FOCUS ASSESSMENTS

1ST ASSESSMENT

Benchmark: SC.912.L.14.1

1. The goal of scientific experimentation is to increase what we know about how the natural world operates. If a hypothesis is tested repeatedly by a wide variety of experimental approaches in many scientific investigations and cannot be proved false, then the hypothesis could be called a

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | conclusion. | |  | **B.** | fact. | |  | **C.** | rule. | |  | **D.** | theory. | |

|  |
| --- |
| 1. In the 1600s, advances in microscopy led to the development of cell theory. Which of the following statements is part of the cell theory? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | All cells require water and oxygen to survive. | |  | **B.** | All living things are made of one or more cells. | |  | **C.** | All cells have organelles with specialized functions. | |  | **D.** | All living things rely on several different types of cells. | |

|  |
| --- |
| 1. In order to function, all living things require which of the following? |
|  |

1. In the 1830s, Theodor Schwann showed that the mature tissues of animals were traceable to embryonic cells. Which of the following statements of cell theory does this provide evidence for?

|  |
| --- |
|  |
|  |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | All living things are made from cells. | |  | **B.** | Cells are the basic units of structure and function in an organism. | |  | **C.** | All cells come from preexisting cells. | |  | **D.** | Each cell has a specific design and purpose. | |

1. Cell theory is a result of the contributions of several different scientists, and applies to all living things. Which of the following explains why cell theory will not ever become the law of cells?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Cells of different organisms are so diverse that it is impossible to come up with a law that would apply to all of them. | |  | **B.** | Because cells undergo change as mutations occur within them, developing anything beyond a cell theory would be impractical. | |  | **C.** | Scientific theories are well-tested explanations, while laws are well-tested descriptions of natural phenomena; one cannot become the other. | |  | **D.** | Scientific theories can only become laws if all possible cases can be tested; it would be impossible to test all living things to see if they have cells. | |

Benchmark: SC.912.L.14.1

2ND ASSESSMENT

1. According to cell theory, which of the following best describes the role of cells in living organisms?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Cells join together to form multicellular organisms. | |  | **B.** | Cells are the basic operating units of living organisms. | |  | **C.** | Cells make up the soft portions of tissues in living organisms. | |  | **D.** | Cells are responsible for coordinating activities in multicellular organisms. | |

1. Which of the following best describes a way in which all living organisms are similar?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | They all need oxygen to survive. | |  | **B.** | They are all made of at least one cell. | |  | **C.** | They are all adapted to survive in their environment. | |  | **D.** | They all need energy from other organisms to survive. | |

|  |
| --- |
| 1. According to modern cell theory, how do new cells develop? |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | |  | **A.** | Cells come from pre-existing cells through cell division. | |  | **B.** | The original cell dies and leaves a new one in its place. | |  | **C.** | Cells form by free-cell formation, similar to how crystals are formed. | |  | **D.** | A membrane forms around DNA that is released from a parent cell, and the DNA contains the information needed to produce organelles. | |

|  |
| --- |
|  |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Microscopes were very primitive in 1665, and no real progress was made on improving them until modern microscopes appeared in the early 1830s. | |  | **B.** | A great multitude of organisms had to be examined and found to be made of cells before the statement that all living things are made of cells could be trusted. | |  | **C.** | When Hooke first proposed that all living things are made of cells, the public was so opposed to the idea that no one dared bring it up again for several generations. | |  | **D.** | Scientists at the time were divided on whether or not cells were living things, and it took generations of debate after the evidence was gathered for a majority to win the fight. | |

1. Robert Hooke saw the first cork cells under a microscope in 1665, but it wasn't until 1839 that cell theory gained the support it needed to be accepted. Why did it take 174 years for cell theory to become widely accepted?
2. When scientists set out to test a hypothesis, it is often most practical to try to prove the hypothesis false rather than to prove it is true in all cases. Scientists place great confidence in cell theory, yet it has not been tested in every living thing on the planet.  
     
   What piece of evidence would cause scientists to decide that cell theory would need to be revised?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | An organism was found with tissues made of something other than cells. | |  | **B.** | A cell was found that could continue to divide and reproduce indefinitely. | |  | **C.** | An animal cell was found that could harness solar energy as plant cells do. | |  | **D.** | Cells were found that used something other than DNA as hereditary material. | |

Benchmark: SC.912.L.14.3

1ST ASSESSMENT

1. Cell membranes are primarily composed of a double layer of phospholipids. Why are phospholipids particularly well suited to serving as membranes?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | They can be used to metabolize starches. | |  | **B.** | They create a selectively permeable membrane. | |  | **C.** | They can work together to perform chemiosmosis. | |  | **D.** | They form a membrane that is impermeable to chemicals. | |

1. Which statement correctly explains a difference between the cells of prokaryotes and the cells of eukaryotes?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Eukaryotic cells reproduce using DNA; prokaryotic cells use RNA only to reproduce. | |  | **B.** | Eukaryotic cells have fewer distinct parts than prokaryotic cells because they are less evolved. | |  | **C.** | Eukaryotic cells do not have cell walls or vacuoles; prokaryotic cells have both of these features. | |  | **D.** | Eukaryotic cells have a nucleus and membrane-bound organelles; prokaryotic cells lack these features. | |

1. Which of the following best explains the difference between passive and active transport within cell membranes?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Passive transport does not require chemical energy to occur; active transport requires energy, such as ATP. | |  | **B.** | Passive transport happens only in the presence of water, while active transport does not require water to occur. | |  | **C.** | Passive transport moves larger substances through the cell membrane; smaller molecules must move by active transport. | |  | **D.** | Passive transport allows whole particles to move through the membrane, while active transport breaks particles down before they can pass through. | |

1. Which of the following statements correctly explains the role of lysosomes within a cell?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The lysosome prepares fats and lipids for transport throughout the cell by sorting and encasing them. | |  | **B.** | The lysosome uses oxygen to convert sugar into chemical energy and also controls the metabolism of the cell. | |  | **C.** | The lysosome breaks down molecules that are not needed within the cell and returns some of the products of digestion to the cell for later use. | |  | **D.** | The lysosome isolates water and other molecular compounds and stores them so they can be used later by the cell, or expels them as waste products. | |

1. Which of the following structures would be present in a plant cell, but not in an animal cell?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | nucleus, mitochondria, chloroplasts | |  | **B.** | chloroplasts, cell wall, central vacuole | |  | **C.** | cell wall, mitochondria, Golgi apparatus | |  | **D.** | central vacuole, Golgi apparatus, nucleus | |

Benchmark: SC.912.L.14.3

2ND ASSESSMENT

1. Which of the following statements best describes the nucleus of a cell?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The nucleus has a membrane that allows for active transport of RNA and proteins. | |  | **B.** | The nucleus exports lysosomes which direct amino acid production within the cell. | |  | **C.** | The nucleus is responsible for supplying the cell with chemical energy in the form of ATP. | |  | **D.** | The nucleus contains some of the genetic material in a cell; the majority is contained in the cytoplasm. | |

1. Which of the following is a structure that is present in both eukaryotic and prokaryotic cells?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Golgi complex | |  | **B.** | plasma membrane | |  | **C.** | nucleus | |  | **D.** | vacuole | |

1. Which of the following statements best describes the function of the lipid bilayer in the cell membrane?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Lipids attract water on both sides of the bilayer. | |  | **B.** | Lipid-soluble material cannot pass through a lipid bilayer. | |  | **C.** | Proteins can only transport uncharged particles through the lipid bilayer. | |  | **D.** | Proteins distributed along the bilayer can allow water to pass through the membrane. | |

1. Which of the following statements correctly explains the function of the Golgi apparatus within a cell?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The Golgi apparatus uses oxygen to convert sugar into chemical energy and also controls the metabolism of the cell. | |  | **B.** | The Golgi apparatus contains most of the genetic material within the cell and is responsible for gene expression and DNA replication when the cell divides. | |  | **C.** | The Golgi apparatus prepares new macromolecules such as fats and lipids by sorting and encasing them before sending them to the correct destination within a cell. | |  | **D.** | The Golgi apparatus breaks down molecules that are not needed within the cell, and returns some of the products of digestion to the cell for use in building new cell parts. | |

|  |
| --- |
| 1. Which of the following is a characteristic shared by both plant and animal cells? |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | |  | **A.** | chloroplasts | |  | **B.** | large central vacuole | |  | **C.** | mitochondria | |  | **D.** | rigid cell walls | |

Benchmark: SC.912.L.14.7

1ST ASSESSMENT

1. When Mr. Williams was mowing the yard, he accidentally hit a young tree with the mower and scraped off a large section of bark all the way down to the wood. Within a few days, leaves on several of the branches began to die. What is the most likely cause of the leaves dying?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The leaves were diseased already, and they died coincidentally when the bark was injured. | |  | **B.** | The wood was weakened by the injury and could no longer support the weight of the branches above it. | |  | **C.** | The bark contained the xylem and phloem tubes and, once they were damaged, they could not feed the leaves. | |  | **D.** | The vascular tissue under the bark was damaged and could no longer transport water and nutrients to the leaves. | |

1. Meristem cells in plants are most similar to which type of animal cells?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | embryonic stem cells | |  | **B.** | macrophage cells | |  | **C.** | motor neuron cells | |  | **D.** | red blood cells | |

|  |
| --- |
| 1. A plant, which sprouted from a seed, has a genetic mutation that keeps it from producing stomata. Is it likely that this plant will live and grow? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Yes, because it will absorb carbon dioxide for photosynthesis through its roots. | |  | **B.** | Yes, because it only needs stomata to decrease water loss in very hot weather. | |  | **C.** | No, because it will not be able to move sugars to its roots without stomata. | |  | **D.** | No, because it will not be able to carry out photosynthesis without stomata. | |

|  |
| --- |
| 1. Which of the following is responsible for the exchange of gases between the plant and the atmosphere during photosynthesis? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | primary and secondary meristems | |  | **B.** | xylem and phloem | |  | **C.** | guard cells and stomata | |  | **D.** | cambium and epidermis | |

1. In some flowers, the ovary is hidden deep within the base of the flower while the pollen is held up in the air, often near a source of nectar. How is this general design helpful to the plant?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | It keeps the pollen dry by exposing it to air while keeping the ovary moist. | |  | **B.** | It makes it possible for seeds to develop both in the ovary and in the pollen grains. | |  | **C.** | It encourages animals to carry pollen for cross-fertilization while leaving the ovary alone. | |  | **D.** | It allows the plant to self-fertilize more easily since the pollen can drop into the ovary. | |

Benchmark: SC.912.L.14.7

2ND ASSESSMENT

1. Which of the following would be most likely to encourage side branches to begin growing along the main stem of a plant?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Pinching off the top bud to remove the apical meristem. | |  | **B.** | Watering the plant heavily to increase the rate of photosynthesis. | |  | **C.** | Adding root hormone to encourage root growth and nutrient absorption. | |  | **D.** | Removing all the leaves along the main stem to give the side branches more light. | |

|  |
| --- |
| 1. When grass is cut with a lawn mower, it gives off a distinct aroma. Why does newly-mowed grass smell a little bit sweet? |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | |  | **A.** | Sugars are produced when the cut leaves of grass begin to decay in sunlight. | |  | **B.** | Sugars stored in the roots are sent to repair the damage to the grass leaves. | |  | **C.** | When the grass leaves are damaged, some of the sugar produced in the leaves escapes. | |  | **D.** | When grass leaves are cut, a small amount of sugar is produced at the site of injury to plug the phloem. | |

1. Many plants have leaves that are quite thin in cross-section. For instance, a live oak leaf might be 6 centimeters (cm) long and 3 cm wide, but only 2 or 3 millimeters thick. How does having thin leaves benefit plants?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The thin leaves allow light to reach the photosynthetic cells within the leaf. | |  | **B.** | Thick leaves are more likely to droop, making photosynthesis more difficult. | |  | **C.** | Thin, flexible leaves are less likely to be damaged by high winds than thick leaves. | |  | **D.** | Water can be absorbed from the air more easily through thin leaves than thick leaves. | |

1. In plants, water can escape through the leaves by the process of transpiration. Which of the following structures are involved in transpiration?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | xylem, phloem, stomata | |  | **B.** | root hairs, xylem, stomata | |  | **C.** | phloem, root hairs, xylem | |  | **D.** | stomata, phloem, root hairs | |

1. Some plants produce fruit which contains their seeds. How does producing fruit benefit the plant?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The fruit keeps the seeds from being damaged when they fall from the plant. | |  | **B.** | Animals often carry the seeds away from the parent plant when they eat the fruit. | |  | **C.** | Fewer seeds get eaten by animals if they are hidden inside the fruit, where they can't be seen. | |  | **D.** | Seeds contained in fruit need the extra nutrients from the surrounding fruit to start growing. | |

Benchmark: SC.912.L.15.13

1ST ASSESSMENT

1. A subspecies is a different group within a species that is able to interbreed but is usually prevented from doing so by geographical isolation. The Florida Panther is a subspecies of the American Cougar, and there are very few (less than 100) remaining in its population. When populations get this small, inbreeding results in low genetic diversity.

