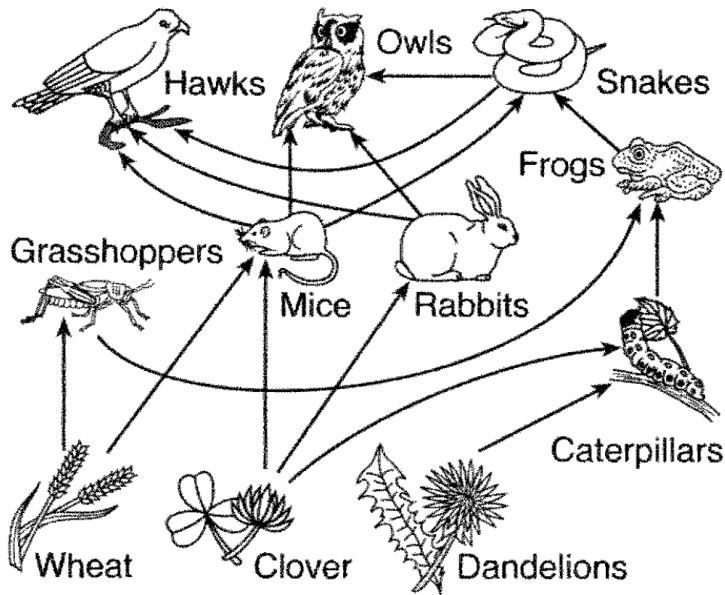


Name:

Date:

Ecology Regents Review

Base your answers to questions 1 and 2 on the diagram below and on your knowledge of biology. The diagram represents a food web in an ecosystem.



1. Which row in the chart below best identifies the relationships between the mice and the wheat?

Row	Role of Mice	Role of Wheat
(1)	producer	consumer
(2)	predator	host
(3)	host	predator
(4)	consumer	producer

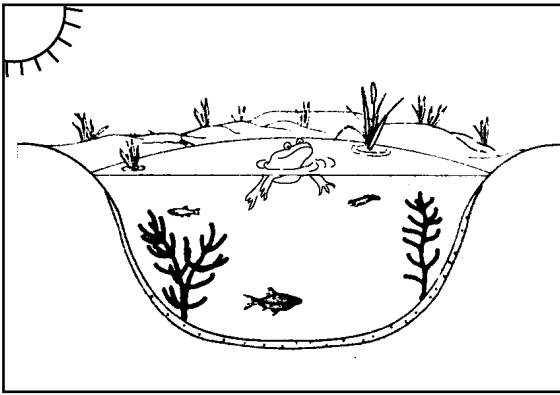
- A) 1 B) 2 C) 3 **D) 4**

2. If the population of hawks in this area increases, their prey populations might decrease. Later, with fewer prey, the hawk population might decrease. The prey populations might then increase. This is an example of

- A) an ecosystem that is completely out of balance
B) how ecosystems maintain stability over time
C) interaction between biotic and abiotic factors within an ecosystem
D) ecological succession in an ecosystem

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3. A pond ecosystem is represented in the diagram below.



Energy for this ecosystem originally comes from

- A) water B) consumers C) **sunlight** D) plants

4. Compared to a natural forest, the wheat field of a farmer *lacks*

- A) heterotrophs B) **significant biodiversity**
C) autotrophs D) stored energy

5. Which list includes only abiotic factors?

- A) **soil, water, air, and sunlight**
B) ducks, fish, soil, and water
C) humidity, temperature, rodents, and grasses
D) trees, flowering plants, mosses, and ferns

6. A limiting factor unique to a field planted with corn year after year is most likely

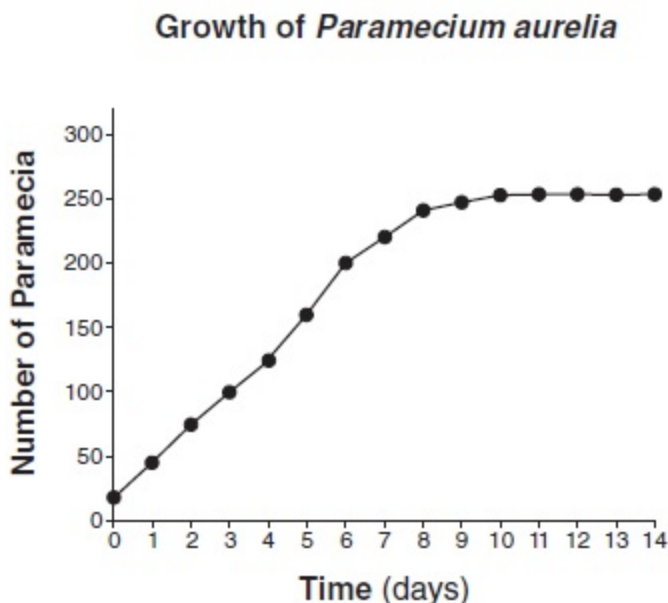
- A) temperature B) sunlight
C) water D) **soil nutrients**

7. Abiotic factors that affect the growth of grass in a lawn include

- A) bacteria and soil B) earthworms and nutrients
C) **moisture and minerals** D) fertilizer and decomposers

Date:

8. Base your answer to the following question on the information below and on your knowledge of biology. The graph below shows the growth of *Paramecium aurelia* in the same culture dish for 14 days.



In another experiment, a second species of paramecium was introduced into a culture dish with *Paramecium aurelia*. Which statement describes a possible result as the populations interact over the next 14 days?

- A) **The population numbers of *Paramecium aurelia* would be lower than 250, since the new species is competing with it for resources.**
- B) The population of *Paramecium aurelia* would increase above 250, since they would mate with the new species.
- C) The population of *Paramecium aurelia* would increase above 250, since the two species occupy the same niche.
- D) The population of *Paramecium aurelia* would remain at 250, since the species compete with each other for the same resources.

9. What are the abiotic factors that characterize a forest ecosystem?

- A) light and biodiversity
- B) temperature and amount of available water**
- C) types of procedures and decomposers
- D) pH and number of heterotrophs

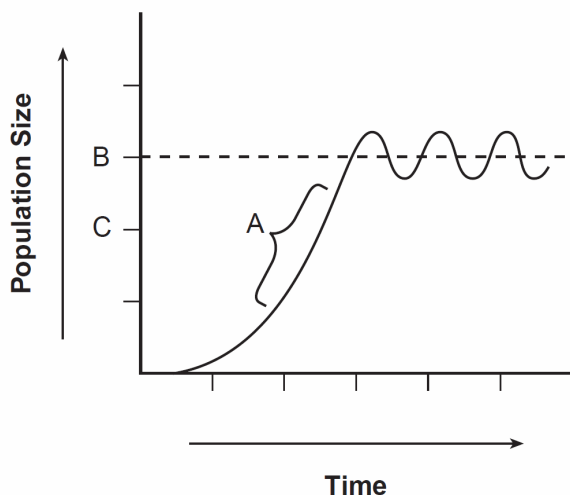
10. Which abiotic factor has the *least* effect on the ability of aerobic organisms to live and reproduce in a cave?

- A) shape of rocks in the cave**
- B) amount of energy present in the cave
- C) amount of oxygen in the cave
- D) availability of moisture in the cave

Date:

11. Base your answer to the following question on the graph below and on your knowledge of biology. The graph shows the growth of a population of rabbits in a specific ecosystem.

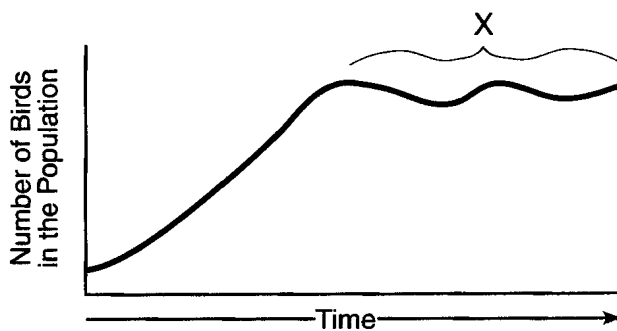
Rabbit Population in a Specific Ecosystem



Which environmental factor could have caused the change indicated at *A*?

- A) increased predation by herbivores
- B) increased availability of food**
- C) increased number of decomposers
- D) increased competition among carnivores

12. The graph below shows the number of birds in a population.



Which statement best explains section X of the graph?

