

Name: _____

Date: _____

1.

Which of the following is an abiotic factor in an ocean ecosystem?

- A. coral
 - B. whale
 - C. water
 - D. shrimp
-

2. How can an infestation of insects in a peach orchard best be controlled in an environmentally friendly way?

- A. spraying the trees with an insecticide
 - B. removing the infected trees
 - C. increasing irrigation to the trees
 - D. introducing a predator of the insect pests
-

3.

Physical and chemical factors may affect an organism's survival. These abiotic factors may include

- A. infectious parasites.
 - B. autotrophs and chemoautotrophs.
 - C. pathogens such as fungi and bacteria.
 - D. available gases such as O₂, CO₂ and N₂.
-

4.

Physical and chemical factors may affect an organism's survival. These abiotic factors may include

- A. infectious parasites.
 - B. autotrophs and chemoautotrophs.
 - C. pathogens such as fungi and bacteria.
 - D. available gases such as O₂, CO₂ and N₂.
-

5. The study of the interaction of organisms with each other and their surroundings is

- A. botany.
 - B. ecology.
 - C. morphology.
 - D. zoology.
-

6. The field of science that studies the interactions among living and nonliving factors in the environment is

- A. anthropology.
 - B. ecology.
 - C. embryology.
 - D. zoology.
-

Biology Standard 4 (BiologyStandard4)

7. The field of science that studies the interactions among living and nonliving factors in the environment is

- A. anthropology.
 - B. ecology.
 - C. embryology.
 - D. zoology.
-

8. The branch of biology that studies how living things interact with their environment is

- A. ecology.
 - B. entomology.
 - C. microbiology.
 - D. zoology.
-

9. The branch of biology that focuses on living things and their relationship with their surroundings is

- A. ecology.
 - B. genetics.
 - C. microbiology.
 - D. paleontology.
-

10. The scientist who studies plants and animals and their interaction would be a(n)

- A. botanist.
 - B. ecologist.
 - C. geologist.
 - D. zoologist.
-

11. The scientist who studies plants and animals and their interaction would be a(n)

- A. botanist.
 - B. ecologist.
 - C. geologist.
 - D. zoologist.
-

12. The science that focuses on the study of the interaction between living things and their environment is known as

- A. botany.
 - B. ecology.
 - C. genetics.
 - D. zoology.
-

13.

Replacing inorganic nutrients in soil is accomplished primarily by the

- A. second-order consumers.
 - B. first-order consumers.
 - C. decomposers.
 - D. herbivores.
-

14.

Replacing inorganic nutrients in soil is accomplished primarily by the

- A. second-order consumers.
 - B. first-order consumers.
 - C. decomposers.
 - D. herbivores.
-

15.

The origin of all of the energy found in **most** ecosystems is

- A. the sun.
 - B. the food pyramid.
 - C. primary producers.
 - D. the top predator.
-

16.

The origin of all of the energy found in **most** ecosystems is

- A. the sun.
 - B. the food pyramid.
 - C. primary producers.
 - D. the top predator.
-

17.

Ecosystems are made up of both abiotic and biotic factors. Which of the following factors is considered biotic?

- A. sand
 - B. water
 - C. bacteria
 - D. carbon dioxide
-

18.

Ecosystems are made up of both abiotic and biotic factors. Which of the following factors is considered biotic?

- A. sand
 - B. water
 - C. bacteria
 - D. carbon dioxide
-

19.

Ecosystems are made up of both abiotic and biotic factors. Which of the following is an abiotic part of an ecosystem?

- A. water
 - B. algae
 - C. lichens
 - D. yeast
-

20.

Ecosystems are made up of both abiotic and biotic factors. Which of the following is an abiotic part of an ecosystem?

- A. water
 - B. algae
 - C. lichens
 - D. yeast
-

21. What makes the sun the ultimate source of energy for all living things?

- A. conversion of radiation into mechanical energy in animals
 - B. emission of oxygen into the atmosphere
 - C. effects of solar winds on plant growth
 - D. use of the sun in photosynthesis in plants
-

22. What makes the sun the ultimate source of energy for all living things?

- A. conversion of radiation into mechanical energy in animals
 - B. emission of oxygen into the atmosphere
 - C. effects of solar winds on plant growth
 - D. use of the sun in photosynthesis in plants
-

23.

In the typical terrestrial ecosystem, the primary producers are usually

- A. abiotic.
 - B. animals.
 - C. herbivores.
 - D. plants.
-

24.

In the typical terrestrial ecosystem, the primary producers are usually

- A. abiotic.
- B. animals.
- C. herbivores.
- D. plants.

25.

Which of the following **best** describes a biome?

- A. areas of like climate and ecology
 - B. primary productivity per square kilometer
 - C. all of the living organisms in an ecosystem
 - D. areas that include the entire range of an organism
-

26.

Which of the following **best** describes a biome?

- A. areas of like climate and ecology
 - B. primary productivity per square kilometer
 - C. all of the living organisms in an ecosystem
 - D. areas that include the entire range of an organism
-

27. Ecology is the study of

- A. plants.
 - B. echoes.
 - C. contagious diseases.
 - D. organisms and their environments.
-

28. Ecology is the study of

- A. plants.
 - B. echoes.
 - C. contagious diseases.
 - D. organisms and their environments.
-

29. Which branch of biology is defined as the study of the relationship of living things to each other and to their surroundings?

- A. anatomy
 - B. ecology
 - C. genetics
 - D. microbiology
-

30. Which branch of biology is defined as the study of the relationship of living things to each other and to their surroundings?

- A. anatomy
 - B. ecology
 - C. genetics
 - D. microbiology
-

31. Which organism is heterotrophic?

- A. moss
 - B. algae
 - C. oak tree
 - D. mushroom
-

32. In the study of ecology, what is a population?

- A. all plants and animals in a given place
 - B. all the living and nonliving things in an environment
 - C. all the organisms of one particular species in a given place
 - D. different plants interacting with each other in a given place
-

33. In the study of ecology, what is a population?

- A. all plants and animals in a given place
 - B. all the living and nonliving things in an environment
 - C. all the organisms of one particular species in a given place
 - D. different plants interacting with each other in a given place
-

34.

Which of the following is an example of ecological succession?

- A. a moth species evolving gray wings for camouflage
 - B. a dog chasing a bird to use it for nutritional value
 - C. a pine forest slowly replacing a grassy meadow
 - D. leaves decomposing in a forest
-

35.

Which of the following is an example of ecological succession?

- A. a moth species evolving gray wings for camouflage
 - B. a dog chasing a bird to use it for nutritional value
 - C. a pine forest slowly replacing a grassy meadow
 - D. leaves decomposing in a forest
-

36.

The biome is the largest ecological unit. The type of biome is determined by what factors?

- A. latitude and climate
 - B. energy flow through the system
 - C. ratio of producers to consumers
 - D. numbers of species in the food web
-

37.