The result is fewer beneficial adaptations that might help the animals survive environmental change, as well as an increase in the occurrence of genetic abnormalities. How can this subspecies of cougar be saved from extinction?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Keep the existing population in a controlled environment until their population increases. | |  | **B.** | Increase the genetic diversity by introducing other subspecies of cougar to the population. | |  | **C.** | Relocate remaining Florida Panthers to the larger populations of cougar subspecies in Texas and California. | |  | **D.** | Remove all the panthers with genetic abnormalities from the environment and leave only the healthy ones. | |

1. Speciation is the process by which a new species is formed. Which of the following conditions will most likely lead to the formation of a new species?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | There is a limited population size of a species. | |  | **B.** | There is little struggle to survive within the population of a species. | |  | **C.** | Individuals within the population of a species undergo random mating. | |  | **D.** | There are no geographical barriers that restrict movement of the population of a species. | |

1. Genetic drift results in a change in the gene pool of a population, and can be described as a mechanism of evolution. How does genetic drift change a population's gene pool?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Individuals develop adaptations and pass them on to their offspring. | |  | **B.** | It causes random changes in allele frequencies in small populations. | |  | **C.** | Individuals at one end of a population growth curve have higher fitness. | |  | **D.** | It causes mutations in the DNA, which lead to a difference in the survival ability of organisms. | |

1. Natural selection is a process that results in change within a species over time. Which of the following is NOT a condition required for natural selection to result in speciation?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | overpopulation of the species | |  | **B.** | genetic equilibrium of the species | |  | **C.** | genetic variation within the species | |  | **D.** | competition for survival within the species | |

1. In order for a new species to arise, inherited variations must make organisms more fit to survive in their environment. Which two processes within a population can lead to inherited variation?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | genetic drift and gene flow | |  | **B.** | natural selection and evolution | |  | **C.** | stabilizing and disruptive selection | |  | **D.** | mutation and genetic recombination through sexual reproduction | |

Benchmark: SC.912.L.15.13

2ND ASSESSMENT

|  |
| --- |
| 1. Florida Panthers are an endangered species. Because the remaining population of Florida Panthers is quite small and fairly closely related, there are concerns that there is not enough genetic variability within the population. How does greater genetic variability within the population affect the Florida Panthers' reproductive success? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | It reduces the need to keep Florida Panthers alive in captivity. | |  | **B.** | It increases the rate of mutations that create helpful adaptations. | |  | **C.** | It reduces the expansion of harmful traits that result from inbreeding. | |  | **D.** | It increases the chance that the Florida Panther will be able to survive sea level rise. | |

1. Tuberculosis is a disease caused by a bacterium and can often be fatal. For several decades, antibiotics were very successful in killing tuberculosis bacteria, but now strains of the bacteria have developed that can only be killed when treated for long periods of time with multiple types of antibiotics. Why have the antibiotics become less effective against tuberculosis?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The antibiotics have a tendency to become weaker over time as they accumulate mutations. | |  | **B.** | Those bacteria that have once come in contact with antibiotics learn to avoid them and are difficult to kill. | |  | **C.** | Human immune systems have adapted to the presence of bacteria, causing antibiotics to be less effective. | |  | **D.** | Any bacteria with mutations protecting them from the antibiotics were more likely to live and pass on the mutations. | |

1. A small population of lizards lives on an island, while a much larger population of the same species of lizard lives in a similar habitat on the mainland. Most of the lizards are solid green, but about 5% of them have an allele that gives them brown speckles.

Which of the following is the BEST explanation for why the island population would lose the allele   
 for brown speckles more quickly than the mainland population?

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | In the small population, only a few lizards would have to lose their speckles for the allele to disappear. | |  | **B.** | Speckled lizards would have more difficulty finding speckled mates on the island since there are fewer lizards. | |  | **C.** | The small population has fewer lizards with the speckled allele, so the possibility of not passing it on increases. | |  | **D.** | It is more likely that the habitat will change on the island than on the mainland, favoring the solid allele over the speckled one. | |

|  |
| --- |
| 1. In which of the following scenarios will natural selection most likely occur? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Very little genetic variation is present within the species. | |  | **B.** | Harsh environmental conditions result in competition for survival. | |  | **C.** | No reproductive isolation barriers exist within a species living in an area. | |  | **D.** | A geographical area has plenty of food to support all individuals within the species living in that area. | |

1. Which of the following best describes how independent assortment results in inherited variations within a species and how it contributes to evolution?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Independent assortment results from the binary fission of a single cell and causes mutations that can be beneficial or harmful to a species. | |  | **B.** | Independent assortment occurs during mitosis and causes uncontrolled cell division which is harmful to a species. | |  | **C.** | Independent assortment results from the copying of DNA during cell division and causes variations that are sometimes beneficial to a species. | |  | **D.** | Independent assortment occurs when chromosomes separate during meiosis and causes variations that can be beneficial or harmful to a species. | |

SC.912.L.15.1:

1ST ASSESSMENT ASSESSMENT

1. Which of the following correctly describes the general trend in hominid evolution?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | larger body size, broad forehead, smaller brains | |  | **B.** | increase in brain capacity, bipedalism, use of tools | |  | **C.** | thickening of the skull, protruding teeth, organized hunting | |  | **D.** | large canine teeth, small skulls, diet of coarse plant material | |

1. Biogeography is the study of the location of organisms around the world. Which of the following best explains how biogeography can provide evidence for evolution?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | It shows that organisms have structures that serve no purpose but that resemble structural roles in related organisms. | |  | **B.** | It shows that there are similarities and differences among the DNA of different species. | |  | **C.** | It shows that organisms have changed gradually over millions of years. | |  | **D.** | It shows that some organisms that are unrelated have developed similar adaptations to similar environments. | |

1. In his trips to the Galapagos Islands, Charles Darwin observed that 4 of the 13 species of the islands' finches have beaks adapted to eating specific foods. Which best explains how these facts provide evidence for divergent evolution?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The finches were different species but resemble each other because of how they evolved in a similar environment. | |  | **B.** | The finches descended from similar ancestors and have evolved adaptations in response to each other's influences. | |  | **C.** | The finches descended from the same ancestor but evolved along their own lines in isolation from each other. | |  | **D.** | The finches descended from a common ancestor but evolved differently in response to their environment. | |

1. Humans and chimpanzees have almost identical DNA and many similarities in anatomy. Which statement about the evolutionary relationship between modern humans and chimpanzees is supported by these facts?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Humans and chimpanzees are unrelated. | |  | **B.** | Humans descended directly from chimpanzees. | |  | **C.** | Humans are a more evolved version of chimpanzees. | |  | **D.** | Humans and chimpanzees share a common ancestor. | |

1. Which of the following statements correctly compares a scientific theory and a scientific law?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | A law is a fact and a theory is an opinion. | |  | **B.** | A law is a theory that has been proven to be true. | |  | **C.** | A law is a description and a theory is an explanation. | |  | **D.** | A law is always true and a theory is sometimes true. | |

SC.912.L.15.1

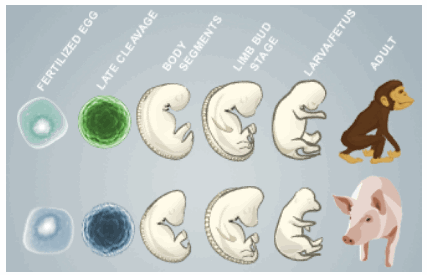
2ND ASSESSMENT

1. Which best explains how the fossil record supports the theory of evolution?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | It provides evidence for how genetic variation in organisms is determined by independent assortment. | |  | **B.** | It explains the impact that humans have had on the evolution of organisms on Earth. | |  | **C.** | It shows how the types and distribution of organisms on Earth have changed over time. | |  | **D.** | It proves that some organisms developed behaviors that helped them to survive. | |

|  |
| --- |
| 1. Many whales have tiny, unused hip and pelvis bones on their torsos. How does this evidence support theories about animal evolution? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | It shows that many animals, including whales, evolved to have unused body parts. | |  | **B.** | It shows that whales may have evolved from land-dwelling animals. | |  | **C.** | It shows that whales evolved at the same time as other non-marine animals. | |  | **D.** | It shows that marine animals, like whales, evolved much more slowly than land-dwelling animals. | |

1. The diagram below shows embryonic stages for a chimpanzee and a pig. How does this information support the theory of evolution?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | It provides evidence that survival in one geographical area may not help survival in another area. | |  | **B.** | It provides evidence that if some individuals in a species adapt well to an ecological niche, a new species can result over time. | |  | **C.** | It provides evidence that these animals came from a common ancestor and have inherited similar phases of development. | |  | **D.** | It provides evidence that heritable traits which help individuals to survive and reproduce will become more common in a species. | |

|  |
| --- |
| 1. Which of the following does NOT describe observable trends in hominid evolution? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | changes in hair and skin color | |  | **B.** | development of tool use and language | |  | **C.** | changes in jaw size and cranial capacity | |  | **D.** | development of bipedal locomotion and increase in brain mass | |

1. Which statement best explains how the theory of evolution is supported by comparative embryology?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | All vertebrate embryos have a biological mother and father. | |  | **B.** | All vertebrate embryos need oxygen, water, and food to survive. | |  | **C.** | All vertebrate embryos have blood, organs, and the same kinds of cells. | |  | **D.** | All vertebrate embryos have similar genes and follow a similar developmental path. | |

1ST ASSESSMENT

Benchmark: SC.912.L.15.6:

1. All prokaryotes reproduce asexually, while many eukaryotes can reproduce sexually. Given this information, which statement best explains why the Eukarya domain includes more complex living things than the Archaea or Bacteria domains?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | All prokaryotes are unicellular, and all eukaryotes are multicellular. | |  | **B.** | Prokaryotes can live in more extreme conditions than eukaryotes. | |  | **C.** | Eukaryotes have a greater variety of genetic material than prokaryotes. | |  | **D.** | There are more eukaryotic organisms than prokaryotic organisms in the world. | |

1. For a long time, algae were considered a part of the plant kingdom. Which statement best explains why most algae are now considered protists and not plants?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Some algae are motile. | |  | **B.** | Some algae are unicellular. | |  | **C.** | Algae obtain energy through photosynthesis. | |  | **D.** | Algae do not have organs or specialized tissue. | |

1. Some organisms are multicellular, sessile (non-moving), and able to create their own food. What biological kingdom do these organisms belong to?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | animal | |  | **B.** | bacteria | |  | **C.** | fungi | |  | **D.** | plant | |

1. Organisms are classified into kingdoms based on their defining characteristics. Which of the following statements correctly compares the animal and plant kingdoms?

|  |
| --- |
|  |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Animal cells have chromosomes; plant cells do not. | |  | **B.** | Animal cells are eukaryotic; plant cells are prokaryotic. | |  | **C.** | Animal cells lack a cell wall; plant cells have a cell wall. | |  | **D.** | Animals give off oxygen; plants give off carbon dioxide. | |

|  |
| --- |
| 1. Many protists are single-celled organisms, as are all bacteria. However, protists and bacteria are in different biological kingdoms. Which of the following comparisons of protists and bacteria is NOT true? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Both protists and bacteria can be motile. | |  | **B.** | Both protists and bacteria are microorganisms. | |  | **C.** | Protists are eukaryotes, while bacteria are prokaryotes. | |  | **D.** | Protists may be photosynthetic, but bacteria cannot be photosynthetic. | |

Benchmark: SC.912.L.15.6:

2ND ASSESSMENT

1. Animals are heterotrophic, meaning that they participate in food chains and get energy from consuming organic compounds. Which other biological kingdom is made up entirely of heterotrophic organisms?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | bacteria | |  | **B.** | fungi | |  | **C.** | plants | |  | **D.** | protists | |

1. All Archaea and bacteria are microscopic, prokaryotic organisms. However, Archaea and bacteria differ in significant ways. Which of the following is the MOST important reason that Archaea and bacteria belong to separate biological domains?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Archaea are less likely to inhabit the bodies of animals than bacteria. | |  | **B.** | Archaea have a very different sensitivity to antibiotics than bacteria and most are more resistant. | |  | **C.** | Archaea transfer genes similar to a eukaryote, and they have a different genetic history than bacteria. | |  | **D.** | Though they are found in many environments, Archaea may live in more extreme conditions than bacteria. | |

1. Some prokaryotes can use inorganic (carbonless) compounds as an energy source for growth. Eukaryotes must use a compound containing carbon for energy.  
     