- A) Interbreeding between members of this population increased the mutation rate.
- B) An increase in the bird population caused an increase in the producer population.
- C) The population reached a state of dynamic equilibrium due to limiting factors.**
- D) Another species came to the area and provided food for the birds.

Date:

13. Which statement best describes bat populations in a stable ecosystem?

- A) **They are held in check by environmental factors.**
- B) They are producers that rely indirectly on other producers.
- C) They are not limited by natural predators.
- D) They are not dependent on other species.

14. An abiotic factor affecting the behavior and survival of such organisms as robins and violets is the

- A) population of rabbits
- B) **length of daylight**
- C) presence of harmful bacteria
- D) number of herbivores

15. A group of organisms within a given area capable of interbreeding and producing fertile offspring under natural conditions is called

- A) an ecosystem
- B) a community
- C) a food web
- D) **a population**

16. The dichotomous key below provides a way to classify some animals into groups according to their physical characteristics.

Dichotomous Key	
I wings.....	go to II
no wings.....	group A
II feathers.....	group B
no feathers.....	go to III
III two legs.....	group C
six legs.....	group D

The key can be used to classify each of the four animals represented below.



Wasp



Ant



Tiger



Bird

Which row in the chart shows the correct classification group for each animal?

Row	Wasp	Ant	Tiger	Bird
(1)	group D	group D	group A	group B
(2)	group B	group A	group D	group C
(3)	group B	group D	group A	group C
(4)	group D	group A	group A	group B

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

17. In order for an ecosystem to remain stable there must be

- A) drastic modifications to the environment
- B) interrelationships and interdependencies among organisms**
- C) limited biodiversity
- D) gradual changes in the climate

18. Male grizzly bears can maintain territorial control over many square miles. What is this role as a top predator in the territory known as?

- A) a biosphere B) an ecosystem C) a habitat **D) a niche**

Date:

19. Base your answer to the following question on the information below and on your knowledge of biology.

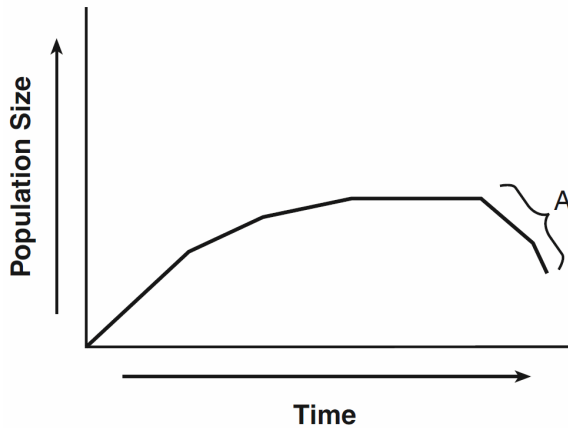
The dodo bird inhabited the island of Mauritius in the Indian Ocean, where it lived undisturbed for years. It lost its ability to fly and it lived and nested on the ground where it ate fruits that had fallen from trees. There were no mammals living on the island. In 1505, the first humans set foot on Mauritius. The island quickly became a stopover for ships engaged in the spice trade. The dodo was a welcome source of fresh meat for the sailors and large numbers of dodos were killed for food. In time, pigs, monkeys, and rats brought to the island ate the dodo eggs in the ground nests.

Which statement describes what most likely happened to the dodo bird within 100 years of the arrival of humans on Mauritius?

- A) Dodo birds developed the ability to fly in order to escape predation and their population increased.
 - B) The dodo bird population increased after the birds learned to build their nests in trees.
 - C) Human exploitation and introduced species significantly reduced dodo bird populations.**
 - D) The dodo bird population became smaller because they preyed upon the introduced species.
20. Rabbits are herbivores that are not native to Australia. Their numbers have increased steadily since being introduced into Australia by European settlers. One likely reason the rabbit population was able to grow so large is that the rabbits
- A) were able to prey on native herbivores
 - B) reproduced more slowly than the native animals
 - C) successfully competed with native herbivores for food**
 - D) could interbreed with the native animals
21. Knowing the type of food consumed by an organism helps to identify the role of the organism in the community. This role is known as its
- A) nesting site
 - B) territorial range
 - C) biomass
 - D) niche**
22. Which term refers to the behavior of two species attempting to use the same living space, food source, and water source?
- A) saprophytic
 - B) competitive**
 - C) predatory
 - D) symbiotic
23. Sugar maples and white pines are two different tree species that often grow side by side in the Adirondack Mountains. Which statement concerning these trees is correct?
- A) Since they are both trees, they can interbreed.
 - B) Since they are not closely related, they do not compete with one another.
 - C) Even though they are both trees, each plays a different role in the ecosystem.**
 - D) They utilize totally different abiotic resources.

Date:

24. The graph below shows the changes in the size of a population over a period of time.



Which environmental condition could have caused the change in the population size at A?

- A) **an increase in competition** B) a constant availability of shelter
C) a decrease in the size of its predators D) an unlimited supply of its food

25. The most likely result of a group of squirrels relying on limited resources would be

- A) an increase in the number of squirrels
B) **competition between the squirrels**
C) increased habitats for the squirrels
D) a greater diversity of food for the squirrels

26. Two different species of insect-eating birds feed and nest at different levels in the same evergreen tree. In this way they *avoid*

- A) predators B) parasites C) succession **D) competition**

27. In a given habitat, different species use the same limited resources. This situation usually leads to

- A) isolation B) succession **C) competition** D) segregation

28. An ecosystem will most likely remain stable if

- A) it has more predators than prey **B) it has a high level of biodiversity**
C) biotic factors decrease D) finite resources decrease

29. Which ecosystem has a better chance of surviving when environmental conditions change over a long period of time?

- A) **one with a great deal of genetic diversity**
B) one with plants and animals but no bacteria
C) one with animals and bacteria but no plants
D) one with little or no genetic diversity

Date:

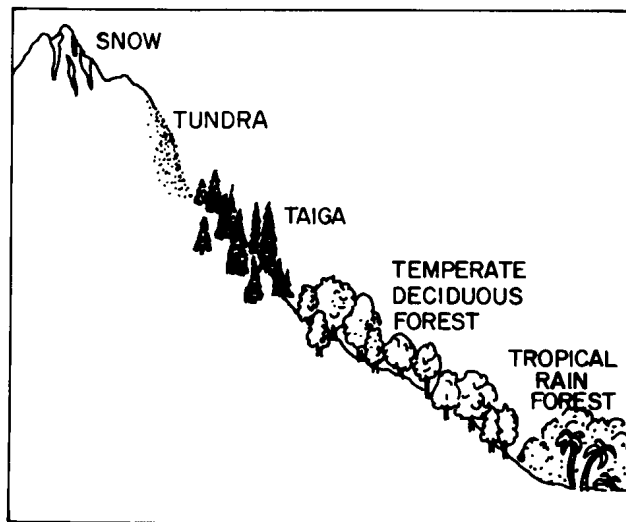
30. Some characteristics of four different biomes are represented in the chart below.

Biome	Characteristic Plant Life	Characteristic Animal Life
A	succulent plants	kangaroo rat, lizard
B	grasses	antelope, bison
C	deciduous trees	fox, deer
D	conifers	moose, black bear

Which biome is characterized by moderate precipitation, cold winters, warm summers, and climax plants that lose their leaves in the winter?

- A) A B) B C) C D) D

31. Base your answer to the following question on the diagram below and on your knowledge of biology. The diagram shows areas on a mountain that represent some major biomes.



In which biome do lichens and mosses grow abundantly and represent the dominant flora?

- A) tundra B) taiga
C) temperate deciduous forest D) tropical rain forest

32. Base your answer to the following question on the biome, chosen from the list below, to which those organisms most likely belong. Then record its number on the separate answer paper.

