

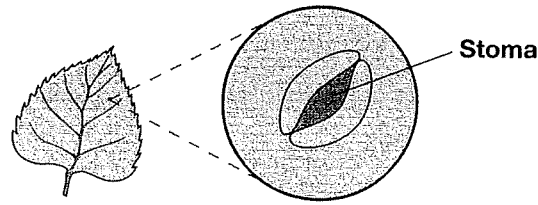


Florida EOC Coach Jumpstart, Biology 1

Pretest

Name: _____

1. As shown below, leaves have small openings called stomata (*singular*, stoma). The stomata are surrounded by guard cells.

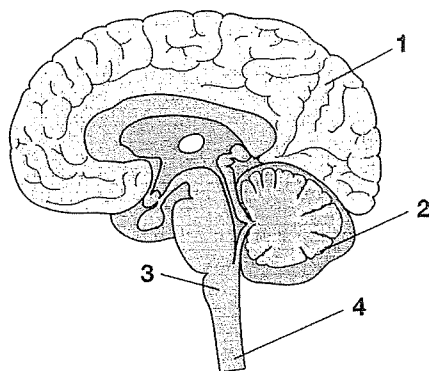


When the temperature of the surrounding air increases, the guard cells close over the stomata. How does this affect plant processes?

- A. The rate of transpiration increases.
- B. Gas exchange with the environment increases.
- C. The amount of water stored in the plant decreases.
- D. The material available for photosynthesis decreases.

2. The illustration below shows the four main parts of the central nervous system.

CENTRAL NERVOUS SYSTEM

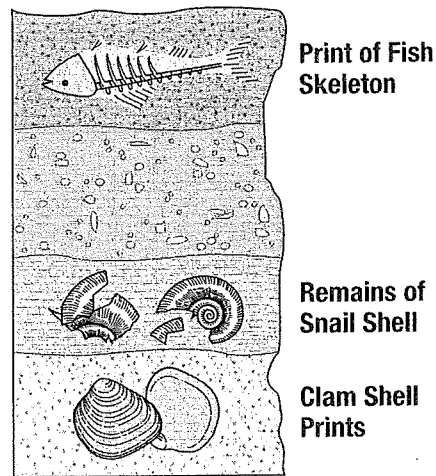


Which part of the central nervous system controls involuntary processes such as breathing?

- A. 1
 - B. 2
 - C. 3
 - D. 4
3. Water has several properties that make it essential to life as we know it. Which property of water is **most** important for delivering nutrients to cells of the human body?
- A. high specific heat
 - B. adhesion
 - C. ability to dissolve many substances
 - D. cohesion

4. Photosynthesis is a biochemical reaction involving reactants and products. Which biochemical process is the **opposite** of photosynthesis?
- A. DNA synthesis
 - B. RNA synthesis
 - C. aerobic respiration
 - D. anaerobic respiration
5. In the 1800s, many people believed that rotting meat formed maggots, which then turned into flies. Francesco Redi performed an experiment in which jars containing meat were either covered with a mesh or left uncovered. Eventually, maggots formed in the uncovered meat, but not in the covered meat. Why was this experiment important to the scientific understanding of life?
- A. It proved that all living things are composed of cells.
 - B. It led directly to the discovery of bacteria and microbes.
 - C. It was the basis for the discovery of vaccines and antibiotics.
 - D. It disproved the idea that organisms can arise from matter that is not alive.

6. Fossils are the remains of organisms that lived in the past. The diagram below shows fossils in sedimentary rock.

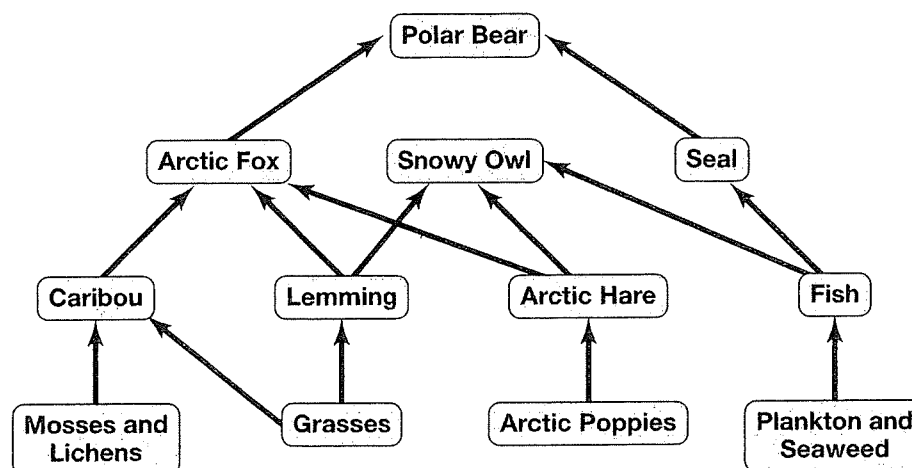


Using the law of superposition, which of the following can be concluded about the fossils shown above?