The biome is the largest ecological unit. The type of biome is determined by what factors?

- A. latitude and climate
 - B. energy flow through the system
 - C. ratio of producers to consumers
 - D. numbers of species in the food web
-

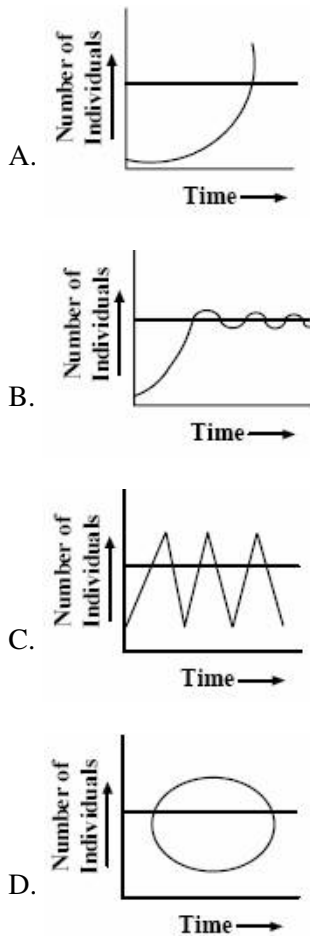
38. Humans have had a tremendous impact on the environment. What has caused an increase in the amount of acid rain?

- A. use of chlorofluorocarbons
 - B. use of pesticides
 - C. coal burning power plants
 - D. nuclear power plants
-

39. Predators often feed on weak or sick animals in an ecosystem. The role of the predator is described as its

- A. community
 - B. habitat
 - C. niche
 - D. population
-

40. An undisturbed deer population grows until its carrying capacity is reached. Which of the graphs below BEST resembles this deer population?



41. Which of the following practices is MOST likely to slow the buildup of CO₂ in the atmosphere?

- A. increased use of tropical rain forest areas for agriculture
 - B. increased use of genetically engineered plants
 - C. decreased pesticide use in favor of biological controls
 - D. decreased use of fossil fuels
-

Biology Standard 4 (BiologyStandard4)

42. Which occurrence is a major source of the gases that can produce acid rain?

- A. a hole in the ozone layer
 - B. burning of fossil fuels
 - C. cloud-seeding by airplanes
 - D. emissions by nuclear reactors
-

43. Which of the following explains why elements, such as carbon and oxygen, that are used in organic molecules are not permanently removed from the environment?

- A. They are replenished by sunlight.
- B. They are cycled through ecosystems.
- C. They are replaced by volcanic eruptions.
- D. They are produced constantly from nutrients.

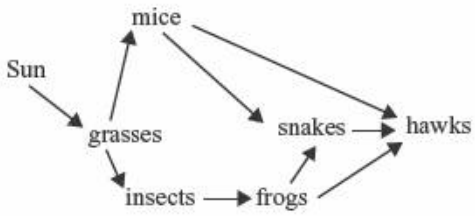
This online assessment item contains material that has been released to the public by the Massachusetts Department of Education.

44. Which of the following correctly explains how atmospheric nitrogen is converted to nitrogen compounds used by living organisms?

- A. Sunlight converts atmospheric nitrogen to a form usable by protists.
- B. Plant leaves convert atmospheric nitrogen to a form usable by animals.
- C. Bacteria in soil convert atmospheric nitrogen to a form usable by plants.
- D. Invertebrate animals in soil convert atmospheric nitrogen to a form usable by fungi.

This online assessment item contains material that has been released to the public by the Massachusetts Department of Education.

45. A food web is shown below.

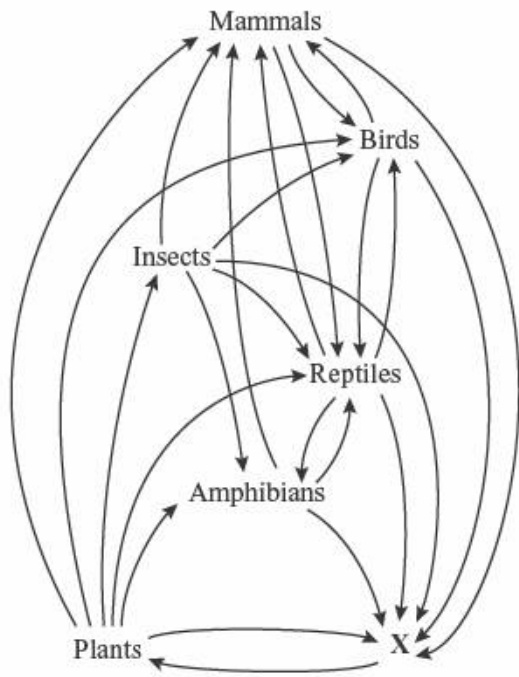


In this food web, the trophic level with the **least** energy includes which of the following organisms?

- A. grasses
- B. mice
- C. snakes
- D. hawks

This online assessment item contains material that has been released to the public by the Massachusetts Department of Education.

46. A food web in a rain forest is shown below.

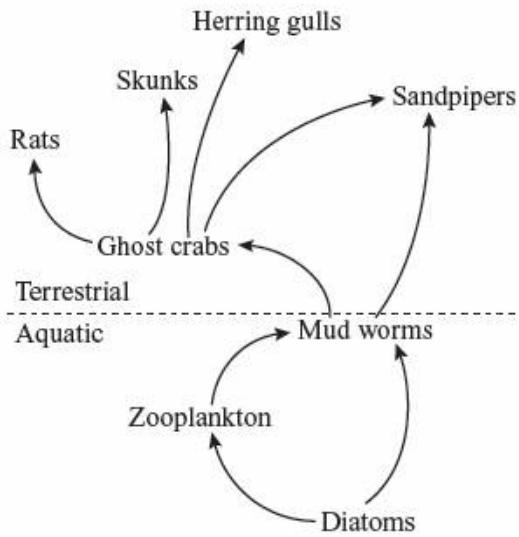


Which of the following **most likely** occupies the location marked **X** in this food web?

- A. decomposers
- B. primary consumers
- C. producers
- D. secondary consumers

This online assessment item contains material that has been released to the public by the Massachusetts Department of Education.

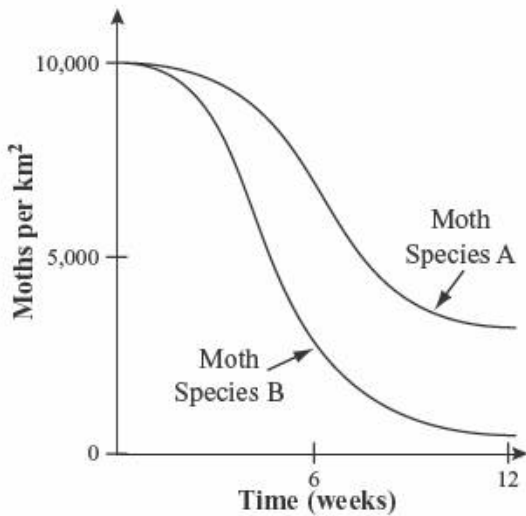
47. A partial food web for a marsh ecosystem is shown below.