Biomes

- (1) Tundra
- (2) Taiga
- (3) Temperate deciduous forest
- (4) Tropical rain forest
- (5) Desert

Lichens and caribou

- A) 1 B) 2 C) 3 D) 4 E) 5

Date:

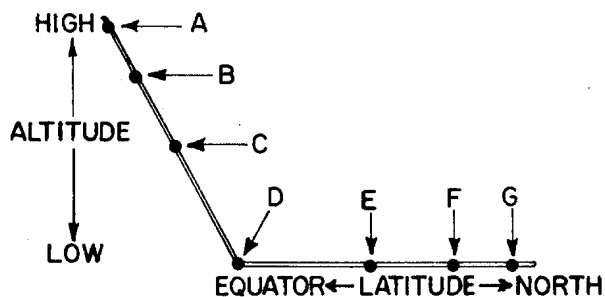
33. Base your answer to the following question on the listed below.

- (A) Tundra
- (B) Taiga
- (C) Temperate deciduous forest
- (D) Tropical rain forest
- (E) Desert

In which biome are coniferous forests located?

- A) A B) B C) C D) D E) E

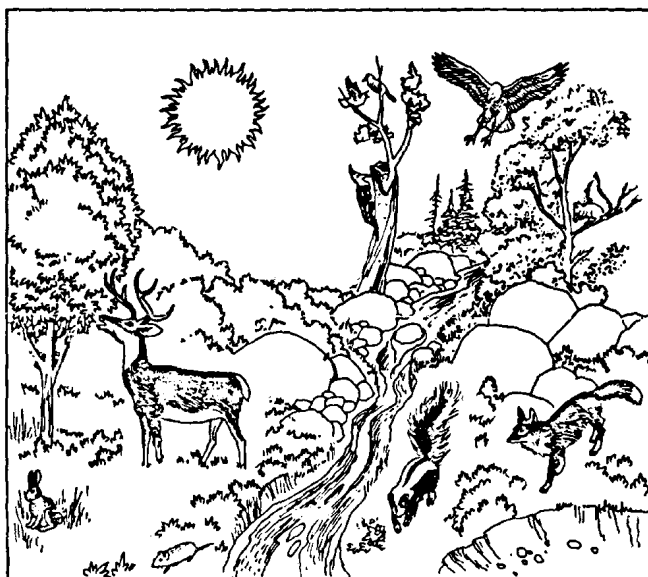
34. Base your answer to the following question on the diagram below which represents a comparison between latitudinal and altitudinal life zones (biomes) in the Northern Hemisphere and on your knowledge of biology.



Which letters most probably represent similar biome areas?

- A) *A and G* B) *B and D* C) *C and F* D) *B and E*

35. Base your answer to the following question on the diagram below and on your knowledge of biology. The diagram represents an ecosystem in the temperate deciduous forest biome.



Which climatic conditions characterize this ecosystem?

- A) **moderate precipitation, cold winters, and warm summers**
- B) little rainfall and extreme daily fluctuations in temperature
- C) little precipitation and permanently frozen subsoil
- D) heavy rainfall and constantly warm temperatures

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Base your answers to questions 36 and 37 on the incomplete chart below, which shows some ecological relationships, and on your knowledge of biology.

Large Climatic Areas	Column 1	Column 2
Desert	Cacti	Rats and snakes
A	Deciduous trees	Deer and foxes
Taiga	B	Moose and lynx
Tundra	Lichens	C

36. Letter A most likely represents

- A) a biosphere B) an ecosystem C) a biome D) a community

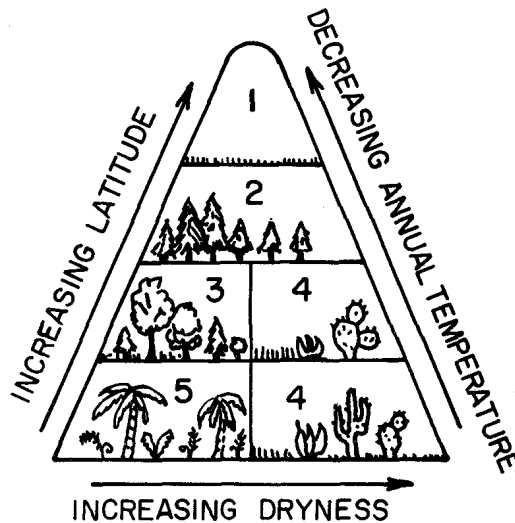
37. Which statement correctly describes a relationship between the species of columns 1 and 2?

- A) The species in column 1 help to determine which species are in column 2.
B) The species in column 2 help to determine which species are in column 1.
C) The species in column 1 are completely dependent on the species in column 2.
D) The species in both columns 1 and 2 help to determine the climate of the area.

38. A coniferous forest would be *least* likely to appear within the

- A) United States B) Arctic Circle
C) Canadian Provinces D) U.S.S.R.

39. Base your answer to the following question on the diagram below which represents the major terrestrial biomes and on your knowledge of biology.



Which biome would have succulent plants as well as plants with reduced leaf surfaces?

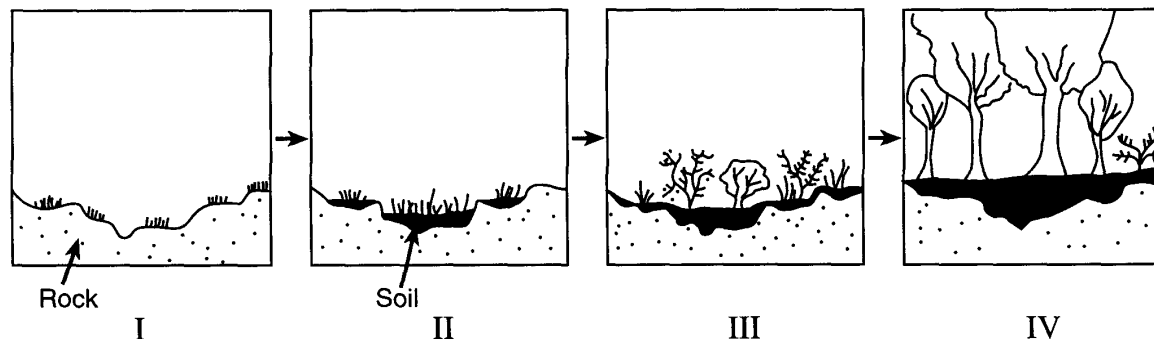
- A) 5 B) 2 C) 3 D) 4

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40. Which statement best explains why there are greater variations in daily temperature in terrestrial biomes than in marine biomes?

- A) **Water has a greater ability to absorb and hold heat than land has.**
- B) The oceans of the world form a continuous biome.
- C) Land areas provide habitats for many organisms.
- D) The ocean has salt water and many dissolved nutrients.

41. Base your answer to the following question on the diagrams below of four stages of a biological process and on your knowledge of biology.



What would most likely be the predominant lifeform found in stage I?

- A) ferns
- B) tracheophytes
- C) mushrooms
- D) **pioneer species**

42. Base your answer to the following question on the information below and on your knowledge of biology.

Years after the lava from an erupting volcano destroyed an area, lichens started to grow in that area. These were gradually replaced by grasses, shrubs, conifers, and finally, by a deciduous forest.

In this sequence of events, the lichens functioned as

- A) primary consumers
- B) climax organisms
- C) abiotic factors
- D) **pioneer organisms**

43. Which two groups of organisms are most likely to be pioneer organisms?

- A) songbirds and squirrels
- B) **lichens and algae**
- C) deer and black bears
- D) oak and hickory trees

44. In New York State, small farms that were abandoned many years ago have become hardwood forests. This is an example of

- A) local deforestation
- B) biotechnology
- C) **ecological succession**
- D) habitat loss

45. A climax community is able to exist in a certain geographic region for a long period of time because it

- A) provides a habitat for parasites
- B) alters the climate of the geographic region
- C) attracts many pioneer organisms
- D) **remains in equilibrium with the environment**

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46. An established ecosystem may remain stable over hundreds of years because

- A) species interdependence is absent
- B) there is a lack of variety in the species
- C) no competition exists between the species
- D) there are natural checks on species**

47. Which succession sequence would most probably lead to the establishment of forests on barren rock areas?

- A) mosses ® grass ® lichens ® woody shrubs
- B) lichens ® mosses ® grass ® woody shrubs**
- C) woody shrubs ® grass ® mosses ® lichens
- D) grass ® mosses ® woody shrubs ® lichens

48. Farmland abandoned in 1899 was observed to have significant changes in plant species over a 50-year period. The changes are shown in the chart below.