- A. The fossils are all the same age but were found at different times.
- B. The remains of the snail shell are older than the fish skeleton print.
- C. The clam shell prints are younger than the remains of the snail shell.
- D. The print of the fish skeleton is older than the snail shell and clam shell.

7. Many factors affect blood flow throughout the body, including stress, exercise, and the buildup of plaque in the blood vessels. Which statement **best** describes how the buildup of plaque in blood vessels affects the body?
- A. It widens blood vessels, causing a decrease in heart rate and depriving tissues of the blood they need.
 - B. It narrows blood vessels, causing a decrease in heart rate and depriving some cells of the nutrients and oxygen they need.
 - C. It narrows blood vessels, causing the heart to work harder to move enough blood to cells that are in need of nutrients and oxygen.
 - D. It widens blood vessels, causing the heart to beat rapidly and exert a strong force on the walls of the blood vessels.
8. Immunity can be active or passive. Which of the following is an example of active immunity?
- A. A person is bitten by a raccoon and given antibodies taken from people who have been vaccinated against rabies.
 - B. A newborn receives IgG antibodies from its mother. The antibodies protect the newborn against infection for several weeks.
 - C. A person is given antibodies from another animal that is immune to a pathogen. The antibodies make the person immune to the pathogen for a short time.
 - D. A person is exposed to a stomach virus and produces antibodies that prevent illness because the person had become sick from the virus at an earlier time.

9. An arctic food web is shown below.



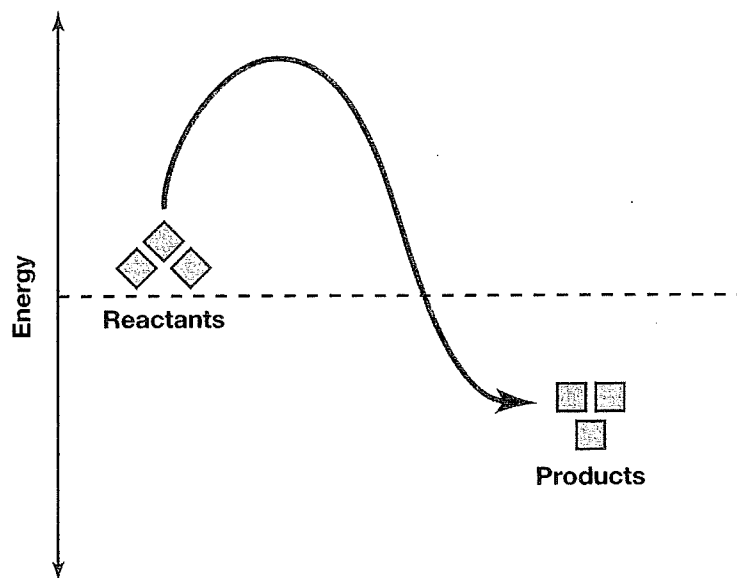
Suppose that the lemming population is removed from this food web. Which of the following will be a **short-term** effect of this change?

- A. The arctic fox population will increase.
 - B. The polar bear population will increase.
 - C. The caribou population will decrease.
 - D. The snowy owl population will decrease.
10. The cells of animals and plants share many characteristics. Which of the following cell structures is present in both animal and plant cells?
- A. cell wall
 - B. chloroplast
 - C. mitochondria
 - D. large central vacuole

11. Many species of animals use hemoglobin to transport oxygen from their lungs to their cells, but they have some differences in their hemoglobin molecules. The hemoglobin molecule in humans is very similar to the hemoglobin in gorillas, and very different from the hemoglobin in mice. Which inference is **best** supported by these observations?
- A. Humans and gorillas are closely related to each other but not to mice.
 - B. Gorillas are closely related to mice, but humans are not.
 - C. Large animals need a specific kind of hemoglobin to transport oxygen throughout their large bodies.
 - D. Humans and gorillas have similar hemoglobin because they are adapted to eat similar foods.
12. Scientists use the similarities and differences among species to determine how they are related. Which of the following is NOT used by scientists to determine relationships among species?
- A. homologous structures
 - B. analogous structures
 - C. vestigial structures
 - D. cellular structures

13. Blood type in humans is a codominant trait. Suppose a man with type B blood and a woman with type AB blood have children. Which of these is NOT a possible blood type for one of their children?
- A. A
 - B. B
 - C. AB
 - D. O
14. Macromolecules are large biological molecules that are made up of smaller molecules. Which of the following correctly pairs a macromolecule with one of its parts?
- A. protein and fatty acid
 - B. lipid and monosaccharide
 - C. DNA and phosphate group
 - D. carbohydrate and amino acid

15. The graph below shows the energy of the reactants and products of a biochemical reaction, as well as its activation energy without an enzyme.