The removal of which of the following organisms would **most** reduce the transfer of energy from aquatic organisms to terrestrial organisms?

- A. herring gulls
- B. sandpipers
- C. rats
- D. ghost crabs

48. The praying mantis is a predatory insect that often eats moths. The graph below shows the relative numbers of two species of moths over 12 weeks after the introduction of the predatory praying mantis.

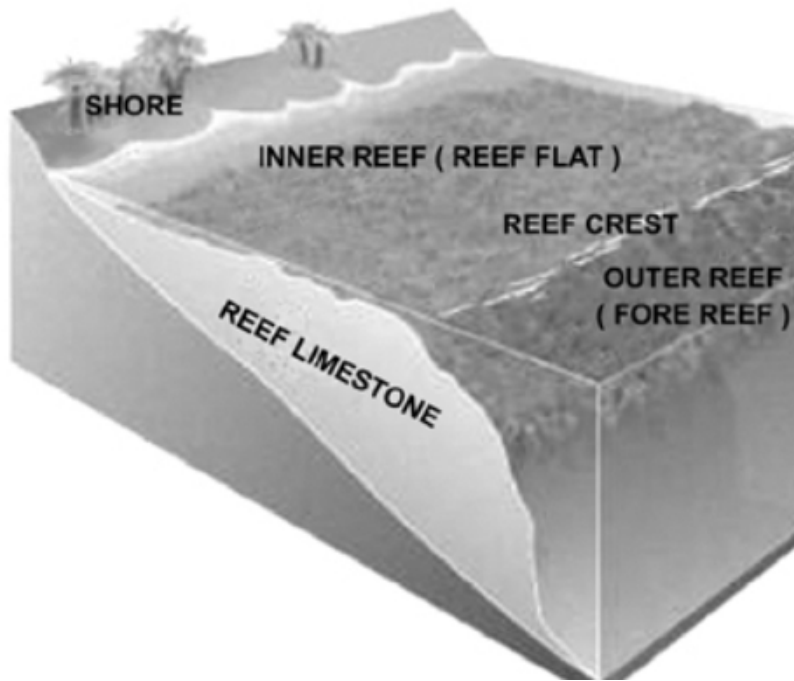


What characteristic of this ecosystem is **best** indicated from this graph?

- A. Species B was preferred as food over species A.
- B. Species B may replace species A in this environment.
- C. Species B will reproduce more rapidly than species A.
- D. Species B was more abundant at the beginning of this time period than species A.

This online assessment item contains material that has been released to the public by the Massachusetts Department of Education.

49.



The diagram illustrates the major zones of a coral reef off of Australia. The shoreline is the sandy area that becomes exposed at low tide. The inner reef is in a zone of constant mixing, due to waves. The reef crest is a calmer zone where wave breaks begin. Finally, the outer reef is deep enough to avoid wave breaks.

A biologist performs a study to determine primary productivity, by algae and coral, on different areas of the reef, and collects the following data:

Shoreline: 0.9 grams carbon/sq meter
Inner reef: 18.3 grams carbon/sq meter
Reef crest: 36.5 grams carbon/sq meter
Outer reef: 18.0 grams carbon/sq meter

Based on this data, form a hypothesis about the relationship between ocean zones and carbon fixation.

- A. The more sunlight that an area collects, the more primary productivity.
 - B. The deeper the ocean zone, the higher the level of primary productivity.
 - C. Primary productivity tends to be highest where there is more sunlight but less mixing.
 - D. Primary productivity tends to be higher where there is more mixing and less sunlight.
-

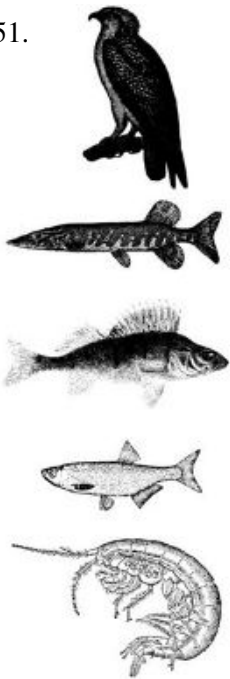
50.

Organize the following levels of biological organization in the proper order.

- A) Individual
- B) Biome
- C) Ecosystem
- D) Community
- E) Population

- A. A, D, E, C, B
 - B. A, D, E, B, C
 - C. A, E, D, C, B
 - D. A, E, D, B, C
-

51.



The picture above shows a food chain for a lake in Norway. Freshwater shrimp, which graze on algae, are eaten by smelt. The smelt are eaten by perch. The perch are eaten by pike. Finally, the pike are eaten by ospreys. Suppose that a virus caused almost all of the perch to die. Which population would INCREASE as a result of the viral outbreak?

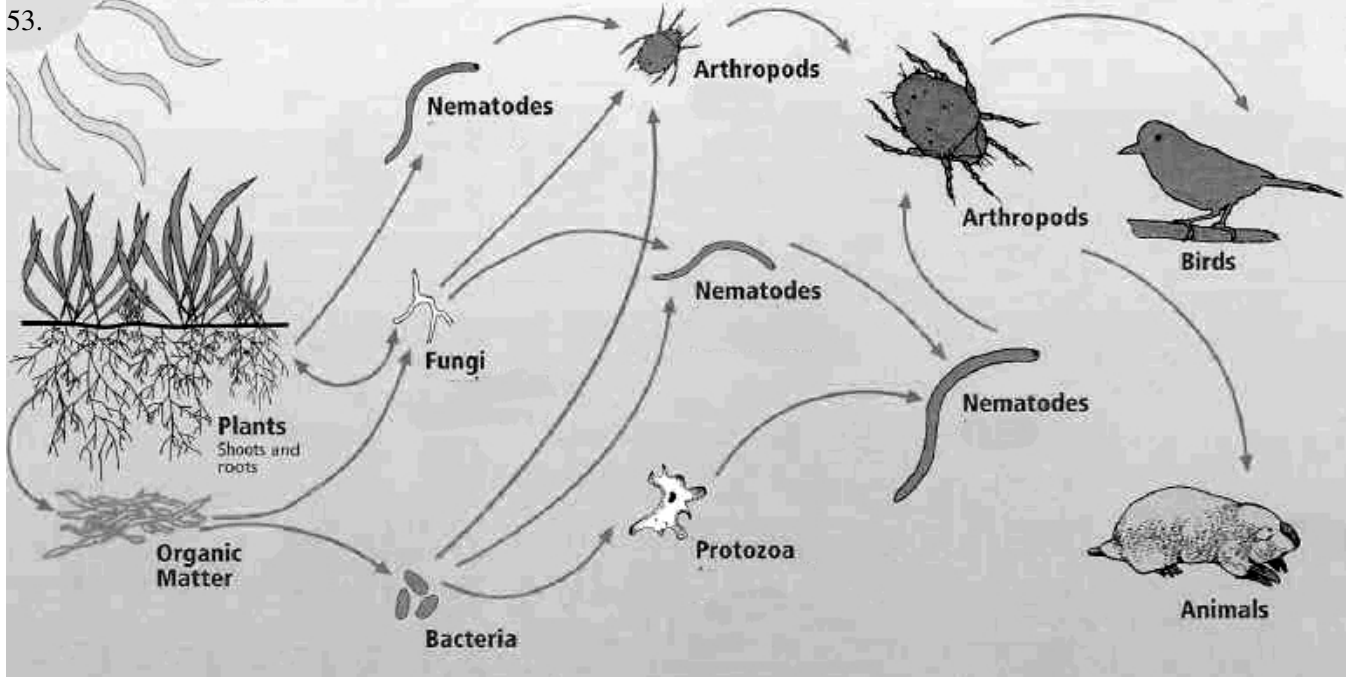
- A. osprey
 - B. pike
 - C. smelt
 - D. shrimp
-