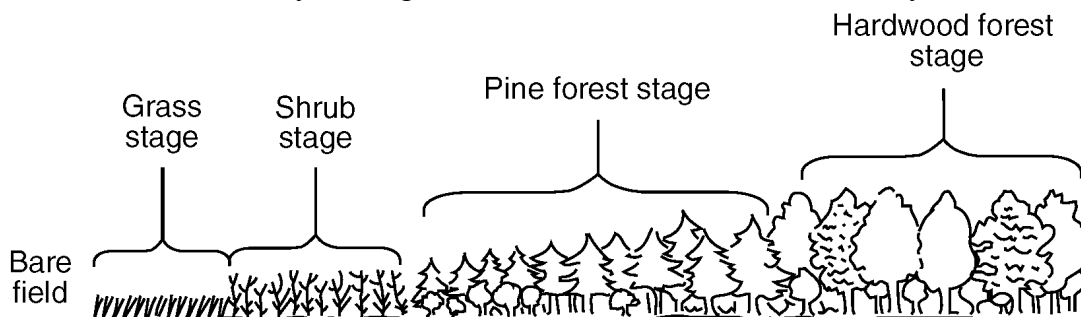
Changes in Plant Species on Abandoned Farmland

Year Observed	Plant Species
1900	grasses
1910	shrubs and briars
1920	birch and cherry trees
1950	beech and maple trees

A forest fire burned all the trees on the land in 1955. Assuming no human interference, climate changes, or natural disasters, the plant species you would expect to see on this land in 2010 would most likely be

- A) grasses
- B) shrubs and briars
- C) birch and cherry trees
- D) beech and maple trees**

49. Which of the stages in the diagram below consists of plant species that modify the environment, eventually making it more suitable for another community?



- A) grass stage, only
- B) grass, shrub, and pine forest stages**
- C) shrub, pine forest, and hardwood forest stages
- D) hardwood forest stage, only

50. After a fire destroys a forest, the area will most likely

- A) remain bare land indefinitely
- B) develop into a desert area
- C) develop into an entirely different type of forest after hundreds of years
- D) recover through gradual changes back to a point of long-term stability**

51. What would most likely occur after an ecosystem is disrupted by fire?

- A) The ecosystem would eventually return to its original state.**
- B) The ecosystem would return to its previous state immediately.
- C) The ecosystem would evolve into a new ecosystem that is totally different from the original.
- D) The ecosystem would become an ever-changing environment with no stability.

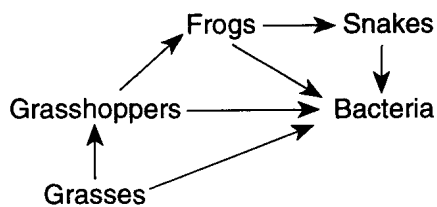
52. In an ecosystem, what happens to the atoms of certain chemical elements such as carbon, oxygen, and nitrogen?

- A) They move into and out of living systems.**
- B) They are never found in living systems.
- C) They move out of living systems and never return.
- D) They move into living systems and remain there.

53. Which processes are most directly involved in the cycling of carbon, hydrogen, and oxygen between plants and animals in an ecosystem?

- A) transpiration and excretion
- B) photosynthesis and respiration**
- C) dehydration synthesis and hydrolysis
- D) decomposition and succession

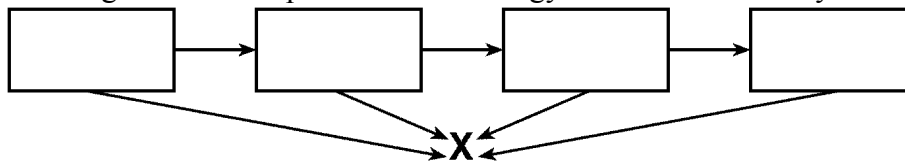
54. A food web is shown below.



Which organisms are necessary for the recycling of nitrogen?

- A) frogs
- B) grasshoppers
- C) snakes
- D) bacteria**

55. The diagram below represents some energy transfers in an ecosystem.

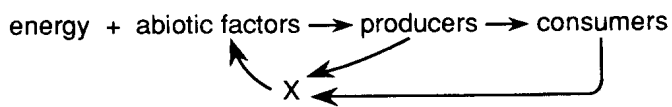


Which type of organism is most likely represented by letter X?

- A) decomposer**
- B) autotroph
- C) producer
- D) herbivore

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56. Which organisms would most likely occupy position *X* in the diagram below?

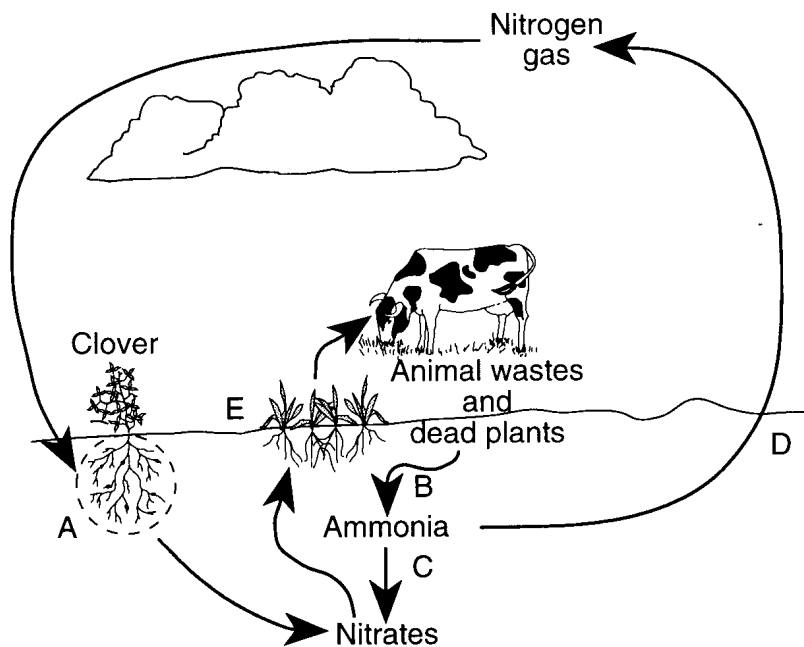


- A) **decomposers** B) carnivores C) herbivores D) scavengers

57. Which statement best describes the role of decomposers?

- A) They convert carbon dioxide and water to glucose.
B) **They break down organic compounds into products used by other organisms.**
C) They release oxygen to the atmosphere.
D) They provide energy for the synthesis of proteins.

58. Base your answer to the following question on the diagram of the nitrogen cycle below and on your knowledge of biology. In the diagram, letters *A* through *E* represent organism carrying on a process at that particular point in the cycle.

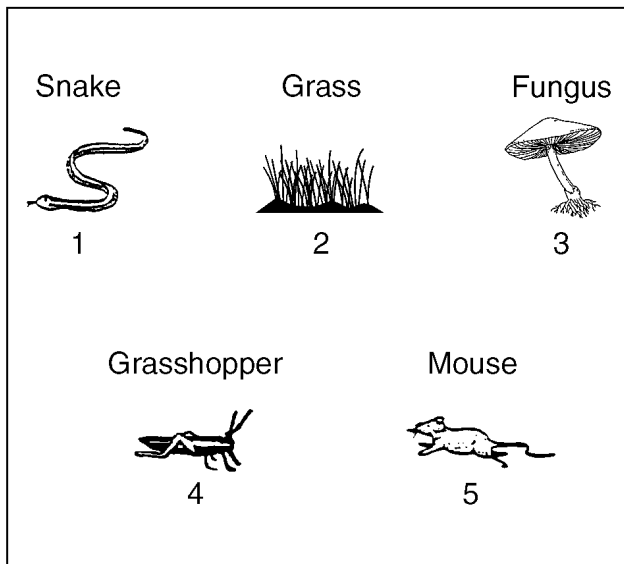


Nitrifying bacteria are represented by letter

- A) *A* B) *E* C) *C* D) *D*

Date:

59. Organisms from a particular ecosystem are shown below.



Which statement concerning an organism in this ecosystem is correct?

- A) Organism 2 is heterotrophic.
- B) Organism 3 helps recycle materials.**
- C) Organism 4 obtains all of its nutrients from an abiotic source.
- D) Organism 5 must obtain its energy from organism 1.

