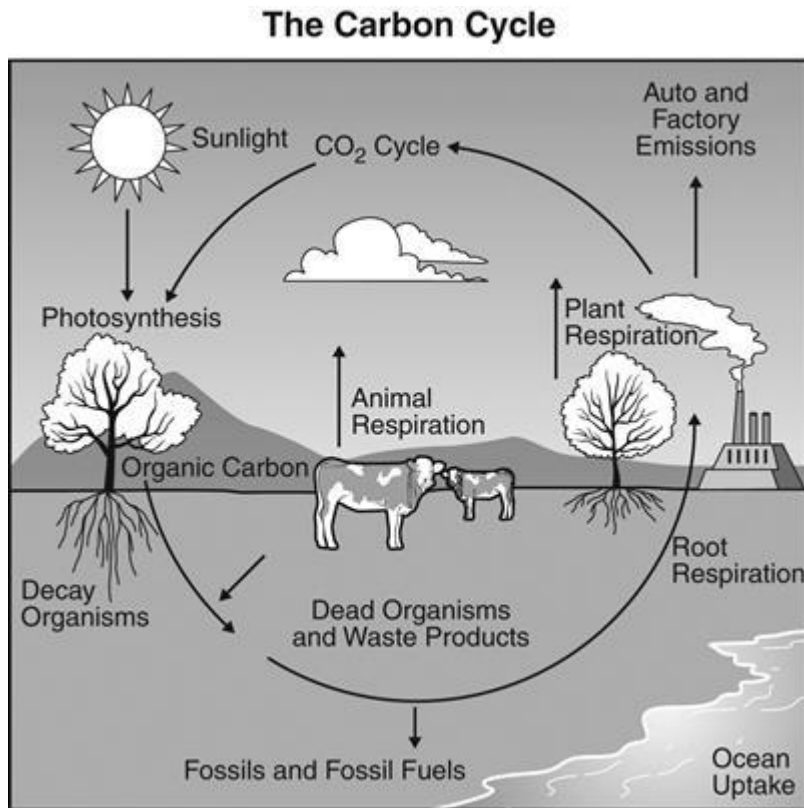


Goal 2.1

Student _____

1. A diagram of the carbon cycle is shown.



Which of the following processes is part of the carbon cycle?

- A. Decomposers put carbon into the soil by breaking down organic material.
- B. Factories remove carbon from the atmosphere by burning materials.
- C. Plants put carbon back into the atmosphere through the process of photosynthesis.
- D. Animals remove carbon from the atmosphere through the process of respiration.

2. What is one way heterotrophs can obtain nitrogen from their environment?
 - A. eating plants
 - B. denitrifying bacteria
 - C. inhaling it from the air
 - D. absorbing it by drinking water

3. Which has the **greatest** impact on the rate of photosynthesis?
 - A. the amount of oxygen present
 - B. the rate of aerobic respiration
 - C. the rate of anaerobic respiration
 - D. the amount of carbon dioxide present

4. Which effect of tropical deforestation will have the **greatest** impact on the functioning water cycle?
 - A. It can decrease the runoff over the earth's surface.
 - B. It can decrease the flow of underground aquifers.
 - C. It decreases the transpiration of water into the atmosphere from dense tropical forests.
 - D. It decreases surface temperatures where a dense forest canopy used to be.

5. If a decline of the nitrogen fixing bacteria population took place worldwide, what would **most likely** be the result?
- A. a decrease in usable oxygen worldwide
 - B. an increase in denitrification worldwide
 - C. a decrease in usable nitrogen worldwide
 - D. an increase in the uptake of usable nitrogen by plant life
6. Transpiration is an important component of which cycle?
- A. water
 - B. oxygen
 - C. carbon
 - D. nitrogen
7. Early in the 20th century, a German scientist named Fritz Haber figured out how to create fertilizers that could be added directly to soil. This technology has spread rapidly, and the use of synthetic nitrogen fertilizers has led to an enormous boom in agricultural productivity. This agricultural productivity has helped us to feed a rapidly growing world population. Will this increased agricultural productivity affect the global nitrogen cycle?
- A. No, it doesn't enter the atmosphere.
 - B. No, it doesn't enter the food chain.
 - C. Yes, it will be converted back to atmospheric nitrogen.
 - D. Yes, there will be more nitrogen available for living organisms.