How would an enzyme affect the reaction?

- A. The activation energy would become lower.
 - B. The activation energy would become higher.
 - C. The energy difference between the reactants and products would increase.
 - D. The energy difference between the reactants and products would decrease.
16. DNA is composed of paired bases. Which of the following bases pairs with guanine in DNA?
- A. uracil
 - B. adenine
 - C. cytosine
 - D. thymine

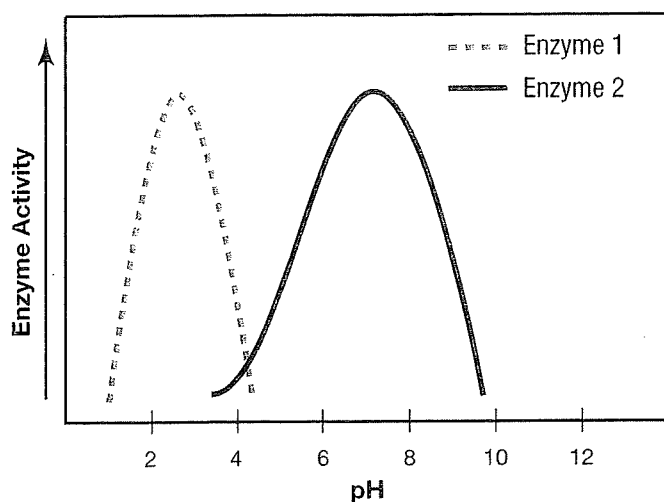
17. A couple's genotypes for a trait are homozygous dominant, DD , and homozygous recessive, dd . What percentage of this couple's offspring would be expected to have the recessive phenotype?
 - A. 0%
 - B. 25%
 - C. 50%
 - D. 75%
18. Mosses are simple multicellular organisms that carry out photosynthesis. They lack vascular tissue and true roots. In which of the following groups would moss be classified?
 - A. bacteria
 - B. fungi
 - C. eukaryotes
 - D. angiosperms
19. The oscar is an aggressive fish native to South America. Many people in Florida keep oscars as pets. When these fish outgrow their aquariums, people sometimes release them into the Everglades. The largemouth bass was abundant in the Everglades until the oscar population increased. Today, oscars are much more common in the Everglades than largemouth bass. Which of the following would be the **best** method to increase the largemouth bass population in the Florida Everglades?
 - A. introduce a species of fish that will eat the oscars
 - B. move more largemouth bass into the Florida Everglades
 - C. make it illegal to release South American fish into the Everglades
 - D. increase the food supply for both the largemouth bass and the oscars

20. Pregnancy is divided into periods called trimesters. Which of the following occurs during the second trimester of pregnancy?
- A. The blastula forms.
 - B. The fetus begins to move.
 - C. The major organs begin to develop.
 - D. The fetus has regular breathing motions.
21. The brown tree snake, which is native to Australia, became an invasive species on the island of Guam when it was brought there by accident aboard a cargo ship. The brown tree snake population grew quickly and devastated Guam's native bird population. Which of the following **best** explains why these snakes were able to reproduce so rapidly in Guam?
- A. They had no natural predators.
 - B. They were not noticed by humans.
 - C. They had ample space in which to live.
 - D. They had only limited competition for food.
22. Cellular respiration is an essential process that gives cells the energy they need for their life processes. What are the reactants of cellular respiration?
- A. water and glucose
 - B. water and carbon dioxide
 - C. oxygen and glucose
 - D. glucose and ATP

23. Which of the following is NOT an example of sustainable development?
- A. using one insect to control another that is consuming crops
 - B. planting crops that will grow in the shade to reduce deforestation
 - C. installing solar power cells to reduce the need to burn fossil fuels
 - D. using the slash-and-burn technique to clear land for farming
24. Which of the following is an example of primary succession?
- A. Deer return to an area that has experienced a forest fire.
 - B. Lichens begin to grow on rocks after a volcanic eruption.
 - C. Trees begin to grow in a field that was abandoned by farmers.
 - D. Plants begin to grow on a riverbank after floodwaters recede.
25. To reduce the use of fossil fuels, automobile makers are producing electric cars. Which of the following is an advantage of using cars that run on electricity instead of gasoline?
- A. Electric cars use batteries that are easy to recharge.
 - B. Electric cars cost less than gasoline-powered cars.
 - C. Electric cars do not release pollutants into the environment.
 - D. Electric cars are easier to operate than gasoline-powered cars.