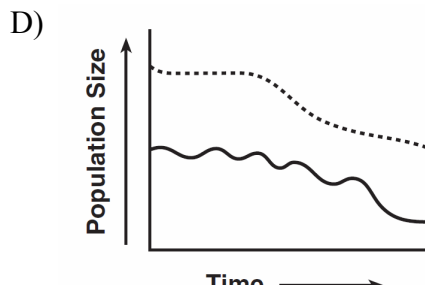
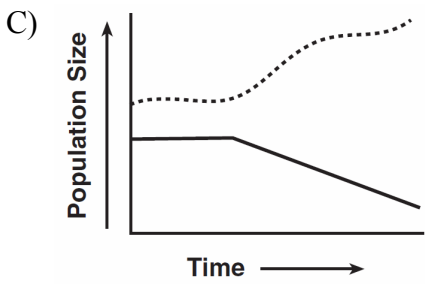
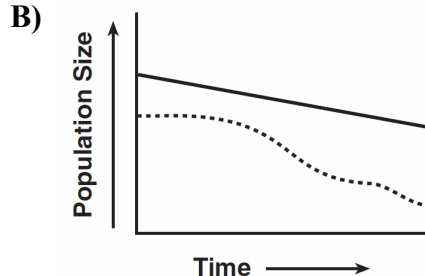
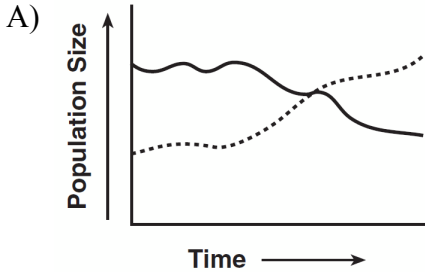
60. An owl cannot entirely digest the animals it preys upon. Therefore, each day it expels from its mouth a pellet composed of fur, bones, and sometimes cartilage. By examining owl pellets, ecologists would be able to determine the

- A) consumers that owls prefer**
- B) autotrophs that owls prefer
- C) organisms that feed on owls
- D) saprophytes that affect owls

Date:

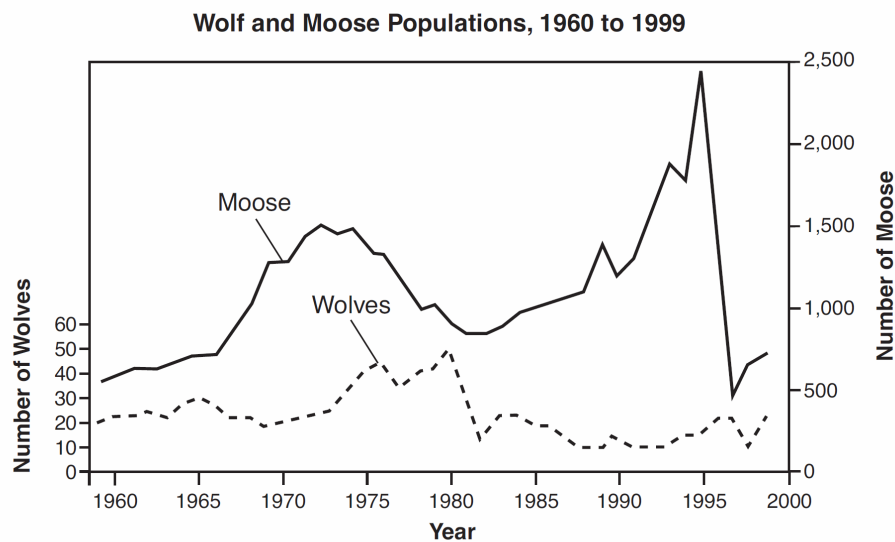
61. In a particular ecosystem, squirrels make up a large portion of the diet of coyotes. A fatal disease in the squirrel population begins to reduce their population over a period of months. Which graph best represents the expected changes in population size of the coyotes and the squirrels?

Key	
—	Squirrel population
⋯	Coyote population



Date:

62. Base your answer to the following question on the diagram below and on your knowledge of biology.



Source: Ecological Studies of Wolves on Isle Royale, Rolf O. Peterson, School of Forestry and Wood Products, Michigan Technological University

An observable trend in the wolf and moose data between 1980 and 1995 is

- A) as the wolf population decreases, the moose population increases
- B) as the wolf population decreases, the moose population decreases
- C) the numbers of wolves and moose are relatively constant
- D) the numbers of wolves and moose appear to be unrelated

63. Deer ticks are responsible for spreading Lyme disease. This organism, which feeds on the blood of warm-blooded organisms like mice, deer, and humans, is best described as a

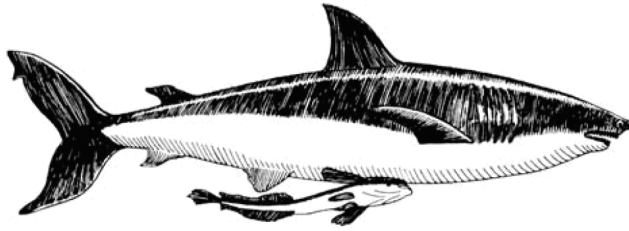
- A) predator
- B) scavenger
- C) **parasite**
- D) host

64. Which type of relationship is illustrated by a protozoan causing the disease malaria in a human host?

- A) **parasitism**
- B) commensalism
- C) saprophytism
- D) mutualism

Date:

65. The diagram below represents a remora fish attached to a shark.



A remora fish has an adhesive disk or sucker on its head, which it uses to attach itself to larger fishes, such as sharks. This attachment causes the shark no harm. The remora fish eat scraps of food that the sharks drop as they feed. This is an example of

- A) **an adaptation to a specialized niche**
- B) an adaptation of a successful parasite
- C) competition between two fish species for food
- D) competition for abiotic resources

66. A particular species of unicellular organism inhabits the intestines of termites, where the unicellular organisms are protected from predators. Wood that is ingested by the termites is digested by the unicellular organisms, forming food for the termites. The relationship between these two species can be described as

- A) harmful to both species
- B) parasite/host
- C) **beneficial to both species**
- D) predator/prey

67. Bacteria which live in the human intestine derive their nutrition from digested foods. From these nutrients digested by the human, the bacteria synthesize vitamins usable by the human. This relationship demonstrates

- A) commensalism
- B) saprophytism
- C) **mutualism**
- D) parasitism

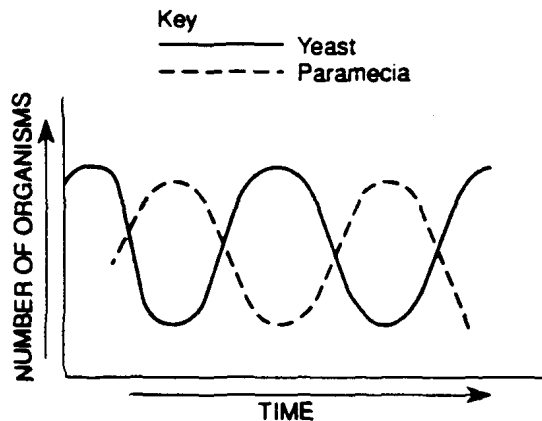
68. Which food chain relationship illustrates the nutritional pattern of a primary consumer?

- A) **seeds and fruits eaten by a mouse**
- B) an earthworm eaten by a mole
- C) a mosquito eaten by a bat
- D) a mold growing on a dead frog

Date:

69. Base your answer to the following question on the information below and on your knowledge of biology.

In an investigation, yeast was grown in a nutrient culture that was maintained at a constant temperature. After a few days, paramecia that feed on yeast were introduced into the culture medium. The numbers of yeast cells and paramecia were determined over a period of several weeks. A graph illustrating these data is shown below.



The paramecia in the investigation are classified as

- A) herbivores B) omnivores C) producers **D) consumers**

70. A food chain is represented below.

grass → rabbit → hawk

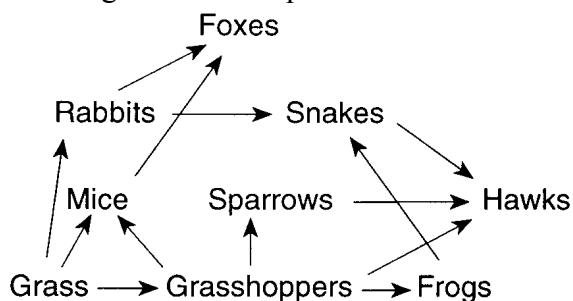
Structures within the rabbit are formed using

- A) solar energy from the grass B) heat energy lost to the environment
C) chemical energy from the hawk **D) chemical energy from the grass**

71. In the spring of 2010, there was a catastrophic explosion on an ocean oil drilling rig, causing millions of gallons of oil to be released into the Gulf of Mexico. Many organisms died due to the thick sludge in their habitat. However, in some organisms, such as shellfish, the oil stuck to tissues inside their shells. Which statement expresses a major concern of environmentalists about the accumulation of the oil in certain organisms in the Gulf of Mexico ecosystem?

