* | True | | *REFERENCES:* | 1.2 Biological Evolution | | *QUESTION TYPE:* | Modified True / False | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.2.3 - Explain how organisms benefit from adaptations. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 98. Protists do not constitute a kingdom because they do not share a unique common ancestor.   |  |  | | --- | --- | | *ANSWER:* | True | | *REFERENCES:* | 1.3 Biodiversity and the Tree of Life | | *QUESTION TYPE:* | Modified True / False | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.1 - Compare the hierarchical categories used in traditional classification. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 99. Much of our understanding of how large organisms respond to environmental variation is based on observations of model species.   |  |  | | --- | --- | | *ANSWER:* | True | | *REFERENCES:* | 1.1 What Is Life? Characteristics of Living Organisms | | *QUESTION TYPE:* | Modified True / False | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.3.4 - Discuss the importance of model organisms in research. | | *KEYWORDS:* | Bloom’s: Remember | |

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| 100. Researchers who study the impact of nitrogen-based fertilizers on increasing crop growth use applied research methods.   |  |  | | --- | --- | | *ANSWER:* | True | | *REFERENCES:* | 1.4 Biological Research | | *QUESTION TYPE:* | Modified True / False | | *LEARNING OBJECTIVES:* | DYNS.RUSS.17.01.4.1 - Discuss the importance of basic research and applied research. | | *KEYWORDS:* | Bloom’s: Analyze | |