   Which of the following is an example of a prokaryotic organism gaining energy from an inorganic compound?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Antibiotics prevent bacteria from growing. | |  | **B.** | Green algae undergo photosynthesis to grow. | |  | **C.** | Iron bacteria cause iron in water wells to rust. | |  | **D.** | Green algae undergo photosynthesis to grow. | |

1. Which of the following statements best explains why viruses do not belong to a biological domain or kingdom?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Viruses lack cell walls of their own. | |  | **B.** | Viruses possess genes and can evolve. | |  | **C.** | Viruses can attack bacteria, animals, or plants. | |  | **D.** | Viruses can only reproduce by using another organism. | |

|  |  |
| --- | --- |
| 1. Plants and fungi are in different biological kingdoms for several reasons. Which of the following does NOT correctly describe a difference between plants and fungi? | |
|  | |
| |  |  |  | | --- | --- | --- | |  | **A.** | Plants create biomass; fungi consume biomass. | |  | **B.** | Plants have seeds and pollen; fungi have spores. | |  | **C.** | Plant cell walls are made of chitin; fungi cell walls are made of cellulose. | |  | **D.** | Plants can make their own food; fungi obtain their food from other sources. | |

Benchmark: SC.912.L.15.8

1ST ASSESSMENT

1. Geological evidence indicates that Earth is approximately 4.6 billion years old. For scientists to be able to explain the origin of life on Earth, they must be able to accurately date organisms. One method that scientists use to date samples is called radioactive dating.

Which of the following best describes radioactive dating?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Radioactive dating is a method of absolute dating. | |  | **B.** | Radioactive dating is a method of relative dating. | |  | **C.** | Radioactive dating uses index fossils to date rocks. | |  | **D.** | Radioactive dating is the use of a geological time scale. | |

1. The endosymbiotic theory proposes that eukaryotic cells arose from living communities formed by the merging of prokaryotic organisms and their hosts.  
     
   Which of the following is the best evidence to support the endosymbiotic theory?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Mitochondria and chloroplasts contain DNA similar to bacterial DNA. | |  | **B.** | Both prokaryotic and eukaryotic organisms require oxygen in order to use energy. | |  | **C.** | Bacteria, mitochondria, and chloroplasts all divide by mitosis, while the cells containing them divide by binary fission. | |  | **D.** | Bacteria and mitochondria contain many features that are similar to each other but different from those of chloroplasts. | |

1. According the the hypothesis of Oparin and the subsequent experiments of Miller and Urey, which of the following situations contributed to the origin of life on Earth?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Organic compounds formed from meteorites that had fallen to Earth. | |  | **B.** | Cells evolved in an environment lacking oxygen. | |  | **C.** | Organic compounds formed from gases available in the atmosphere. | |  | **D.** | Cells evolved from large prokaryotic cells that engulfed smaller prokaryotic cells. | |

|  |  |
| --- | --- |
| 1. Science explains that different forms of life on Earth developed over a long period of time from a common ancestor. The process by which unrelated organisms come to resemble one another (e.g., birds, bats, and butterflies all having wings) is known as which term? | |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | adaptive radiation | |  | **B.** | convergent evolution | |  | **C.** | genetic drift | |  | **D.** | punctuated equilibrium | |

1. Biologists have considered two different explanations to the rate of evolution: gradualism and punctuated equilibrium. Which of the following would indicate that an organism had evolved via punctuated equilibrium?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The fossil record would show a slow, steady rate of change from a common ancestor. | |  | **B.** | The fossil record would be incomplete, and numerous holes would exist within the ancestral record. | |  | **C.** | The fossil record would show rapid change over an extended period of time, with occasional periods of little change. | |  | **D.** | The fossil record would show little change over long periods of time, followed by a sudden, brief period of rapid change. | |

Benchmark: SC.912.L.15.8

2ND ASSESSMENT

1. Fossils sometimes show that a single species or a small group of species has evolved into diverse forms that live in different ways. An example of this would be a group of present-day mammals all having a common ancestor.  
     
   Which term describes this phenomenon?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | adaptive radiation | |  | **B.** | convergent evolution | |  | **C.** | gradualism | |  | **D.** | mutualism | |

1. The fossil record indicates that some organisms have become extinct. However, some of these extinct organisms closely resemble organisms that are still alive today.  
     
   Which of the following best describes why some extinct species in the fossil record are similar to living organisms?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | All organisms have identical genetic codes and therefore produce similar features. | |  | **B.** | Organisms are related by a common ancestor that evolved over a very long period of time. | |  | **C.** | Organisms adapted the same way to their environments in order to produce beneficial traits. | |  | **D.** | Following mass extinctions, new organisms followed the genetic path of the previous extinct organisms. | |

|  |
| --- |
| 1. Scientists theorize that it took a billion years or more for oxygen in the atmosphere to reach the levels of today. Based on this idea, the first cells could be classified as which of the following? |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | |  | **A.** | aerobic and photosynthetic | |  | **B.** | anaerobic and heterotrophic | |  | **C.** | photosynthetic and unicellular | |  | **D.** | heterotrophic and eukaryotic | |

1. In the 1950s, Stanley Miller and Harold Urey conducted experiments in which they fired electrical sparks in the presence of a mixture of different gases. How did these experiments contribute to the theory of the origins of life on Earth?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | They proved that organic molecules formed from the accumulation of debris from space. | |  | **B.** | They showed that organic molecules could be formed from materials available in the Earth's early atmosphere. | |  | **C.** | They determined that the age of organic molecules can be measured by the half-life of isotopes. | |  | **D.** | They discovered that organic molecules would not have formed without the presence of oxygen in the atmosphere. | |

1. Which of the following best explains the theory of how eukaryotic cells originated?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Eukaryotic cells developed from mutations in prokaryotic cells. | |  | **B.** | Eukaryotic cells originated from a combination of gases and heat in the atmosphere. | |  | **C.** | Eukaryotic cells were originally large prokaryotic cells that absorbed smaller prokaryotic cells. | |  | **D.** | Eukaryotic cells developed from organic compounds carried to Earth by debris from space. | |

Benchmark: SC.912.L.16.10

1ST ASSESSMENT

1. The Human Genome Project began in 1989 with the purpose of identifying the thousands of genes of the human genome. The first draft of the genome was released in 2000 and was completed in 2003. Which of the following describes the main benefit of mapping the human genome?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | the ability to clone humans | |  | **B.** | the ability to design new human genes | |  | **C.** | the ability to easily identify genetically-based diseases | |  | **D.** | the ability to patent specific human genes | |

1. About one-sixth of the world's population does not have access to clean drinking water. Biotechnology-based tests and filters for drinking water are being developed to help alleviate this problem. What is the most direct effect of the lack of clean drinking water on this portion of our population?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Lack of clean water can lead to an increase in poverty and malnutrition. | |  | **B.** | Crops grown with unsanitary water will likely spread disease when eaten. | |  | **C.** | The risk of contracting water-borne diseases, such as cholera, increases. | |  | **D.** | Without access to clean water, the risk of dehydration, increases. | |

|  |  |
| --- | --- |
| 1. Several years ago, some crop plants were genetically modified to be immune to the effects of glyphosate, a weed killer that worked well on weeds. As a result, the crop could be sprayed with glyphosate, and the weeds would be killed, but the crop would survive.  From an ecological point of view, which of the following is most important to determine prior to planting the resistant crop in farm fields? | |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | What effect does the presence of glyphosate-resistant crops have on insect populations in adjacent fields? | |  | **B.** | Is it possible for the gene for resistance to glyphosate to pass from the crop plants to weeds under natural conditions? | |  | **C.** | Does the genetically modified crop produce yields that are better in quality and quantity than those of unmodified varieties? | |  | **D.** | Is the gene for resistance stable enough in the crop plant that it will be passed to the next generation when the crop plant reproduces? | |

1. Great strides are being made in identifying genetic markers for disease within the human genome. Which of the following would be considered an ethical misuse of this information?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | hospitals using genetic information about specific patients in order to develop treatments for those individuals | |  | **B.** | individuals deciding not to have children based on the results of genetic testing showing they carry the allele for a fatal disease | |  | **C.** | insurance companies refusing to insure a person based on information they required about the person's genome indicating a high risk for a certain disease | |  | **D.** | doctors informing their patients that they are likely to develop a debilitating illness for which there is no treatment based on patient-requested genetic tests | |

|  |  |
| --- | --- |
| 1. What do all forms of biotechnology have in common? | |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | They all involve modifying an organism's genetic makeup. | |  | **B.** | They all create intense public debate when they are first introduced. | |  | **C.** | They all make use of living organisms to do a job or provide a service. | |  | **D.** | They all combine the use of machines with living organisms in some way. | |

Benchmark: SC.912.L.16.10

2ND ASSESSMENT

1. Sandra is a 30-year-old woman. After medical images and blood tests, Sandra's mother has just been diagnosed with breast cancer. Her mother's mother died of breast cancer several years ago. Should Sandra be concerned that she might be at higher risk for breast cancer herself?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Yes. Some forms of breast cancer have been linked to a gene mutation which she may have inherited from her mother's side of the family. | |  | **B.** | Yes. While there does not seem to be a genetic link with breast cancer, she has been exposed to the same environmental factors as the rest of her family. | |  | **C.** | No. The causes of breast cancer have not been completely identified so she is probably at no greater risk than any other woman in the population. | |  | **D.** | No. Detection of and treatments for breast cancer have improved so dramatically in recent years that it is unlikely she would develop breast cancer. | |

1. In the aftermath of a natural disaster, such as severe flooding or a major hurricane, aid agencies make it a priority to bring drinking water to the affected population immediately. Biotechnology-based tests and filters for clean water become especially useful after natural disasters.  
     