26. Most cells contain tightly coiled structures made up of DNA and protein. What are these structures?
- A. genes
 - B. nucleoli
 - C. ribosomes
 - D. chromosomes
27. Cells assemble proteins based on information stored in the cell. In which order are the following parts of the cell involved in creating proteins?
- A. DNA, mRNA, ribosome, tRNA
 - B. mRNA, DNA, ribosome, tRNA
 - C. ribosome, tRNA, mRNA, DNA
 - D. tRNA, DNA, mRNA, ribosome

28. The graph shows the activity of two digestive enzymes.



Which **most likely** describes where these enzymes are active?

- A. Enzyme 1 and Enzyme 2 are both active in the stomach.
 - B. Enzyme 1 and Enzyme 2 are both active in the small intestine.
 - C. Enzyme 1 is active in the stomach, and Enzyme 2 is active in the small intestine.
 - D. Enzyme 1 is active in the small intestine, and Enzyme 2 is active in the stomach.
29. Different types of mutation can occur when a cell divides. Which type of mutation can result in a change in the number of chromosomes?
- A. deletion
 - B. insertion
 - C. frameshift
 - D. nondisjunction

30. ATP is a molecule that plays an important role in cell metabolism. How does ATP transfer energy to biochemical reactions in the cell?
- A. It breaks down oxygen.
 - B. It breaks down glucose.
 - C. It gains a phosphate group.
 - D. It loses a phosphate group.
31. Scientific knowledge changes over time because of new discoveries and evidence. The classification of organisms has changed over time. Which of the following explains the most recent changes in how organisms are classified?
- A. Organisms have changed over the years, so they need reclassification.
 - B. Scientists now focus more on the anatomy and physiology of organisms.
 - C. Scientists have replaced the basic categories first proposed by Linnaeus.
 - D. Advances in technology have made it easier for scientists to compare DNA.

32. The early Earth had many active volcanoes, which contributed to the atmosphere. How did that early atmosphere differ from Earth's atmosphere today?
- A. The early atmosphere contained more oxygen, which was harmful to many organisms.
 - B. The early atmosphere contained far less oxygen but higher levels of other, toxic gases.
 - C. The early atmosphere contained more water vapor and not enough oxygen to support life.
 - D. The early atmosphere contained far less carbon monoxide, carbon dioxide, methane, and ammonia.
33. Scientists have replicated conditions early in Earth's history to show how life may have originated. Which of the following **best** supports the idea that many chemicals necessary for life formed in space?
- A. Stanley Miller and Harold Urey modeled Earth's early atmospheric conditions.
 - B. Juan Oro proved that amino acids can be made from chemicals present on early Earth.
 - C. Experiments by Crick and Orgel suggested that RNA evolved much earlier than DNA.
 - D. Some of the molecules necessary to form life have been found on meteorites.

34. A pseudoscience describes ideas or theories that seem scientific but are not. Which of the following can be classified as a pseudoscience?
- A. ecology
 - B. geology
 - C. phrenology
 - D. genetics
35. Species in the family that includes humans but not great apes are called hominids. The first hominids appeared between 6 and 7 million years ago. Since then, several species of hominids have evolved. As the brain size of hominids increased, which of the following also occurred?
- A. The teeth became larger.
 - B. The pelvis became narrower.
 - C. The jaws became larger.
 - D. The brow ridges became smaller.

36. Substances cross the cell membrane through both passive and active transport. What is the **main** difference between passive and active transport?
- A. Active transport requires energy, but passive transport does not.
 - B. Active transport results in equilibrium, but passive transport does not.
 - C. Passive transport requires a protein channel, but active transport does not.
 - D. Passive transport results in a concentration gradient, but active transport does not.
37. Cells can be prokaryotic or eukaryotic. Which of the following structures is present in eukaryotic cells but NOT in prokaryotic cells?
- A. DNA
 - B. nucleus
 - C. cell wall
 - D. cell membrane