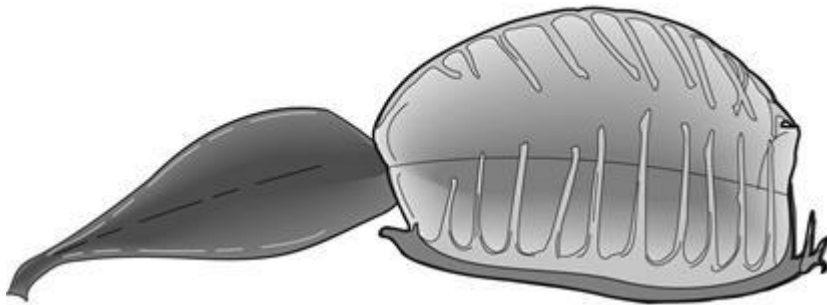
8. Animals require a constant source of carbon compounds for the proper functioning of body processes. In which way are animals able to obtain usable atmospheric carbon?
- A. through the decomposition of water
 - B. through the combustion of fossil fuels
 - C. through aerobic respiration of bacteria
 - D. through digestion of plants that carry out photosynthesis
9. Which serves as a major source of carbon dioxide for photosynthesis?
- A. evaporation
 - B. precipitation
 - C. respiration
 - D. transpiration
10. Which statement **best** explains what happens to dead organisms?
- A. Decomposers use the material found in a rotting organism as food.
 - B. Natural chemical processes cause the materials to rot directly into rich soil.
 - C. Decay is a natural process that destroys materials found in rotting organisms.
 - D. Carnivores break down the waste of organisms and return the material to the environment.

11. What is the source of energy behind the carbon cycle?
- A. sun
 - B. consumers
 - C. combustion
 - D. decomposition
13. What effect would an increase in atmospheric carbon dioxide have on plant mass?
- A. increase in plant mass
 - B. no change in plant mass
 - C. slight decrease in plant mass
 - D. significant decrease in plant mass
15. **The life cycle of a mosquito depends on the availability of standing or slow-moving water. If there is a lower-than-normal number of mosquitoes present in one area, which limiting factor is most likely the cause?**
- A. a severe drought
 - B. an abnormally mild winter
 - C. a reduction in pesticide usage
 - D. a decline in populations of insect-eating birds

- 16. For a certain species of butterfly on a South Pacific Island, females carry a bacterium that kills males before they hatch. Within one year, the population of male butterflies increased from 1% to 39%. A gene was discovered that may inhibit the reproduction of the bacterium. Which is an important factor in this process of natural selection?**
- A. Offspring have an equal chance in surviving.
 - B. There is inherited variation between individuals in a species.
 - C. Parents only produce enough offspring to replace themselves.
 - D. Mutations are advantageous to the species in which they originated.
- 17. Male peacocks spreading their feathers to impress a mate is which type of adaptation?**
- A. structural
 - B. behavioral
 - C. reproductive
 - D. embryological
- 18. Many types of organisms live in a meadow. With the introduction of a large, swift-moving predator into the meadow ecosystem, which group of organisms will MOST likely have an advantage of surviving and reproducing?**
- A. mice that have the thickest fur
 - B. foxes that have the largest ears
 - C. gophers that dig the deepest holes
 - D. rabbits that can run the fastest

21. Animals of the same species may have difficulty recognizing each other. Which adaptation most likely developed to help animals recognize each other?
- A. the ability to migrate
 - B. the ability to camouflage
 - C. the ability to produce body scents
 - D. the ability to produce body wastes
23. The Venus flytrap inhabits humid bogs. It is photosynthetic and makes glucose ($C_6H_{12}O_6$) from carbon dioxide (CO_2) and water (H_2O). Additionally, the Venus flytrap catches, kills, and digests insects. This adaptation is used to supplement the Venus flytrap with a nutrient that is in short supply.