   Why is drinking water a priority if the flood or hurricane has left huge amounts of water behind?

|  |
| --- |
|  |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Bringing water is a show of concern and allows the aid agencies to get into affected areas and assess the needs of the population. | |  | **B.** | Many life-threatening diseases such as cholera and dysentery are transmitted from person to person through contaminated drinking water. | |  | **C.** | The water left behind is generally untreated and therefore people refuse to drink it, leading to problems caused by heat and dehydration. | |  | **D.** | People tend to forget to drink enough water when they are in stressful situations which can make any diseases they already have much worse. | |

1. In what way is genetic engineering of crops similar to the more traditional practice of artificial selection of crop varieties?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Both methods result in a crop that has some desirable characteristic. | |  | **B.** | Both techniques produce plants that have higher yields than previously. | |  | **C.** | In both cases, two different crop plants are crossed to develop a new one. | |  | **D.** | In both procedures, genes from unrelated organisms can be added to the plant. | |

1. Treating most diseases involves a certain amount of trial and error, because some drugs or treatments are more effective for some individuals than for others. How could more precise information about variations within the human genome help doctors?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Doctors would be able to tell patients whether or not they would survive a disease based on the patient's DNA. | |  | **B.** | Knowing which drugs or treatments worked best on specific genotypes would help pinpoint treatments more quickly. | |  | **C.** | It would allow doctors to alter a patient's genome so that he or she could be treated more effectively with current drugs. | |  | **D.** | Knowing the patient's genome would provide information about how long the treatment would take once the correct drug was identified. | |

1. Rice is a staple food source for much of the world's population. At present, there is a limited region in which rice can be grown successfully, and if world climates change as scientists predict, the rice-growing region will become even more limited.  
     
   Which of the following is the most likely way in which biotechnology could be employed to keep rice harvests from declining?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | identifying new areas with soil fertile enough for rice production | |  | **B.** | developing clean energy sources to reduce CO2 production worldwide | |  | **C.** | seeding clouds with dry ice to produce more rainfall where it is needed | |  | **D.** | genetically engineering rice crops that can grow well in warmer climates | |

Benchmark: SC.912.L.16.13

1st ASSESSMENT

1. Folate is a crucial vitamin for proper development of the neural tube, which eventually becomes the brain and spinal cord. Which of the following might explain why neural tube defects occur more frequently than other types of birth defects?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Folate is rarely found in common foods and must be supplemented. | |  | **B.** | Since the nervous system forms so late, defects go undetected by early ultrasounds. | |  | **C.** | The neural tube forms in the first three weeks, before most women know they are pregnant. | |  | **D.** | The first and second trimesters of pregnancy use most of the mother's folate supply, leaving a limited amount for neural tube formation. | |

1. Sperm cells are mobile and must travel through the female reproductive tract to fertilize an egg. Which of the following structures enables sperm cells to swim?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | cilia | |  | **B.** | flagella | |  | **C.** | pseudopods | |  | **D.** | ribosomes | |

|  |  |
| --- | --- |
| 1. Which of the following sequences correctly describes prenatal development? | |
|  | |
| |  |  |  | | --- | --- | --- | |  | **A.** | blastocyst implants in uterus, zygote forms, heart begins beating, lungs can breathe air, sex organs become visible | |  | **B.** | blastocyst implants in the uterus, zygote forms, heart begins beating, sex organs become visible, lungs can breathe air | |  | **C.** | zygote forms, blastocyst implants in the uterus, heart begins beating, sex organs become visible, lungs can breathe air | |  | **D.** | zygote forms, blastocyst implants in the uterus, sex organs become visible, heart begins beating, lungs can breathe air | |

1. Which of the following is NOT a structure of the male reproductive system?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | fallopian tubes | |  | **B.** | seminal vesicles | |  | **C.** | urethra | |  | **D.** | vas deferens | |

|  |
| --- |
| 1. Which of the following correctly describes the function of amniotic fluid as it relates to the development of a human fetus? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | It provides protection and moisture for the fetus. | |  | **B.** | It carries blood between the fetus and the mother. | |  | **C.** | It is where the first fetal blood cells originate. | |  | **D.** | It provides nutrition and oxygen for the fetus. | |

2ND ASSESSMENT

SC.912.L.16.13

1. Which of the following statements about reproductive hormones is TRUE?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Only women produce progesterone. | |  | **B.** | Estrogen levels are highest during early pregnancy. | |  | **C.** | Reproductive hormones affect only the reproductive system. | |  | **D.** | Men and women produce both estrogen and testosterone. | |

1. Spermatozoa are male gametes, which contain haploid DNA. Where are spermatozoa produced?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | ovaries | |  | **B.** | penis | |  | **C.** | prostate | |  | **D.** | testes | |

1. Spermatogenesis is the process by which sperm develop and mature. Which of the following sequences correctly describes the anatomical path of spermatozoa from formation to ejaculation?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | testes, vas deferens, prostate, urethra | |  | **B.** | testes, urethra, prostate, vas deferens | |  | **C.** | prostate, vas deferens, testes, urethra | |  | **D.** | prostate, urethra, testes, vas deferens | |

1. In the male reproductive system, gametes are produced in the testicles. Which of the following structures of the female reproductive system has the same function as the testicles?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | cervix | |  | **B.** | uterus | |  | **C.** | fallopian tubes | |  | **D.** | ovaries | |

|  |
| --- |
| 1. A normal human gestational period lasts forty weeks. Which of the following explains why the eighth week of gestation is notable? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The gender of the fetus can be determined. | |  | **B.** | The embryo is approximately the size of a lime. | |  | **C.** | The embryo stage ends and the fetal stage begins. | |  | **D.** | Most organ systems are developed and functional. | |

1st ASSESSMENT

Benchmark: SC.912.L.16.17

1. Some organisms are capable of reproducing asexually through processes such as budding or parthenogenesis. What is an advantage of asexual production for an organism?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | It allows organisms to increase population rapidly. | |  | **B.** | It allows haploid cells to unite to produce a zygote. | |  | **C.** | It allows for greater genetic diversity within a species. | |  | **D.** | It allows crossing over to take place during replication. | |

|  |
| --- |
| 1. Mitosis and meiosis are processes that occur in an organism during reproduction. Which of the following is a result of mitosis? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | two identical daughter cells | |  | **B.** | four haploid cells that have genetic variation | |  | **C.** | uncontrolled cell division in the form of cancer cells | |  | **D.** | a single diploid cell that is genetically identical to the parent cell | |

|  |  |
| --- | --- |
| 1. Mitosis and meiosis are both processes involved in reproduction. Which statement correctly compares mitosis and meiosis? | |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Mitosis and meiosis both produce genetic variation within their daughter cells. | |  | **B.** | Mitosis results in the production of two genetically identical diploid cells and meiosis produces four haploid cells. | |  | **C.** | Mitosis and meiosis are both divided into only four distinct phases: prophase, metaphase, anaphase, and interphase. | |  | **D.** | Mitosis results in the production of two genetically identical diploid cells and meiosis produces four genetically identical haploid cells. | |

|  |  |
| --- | --- |
| 1. A scientist is developing a potential treatment for cancer. She grows cells in hundreds of petri dishes and exposes the dishes to environments that are known to cause cancer. After exposure, the scientist determines that some of the petri dishes have cancer cells.  What factor do all the petri dishes that contain cancer cells have in common? | |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | All the petri dishes with cancer cells have a disrupted cell cycle. | |  | **B.** | All the petri dishes with cancer cells have been exposed to tobacco smoke. | |  | **C.** | All the petri dishes with cancer cells could be treated successfully if they receive the same treatment. | |  | **D.** | All the petri dishes with cancer cells have genetically identical cells that make them susceptible to cancer. | |

1. In order to survive, an organism must have the correct number of chromosomes. To maintain a consistent number of chromosomes within a species, which of the following must an organism's germ cells do?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | undergo mitosis | |  | **B.** | undergo meiosis | |  | **C.** | become diploid cells | |  | **D.** | produce genetically identical offspring | |

Benchmark: SC.912.L.16.17

2ND ASSESSMENT

|  |  |
| --- | --- |
| 1. Sponges are important in aquatic ecology and they are capable of reproducing both sexually and asexually. What is an advantage to a species, such as the sponge, of being able to reproduce sexually? | |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Sexual reproduction increases genetic variation within a species. | |  | **B.** | Sexual reproduction produces offspring that are genetically identical to the parents. | |  | **C.** | Sexual reproduction allows the zygote to have twice the number of chromosomes of the parent. | |  | **D.** | Sexual reproduction produces a genetically improved zygote from the mutation of the parents' haploid gametes. | |

1. Meiosis and mitosis are processes that occur in an organism during reproduction. The process of meiosis results in which of the following?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | two diploid cells | |  | **B.** | four haploid cells | |  | **C.** | four genetically different diploid cells | |  | **D.** | two genetically identical haploid daughter cells | |

1. Meiosis and mitosis are both processes involved in reproduction. Which statement does NOT describe the process of meiosis?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Meiosis allows gametes to have a haploid number of chromosomes. | |  | **B.** | During meiosis, the number of chromosomes per cell is reduced by half. | |  | **C.** | During meiosis II, chromosomes replicate and crossing over allows genetic variation within the species. | |  | **D.** | Prior to meiosis I, each chromosome is replicated, and by the end of meiosis II, the number of chromosomes is reduced. | |

|  |
| --- |
| 1. If an experimental drug aims to prevent and inhibit the multiplication of cancer cells, which of the following would be the best approach for scientists to take in developing the anticancer drug? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The drug should focus on stimulating weakened cells to grow and divide. | |  | **B.** | The drug should prevent meiosis, but also increase mitosis in the cancer cells. | |  | **C.** | The drug should stimulate the cells to continue to divide, but at an increased rate. | |  | **D.** | The drug should interrupt the cell cycle and prevent cell division in the cancer cells. | |

1. During meiosis I, cells begin to divide in a way that is very similar to the process of mitosis. However, what major event takes place in meiosis I that does not occur in mitosis?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | crossing over | |  | **B.** | chromosome replication | |  | **C.** | interphase | |  | **D.** | mutation | |

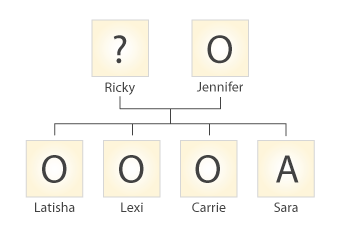
Benchmark: SC.912.L.16.1

1ST ASSESSMENT

1. Colorblindness is a recessive, sex-linked trait located on the X chromosome. Gaspar is a colorblind man, and his wife Stephanie is a carrier for colorblindness.  
     
   If they have a male child, what is the probability that their son will be colorblind?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | 0% | |  | **B.** | 25% | |  | **C.** | 50% | |  | **D.** | 100% | |

1. There are three alleles for blood type: A, B and O. Types A and B are co-dominant, and O is recessive. Based on phenotypes in the pedigree chart below, what is the genotype of the father, Ricky?



|  |  |
| --- | --- |
| **A.** | AA |
|  | **B.** | AO |
|  | **C.** | AB |
|  | **D.** | OO |

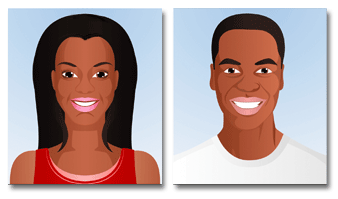
1. Gregor Mendel collected data on more than 28,000 pea plants in his research. Two traits he studied were seed color (yellow or green) and flower color (red or white). He found that the dominant traits are yellow seeds (Y) and red flowers (R).

If Mendel crossed plants heterozygous for yellow seeds (Yy) and heterozygous for red flowers

(Rr) with plants homozygous for green seeds (yy) and heterozygous for red flowers (Rr), what

fraction of their offspring will have both white flowers and green seeds?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | http://focus.florida-achieves.com/(S(e1folj55etqzp0qo2mlubq55))/student/images/math/1_8.gif | |  | **B.** | http://focus.florida-achieves.com/(S(e1folj55etqzp0qo2mlubq55))/student/images/math/1_4.gif | |  | **C.** | http://focus.florida-achieves.com/(S(e1folj55etqzp0qo2mlubq55))/student/images/math/1_2.gif | |  | **D.** | http://focus.florida-achieves.com/(S(e1folj55etqzp0qo2mlubq55))/student/images/math/3_4.gif | |

1. A hairline that comes to a point in the center of the forehead is called a widow's peak. Having a widow's peak is a dominant trait, while having a straight hairline is a recessive trait. Cate, a woman with a widow's peak, has two children with James, a man with a straight hairline like her father.  
     
   What is the probability that their next child will have a straight hairline?