- A) Larger organisms eat the shellfish and more chemicals will build up in their tissues.**
B) The shellfish will prevent other organisms from obtaining oil.
C) Smaller organisms will be unaffected by the chemicals.
D) Larger organisms will be less affected by the oil, because they can eat other organisms.

72. The diagram below represents a food web.



Which statement is supported by the information shown?

- A) **Foxes, snakes, and sparrows are secondary consumers.**
- B) Snakes eat grass, grasshoppers, and frogs.
- C) Rabbits, mice, and grasshoppers contain the greatest amount of stored energy.
- D) Sparrows and hawks are omnivores.

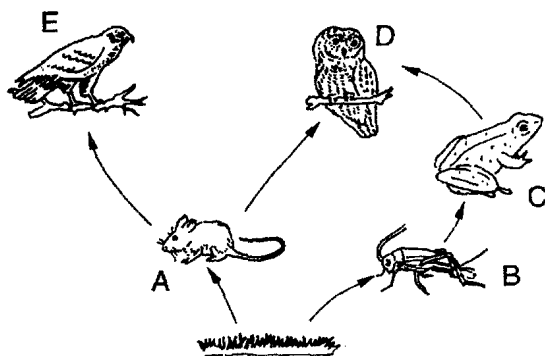
73. Which condition would cause an ecosystem to become unstable?

- A) **only heterotrophic organisms remain after a change in the environment**
- B) a slight increase in the number of heterotrophic and autotrophic organisms occurs
- C) a variety of nonliving factors are used by the living factors
- D) biotic and abiotic resources interact

74. Imported animal species often disrupt an ecosystem because in their new environment, they will most likely

- A) eliminate the genetic variation of the autotrophs
- B) increase the number of mutations in the herbivores
- C) **have no natural enemies**
- D) be unable to produce offspring

75. The diagram below shows a food web.



Which organisms would most likely be competitors?

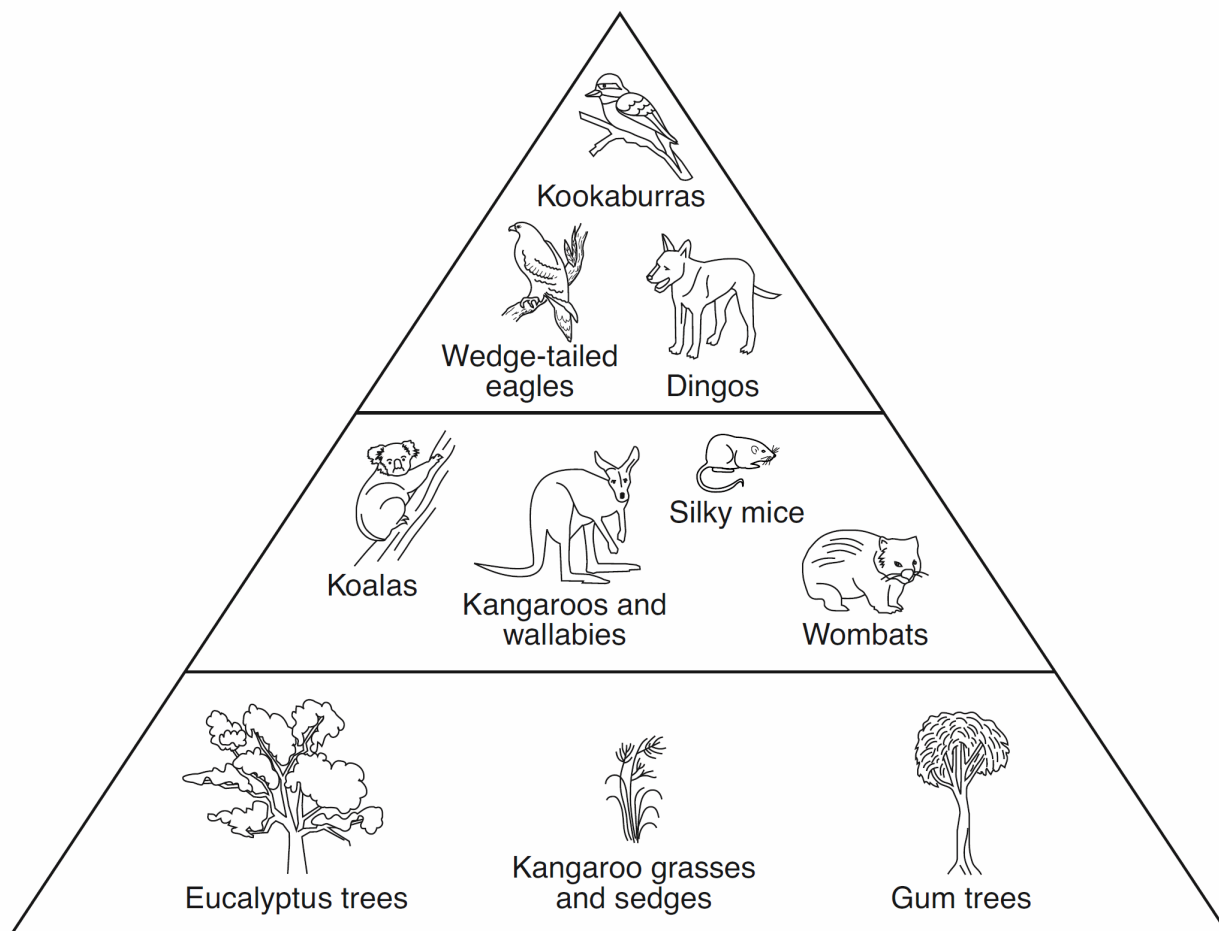
- A) A and C
- B) B and C
- C) B and D
- D) **D and E**

Date:

76. A pyramid of energy can be used to illustrate the loss of usable energy at each feeding level in a food web. In which feeding level would the *smallest* amount of energy be found?

- A) autotrophs
- B) producers
- C) primary consumers
- D) secondary consumers**

77. Base your answer to the following question on the diagram below and on your knowledge of biology. The diagram represents an energy pyramid for an ecosystem in the Australian outback.

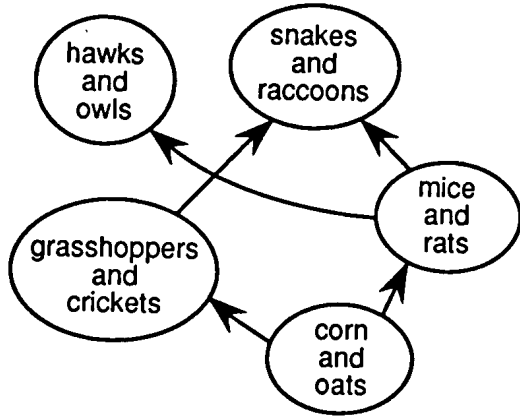


Dingos are an introduced species in Australia that are outcompeting many native species. Which of the current environmental problems most likely resulted directly from the introduction of dingos to Australia?

- A) vanishing of kangaroo grasses
- B) near extinction of wallabies**
- C) forests overrun with koalas
- D) increase in the kookaburra population

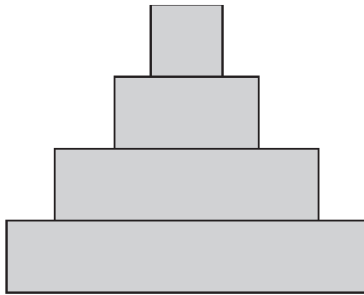
Date:

78. Which group in the food web represented below would most likely have the greatest biomass?



- A) corn and oats
- B) hawks and owls
- C) mice and rats
- D) snakes and raccoons

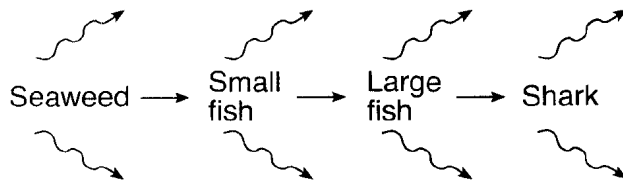
79. A diagram frequently used in ecological studies is shown below.