Venus Flytrap



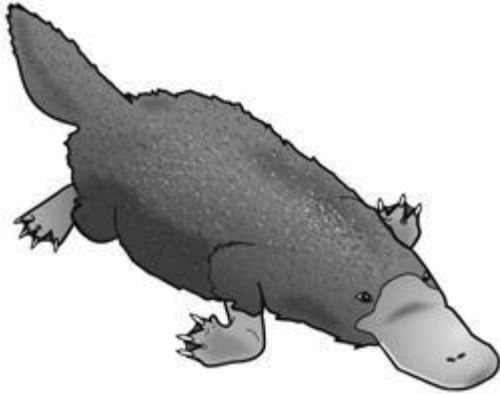
Which is the most likely nutrient that is in short supply?

- A. carbon
- B. hydrogen
- C. nitrogen
- D. water

25. In an experiment, a dog was made to salivate when it heard the ringing of a bell. Which type of learning is demonstrated by the dog?
- A. imprinting
 - B. habituation
 - C. conditioning
 - D. trial and error
26. The exotic plant *Melaleuca*, or Australian Pine, has increased the intensity of fires across the Everglades. The amount of fuel available for fires has increased due to the presence of the *Melaleuca*. The *Melaleuca* releases massive numbers of seeds in response to fire, drought, and herbicide damage. Which best describes the reason the *Melaleuca* has been able to survive?
- A. adaptation
 - B. competition
 - C. diversification
 - D. mutation
27. In the winter, the Canadian tundra is covered with snow. In the summer, grasses and small shrubs cover the Canadian tundra. Which adaptation would best help the Arctic hare survive and reproduce in the Canadian tundra?
- A. thick fur that retains heat in the summer
 - B. long ears that remove excess heat in the winter
 - C. white fur in the winter that changes to brown fur in the summer
 - D. long claws in the summer that change to short claws in the winter

28. A platypus has feet similar to those in the drawing.

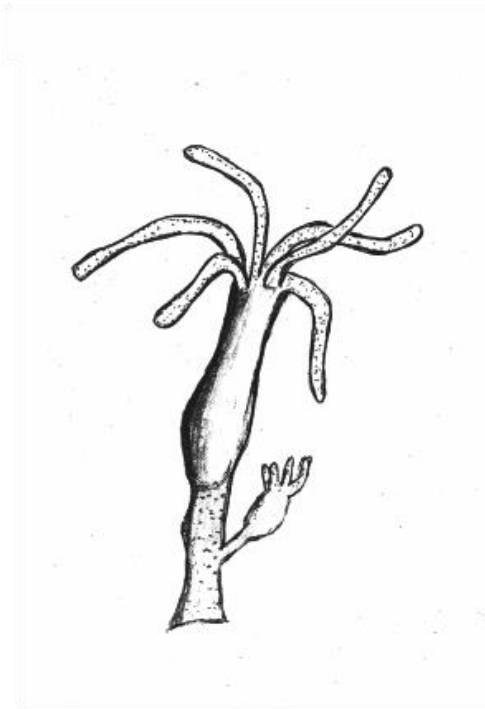
Duck-Billed Platypus



Which best explains how the feet of a platypus enable it to survive?

- A. Webbing allows the platypus to move through the water.
 - B. Claws help the platypus to grip while climbing trees.
 - C. The shape of the foot enables the platypus to walk long distances.
 - D. The number of toes on the feet helps the platypus to capture its prey.
30. Many animals hibernate to survive during certain times of the year. Which best explains the relationship between hibernation and how an animal competes for resources?
- A. Hibernation helps an animal avoid being attacked by predators.
 - B. Hibernation allows an animal to keep its core body temperatures colder.
 - C. Hibernation decreases the need an animal has for oxygen when air is cold.
 - D. Hibernation reduces the need an animal has for food when resources are limited.

32. The *Hydra* pictured below reproduces by budding, stings and paralyzes small invertebrate animals, and requires oxygen to produce energy from the breakdown of sugars.