52.



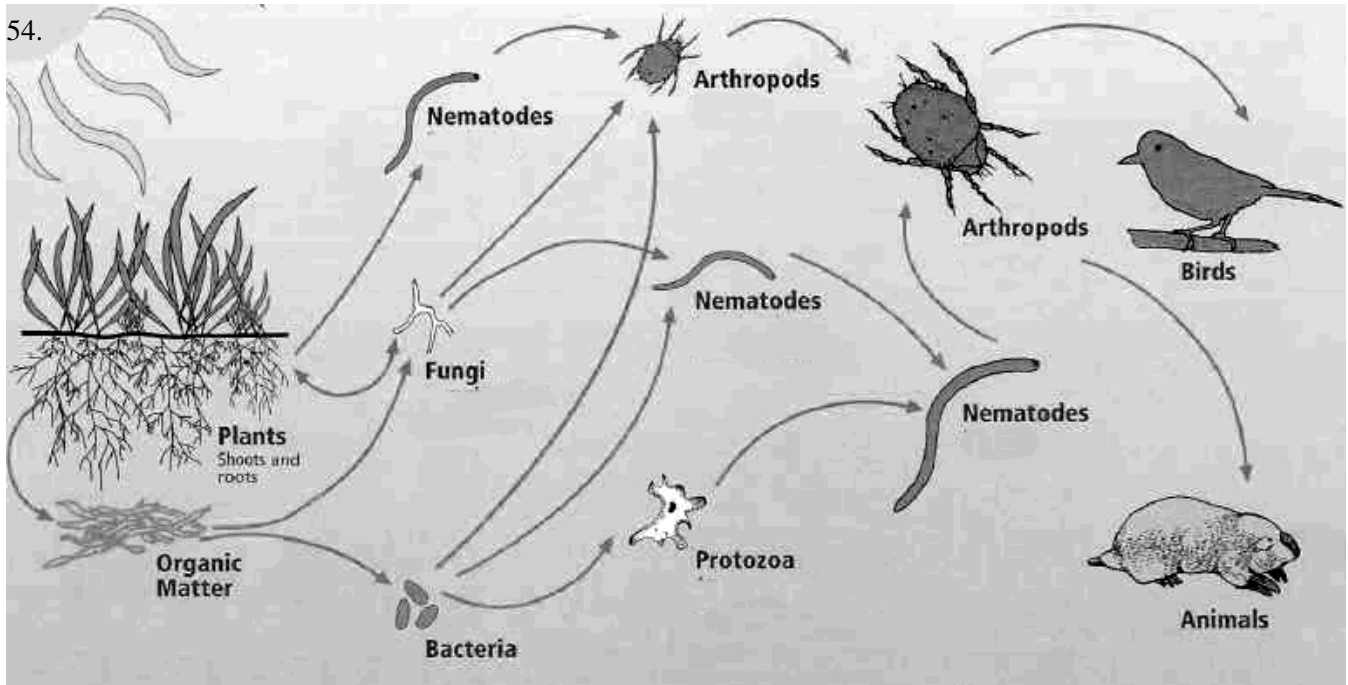
Clownfish hide in anemones for protection because the stinging cells of the anemone cannot penetrate the thick layer of mucus on their skin. However, predatory fish are stung if they touch the anemone. It has not been shown that clownfish either harm or help the anemone. This type of ecological relationship is called

- A. symbiosis.
 - B. mutualism.
 - C. competition.
 - D. commensalism.
-



In the soil food chain shown, arthropods would be considered _____ with respect to nematodes.

- A. primary producers
 - B. secondary producers
 - C. primary consumers
 - D. secondary consumers
-



Which of the organisms in the food chain shown above would have the LEAST amount of overall biomass?

- A. animals
- B. arthropods
- C. bacteria
- D. grass

55.

A Columbian tropical rainforest food chain includes the following set of feeding relationships:

Fig leaves -> Leaf cutter ants -> Anteater -> Jaguar.

Approximately how many pounds of ants would be needed to support one 300-pound adult jaguar?

- A. 300,000
- B. 30,000
- C. 3,000
- D. 300

56.

Which biome is characterized by poor soil, abundant daily rainfall, plants with wide leaf blades, and extremely high animal biodiversity?

- A. taiga
- B. kelp forest
- C. tropical rainforest
- D. temperate deciduous forest

57.

Which of these scenarios BEST describes a biological community?

- A. All of the French Angelfish on an individual coral reef off of Key West.
 - B. All of the living French Angelfish in the reefs of the Atlantic Ocean.
 - C. The coral reefs, tides, water salinity, and other physical factors in the places that French Angelfish live.
 - D. All of the French Angelfish, starfish, cleaner shrimp, corals, and moray eels in an aquarium in the Miami Zoo.
-



The picture above shows a coral reef in the Red Sea. What is the relationship between the damselfish and the coral animals?

- A. They are part of the same population and the same community.
 - B. They are not part of the same community, nor the same population.
 - C. They are part of the same population, but are part of different communities.
 - D. They are part of the same community, but they are different populations.
-

59.

Which of these organisms contributes the MOST biomass and MOST energy to a food chain?

- A. pine trees
 - B. humans
 - C. coral reef animals
 - D. bacteria
-

60.

Arrange the members of a Southwestern food chain in the proper order, from primary producer to secondary consumer.

- Black buzzard
- Coyote
- Field mouse
- Garter snake
- Grass seeds

- A. Grass seeds → field mouse → garter snake → coyote
 - B. Grass seeds → garter snake → field mouse → coyote Detritivore: black buzzard
 - C. Grass seeds → field mouse → coyote → garter snake Detritivore: black buzzard
 - D. Grass seeds → field mouse → coyote → black buzzard Detritivore: garter snake
-

61.