38. Which of the following types of cells contain mitochondria?
- A. animal cells only
 - B. animal and bacterial cells
 - C. animal and plant cells
 - D. animal, plant, and bacterial cells
39. Cells produce many different types of proteins. Where in the cell is an mRNA sequence translated to make a protein?
- A. nucleus
 - B. ribosome
 - C. Golgi body
 - D. mitochondria

40. Which of these does a cell use for active transport?
- A. a concentration gradient
 - B. carrier proteins
 - C. facilitated diffusion
 - D. endoplasmic reticulum
41. Charles Darwin first proposed natural selection as an explanation for evolutionary change. Which of the following describes another mechanism for evolutionary change?
- A. A population can become separated and split into two different species.
 - B. Random chance can increase the frequency of certain traits that do not affect fitness in a given environment.
 - C. Certain alleles in a population can increase or decrease over time due to a difference in fitness.
 - D. Limited resources mean that only some of the offspring in a population can survive and reproduce.

42. Natural selection is an explanation for changes in species over time. There are four main principles to this theory. Which of the following is NOT a principle of natural selection?
- Variation exists within populations.
 - Organisms produce more offspring than can survive.
 - Populations have access to more resources than they need.
 - Individuals with variations suitable for their habitat survive.
43. Crossing-over is a process that occurs during the formation of gametes. How does crossing-over lead to genetic variation?
- The number of mutations decreases.
 - The number of chromosomes increases.
 - The number of chromosomes decreases.
 - The number of combinations of alleles increases.
44. The different forms of a gene are called alleles. Punnett squares are used to determine the probability of offspring receiving different combinations of alleles from their parents. The Punnett square shown is missing two of the parental alleles.

	<u>?</u>	<u>?</u>
<i>b</i>	<i>Bb</i>	<i>bb</i>
<i>b</i>	<i>Bb</i>	<i>bb</i>

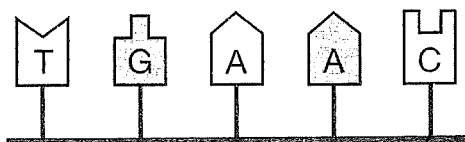
Which of the following are the missing alleles, in order from left to right?

- b, b*
- b, B*
- B, B*
- B, b*

45. In the 1980s, Lynn Margulis proposed the endosymbiotic theory to explain the origins of some cell organelles. Which of the following allowed endosymbiotic theory to become widely accepted by scientists?

- A. The theory became a law.
- B. The theory could not be proven false.
- C. The theory was supported by various types of evidence.
- D. The theory became more popular among younger scientists.

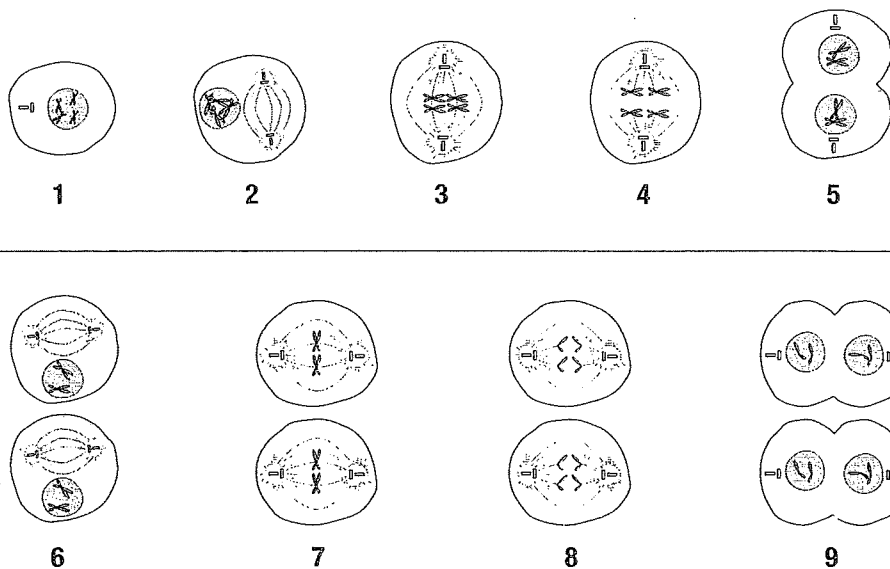
46. A portion of a DNA strand is shown.



Which sequence of nucleotides, read from left to right, would form complementary base pairs with the DNA strand shown?

- A. A-C-T-T-G
- B. T-G-A-A-C
- C. C-A-G-G-T
- D. G-T-C-C-A

For questions 47, 48, 49, and 50, refer to the following illustration.