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | 0% | |  | **B.** | 25% | |  | **C.** | 50% | |  | **D.** | 75% | |
| 1. Some traits are determined by a single gene; for example, presence of freckles (F) is a dominant trait, and lack of freckles (f) is recessive. Having detached earlobes (D) is a dominant trait, and having attached earlobes (d) is recessive.  Pedro and his wife Rosa have detached earlobes, but Rosa has freckles and Pedro does not. Their daughter Jessica has attached earlobes and does not have freckles. Which of the following genotypes must Rosa have? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | FFDD | |  | **B.** | FFDd | |  | **C.** | FfDD | |  | **D.** | FfDd | |

Benchmark: SC.912.L.16.1

2ND ASSESSMENT

1. Four major blood phenotypes (A, B, AB, and O) are determined by three alleles: A, B, and O. A person with type A has a certain protein on their blood cells' membranes. A person with type B has a different protein appearing on their cells' membranes. Cells from type AB have both proteins, but cells from type O, which is recessive, has neither protein.  
     
   This example illustrates which of the following phenomena?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | codominance | |  | **B.** | complete dominance | |  | **C.** | partial dominance | |  | **D.** | polygenic inheritance | |

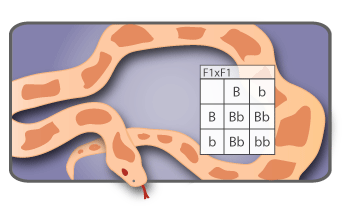
|  |
| --- |
| 1. A goat that is heterozygous for long hair (Hh) and curved horns (Cc) mates with a goat that is homozygous for short hair (hh) and straight horns (cc). Which of the following genotypes is impossible for their offspring to have? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | HhCc | |  | **B.** | HHCc | |  | **C.** | hhCc | |  | **D.** | hhcc | |

1. Coat color in cats is polygenic. An autosomal gene codes for white color, and a sex-linked gene codes for black or orange color. The sex-linked gene is codominant, which can result in a patchy calico coat. Based on this information, which of the following is impossible to find?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | a white and orange male cat | |  | **B.** | a black and orange male cat | |  | **C.** | a black and orange female cat | |  | **D.** | a black, orange, and white female cat | |

1. Red albino corn snakes lack the dominant black pigment trait (B). One homozygous wild-type snake is mated with one homozygous albino snake. What percent of the second generation will appear albino?



|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | 25% | |  | **B.** | 50% | |  | **C.** | 75% | |  | **D.** | 100% | |

|  |
| --- |
| 1. Scientists have introduced a color gene into some zebra fish to glow under fluorescent or black light. Three alleles were created: red (R), orange (O) and green (G). The fluorescent colors are dominant in the golden-colored wild type. A fish with a red phenotype is mated with a wild-type fish.  What is the chance that their offspring are red? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | 0% | |  | **B.** | 25% | |  | **C.** | 50% | |  | **D.** | 75% | |

1ST ASSESSMENT

Benchmark: SC.912.L.16.3

|  |
| --- |
| 1. Which of the following statements describes processes that occur during DNA replication? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | A DNA sequence is read by RNA polymerase, which produces another RNA strand complementary to the first strand. | |  | **B.** | Two free-floating single strands of DNA are joined by polymerase. The polymerase finds the point at which the two strands will match up into a double strand. | |  | **C.** | Messenger RNA are decoded by a ribosome to produce an amino acid chain. In the cell's cytoplasm, transfer RNA join the messenger RNA, forming a polypeptide. | |  | **D.** | A double-stranded DNA molecule is unwound into single strands. Polymerase matches the right nucleotides to the single strand so that each forms a double strand of DNA. | |

1. The genetic code is nearly universal, meaning that almost all organisms use the same genetic code. Which statement does NOT help explain why the genetic code is nearly universal?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | All organisms encode their genes using DNA or RNA. | |  | **B.** | All organisms can grow, respond to stimuli, and reproduce. | |  | **C.** | All organisms use the same codon for the same amino acid. | |  | **D.** | All organisms are genetically related to all other organisms. | |

1. DNA mutations can be present in a gene for many reasons. Which of the following does NOT describe a reason genetic mutations may exist in a gene?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | When a cell dies, the DNA in the cell's nucleus can mutate. | |  | **B.** | Exposure to chemicals or radiation can cause mutation in DNA. | |  | **C.** | Mutations in DNA can be passed down from a parent to a child. | |  | **D.** | Polymerase can make a mistake in matching nucleotides during replication. | |

1. Mutations in an organism's DNA may be either beneficial or harmful. Which of the following statements best describes the concept of DNA mutation?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | DNA mutation is an alteration in DNA replication that always results in phenotypic change. Mutations are usually due to radiation or other environmental factors. | |  | **B.** | DNA mutation is a change in the way that genes reproduce themselves, which may or may not affect phenotypic characteristics. Mutations are usually due to environmental factors or heredity. | |  | **C.** | DNA mutation is a change in the gene sequence, which sometimes results in phenotypic change. Mutations can be due to environmental factors, heredity, or a mistake in DNA replication. | |  | **D.** | DNA mutation is an alteration in the nucleus of a cell that makes certain genes unable to be copied, and they result in phenotypic change. Mutations are usually due to viruses and environmental factors. | |

1. Which of the following accurately describes the difference between transcription and translation?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | In transcription, the genetic code of a DNA molecule is first encoded. Translation is the process of converting the DNA code into code that RNA can use. | |  | **B.** | In transcription, an amino acid chain is encoded in a DNA molecule. Translation is the process of turning the amino acids into nucleic acids in an RNA molecule. | |  | **C.** | In transcription, the genetic code of a DNA molecule is transferred to a messenger RNA molecule. Translation is the process of creating an amino acid chain using the encoded messenger RNA. | |  | **D.** | In transcription, a double helix DNA molecule is split into two separate single strands. Translation is the process of joining each single DNA strand with a single strand of matching RNA. | |

2ND ASSESSMENT

SC.912.L.16.3:

|  |
| --- |
| 1. Which statement correctly describes the difference between DNA transcription and DNA replication? |
|  |

|  |  |  |
| --- | --- | --- |
|  | **A.** | DNA replication results in a single-stranded RNA molecule, while DNA transcription results in two copies of a double helix of DNA. |
|  | **B.** | DNA replication results in two copies of a double helix of DNA, while DNA transcription results in a single-stranded RNA molecule. |
|  | **C.** | DNA replication results in a single copy of a double helix of DNA, while DNA transcription results in two copies of a single-stranded RNA molecule. |
|  | **D.** | DNA replication results in two copies of a single-stranded RNA molecule, while DNA transcription results in a single copy of a double helix of DNA. |

|  |
| --- |
| 1. Which of the following statements does not describe a difference between the DNA of prokaryotes and the DNA of eukaryotes? |
|  |

|  |  |  |
| --- | --- | --- |
|  | **A.** | Prokaryotic DNA is shorter and less complex than eukaryotic DNA. |
|  | **B.** | Prokaryotic DNA chains have two nucleotides, eukaryotic DNA has four. |
|  | **C.** | Prokaryotic DNA has single chromosomes; eukaryotic DNA has multiple chromosomes. |
|  | **D.** | Prokaryotic DNA is arranged in circular structures; eukaryotic DNA consists of linear strands. |

1. Mutations in DNA may or may not result in a change in the phenotype of an organism. In which of the following situations will a mutation appear in the phenotype of an individual?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The genetic code for protein synthesis has not been altered. | |  | **B.** | The mutation occurs in an organism which is past reproductive age. | |  | **C.** | The mutation is recessive and is present in one copy of the diploid gene. | |  | **D.** | The mutation is recessive and is present in both copies of the diploid gene. | |

1. In a family with four children, both parents and three of the children have brown eyes; however, the fourth child's eyes are blue. Given these facts, which of the following statements is false?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Both parents carry one blue-eye gene and one brown-eye gene. | |  | **B.** | The brown-eye gene is dominant and the blue-eye gene is recessive. | |  | **C.** | The blue-eyed child has one blue-eye gene and one brown-eye gene. | |  | **D.** | It is possible that one of the brown-eyed children has two brown-eye genes. | |

|  |
| --- |
| 1. The genetic code is universal, and is composed of nucleotide triplets. Which of the following lists the four types of nucleotide bases found in the nucleotide triplets of a single strand of DNA? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | ribose, thymine, glucose, uracil | |  | **B.** | adenine, cytosine, guanine, uracil | |  | **C.** | adenine, cytosine, guanine, thymine | |  | **D.** | adenine, deoxyribose, guanine, ribose | |

Benchmark: 912.L.17.20

1ST ASSESSMENT

1. Most deforestation occurs for agricultural purposes as farmers cut and burn forests to grow crops. On a local scale, animals living in the forested area will either die or be forced from their habitat. On a larger scale, many plant and animal species may become extinct.  
     
   What is another global effect of deforestation?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Production of fossil fuels will decrease as foliage is destroyed. | |  | **B.** | Soil erosion will decrease as ash covers and protects the topsoil. | |  | **C.** | Herbivore populations will increase as more plants become available for food. | |  | **D.** | Greenhouse gases will increase as carbon dioxide is released into the atmosphere. | |

1. The Marianas flying fox is a species of bat found in the Pacific islands that plays an important role in pollination and seed dispersal. Hunting and habitat destruction have contributed to a drastic decline in their population. If this continues, what would be a consequence of the extinction of the Marianas flying fox?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Organisms dependent on the flying fox would adapt to other organisms. | |  | **B.** | Plant populations would flourish due to lack of competition for resources. | |  | **C.** | The region would experience more extreme climatic conditions due to instability of plant and animal species. | |  | **D.** | Other animal and plant populations dependent on the flying fox would also decrease and may become extinct. | |

1. A lake that has been affected by acid rain may have an altered pH level. Although the pH may be lower than normal, the lake may still appear blue and clear.  
     
   Which of the following best explains why this may occur?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Acid rain may promote the growth of organisms that consume lake algae. | |  | **B.** | Acid rain may introduce invasive species that compete with algae for resources. | |  | **C.** | Acid rain may neutralize the lake's natural alkalinity which would decrease any cloudiness. | |  | **D.** | Acid rain may affect the whole lake ecosystem by first killing algae that cause cloudiness. | |

1. Human activities affect the quality and supply of natural resources for future generations. Since the Industrial Revolution, the use of fossil fuels has greatly increased industrial productivity, but it has also caused environmental issues.  
     