A botanist studying the Galapagos islands notes that there are 37% fewer Boo-bah berry bushes growing on the island this year. Which of these is a **density-independent abiotic factor** that could be to blame?

- A. an overpopulation of giant tortoises, which eat the Boo-bah berries
 - B. competition for sunlight due to an increase in dense plant growth
 - C. a lack of rainfall on the island in the current year
 - D. the spread of a fungus that kills Boo-bah berry bushes
-

62.

In regard to mutualism versus parasitism, what is the relationship between the two involved organisms?

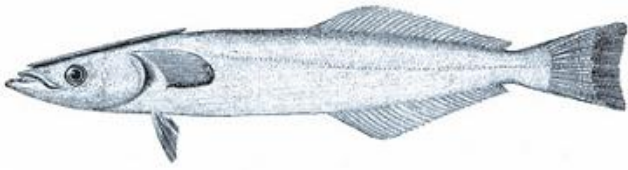
- A. Both organisms benefit in mutualism; both organisms are harmed in parasitism.
 - B. One organism receives a benefit in mutualism; both organisms are harmed in parasitism.
 - C. Both organisms receive a benefit in mutualism; one organism is harmed and the other helped in parasitism.
 - D. One organism receives a benefit in mutualism; one organism is hurt and the other is harmed in parasitism.
-

63.

An African savanna wildlife park contains fruit-producing Baobob trees, predatory leopards, herbivorous baboons, and hyenas, which are scavengers. Which of these organisms would receive the lowest amount of energy from the ecosystem?

- A. baboons
 - B. Baobob trees
 - C. hyenas
 - D. leopards
-

64.



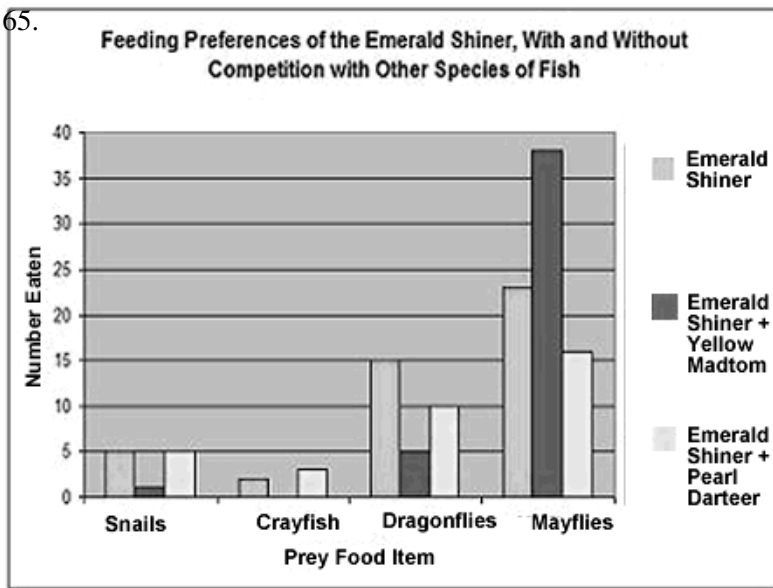
The picture above shows a remora, a species of fish that attaches itself harmlessly to sharks and other large fish with a sucker-like organ on its head.

The remora receives the benefit of a free ride and scraps of food from any meals the large fish eats. While the remora does not hurt the large fish, no one has ever proven that they help the fish either.

This type of relationship is known as

- A. mutualism.
- B. symbiosis.
- C. co-evolution.
- D. commensalism.

65.



The graph above shows the feeding preferences for the Emerald Shiner, a small stream fish found in the southeastern United States. Based on the feeding graph shown above, which of these conclusions is accurate about the niche of the shiner?

- A. The realized niche for feeding on crayfish is the same as the fundamental niche, even in competition with the yellow madtom.
- B. Competition with pearl darters causes emerald shiners to feed more heavily on snails.
- C. The majority of the emerald shiner's realized feeding niche is mayflies when it is in competition with the yellow madtom.
- D. Competition with the pearl darter causes emerald shiners to stop feeding on crayfish.

66.



The picture shows several fish populations interacting with one another in a display tank at a popular public aquarium. What level of biological organization is depicted in the photograph?

- A. a population
 - B. a community
 - C. a biome
 - D. an ecosystem
-

67.

Krakatoa was an island in the Pacific Ocean that was completely destroyed by a volcano in 1886. By 1960, the volcano had formed a new island called Surtsey. A type of grass became the first plant life on Surtsey, when the seeds were dropped by birds that had passed over the island in flight. What type of ecological change does this describe?

- A. ecological turnover
 - B. pioneer succession
 - C. primary succession
 - D. secondary succession
-

68.

Julie often uses hairspray every morning. The hairspray is propelled by Chlorofluorocarbons (CFCs). Julie is likely contributing to which of these environmental problems?

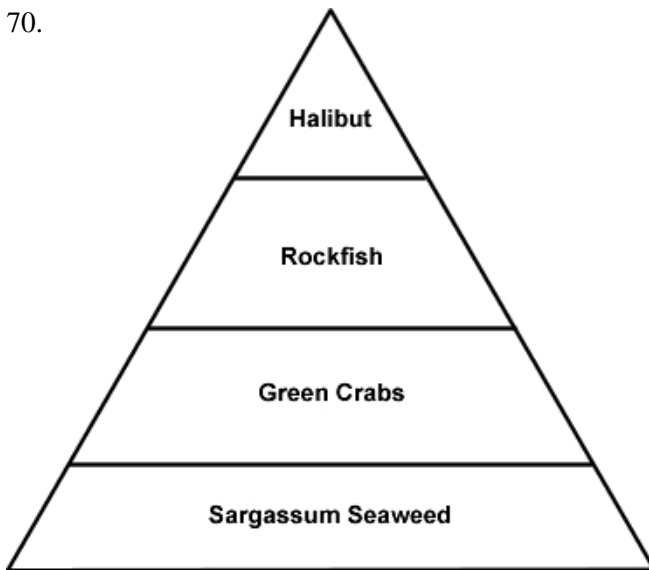
- A. acid rain
 - B. biomagnification
 - C. global warming
 - D. ozone depletion
-

69.

If decomposers, such as bacteria and fungi, were removed from the earth, what would the greatest consequence be to the carbon cycle?

- A. Organic compounds would fail to recycle.
 - B. Plants would no longer be able to photosynthesize.
 - C. Excess carbon dioxide would accumulate in the atmosphere.
 - D. Limestone in the oceans would degrade and ruin coral reef ecosystems.
-

70.



The energy pyramid shows feeding relationships in an Oregon coastline ecosystem. According to the energy pyramid, about how many pounds of sargassum seaweed would need to be present in the ecosystem, in order to support a 10 pound rockfish?

- A. 1 pound
 - B. 10 pounds
 - C. 100 pounds
 - D. 1000 pounds
-

71.