47. What cell process is shown in the diagram?

- A. mitosis
- B. meiosis
- C. cell cycle
- D. DNA replication

48. The process shown in the diagram results in which of the following?
- A. two daughter cells with the same number of chromosomes as the parent cell
 - B. two daughter cells with half as many chromosomes as the parent cell
 - C. four daughter cells with the same number of chromosomes as the parent cell
 - D. four daughter cells with half as many chromosomes as the parent cell
49. In which stage in the process shown does crossing-over occur?
- A. 1
 - B. 2
 - C. 4
 - D. 6
50. Cells can be described as either haploid or diploid, depending on the number of chromosomes they contain. Which correctly describes stages at which haploid and diploid cells are found?
- A. Stages 1 and 5 show diploid cells, and stage 7 shows haploid cells.
 - B. Stages 1 and 7 show diploid cells, and stage 5 shows haploid cells.
 - C. Stage 1 shows a diploid cell, and stages 5 and 7 show haploid cells.
 - D. Stage 7 shows a diploid cell, and stages 1 and 5 show haploid cells.

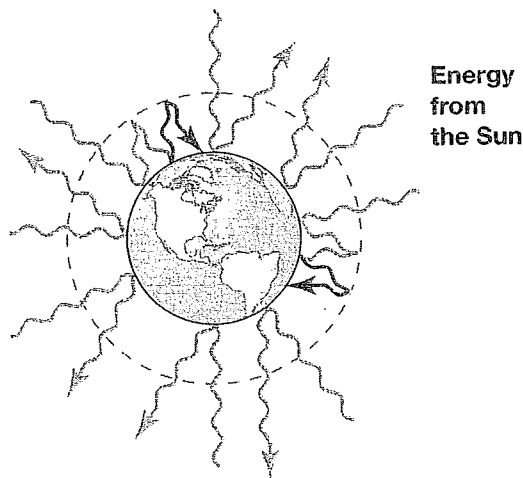
For questions 51, 52, and 53, refer to the following passage and illustration.

Polar bears may become extinct in the near future. The main threat to these arctic mammals is the loss of sea ice, which is an important part of their habitat. As global warming increases Earth's temperature, the ice platforms on which polar bears hunt and rest are moving farther apart, making it dangerous for a bear to swim from one platform to the next. The growing gap of open water between the sea ice and the shore also makes the waves rougher. This increases the risk of drowning when bears try to swim from the shore to the sea ice. The loss of sea ice also affects seals, the polar bear's main food source.

The only way to save the polar bears is to reduce global warming. Scientists think that one cause of global warming is the release of carbon dioxide into the atmosphere when fossil fuels are burned. This extra carbon dioxide increases the greenhouse effect, a natural process that under normal circumstances keeps most of Earth warm enough to sustain life.

The diagram below shows that some of the sun's rays are reflected from Earth and its atmosphere back toward space. Gases in the atmosphere retain some of the sun's energy. The effect is similar to the way that a greenhouse holds in heat. Excess carbon dioxide in the atmosphere from the burning of fossil fuels holds in even more of these rays, increasing the temperature on Earth.