   Which of the following is least likely to be caused by the burning of fossil fuels?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | acid rain | |  | **B.** | global warming | |  | **C.** | an increase in smog | |  | **D.** | holes in the ozone layer | |

1. Some farmers have begun using biological pest controls to manage their crops. Which of the following is an example of using biological pest controls to contribute to sustainability?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | adding ladybugs to the fields of crops | |  | **B.** | cutting down only selected trees in a field | |  | **C.** | spraying pesticides that target only some insect species | |  | **D.** | using modern machinery that is more environmentally friendly | |

Benchmark: 912.L.17.20

2ND ASSESSMENT

1. When an island or coastline is deforested, what happens to the coral reefs in the ocean surrounding the island or coastline?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | There will be an increase in production by the coral reef, adding to stability. | |  | **B.** | Increased erosion will lead to an increase in sediment, damaging the coral reefs. | |  | **C.** | With fewer trees, the coral reefs will receive more sunlight, increasing biodiversity. | |  | **D.** | Plant and animal populations on land will decrease, leading to an increase in predators in the coral reefs. | |

|  |
| --- |
| 1. Which of the following best describes the main focus of sustainability in the modern world? |
|  |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | |  | **A.** | using Earth's natural resources without depleting them | |  | **B.** | providing for the food demands of the world's population | |  | **C.** | ensuring that endangered species are protected to prevent extinction | |  | **D.** | developing ways to use natural resources in the most efficient manner | |

|  |
| --- |
| 1. If a scientist discovers a new synthetic chemical that appears to have many potential uses, why must society be extremely cautious after the new chemical is manufactured? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The scientist's work may be flawed, and his work must be verified. | |  | **B.** | The chemical may be too expensive to manufacture for the general population. | |  | **C.** | Harmful problems for individuals and the environment may not be initially known. | |  | **D.** | The best use may not be immediately obvious, and the chemical may be wasted. | |

1. Fossil fuels such as coal, oil, and natural gas supply much of the world's energy. However, these fuels have a tremendous negative effect on the environment. Which of the following would be the best strategy to alleviate this problem?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Impose fines on individuals that overuse fossil fuels and use the money for environmental cleanup. | |  | **B.** | Educate society on the harmful effects and gradually replace fossil fuels with alternative renewable resources. | |  | **C.** | Fund scientific research for discovering new energy sources and use the remaining supply of fossil fuels until then. | |  | **D.** | Create an environmental policy that would ban the use of all fossil fuels due to the negative environmental effects. | |

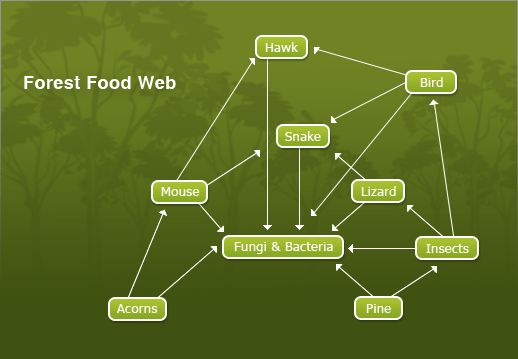
|  |
| --- |
| 1. Monoculture is the agricultural practice of producing a single crop over a large area. In the 1980s, scientists discovered and produced a monoculture of cotton that was eventually planted throughout the southern states.  What could be one possible side effect of the monoculture cotton? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The farmers could destroy the land due to lack of crop rotation. | |  | **B.** | Supply could not meet demand because of the single cotton crop. | |  | **C.** | The price of cotton could escalate because of lack of competition. | |  | **D.** | Disease could spread throughout the crop due to lack of genetic variation. | |

Benchmark: 912.L.17.5

1ST ASSESSMENT

|  |
| --- |
| 1. The diagram shows the flow of energy in a forest ecosystem. One year, a disease affecting lizards caused a widespread decline in their population. Which of the following is the most likely consequence of this event? |



|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | a decrease in the bird population | |  | **B.** | a decrease in the acorn population | |  | **C.** | an increase in the snake population | |  | **D.** | an increase in the insect population | |

1. In a marsh ecosystem, alligators, woodstorks, muskrats, cattails, ferns, and grasses make up a food web. If a disease eliminates the fern population, which of the following is the most likely consequence?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The herbivores would consume the decomposers. | |  | **B.** | The carnivores would adapt to become herbivores. | |  | **C.** | The animals relying solely on ferns for food would die out. | |  | **D.** | All trophic levels would be affected except the top consumers. | |

|  |  |
| --- | --- |
| 1. In the 1930s, the Red Imported Fire Ant was accidentally introduced into the United States. This species is native to South America, but has thrived in the United States because of a lack of natural enemies here.  Which of the following best explains how the Red Imported Fire Ant has affected native ant species in the U.S. that do have predators? | |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Native ant species preyed on the Red Imported Fire Ant and increased in population. | |  | **B.** | Native ant species interbred with the Red Imported Fire Ant, creating new ant species. | |  | **C.** | The Red Imported Fire Ant caused native ant species to become more susceptible to predators. | |  | **D.** | The Red Imported Fire Ant caused a decline in native ant species by competing for their resources. | |

|  |  |
| --- | --- |
| 1. Scientists that study the effects of global warming predict that a change in Earth's average temperature of even a few degrees will have dramatic effects. One consequence of global warming is the melting of the polar ice caps, which will in turn affect polar bears that use sea ice as a platform for hunting seals. What will most likely happen to the population of polar bears as a result of global warming? | |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | It will increase as polar bears adapt to other habitats. | |  | **B.** | It will increase because polar bears will have fewer predators. | |  | **C.** | It will decrease as the habitat suitable for polar bears decreases. | |  | **D.** | It will decrease because polar bears will become easier to hunt. | |

1. The carrying capacity of an ecosystem is the maximum number of individuals of a particular species that can be supported on a long-term basis in a given amount of land. For example, the carrying capacity of the Florida Panther may be 50 panthers per 10,000 square kilometers of habitat in the Everglades ecosystem.  
     
   Which of the following determines the carrying capacity of an ecosystem?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | the average daily temperature of the ecosystem | |  | **B.** | the most limited resources required for survival | |  | **C.** | the number of predators found in the ecosystem | |  | **D.** | the amount of disease affecting organisms in the ecosystem | |

Benchmark: 912.L.17.5

2ND ASSESSMENT

|  |
| --- |
| 1. During the summer of 1988, fires burned much of Yellowstone National Park, leaving a patchwork of burned and unburned areas. In the year following the fires, wildflowers sprouted in all the burned areas, closely followed in subsequent years by seedlings of the trees that normally grow in the area, such as aspens and lodgepole pines.   What changes in the ecosystem will take place during the course of succession? |

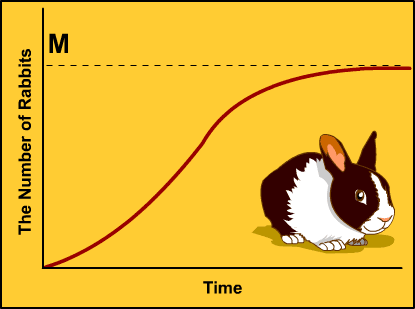
|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The flowers will shade out the small trees creating a permanent meadow. | |  | **B.** | The flowers will eventually be shaded out by the trees and will not be able to grow. | |  | **C.** | The trees will not grow well because of the toxic chemicals produced by the flowers. | |  | **D.** | The trees will take the nutrients that the flowers need, and the flowers will be stunted. | |

|  |
| --- |
| 1. In New England forests, birch trees are most often found growing in areas that have been opened up by fire or high winds. Their seeds rarely sprout in established beech-maple forests. Birch trees are an example of a pioneer species. Which of the following is a characteristic of pioneer species in general? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Their seeds tend to need full sunlight to sprout. | |  | **B.** | Their seeds generally rot in damp, shady forests. | |  | **C.** | They cannot grow tall enough to compete with other trees. | |  | **D.** | They can only grow when there are no other trees around. | |

1. Housefly populations tend to grow exponentially until they reach the carrying capacity of their environment. Which of the following determines an environment's carrying capacity?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | the stage of succession of the community | |  | **B.** | the needed resource that begins to run out first | |  | **C.** | the number of carnivores occupying the food web | |  | **D.** | the number of organisms that share an environmental niche | |

1. Ariel is studying ecosystems. She learns that there is a limit to the number of organisms an ecosystem can support. This limit is demonstrated by the example of a rabbit population, shown in the graph below. What does the dotted line on the graph represent in an ecosystem?

|  |  |
| --- | --- |
| **A.** | carrying capacity |
|  | **B.** | population density |
|  | **C.** | predation rate |
|  | **D.** | reproduction rate |

1. As forested areas are cut down, habitats are often permanently changed to agriculture or other land use. How does the conversion of natural forest to human land uses affect an ecosystem?

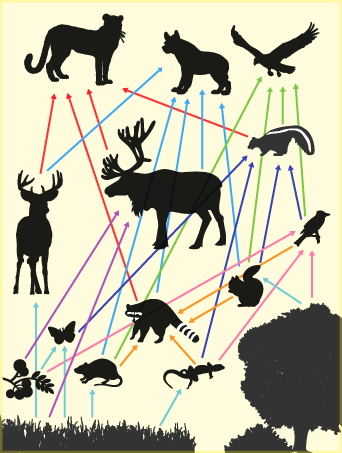
|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | There will be a decrease in biodiversity in the ecosystem. | |  | **B.** | There will be an increase in animal populations in the ecosystem. | |  | **C.** | There will be less space to plant crops and build houses in the ecosystem. | |  | **D.** | There will be more nutrients in the ecosystem's soil after the forests are cut down. | |

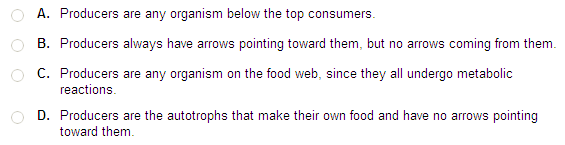
Benchmark: 912.L.17.9

1st ASSESSMENT

1.. A forest food web is shown in the picture below. How can producers be identified in this food

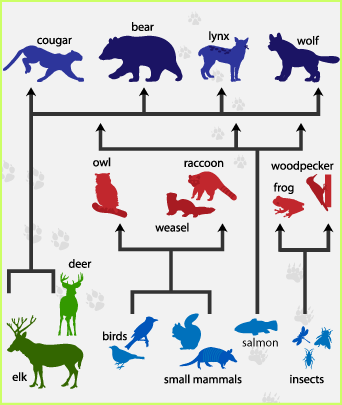
web?

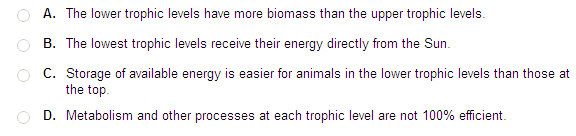




2. Which of the following correctly explains why the distribution of available energy decreases as the

food web, shown below, moves from primary consumers to secondary and tertiary consumers?





3. Energy flows through the trophic levels of a food web. Which of the following statements

regarding this flow of energy is true?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Generally, only 10% of energy is transferred from one trophic level to the next. | |  | **B.** | Energy is neither created nor destroyed; therefore, it is fully transferred to each trophic level. | |  | **C.** | Ecological pyramids diagram the flow of energy with producers at the top and consumers at the bottom. | |  | **D.** | Energy flows down from the top consumers to other carnivores, then herbivores, and finally down to the producers. | |

4. In the carbon cycle, what purpose do the bacteria serve?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | They absorb carbon dioxide from the atmosphere and convert the carbon into glucose for organisms to consume. | |  | **B.** | They act as a reservoir for carbon by storing it in the form of dissolved organic carbon. | |  | **C.** | They break down carbon from decaying organisms and release the carbon as carbon dioxide. | |  | **D.** | They convert glucose from living organisms into energy and release the carbon in the form of carbon dioxide. | |

5. Energy within an ecosystem flows from the producers to the consumers. However, a very

important group of heterotrophs are decomposers. What role do decomposers serve in an

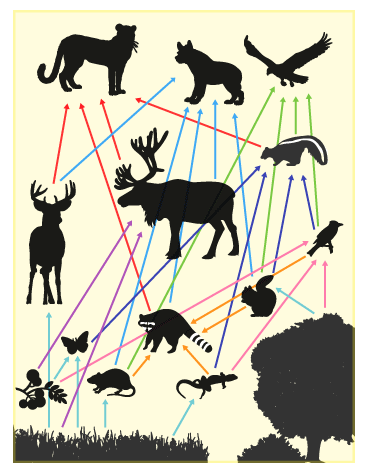
ecosystem?

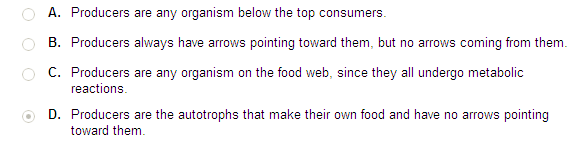
|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | They break down organic matter into nutrients for other organisms. | |  | **B.** | The make their own food and provide energy for the rest of the system. | |  | **C.** | They consume the producers and provide energy for the higher consumers. | |  | **D.** | They change electromagnetic energy from the Sun into usable energy forms. | |

Benchmark: 912.L.17.9

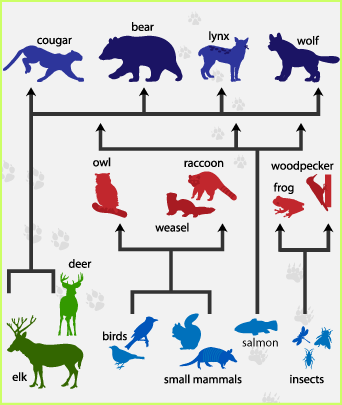
2ND ASSESSMENT

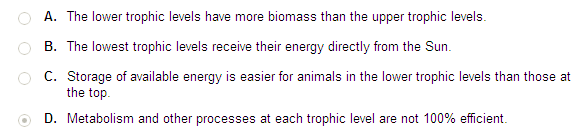
1. A forest food web is shown in the picture below. How can producers be identified in this food web?