Bears are omnivores, because they eat both animal and plant matter, such as salmon and blueberries. Which level of the food pyramid lacks that characteristics necessary to sustain Bears?

- A. the bottom level of the pyramid
 - B. the second step of the pyramid
 - C. the third step of the pyramid
 - D. the top level of the pyramid
-

72.

Which animal adaptation is related to the species survival in cold environmental conditions?

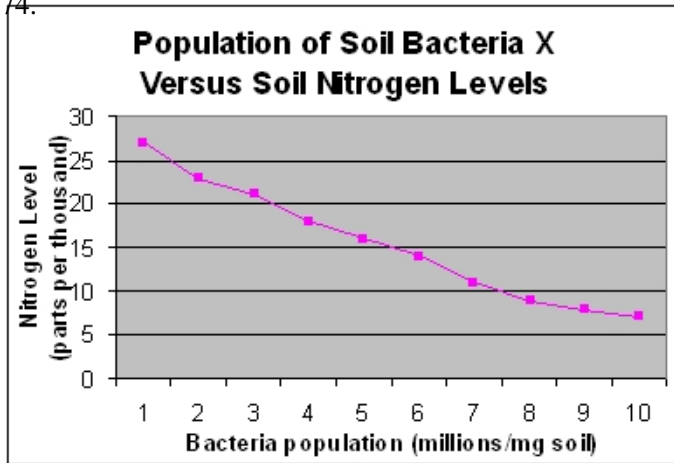
- A. mimicry.
 - B. migration.
 - C. nocturnal activity
 - D. cold-blooded circulatory system.
-

73.

Why does the existence of animals, and their ability to make proteins, depend upon soil bacteria in the nitrogen cycle?

- A. The bacteria are a food source for animals.
- B. The bacteria remove major sources of pollution from the environment.
- C. The bacteria combine nitrogen with other atoms to make amino acids that plants take up. The animals then eat the plants.
- D. The bacteria allow plants to take up nitrogen. The plants turn the nitrogen into amino acids. The animals then eat the plants.

74.



Dr. Jackson discovers a denitrification bacteria that he calls Bacteria X. The graph above shows the effects that bacteria X has on topsoil, as its population increases. Why might plants be scarce in an area of soil with 10 million denitrifying bacteria per milligram?

- A. Plants need nitrogen sources, and the bacteria are removing them.
- B. Denitrifying bacteria put too many nitrates into the soil, which are toxic to plants.
- C. Atmospheric nitrogen is toxic to plants, and the bacteria are putting too much of it into the soil.
- D. The bacteria have run out of nitrogen in the soil, so they have begun to infect the plants and feed on them.

75.

A population of lions live on a grassland in Africa. A population of zebra and a population of gazzelle also live there. Together, these populations interact with one another. Which of these is the best description of a group of populations interacting together?

- A. ecosystem
- B. community
- C. biome
- D. cladosphere



Mimosa tree leaves wilt when they are touched. The firm small leaves shown here quickly droop and close up, even if an animal or person barely grazes them. To do this, the tree draws moisture out of the leaves and further into the stem. This adaptation is thought to make the leaves less appealing to animals that would try to eat them. Minutes later, after the animal has probably passed, the leaves regain water pressure and look normal. What type of tropism does the mimosa tree show?

- A. chemotropism
 - B. gravotropism
 - C. thermotropism
 - D. thigmotropism
-

77.

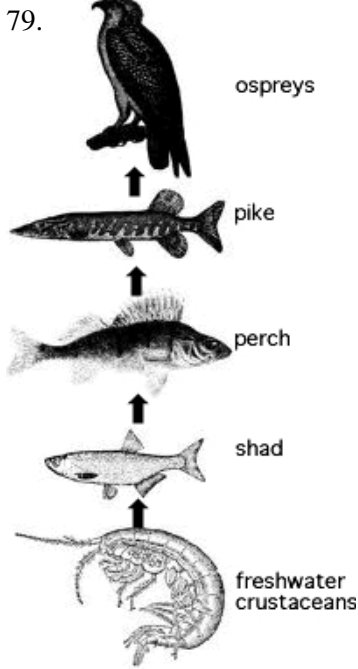
Strangler figs are found in tropical areas of the world. Rather than waste their own energy growing a thick trunk, strangler figs grow over the tops of other trees to reach the sunlight at the top of the rainforest. What type of tropism does the strangler fig demonstrate, in using other trees for support?

- A. chemotropism
 - B. gravotropism
 - C. phototropism
 - D. thigmotropism
-

78.

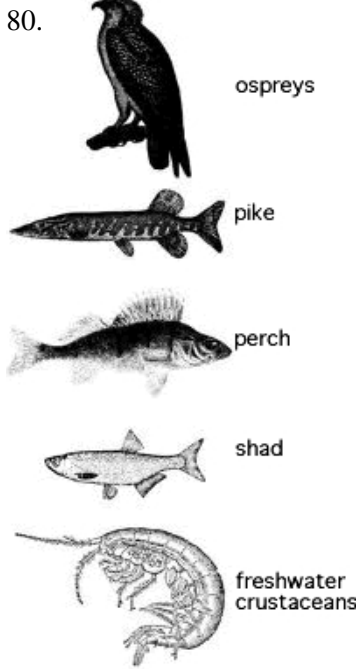
What event is most likely to be associated with secondary ecological succession in a forest ecosystem?

- A. a forest fire that kills smaller plants and allows the improved growth of bushes and trees
 - B. the rapid evolution of a number of animal species from one ancestor
 - C. the development of an ecosystem with only mature forest trees
 - D. a meteor impact that kills every occupant of the ecosystem
-



The food chain shown is from a lake in Norway. From the first consumer, shown on the bottom, to the top predator, the organisms in the food chain are a freshwater crustacean → shad → perch → pike → and → osprey. Suppose that an ecologist discovers that a pesticide is being sprayed on potato fields near the lake. Which organism is likely to suffer the worst effects from the pesticide, due to biomagnification?

- A. the pike
 - B. the osprey
 - C. the freshwater shrimp
 - D. all organisms will be affected equally
-



The food chain shown is from a lake in Norway. In order, from lowest level consumer to top level predator, the food web includes freshwater crustaceans, shad, perch, pike, and ospreys. The freshwater crustaceans eat green algae. Suppose that organisms in this lake only feed in this order. Identify the organism that is the secondary consumer in this ecosystem.

- A. freshwater crustaceans
 - B. perch
 - C. shad
 - D. pike
-

81.

The first living member of any food chain is what type of organism?

- A. a scavenger or detritivore
 - B. a top level predator
 - C. an autotroph
 - D. a heterotroph
-

82.

About how much usable biochemical energy is passed between a primary producer, such as a plant, and a primary consumer, such as a deer, in a biological energy pyramid?

- A. 100%
 - B. 50%
 - C. 20%
 - D. 10%
-

83.

Which of these current environmental concerns is most likely to have the largest and most widespread impact on the global environment?