This diagram can be used to represent the

- A) dependency of animal survival on physical conditions in an ecosystem
- B) loss of energy from various groups of organisms in an ecosystem**
- C) competition among species in an ecosystem
- D) mechanisms that maintain homeostasis in the plants in an ecosystem

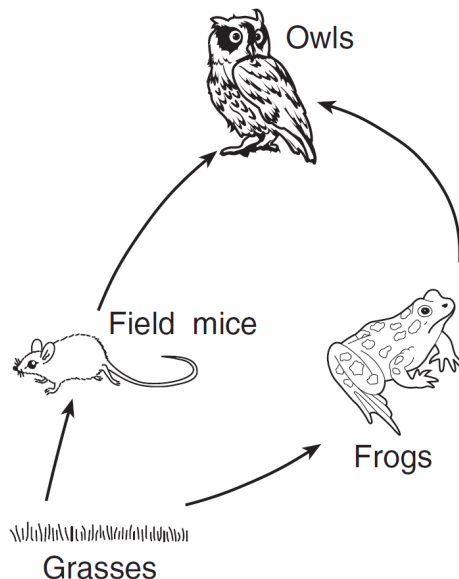
80. A food chain is illustrated below.



The arrows represented as $\sim\sim>$ most likely indicate

- A) energy released into the environment as heat**
- B) oxygen produced by respiration
- C) the absorption of energy that has been synthesized
- D) the transport of glucose away from the organism

81. A food web is represented below.



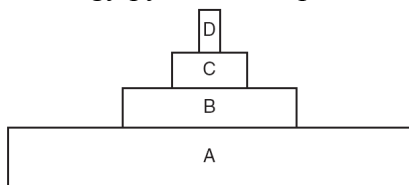
Which organism would receive the *least* amount of transferred solar energy?

- A) grasses **B) owls** C) frogs D) field mice

82. Which factor would have the greatest effect on the flow of energy into an ecosystem?

- A) a large decrease in the amount of sunlight available**
 B) a large increase in the number of carnivores
 C) a small increase in the number of decomposers
 D) a small decrease in the amount of minerals available

83. An energy pyramid is represented below.



How much energy would be available to the organisms in level *C*?

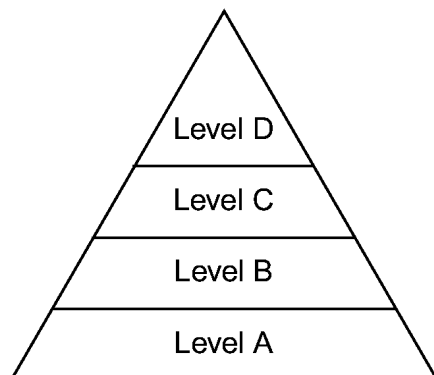
- A) all of the energy in level *A*, plus the energy in level *B*
 B) all of the energy in level *A*, minus the energy in level *B*
C) a percentage of the energy contained in level *B*
 D) a percentage of the energy synthesized in level *B* and level *D*

84. Which condition would *most likely* upset the stability of an ecosystem?

- A) a cycling of elements between organisms and the environment
 B) energy constantly entering the environment
 C) green plants incorporating sunlight into organic compounds
D) a greater mass of animals than plants

Date:

85. Base your answer to the following question on the energy pyramid below and on your knowledge of biology.



The greatest amount of available energy is transferred from level

- A) *A to level B* B) *A to level C* C) *B to level A* D) *D to level A*

86. Dumping raw sewage into a river will lead to a reduction in dissolved oxygen in the water. What will this reduction *most likely* cause?

- A) an increase in fish populations
B) a decrease in most aquatic animal populations
C) an increase in acid rain
D) a decrease in water temperature

87. Water pollution as a result of fertilizer runoff from farms is harmful because it initially

- A) changes the chemical composition of nearby streams and lakes**
B) adds ozone to the atmosphere, increasing global temperatures
C) decreases the water temperature of streams and lakes
D) decreases the amount of nutrient recycling in lakes

88. Many scientists are worried about some of Earth's finite resources because humans are

- A) using carbon dioxide faster than it is being produced
B) placing industrial wastes in landfills
C) interfering with energy flow from consumers to producers
D) using large amounts of some materials that cannot be renewed

89. Chittenango Falls State Park in central New York State is the only known habitat for an endangered species of aquatic snail. Contamination of its water supply and reduction of its habitat have threatened the future of this snail. Which step could be taken to protect this species of snail?

- A) banning human activities that damaged the habitat**
B) introducing a new snail predator into the habitat
C) transferring the snail to a terrestrial environment
D) crossbreeding the snail with another species

Date:

90. Car manufacturers have begun to explore the use of biofuels, such as biodiesel, ethanol, and cooking oils made from plant material. The desired outcome of using these biofuels would be

- A) **a decrease in the use of fossil fuels**
- B) a decrease in the release of oxygen gas
- C) an increase in abiotic resources
- D) an increase in global warming

91. Some negative effects of human activities on the environment can be counteracted by increasing

- A) growth of the human population
- B) use of pesticides
- C) **enforcement of pollution control laws**
- D) use of non-biodegradable materials

92. Which method of combating insect pests is *least* likely to affect other animal species, disrupt food webs, and contaminate the land?

- A) **using biological controls**
- B) employing fluid biocides
- C) using powdered pesticides
- D) draining wetlands

93. Base your answer to the following question on the information below and on your knowledge of biology .

. . . Unless actions are taken to slow the decline of domesticated honeybees and augment [increase] their populations with wild bees, many fruits and vegetables may disappear from the food supply said Claire Kremen, a conservation biologist at Princeton University in New Jersey

The honeybee decline, which is affecting domesticated and wild bee populations around the world, is mostly the result of diseases spread as a result of mites and other parasites as well as the spraying of crops with pesticides, scientists say

Source: "Bee Declines May Spell End of Some Fruits, Vegetables,"

National Geographic News, October 5, 2005

A decrease in honeybee populations will

- A) eliminate the need to spray crops
- B) increase the number of bee parasites
- C) reduce the occurrence of natural disasters
- D) **disrupt the stability of an ecosystem**

94. Many people place bat boxes on their property to provide housing that attracts insect-eating bats. This activity has a positive effect on the environment because it represents an increased use of

- A) saprophytic relationships
- B) biocides
- C) **biological controls**
- D) herbicides

Date:

95. Scientists are concerned that the destruction of the ozone layer is allowing more ultraviolet radiation to reach the surface of the Earth. The chief reason for this concern is that ultraviolet radiation often acts as a
- A) growth inhibitor **B) mutagenic agent**
C) biocide D) pollutant
96. Changes in the chemical composition of the atmosphere that may produce acid rain are most closely associated with
- A) insects that excrete acids B) runoff from acidic soils
C) industrial smoke stack emissions D) flocks of migrating birds
97. A reporter conducted a number of "on-the-street" interviews with people selected at random. The reporter found that many people gave responses similar to those of the person quoted below.

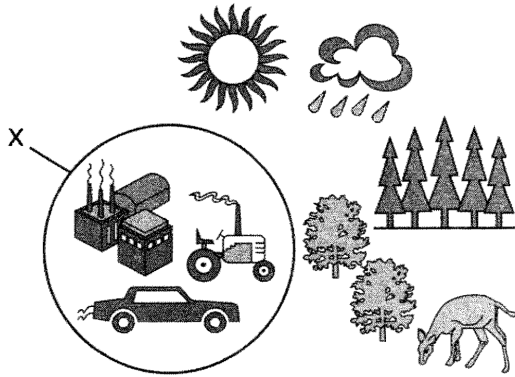
Question	Response of Person Interviewed
Would you be concerned if winters in this area became more severe and the cost of plowing and sanding snowy roads increased?	Of course I would be concerned. I can't afford higher taxes!
Would you be willing to pay more for a car that has better fuel economy if it would benefit the environment?	No! Cars that would use less gasoline would have to be much smaller. I like my big car—and besides that, it's safer.
If droughts became more common, would you be upset if you had to pay more for your food at the grocery store or a restaurant?	Definitely. My weekly food bill is too high already!
Would it bother you if the sea level increased a foot or two, causing many lowland areas to flood?	Not really. People could always move to higher ground. But I wouldn't want to see my taxes go up because we have to spend more on aid to help them move.
Are you concerned about global warming?	Not really. It doesn't affect me.