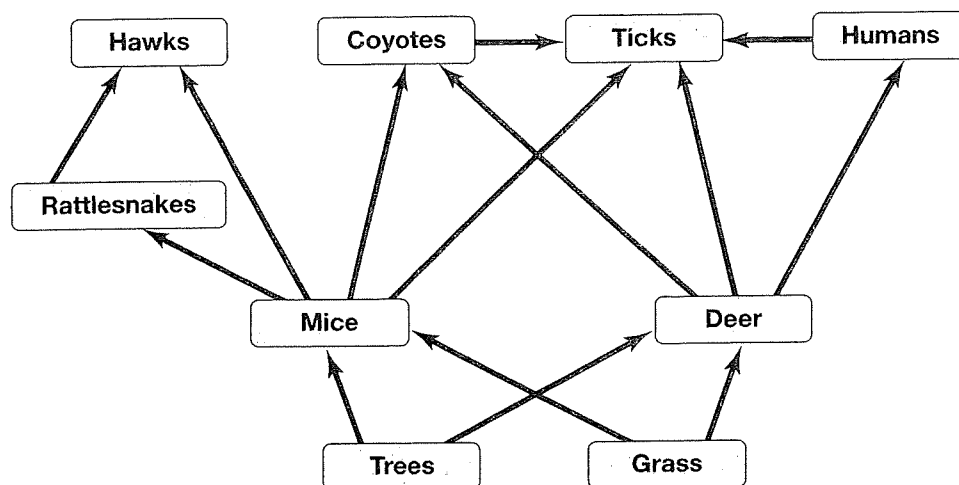
THE GREENHOUSE EFFECT



51. Thick low clouds, like sea ice, reflect more sunlight than the open ocean. How would an increase in the number of low clouds over the Arctic Ocean **most likely** affect the polar bears?
- A. The amount of sea ice would increase, giving the bears more area in which to hunt.
 - B. The amount of sea ice would increase, making it harder for the bears to find mates.
 - C. The amount of sea ice would decrease, giving the bears less area in which to hunt.
 - D. The amount of sea ice would decrease, making it easier for the bears to find and capture seals.
52. Arctic seals and polar bears are tertiary consumers in their food web. The base of the food web includes tiny algae called diatoms. Diatom populations grow rapidly in spring and summer. The population may then decrease suddenly because the diatoms use up resources they need. When this happens, their remains sink to the ocean floor. How does this **most likely** affect the carbon-oxygen cycle?
- A. The remaining diatoms release excess carbon dioxide to the atmosphere.
 - B. Seals and polar bears use up oxygen in breaking down the dead diatoms.
 - C. The amount of available carbon near the surface of the ocean decreases.
 - D. The amount of oxygen available to the seals and polar bears increases.
53. Suppose that people reduce the amount of fossil fuel they burn. How would this help the polar bear in the future?
- A. The seals would not be in danger.
 - B. Temperatures would decrease.
 - C. The amount of sea ice would increase.
 - D. The situation would not become worse.

54. A student wants to do further research on the effects of global warming on biodiversity. Which of the following Web sites would be the **least** reliable source of information about global warming?
- A. a university Web site
 - B. an oil company Web site
 - C. a nonprofit agency Web site
 - D. a government agency Web site
55. Organisms are classified into kingdoms, which include Protista, Fungi, Plantae, and Animalia. What characteristic do all the organisms in these four kingdoms have in common?
- A. They are eukaryotic.
 - B. They are multicellular.
 - C. They are capable of digestion.
 - D. They are capable of locomotion.

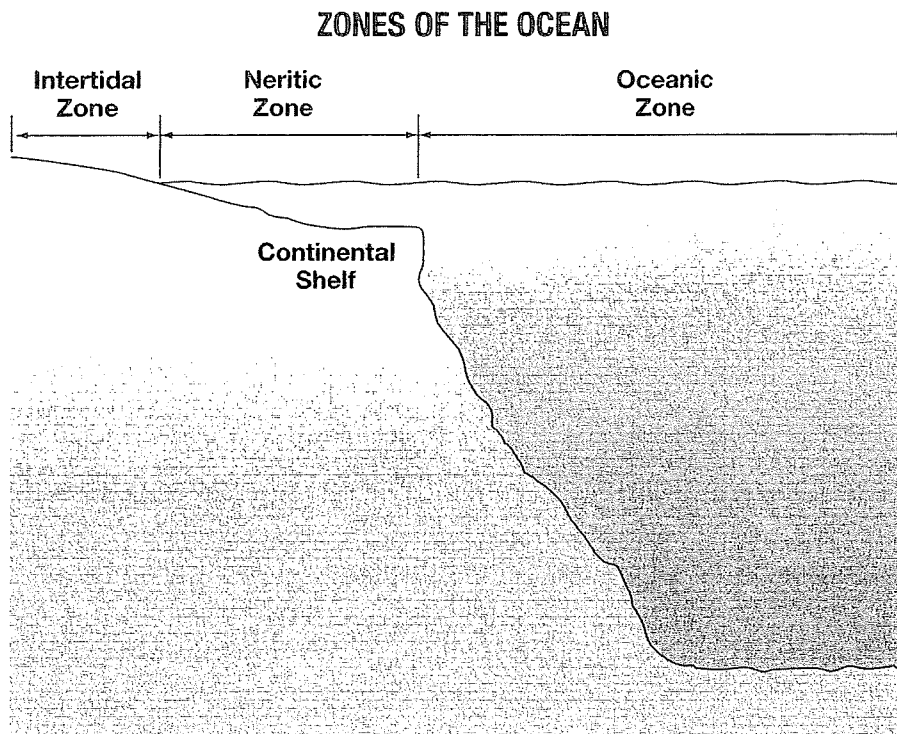
56. A food web is shown below.



Which group of organisms is NOT represented in the diagram?