- A. pollution from coal mining
 - B. over fishing of oceans
 - C. human overpopulation
 - D. logging of forests
-

84.

The following statements describe several human activities. All of these activities directly contribute to global warming and the greenhouse effect EXCEPT

- A. Francis drives her car 30 miles to work every day, using 2 gallons of diesel fuel per day.
 - B. Chuck works for a logging company that clears about 50,000 acres of rainforest per year so that farmers can grow crops.
 - C. Bruce raises 5,000 beef cattle per year. Each cow contributes about 10,000 liters of methane and carbon dioxide gas to the atmosphere.
 - D. Jackson sprays his corn crops with a strong pesticide that remains in the environment for many years because animals cannot digest it.
-

85.

What will happen in a forest ecosystem if stable environmental conditions allow ecological succession to proceed naturally to its endpoint?

- A. One pioneer species will remain in the end.
 - B. A climax community of mature forest trees will form.
 - C. Secondary succession will create a mix of grasses, shrubs, and trees.
 - D. Competition between tree species will cause the forest to die, and a grassland to form.
-

86.

In the rhododendron plant, the leaves exhibit thermotropic behavior. In temperatures below 35°C, these leaves begin to curl at the edges. This process is likely

- A. to retain heat in the plant.
 - B. to increase the rate of photosynthesis.
 - C. to prevent water loss through the leaves.
 - D. to increase plant stability through the winter.
-

87.



The creature shown above is Eohippus, an ancestor of modern horses that was found in jungles. As can be seen in the diagram, Eohippus stood only about 20 cm tall. While modern horses have hooves for running fast in open areas to avoid predators, Eohippus had small toes. What change in the environment of the Eohippus best explains why horses grew larger and faster?

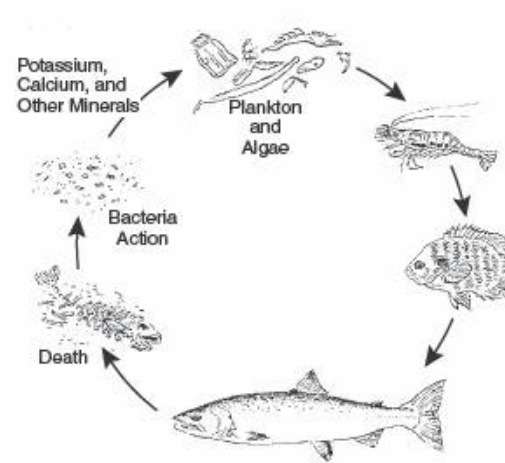
- A. Prolonged droughts caused less food to be available.
 - B. Large, fast saber-toothed cats migrated to their habitat.
 - C. Modern horses needed to become taller to reach the tops of trees to feed.
 - D. The smaller Eohippus was almost certainly a carnivore, while modern horses are herbivores.
-

88. **Unlike other animals, mammals can perspire. The main benefit of perspiring is that it —**

- A. removes extra water from the cells
- B. cools the skin with evaporation
- C. removes dirt from the surface of the skin
- D. relaxes the muscles

*Permission has been granted for reproduction by the Virginia Department of Education
© Virginia Department of Education*

89.



According to this diagram, both of these fish —

- A. eat bacteria.
- B. give off toxic wastes.
- C. take in minerals through their gills.
- D. get their energy from other animals.

*Permission has been granted for reproduction by the Virginia Department of Education
© Virginia Department of Education*

Bear Ranges and Food Sources

Species	Range	Foods
Brown bear	Europe, Asia, Canada, Western U.S. and Alaska	Fruits, nuts, roots, insects, fish, small vertebrates, and carrion
Black bear	Canada, U.S., Northern Mexico	Fruits, berries, nuts, roots, honey, insects, rodents, fish, and carrion
Polar bear	Arctic	Seals, fish, seabirds, hares, caribou, and musk oxen
Panda	Mountains of Central China	Bamboo stems and leaves

90.

Which of these species would be *most* in danger of becoming extinct if one of their food sources became unavailable?

- A. Brown bear
- B. Panda
- C. Polar bear
- D. Black bear

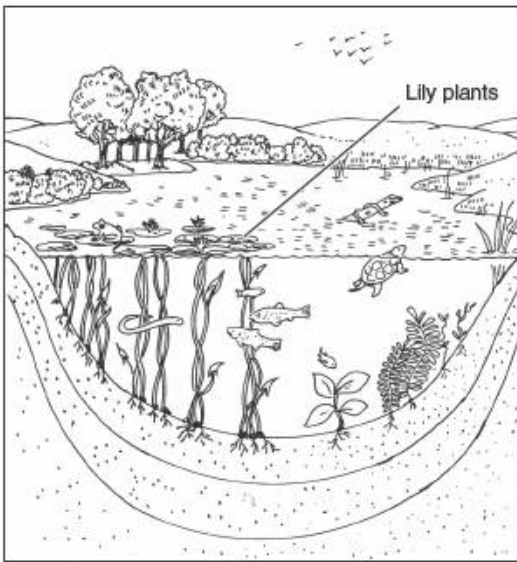
Bear Ranges and Food Sources

Species	Range	Foods
Brown bear	Europe, Asia, Canada, Western U.S. and Alaska	Fruits, nuts, roots, insects, fish, small vertebrates, and carrion
Black bear	Canada, U.S., Northern Mexico	Fruits, berries, nuts, roots, honey, insects, rodents, fish, and carrion
Polar bear	Arctic	Seals, fish, seabirds, hares, caribou, and musk oxen
Panda	Mountains of Central China	Bamboo stems and leaves

91.

Which of these species would be *most* in danger of becoming extinct if one of their food sources became unavailable?

- A. Brown bear
- B. Panda
- C. Polar bear
- D. Black bear

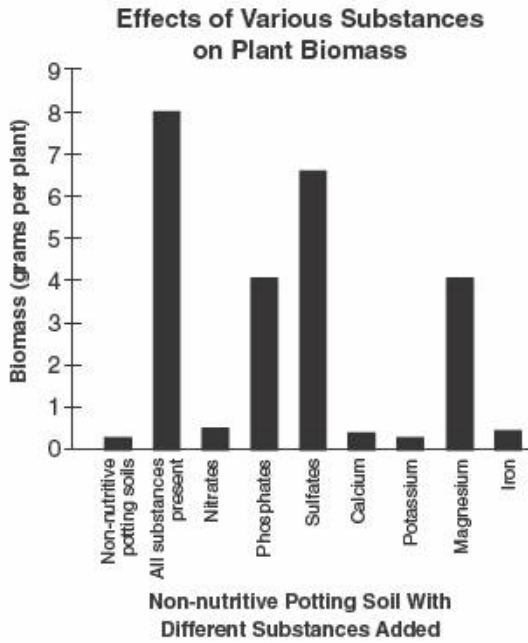


92.