1. Which of the following correctly explains why the distribution of available energy decreases as the food web, shown below, moves from primary consumers to secondary and tertiary consumers?





1. Energy flows through the trophic levels of a food web. Which of the following statements regarding this flow of energy is true?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Generally, only 10% of energy is transferred from one trophic level to the next. | |  | **B.** | Energy is neither created nor destroyed; therefore, it is fully transferred to each trophic level. | |  | **C.** | Ecological pyramids diagram the flow of energy with producers at the top and consumers at the bottom. | |  | **D.** | Energy flows down from the top consumers to other carnivores, then herbivores, and finally down to the producers. | |

1. In the carbon cycle, what purpose do the bacteria serve?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | They absorb carbon dioxide from the atmosphere and convert the carbon into glucose for organisms to consume. | |  | **B.** | They act as a reservoir for carbon by storing it in the form of dissolved organic carbon. | |  | **C.** | They break down carbon from decaying organisms and release the carbon as carbon dioxide. | |  | **D.** | They convert glucose from living organisms into energy and release the carbon in the form of carbon dioxide. | |

1. Energy within an ecosystem flows from the producers to the consumers. However, a very important group of heterotrophs are decomposers. What role do decomposers serve in an ecosystem?

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | They break down organic matter into nutrients for other organisms. | |  | **B.** | The make their own food and provide energy for the rest of the system. | |  | **C.** | They consume the producers and provide energy for the higher consumers. | |  | **D.** | They change electromagnetic energy from the Sun into usable energy forms. | |

Benchmark: 912.L.18.12:

1st ASSESSMENT

1. When water in a lake freezes, the ice that forms floats on top of any water that is still liquid. Why does the ice float?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Ice is less dense than liquid water, so it floats. | |  | **B.** | Air bubbles trapped in the ice cause the ice to float. | |  | **C.** | Ice crystals are polar, and they float on top of non-polar water. | |  | **D.** | The ice forms at the top of the water, so it stays there and floats. | |

1. When the oxygen atom in one water molecule is close to a hydrogen atom in another water molecule, what is most likely to happen?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The water molecules will draw toward each other. | |  | **B.** | The two water molecules will form a larger molecule. | |  | **C.** | The like charges of the water molecules will repel each other. | |  | **D.** | The two water molecules will gain energy and vaporize, becoming water vapor. | |

1. When trees pull water in through their roots, they must then move the water up to their leaves in order to carry out photosynthesis. Since the water molecules cling to each other and to the inner surface of the xylem, the water can pull itself up through the tree by capillary action.  
     
   Which property of water molecules allows them to cling together?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Water molecules are polar molecules. | |  | **B.** | Water molecules are small molecules. | |  | **C.** | Water molecules have an odd number of atoms. | |  | **D.** | Water molecules have covalent bonds between atoms. | |

1. In Florida, daytime and nighttime temperatures usually only differ by 5 to 10°C, while temperatures in the desert often differ by as much as 40°C. What role does water play in keeping temperatures in Florida from fluctuating dramatically?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Bodies of water store heat during the day and release it at night. | |  | **B.** | Humid air releases heat as it rises, keeping temperatures constant. | |  | **C.** | Evening rain brings heat from the upper atmosphere back to Earth. | |  | **D.** | Water cools the land around it so that it never gets as hot as a desert. | |

|  |  |
| --- | --- |
| 1. When salt is mixed with water and stirred, the salt will dissolve, forming a solution. When sand is mixed with water, the sand will not dissolve. Why will salt form a solution with water but sand will not? | |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Sand is much harder than salt and so it will not form a solution with water. | |  | **B.** | Salt is pulled apart into two ions by the polar water molecules, and sand is not. | |  | **C.** | Salt consists of only 2 atoms and is small enough to dissolve, while sand is too large. | |  | **D.** | Sand forms complex crystals which dissolve much more slowly than non-crystalline salt. | |

Benchmark: 912.L.18.12

2nd ASSESSMENT

1. Small insects can walk across the surface of calm water. Their feet push the surface of the water down slightly, somewhat like a person walking across a trampoline, but they do not break the surface. What is the best explanation for why this happens?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The insects are light enough so that they do not break the hydrogen bonds holding the water molecules together. | |  | **B.** | The insects actually use their wings to hover slightly above the water's surface and they only skim it with their feet. | |  | **C.** | The insects' feet are non-polar, so they are repelled by the polar water molecules and are pushed away from the water's surface. | |  | **D.** | The insects are small enough to see the individual water molecules, so they are able to step carefully from one molecule to the next. | |

1. Once ice forms on a lake in winter, the water underneath the ice remains about 4°C, even if the air temperature just above the ice is far below freezing. What property of water helps keep the water below the ice from freezing?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | When covalent bonds form between the water molecules in ice, they give off heat. | |  | **B.** | Each water molecule stores heat in its covalent bonds during the summer and releases it slowly over the winter. | |  | **C.** | The hydrogen bonds that form in the ice create a lattice structure, and the resulting extra space enables the ice to act as insulation. | |  | **D.** | The unstable hydrogen bonds between the water molecules break and push the molecules around, which keeps the water from freezing. | |

|  |  |
| --- | --- |
| 1. Compared to many other liquids, water has a high heat of vaporization, which means a relatively large amount of heat must be added to the water before the water molecules are moving fast enough to escape the surface as a gas. Which of the following explains why water has a high heat of vaporization? | |
|  | |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Adding heat to the water causes the molecules to move around, and the motion keeps pushing them back below the water's surface. | |  | **B.** | As water molecules heat up they tend to form more hydrogen bonds with each other, making it difficult for any of the molecules to vaporize. | |  | **C.** | Water molecules have a relatively high molecular weight compared to other molecules, so more energy is needed for the water molecules to vaporize. | |  | **D.** | Enough heat must be added to water molecules' hydrogen bonds to break the bonds and provide the molecules enough energy to escape the surface. | |

1. At which of the following temperatures is fresh water most dense?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | −4°C | |  | **B.** | 0°C | |  | **C.** | 4°C | |  | **D.** | 100°C | |

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | |  | **A.** | It must be at least as small as the polar water molecules. | |  | **B.** | It must be nonpolar to be able to react with the polar water molecules. | |  | **C.** | It must be at least slightly polar to be able to react with the polar water molecules. | |  | **D.** | It must be covalently bonded in order to form new bonds with the polar water molecules. | |
|  |

Benchmark: 912.L.18.1

1st ASSESSMENT

|  |  |
| --- | --- |
| 1. A carbohydrate is an organic compound that is composed of carbon, hydrogen, and oxygen. The unique structure of carbohydrates makes them useful material for building cell walls in plants. Which of the following is a function of carbohydrates in animals? | |
| |  |  |  | | --- | --- | --- | |  | **A.** | digesting food | |  | **B.** | fighting disease | |  | **C.** | storing short-term energy | |  | **D.** | transmitting nerve impulses | | |
|  |
|  |  |

1. A scientist analyzing an unknown substance has determined that it consists of carbon, hydrogen and oxygen. During experimentation, she determines that the substance is soluble in oil but not in water.  
     
   Which of the following macromolecules is the unknown substance most likely to be?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | carbohydrate | |  | **B.** | lipid | |  | **C.** | nucleic acid | |  | **D.** | protein | |

1. Carbohydrates are a type of biological macromolecule required to carry out life functions. Which of the following is NOT true regarding carbohydrates?

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | |  | **A.** | Monomers of starch are sugars such as glucose. | |  | **B.** | Living things store extra sugars as complex carbohydrates. | |  | **C.** | They contain carbon, hydrogen and oxygen, usually in the ratio of 1:2:1. | |  | **D.** | Carbohydrates are the main substance that makes up biological membranes. | |
|  |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Amino acids are the monomers of proteins. | |  | **B.** | Proteins contain nitrogen as well as carbon, hydrogen, and oxygen. | |  | **C.** | Proteins have only one specific role - to regulate the rate of biochemical reactions. | |  | **D.** | Protein monomers have a carboxyl group on one end and an amino acid on the other. | |

1. Proteins are one of four classes of biological macromolecules. Which of the following statements regarding proteins is NOT true?
2. Enzymes are a special type of protein that speeds up biological reactions. How do they accomplish this task?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | They are able to operate at any pH value. | |  | **B.** | They lower the activation energy of reactions. | |  | **C.** | They form peptide bonds between amino acids. | |  | **D.** | They decrease the number of collisions in the reacting substances | |

Benchmark: 912.L.18.1

2nd SSESSMENT

1. Metabolism is generally referred to as the chemical processes that allow the body to function. How do enzymes allow metabolic chemical reactions to proceed more quickly?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | They lower the activation energy of biochemical reactions. | |  | **B.** | They cause products of biochemical reaction to break down. | |  | **C.** | They convert carbohydrates into proteins during biochemical reactions. | |  | **D.** | They decrease the amount of reactants needed for biochemical reactions. | |

1. Hormones are proteins that regulate many functions in the body, such as growth and cell differentiation. Which of the following does NOT describe a function of proteins in living organisms?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | They catalyze biochemical reactions. | |  | **B.** | They provide support for connective tissues. | |  | **C.** | They serve as a short-term energy source for the body. | |  | **D.** | They carry molecules from one place to another in the body. | |

1. Carbohydrates are a type of biological macromolecules required to carry out life functions. Which of the following statements regarding carbohydrates is true?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | They contain fatty acids and glycerol. | |  | **B.** | They are made of monomers called amino acids. | |  | **C.** | They are used by living things as the main source of energy. | |  | **D.** | They are not used for structural support in living organisms. | |

1. Proteins are one of four classes of biological macromolecules. Which of the following statements about proteins is NOT correct?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Enzymes are specific types of proteins. | |  | **B.** | There are 20 different amino acids that make up proteins. | |  | **C.** | All R chains on the amino acids that make up proteins are polar and acidic. | |  | **D.** | Peptide bonds form between amino acids in a dehydration reaction, creating proteins. | |

1. How do enzymes speed up the rate of biological reactions?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Enzymes increase the activation energy of the reaction. | |  | **B.** | Enzymes provide a site where reactants can be brought together. | |  | **C.** | Enzymes become reactants and are used up in the chemical reaction. | |  | **D.** | Enzymes change the temperature of the surroundings to be suitable for the reaction. | |

Benchmark: 912.L.18.9:

1st ASSESSMENT

1. Which equation best describes a method of anaerobic respiration?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Glucose yields energy and lactic acid. | |  | **B.** | Glucose and oxygen yield lactic acid and water. | |  | **C.** | Glucose and lactic acid yield energy and carbon dioxide. | |  | **D.** | Glucose and oxygen yield energy, carbon dioxide, and water. | |

1. Which statement best describes the way that an adenosine diphosphate (ADP) molecule becomes an adenosine triphosphate (ATP) molecule in the human body?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Protein causes phosphate molecules to bind to sugars and form ATP. | |  | **B.** | Food energy is used to attach a phosphate molecule to an ADP molecule. | |  | **C.** | Ionized oxygen in cells causes sugars and phosphate molecules to form ATP. | |  | **D.** | Water breaks down ADP molecules which form into ATP molecules over time. | |

1. Which statement accurately describes the way that adenosine triphosphate (ATP) transfers energy within a cell?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | ATP molecules break up sugars such as glucose into energy-rich compounds like lactose. | |  | **B.** | ATP molecules split carbon dioxide molecules, and the carbon is used as fuel by the cell. | |  | **C.** | ATP molecules ionize oxygen molecules, which give up electrons that can then be used for energy. | |  | **D.** | An ATP molecule reacts with water and loses a phosphate group, breaking a bond and releasing energy. | |