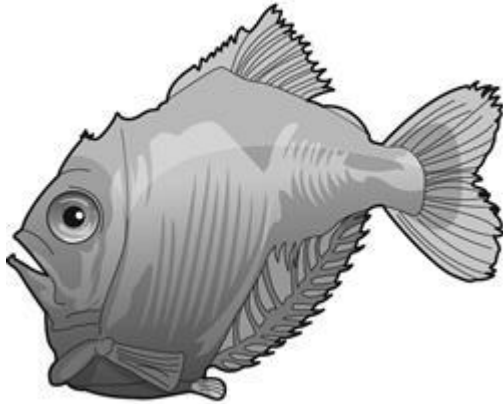


Which terms **most likely** describe this organism?

- A. multicellular, asexual reproduction, predator, carnivore, autotrophic, anaerobic
- B. multicellular, sexual reproduction, predator, carnivore, heterotrophic, aerobic
- C. multicellular, asexual reproduction, predator, carnivore, heterotrophic, aerobic
- D. multicellular, asexual reproduction, predator, herbivore, heterotrophic, aerobic

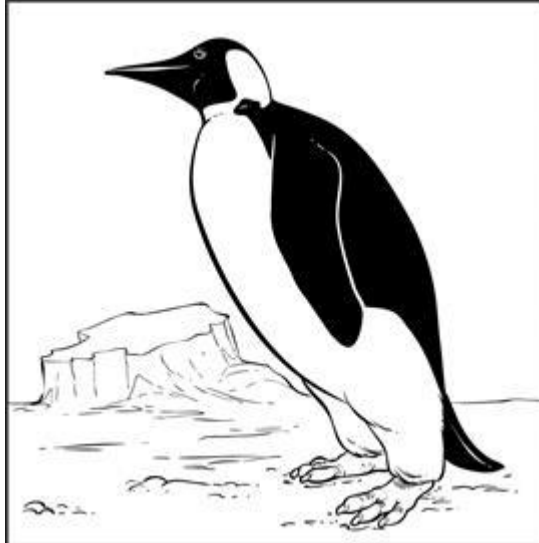
35. The hatchet fish lives in the deeper zones of the ocean. Over time it has developed an upturned mouth to capture food floating down from the surface. Most hatchet fish also have patches around their mouths which seem to attract prey.

Hatchet Fish



- Which best describes why the hatchet fish has been able to survive?
- A. It has occupied the largest area.
 - B. It has eaten and eliminated smaller fish.
 - C. It has multiplied faster than other marine life.
 - D. It has adapted to feed on available food.
36. One species of mammal that lives in northern regions gives birth to offspring with white fur. Over the following months, the fur of the offspring darkens. In what season are the offspring most likely born?
- A. spring
 - B. summer
 - C. winter
 - D. autumn

37. Emperor penguins live in an extremely cold environment. An emperor penguin has a high density of feathers on its body that keeps the penguin from freezing. Tufts of down on the feather shafts increase the insulative property of the feathers. The penguin's streamlined body shape and flippers help propel it through the water.



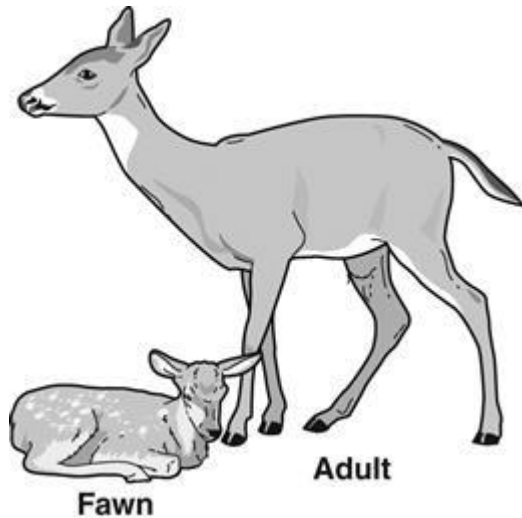
The emperor penguin survives in these harsh conditions because of

- A. the ability to migrate long distances.
 - B. specific adaptations to the environment.
 - C. maintaining a diet rich in fish oil.
 - D. recessive genes inherited from ancestors.
38. How has the mountain ash tree evolved in order to allow its seeds to be spread far from their source?



- A. The seeds are brightly colored and attract animals to the plant.
- B. The seeds have light stems that allow them to be carried by the wind.
- C. The seeds are lightweight so animals can pick them up and carry them back to their nests.
- D. The seeds are in berries that are eaten by birds and dropped as waste away from the plant.