The picture shows a pond ecosystem. What would *most likely* happen if all the lily plants were removed from this community?

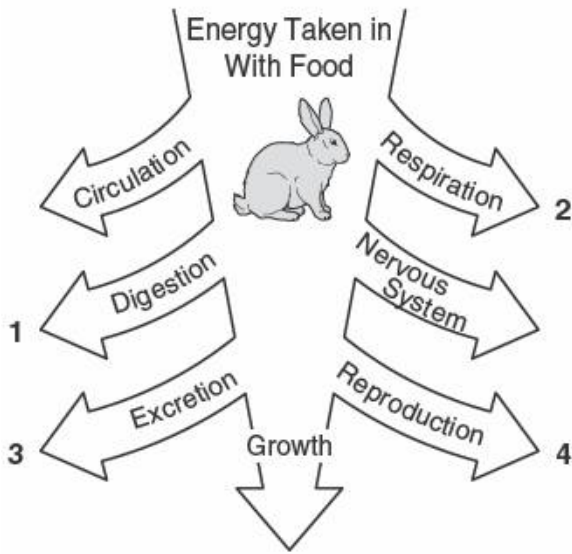
- A. There would be more oxygen in the air.
- B. The pond water currents would be slower.
- C. There would be more kinds of animals in the pond.
- D. The animals would have fewer places to hide.

*Permission has been granted for reproduction by the Virginia Department of Education
© Virginia Department of Education*



93. According to this graph, which of these is most important in developing the biomass of these plants?

- A. Nitrates
- B. Sulfates
- C. Magnesium
- D. Iron



94.

Rabbits have developed behavioral and physiological strategies to sustain them through periods of environmental stress. Which of the numbered life processes above could be sacrificed without affecting an individual rabbit's survival in periods of extremely poor environmental conditions?

- A. 1
- B. 2
- C. 3
- D. 4

*Permission has been granted for reproduction by the Virginia Department of Education
© Virginia Department of Education*

95. The organisms in a typical backyard are likely to include bacteria, grass, shrubs, trees, insects, spiders, birds, and small mammals. Together, all these organisms make up —

- A. a kingdom
- B. a community
- C. a population
- D. an experimental group

*Permission has been granted for reproduction by the Virginia Department of Education
© Virginia Department of Education*

Biology Standard 4 (BiologyStandard4)

96. **Bivalves, such as clams, are found in salt water. The clam captures food particles from water that flows over its gills. Which of these is the best classification of the clam?**

- A. filter feeder
- B. grazer
- C. chunk feeder
- D. decomposer

*Permission has been granted for reproduction by the Virginia Department of Education
© Virginia Department of Education*

97. **In an aquatic habitat, an example of organisms from the pioneer community would be —**

- A. water reeds.
- B. water lilies.
- C. grass.
- D. algae.

*Permission has been granted for reproduction by the Virginia Department of Education
© Virginia Department of Education*

Answer Key

1. C) water
2. D) introducing a predator of the insect pests
3. D) available gases such as O₂, CO₂ and N₂.
4. D) available gases such as O₂, CO₂ and N₂.
5. B) ecology.
6. B) ecology.
7. B) ecology.
8. A) ecology.
9. C) microbiology.
10. B) ecologist.
11. B) ecologist.
12. B) ecology.
13. C) decomposers.
14. C) decomposers.
15. A) the sun.
16. A) the sun.
17. C) bacteria
18. C) bacteria
19. A) water
20. A) water
21. D) use of the sun in photosynthesis in plants
22. D) use of the sun in photosynthesis in plants
23. D) plants.
24. D) plants.
25. A) areas of like climate and ecology
26. A) areas of like climate and ecology

Biology Standard 4 (BiologyStandard4)

27. D) organisms and their environments.

28. D) organisms and their environments.

29. B) ecology

30. B) ecology

31. D) mushroom

32. C) all the organisms of one particular species in a given place

33. C) all the organisms of one particular species in a given place

34. C) a pine forest slowly replacing a grassy meadow

35. C) a pine forest slowly replacing a grassy meadow

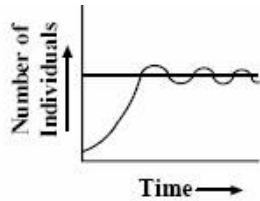
36. A) latitude and climate

37. A) latitude and climate

38. C) coal burning power plants

39. C) niche

40. B)



41. D) decreased use of fossil fuels

42. B) burning of fossil fuels

43. B) They are cycled through ecosystems.

44. C) Bacteria in soil convert atmospheric nitrogen to a form usable by plants.

45. D) hawks

46. A) decomposers

Biology Standard 4 (BiologyStandard4)

- 47. D) ghost crabs
- 48. A) Species B was preferred as food over species A.
- 49. C) Primary productivity tends to be highest where there is more sunlight but less mixing.
- 50. C) A, E, D, C, B
- 51. C) smelt
- 52. D) commensalism.
- 53. D) secondary consumers
- 54. A) animals
- 55. B) 30,000
- 56. C) tropical rainforest
- 57. D) All of the French Angelfish, starfish, cleaner shrimp, corals, and moray eels in an aquarium in the Miami Zoo.
- 58. D) They are part of the same community, but they are different populations.
- 59. A) pine trees
- 60. A) Grass seeds → field mouse → garter snake → coyote
- 61. C) a lack of rainfall on the island in the current year
- 62. C) Both organisms receive a benefit in mutualism; one organism is harmed and the other helped in parasitism.
- 63. B) Baobob trees
- 64. D) commensalism.
- 65. C) The majority of the emerald shiner's realized feeding niche is mayflies when it is in competition with the yellow madtom.
- 66. B) a community
- 67. C) primary succession
- 68. D) ozone depletion
- 69. A) Organic compounds would fail to recycle.
- 70. D) 1000 pounds
- 71. A) the bottom level of the pyramid
- 72. B) migration.
- 73. D) The bacteria allow plants to take up nitrogen. The plants turn the nitrogen into amino acids. The animals then

Biology Standard 4 (BiologyStandard4)

eat the plants.

74. A) Plants need nitrogen sources, and the bacteria are removing them.

75. B) community

76. D) thigmotropism

77. C) phototropism

78. A) a forest fire that kills smaller plants and allows the improved growth of bushes and trees

79. B) the osprey

80. C) shad

81. C) an autotroph

82. D) 10%

83. C) human overpopulation

84. D) Jackson sprays his corn crops with a strong pesticide that remains in the environment for many years because animals cannot digest it.

85. B) A climax community of mature forest trees will form.

86. C) to prevent water loss through the leaves.

87. B) Large, fast saber-toothed cats migrated to their habitat.

88. B) cools the skin with evaporation

89. D) get their energy from other animals.

90. B) Panda

91. B) Panda

92. D) The animals would have fewer places to hide.

93. B) Sulfates

94. D) 4

95. B) a community

96. A) filter feeder

97. D) algae.