- A. decomposers
- B. herbivores
- C. consumers
- D. producers

57. The three zones of the ocean are shown below.

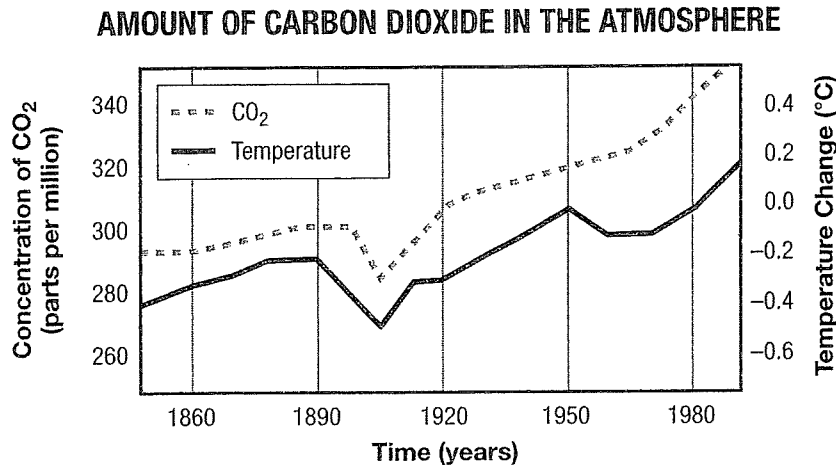


Which of the following would be found in the intertidal zone?

- A. a coral reef that needs shallow water and abundant sunlight
- B. a crab that can live submerged in water or exposed to air and sunlight
- C. a dolphin that can travel easily between the surface and deep waters
- D. a fish that needs cool, nutrient-rich water that moves in from the deep ocean

58. Biodiversity refers to the number of different kinds of organisms living in an ecosystem. Which of the following is **least** likely to reduce the biodiversity in an ecosystem?
- A. Farmers in an area clear several hundred hectares of forest to grow crops.
 - B. Heavy rains cause major flooding in an area, destroying many trees and homes.
 - C. When there is a shortage of their usual food, birds switch to a different food source.
 - D. People release unwanted pet snakes from a foreign country into the wild.
59. Plants can be classified as vascular or nonvascular. Nonvascular plants, such as moss, absorb nutrients directly from their surroundings. Seedless vascular plants and all nonvascular plants make spores. Which of the following is the purpose of spores?
- A. to prevent water loss
 - B. to aid in reproduction
 - C. to distribute nutrients
 - D. to aid in photosynthesis

60. Over the past two centuries, people's use of coal and oil has increased dramatically. The graph below shows the amount of carbon dioxide in the atmosphere and changes in Earth's average temperature from the middle 1800s to the late 1900s.



Which of the following is the **best** explanation for the data shown in the graph?

- A. Carbon dioxide increases naturally over time and causes temperatures to rise.
 - B. The use of fossil fuels puts carbon dioxide into the air and causes temperatures to rise.
 - C. Increases in temperature are not related to increases in carbon dioxide.
 - D. Increases in carbon dioxide are not related to human activities.
61. Which of the following ecosystems has the **lowest** carrying capacity?
- A. a prairie in central Canada
 - B. a rain forest near the equator
 - C. a desert in the western United States
 - D. a forest in the eastern United States

62. Plants are composed of different organs, tissues, and cells. Which are found **only** in vascular plants?
- A. gametes and leaves
 - B. xylem and phloem
 - C. stomata and guard cells
 - D. flowers and spores
63. Cells can carry out either aerobic or anaerobic respiration. Which of the following describes a difference between aerobic and anaerobic respiration?
- A. Aerobic respiration produces more ATP than anaerobic respiration.
 - B. Aerobic respiration is more commonly carried out by microorganisms.
 - C. Anaerobic respiration requires oxygen, while aerobic respiration does not.
 - D. Anaerobic respiration requires less carbon dioxide than anaerobic respiration.
64. A biochemical reaction changes substances called reactants into substances called products. Which of the following are the reactants in photosynthesis?
- A. oxygen and water
 - B. glucose and oxygen
 - C. carbon dioxide and water
 - D. carbon dioxide and oxygen

65. In winter, a layer of surface ice on lakes helps keep deeper water from freezing. Organisms under the ice can survive. Which property of water allows this to happen?
- A. Water dissolves most substances.
 - B. Water decreases in density when solid.
 - C. Water has high cohesion and adhesion.
 - D. Water has a high degree of surface tension.
66. Scientists use genetic engineering to produce new, desirable traits in organisms. For example, scientists have developed crops that are resistant to weed killers. Which of the following is a possible risk of using genetic engineering in this way?
- A. more new diseases
 - B. more harmful insects
 - C. more resilient weeds
 - D. more genetic variation