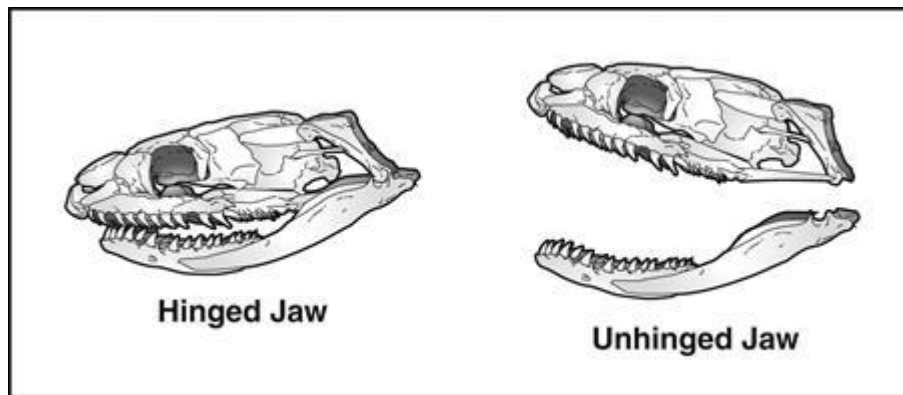
39. A newborn whitetail deer fawn is born with white spots on its fur. The mother deer may leave the fawn unattended in the forest while she forages. As the fawn matures into an adult and can forage for its own food, these spots fade.



How do the white spots most likely help the fawn survive?

- A. They provide camouflage in the forest.
- B. They help the mother deer recognize her young.
- C. They signal other members of the deer population.
- D. They are warning colors that can frighten predators.

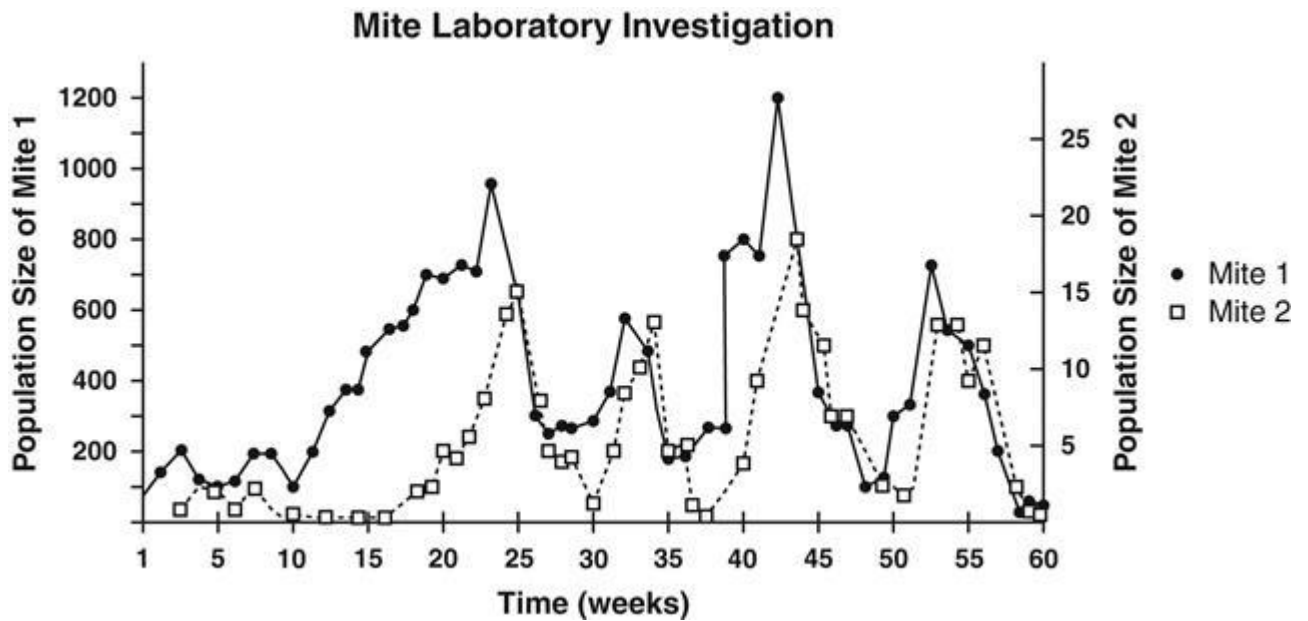
40. The jaw of the California Kingsnake can unhinge, allowing it to open its mouth to a size greater than that of its head.