1. Which reactants of aerobic cellular respiration are the byproducts of photosynthesis?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | glucose and water | |  | **B.** | oxygen and glucose | |  | **C.** | carbon dioxide and water | |  | **D.** | oxygen and carbon dioxide | |

1. Which of the following does NOT describe a similarity between photosynthesis and cellular respiration?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Both transform food into energy. | |  | **B.** | Both are transformations of energy. | |  | **C.** | Both involve the exchange of gases. | |  | **D.** | Both are necessary for life on Earth. | |

Benchmark: 912.L.18.9:

2nd ASSESSMENT

1. Which equation best describes aerobic respiration?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Glucose yields energy and lactic acid. | |  | **B.** | Glucose and energy yield carbon dioxide. | |  | **C.** | Glucose and oxygen yield energy and carbon dioxide. | |  | **D.** | Glucose and oxygen yield energy, carbon dioxide, and water. | |

|  |
| --- |
| 1. Which equation best describes photosynthesis? |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Water and energy yield carbohydrates and carbon dioxide. | |  | **B.** | Carbohydrates and carbon dioxide yield energy and oxygen. | |  | **C.** | Energy, water, and chlorophyll yield carbon dioxide and oxygen. | |  | **D.** | Carbon dioxide, water, and energy yield carbohydrates and oxygen. | |

1. Which of the following best describes one of the relationships between light and the chemical reactions that occur in photosynthesis?

|  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| |  |  |  | | --- | --- | --- | |  | **A.** | Chlorophyll molecules absorb electromagnetic energy as protons. The extra protons make ATP unstable and chemical energy is released. This chemical energy causes the chemical reactions to occur. | |  | **B.** | Radiation from sunlight is absorbed by the outermost chloroplasts. The radiation damages the chloroplasts and some die. The decomposing chloroplasts release hydrogen through a series of chemical reactions. | |  | **C.** | Light heats the chloroplast. The heat causes chloroplasts to expand and creates pressure on the stoma, which close to preserve water. The heat allows the water to make the chemical reactions possible. | |  | **D.** | A chlorophyll molecule absorbs photons of light, which excites electrons. The electrons are picked up by an electron transport chain. Electrons transported down the transport chain take part in chemical reactions. | |

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Anaerobic respiration relies on glycolysis; anaerobic respiration does not. | |  | **B.** | Aerobic respiration results in a higher yield of ATP than anaerobic respiration. | |  | **C.** | Anaerobic respiration produces lactic acid as waste while aerobic respiration does not. | |  | **D.** | Aerobic respiration takes place in the presence of oxygen; anaerobic respiration does not. | |

1. Which statement does NOT describe a key difference between aerobic and anaerobic respiration?
2. Which of the following best describes a distinct difference between photosynthesis and cellular respiration?

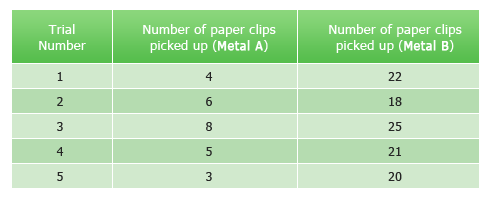
|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | The process of cellular respiration involves glucose; the process of photosynthesis does not. | |  | **B.** | The process of cellular respiration releases energy; the process of photosynthesis stores energy. | |  | **C.** | Cellular respiration takes place in the chloroplasts; photosynthesis takes place in the mitochondria. | |  | **D.** | The waste product of cellular respiration is oxygen; the waste product of photosynthesis is carbon dioxide. | |

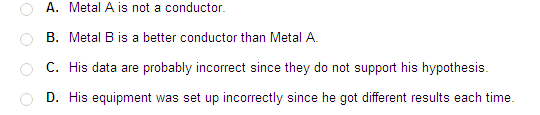
Benchmark: 912.N.1.1

1st ASSESSMENT

1. Michael wants to test the effect that different concentrations of stomach acid will have on the dissolution of a particular kind of oral medication. As he sets up and completes his experiment, which of the following experimental designs would be most likely to help him answer his question?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Allow several pills to soak in different amounts of acid of a single concentration and then measure the amount of dissolution on each. | |  | **B.** | After allowing several pills to be exposed to different acid concentrations, measure the surface area of each that is dissolved. | |  | **C.** | After allowing a pill to be exposed to one acid concentration, place it in different acid concentrations, and then measure the surface area that is dissolved | |  | **D.** | Prepare solutions of different acid concentrations, measure 50 milliliters of each into different beakers, and place different types of pills of the same mass into the beakers. | |

1. A Magnetic Resonance Imaging (MRI) scanner is a machine used in medicine to display accurate 2-D and 3-D images of organs inside the human body. It applies strong magnetic fields on the body which are produced by electromagnets composed of wire coils. The amount of electric current in the wire affects the electromagnet's strength.  
     
   Logan has created two electromagnets by tightly wrapping wire around two different nails, each made of a different metal (Metal A and Metal B), and connecting the wires to D batteries. He hypothesizes that Metal A is a better conductor than Metal B. He tests his hypothesis by seeing how many paper clips each electromagnet can pick up. His results are shown below.  
     
   Which is the best explanation for Logan's results?



1. Several groups of researchers were conducting experiments to study how exercise affects cholesterol levels. One group had college students run two miles a day for six weeks. Another group had senior citizens participate in gentle water aerobics twice a week for a year. Cholesterol levels dropped slightly among the college students but dropped significantly among the senior citizens.  
     
   Based on these results, what should the researchers plan to do next to validate the findings?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Determine that exercise is more useful in lowering cholesterol levels in older people than in young adults. | |  | **B.** | Conclude that moderate exercise is more beneficial at lowering cholesterol levels than more intensive exercise. | |  | **C.** | Design more studies testing the effect of duration and intensity of exercise on cholesterol levels in different age groups. | |  | **D.** | Repeat the experiment on college students using different groups of students until the results show a drop in cholesterol levels. | |

|  |
| --- |
| 1. Sometimes scientists must make assumptions about their subject of study because some aspect of it cannot be tested directly. In cases like this, scientists assume that the natural world operates in a consistent fashion.  Which of the following would be the best example of a case in which scientists would have to make an assumption based on present experience? |
|  |

|  |  |  |
| --- | --- | --- |
|  | **A.** | assuming that modern DNA is composed of the same nucleotide bases that made up DNA 1,000 years ago |
|  | **B.** | assuming that rainfall patterns in the northern United States are similar to rainfall patterns there 50 years ago |
|  | **C.** | assuming that trees in Brazil use the chlorophyll in their leaves for photosynthesis in the same way trees in Florida do |
|  | **D.** | assuming that the feathers on a dinosaur skeleton were used for flight and insulation as they are in modern birds |

1. A scientist wanted to find out if the height of a shrub would make it more prone to frost damage. He found a hillside covered with shrubs and trimmed all the shrubs located at the bottom to one meter tall. He left the shrubs growing at the top of the hill untrimmed. They ranged from one to three meters tall.  
     
   After a heavy frost, he found that 90% of the shorter shrubs had frost damage while only 10% of the tall shrubs did. He concluded that short shrubs were more likely to suffer frost damage than tall shrubs.   
     
   When he submits his research report for review by other scientists, which of the following are they likely to criticize about his experiment?

|  |  |  |  |  |  |  |  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | His hypothesis that shrub height might influence frost damage is not a question worth testing. | |  | **B.** | His conclusion is inaccurate because the location of the shrubs on the hillside might also have contributed to where frost damage occurred. | |  | **C.** | His methods of recording frost damage must have been biased toward tall shrubs since there was such a large difference in frost damage. | |  | **D.** | His results are not valid because he had some shrubs in the tall group that were close to the same height as some shrubs in the short group. | |

Benchmark: 912.N.1.1

2nd ASSESSMENT

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | Find out what factors contribute most to the erosion of the beach each year. | |  | **B.** | Compare the physical features of this beach to those of beaches in other towns. | |  | **C.** | Take photographs of all areas of the beach over several years to look objectively for differences. | |  | **D.** | Survey the residents who live near the beach year round to see if they notice any changes in erosion. | |

1. Each summer, Janine spends two weeks visiting her grandparents, who live near a beach. She notices that the shore in one area appears to erode more each year than any other area. Which of the following would be the best way to determine if different areas of this beach experience more erosion than others each year?
2. A pharmaceutical company is developing a new drug that is designed to help prevent osteoporosis. One of the company's goals in conducting clinical trials is to determine if the drug will be more effective in women than men, and they also want to determine the optimum dosage of the drug. Which of the following is the best way to set up the groups of participants in the clinical trials?

|  |
| --- |
|  |
|  | |  |  |  | | --- | --- | --- | |  | **A.** | There should be twenty groups, each taking a different dosage of the drug, and each group should consist of one man and one woman. | |  | **B.** | There should be two groups of participants: one consisting of only women who are taking the drug, and the other of men who are not taking the drug. | |  | **C.** | There should be five groups, with four taking a different dosage of the drug and one not taking any drugs, and each group should consist of one hundred randomly assigned participants. | |  | **D.** | There should be two groups of participants: one consisting of men and women who already have osteoporosis and are taking the drug, and the other of men and women without osteoporosis who are not taking the drug. | |

|  |
| --- |
| 1. http://focus.florida-achieves.com/student/images/science/51/N11MC3R.gifMarshall is interested in how temperature affects the volume of a new polymer gel that may be useful in sorting DNA fragments using gel electrophoresis. He conducts an experiment in which he measures the volume of the mass of the gel, in milliliters (mL), at various temperatures, in Kelvin (K). He plots his results, as shown in the graph.  Which of the following is the best explanation of Marshall's results? |
| |  |  |  | | --- | --- | --- | |  | **A.** | Temperature is directly proportional to the volume of a given mass. | |  | **B.** | Energy may change form, but it cannot be created nor destroyed. | |  | **C.** | Temperature is inversely proportional to the volume of a given mass. | |  | **D.** | Mass may change form, but it can neither be created nor destroyed. | |  |

|  |
| --- |
| 1. Corey is analyzing samples of two compounds. Through scientific experimentation, she has determined that the compounds are types of CFCs, or chlorofluorocarbons, which are environmental pollutants that contain the elements carbon (C), chlorine (Cl), and fluorine (F). She now wants to determine if the two samples have the same concentration of the elements Cl and F. The table below shows the mass, in grams (g), of Cl and F in each sample.   Which of the following is the best explanation of Corey's data?   http://focus.florida-achieves.com/student/images/science/51/N11MC4R.gif |
| |  |  |  | | --- | --- | --- | |  | **A.** | Both compound samples have more chlorine than fluorine. | |  | **B.** | Sample 1 has a greater concentration of fluorine than Sample 2. | |  | **C.** | Sample 1 has a greater concentration of chlorine than Sample 2. | |  | **D.** | Both samples have the same concentration of chlorine and fluorine. | |  |

|  |
| --- |
| 1. Omar compares the body shapes of different species to understand what helps them move. He has read that when monkeys swing from tree to tree, they move like pendulums. When they swing from one branch immediately to another, they swing slowly. But, when they prepare to let go and fly to a branch a greater distance away, they swing quickly. Omar wants to figure out what basic variables affect their pendulum motion.  Omar designs an experiment to determine what affects the time it takes for a pendulum to oscillate (swing back and forth one time). In his experiment, three independent variables are tested, one at a time. The independent variables being tested are length of the pendulum, mass of the pendulum, and angle of release. Omar's results are shown here.  What can be concluded from the information in the tables?   http://focus.florida-achieves.com/student/images/science/51/N11MC5R.gif |
|  |  |

|  |  |  |
| --- | --- | --- |
|  | **A.** | Only the angle of release has an effect on the time it takes to complete one oscillation. |
|  | **B.** | Only the mass of the pendulum has an effect on the time it takes to complete one oscillation. |
|  | **C.** | Only the length of the pendulum has an effect on the time it takes to complete one oscillation. |
|  | **D.** | All three independent variables have an effect on the time it takes to complete one oscillation. |