What survival advantage does an unhinged jaw give the California Kingsnake?

- A. ability to conform to tight spaces
 - B. greater efficiency in oxygen absorption
 - C. capability to consume prey of variable size
 - D. better vision due to eye positioning on head
41. Which is considered a parasite?
- A. flea
 - B. fire ant
 - C. scorpion
 - D. black widow spider

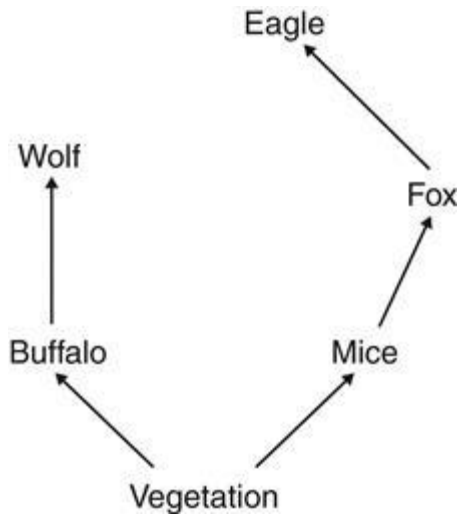
42. Two mite species, Mite 1 and Mite 2, shared the same habitat in a laboratory investigation. Changes in the population size of each organism were graphed.



Based on the data shown in the graph, it can be concluded that Mite 2 acted as which in regard to Mite 1?

- A. host
- B. mutualist
- C. predator
- D. prey

43. A food web is shown.



A decrease in the wolf population will most likely first result in

- A. an increase in the eagle population.
 - B. a decrease in the amount of vegetation.
 - C. a decrease in the number of buffalo.
 - D. an increase in the fox population.
44. Which describes a mutualistic relationship between two different organisms?
- A. two organisms fighting over limited resources
 - B. two organisms benefiting from interacting together
 - C. one organism benefits by eating the other organism
 - D. one organism benefits at the expense of the other organism

45. Fungi grow in long, thin strands called hyphae. Individually, hyphae are usually so small they cannot be seen by the human eye.

Hyphae



How do hyphae most likely improve soil's ability to hold water?

- A. by obtaining nutrients from living organisms
 - B. by creating channels for drainage
 - C. by trapping soil particles
 - D. by breaking rocks
46. Joann repeatedly overfed the fish in the pond behind her house. The nitrates from the excess food contributed to an overgrowth of algae. To correct the problem, Joann added more plants to the pond. How will adding more plants help?
- A. The plants make the pond look beautiful.
 - B. The plants will camouflage the green algae.
 - C. The plants will compete with algae for nutrients.
 - D. The plants will provide all the food for the fish.

51. How is disease affected by a population's size?
- A. Population size has no effect on the spread of disease.
 - B. As population size increases, the spread of disease is increased.
 - C. As population size increases, the spread of disease is decreased.
 - D. As population size decreases, the spread of disease is increased.
53. **If the environment in an area is destroyed, a new community of organisms sometimes takes the place of previous communities. The introduction of a new community of organisms is known as**
- A. evolution.
 - B. adaptation.
 - C. biological diversity.
 - D. ecological succession.
55. What could cause a population to reach its carrying capacity?
- A. The population adapts.
 - B. The population becomes extinct.
 - C. The population has a limited food supply.
 - D. The population finds a new food source.

57. A population of baboons has access to plenty of food, shelter, and space to live but an inadequate supply of water. Which of these best defines the water in this case?

- A. limiting factor
- B. limiting reagent
- C. ecological shortfall
- D. ecological constraint

58. Fires in forests from lightning rid the forest of dead branches and leaves. If the trees survive and the soil remains intact, the forest will experience regrowth to its climax state by which process?

- A. tropism
- B. succession
- C. gradualism
- D. eutrophication