Which statement is best supported by these interviews?

- A) Many people are very aware of the possible effects of global warming.
B) Many people care more about their personal comforts than about the possible effects of global warming.
C) Many people are willing to sacrifice to reduce the possible effects of global warming.
D) Many people are now taking action to reduce the possible effects of global warming

Date:

98. The diagram below represents factors that affect New York State ecosystems.



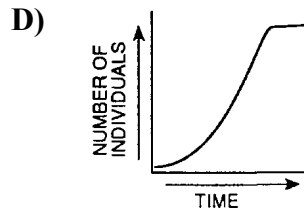
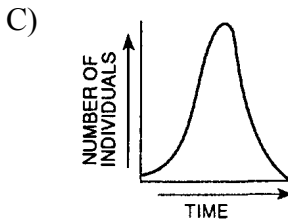
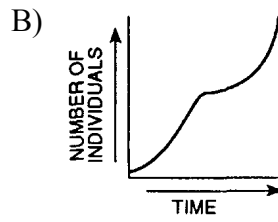
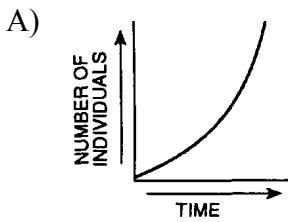
An increase in human activity at X would most likely result in

- A) a decrease in rainfall in the area
- B) a decrease in available carbon dioxide
- C) an increase in air pollution in the area**
- D) an increase in the supply of fossil fuels

99. Most scientists recommend reducing carbon dioxide emissions. Less carbon dioxide in the atmosphere would be expected to

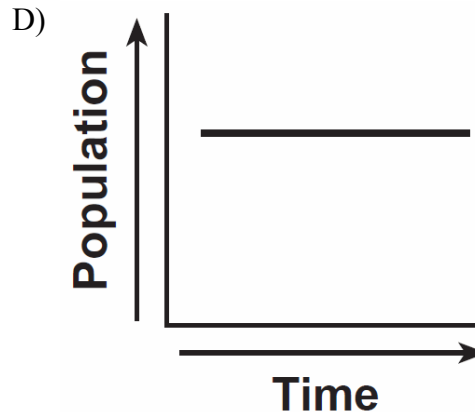
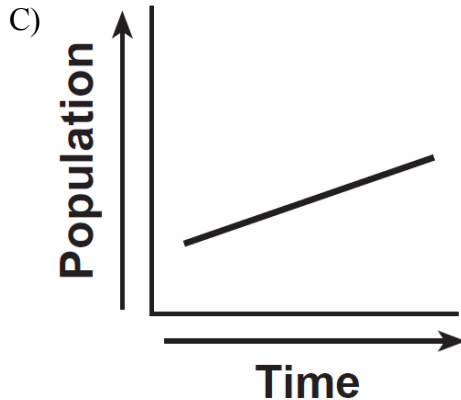
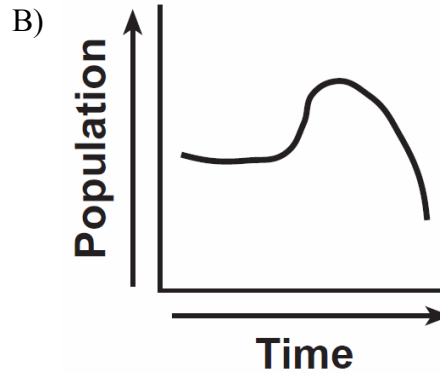
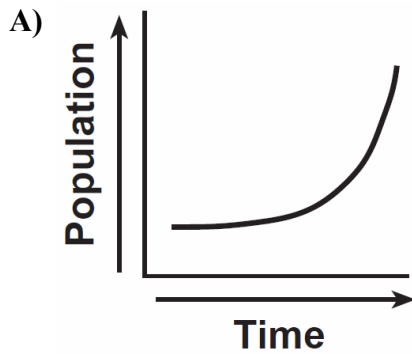
- A) reduce the rate of global warming**
- B) increase damage caused by acid rain
- C) decrease the number of biotic factors in ecosystems
- D) reduce destruction of the ozone layer

100. Which graph best indicates the effects of successful population control in humans?



Date:

101. Which graph best illustrates the change in the human population over the past 2000 years?



102. Human population growth has led to a reduction in the populations of predators throughout natural ecosystems across the United States. Scientists consider the loss of these predators to have a

- A) positive effect, because an increase in their prey helps to maintain stability in the ecosystem
- B) positive effect, because predators usually eliminate the species they prey on
- C) negative effect, since predators have always made up a large portion of our food supply
- D) negative effect, because predators have an important role in maintaining stable ecosystems**

103. Because of an attractive tax rebate, a homeowner decides to replace an oil furnace heating system with expensive solar panels. The trade-offs involved in making this decision include

- A) high cost of solar panels, reduced fuel costs, and lower taxes**
- B) low cost of solar panels, increased fuel costs, and higher taxes
- C) increased use of fuel, more stable ecosystems, and less availability of solar radiation
- D) more air pollution, increased use of solar energy, and greater production of oil

Date:

104. A list of environmental issues is shown below.

- Rabbits transported from Europe overrun and deplete farmlands in Australia.
- Many areas in the southeastern United States are overgrown with the kudzu plant from Asia.
- In parts of New York State, bluebirds must compete with starlings originally brought here from England.

All of these issues are the result of

- A) introduction of nonnative species into stable ecosystems**
- B) genetic engineering without using adequate safety precautions
- C) preservation of habitats due to human population growth
- D) use of foreign species to replace native predators

105. Many homeowners who used to collect, bag, and discard grass clippings are now using mulching lawnmowers, which cut up the clippings into very fine pieces and deposit them on the soil. The use of mulching lawnmowers contributes most directly to

- A) increasing the diversity of life
- B) recycling of nutrients**
- C) the control of pathogens
- D) the production of new species

106. Which human activity would preserve finite resources?

- A) deforestation
- B) removing carnivores from a forest
- C) recycling aluminum**
- D) heating homes with fossil fuel

107. The ecological survival of many plants and animals has been aided most by the

- A) raising of industrial smoke stacks to spread sulfur dioxide away from the immediate vicinity of the combustion
- B) reduction in the number of pollution control laws
- C) heavy use of insecticides to kill all insect pests that compete with humans for food sources
- D) development of research aimed toward the preservation of endangered species**

108. A greater stability of the biosphere would most likely result from

- A) decreased finite resources
- B) increased deforestation
- C) increased biodiversity**
- D) decreased consumer populations

109. Which result of technological advancement has a positive effect on the environment?

- A) development of new models of computers each year, with disposal of the old computers in landfills
- B) development of new models of cars that travel fewer miles per gallon of gasoline
- C) development of equipment that uses solar energy to charge batteries**
- D) development of equipment to speed up the process of cutting down trees

110. Farming reduces the natural biodiversity of an area, yet farms are necessary to feed the world's human population. This situation is an example of

- A) poor land use
- B) a trade-off**
- C) conservation
- D) a technological fix

Date:

111. In 1960, an invasive species of fish was introduced into the stable ecosystem of a river. Since then, the population of a native fish species has declined. This situation is an example of an

- A) ecosystem that has recovered
- B) ecosystem altered through the activities of an organism**
- C) environmental impact caused by physical factors
- D) ecological niche without competition

112. A major reason that humans have negatively affected the environment in the past is that humans have

- A) frequently lacked an understanding of how their activities affect the environment**
- B) passed laws to protect certain wetlands
- C) attempted to control their population growth
- D) discontinued the use of certain chemicals used to control insects

113. Which human activity would interfere most directly with the production of oxygen in the environment?

- A) using fertilizer for agriculture
- B) using nuclear fuels
- C) accelerating deforestation**
- D) preserving wetlands

114. Modern methods of agriculture have contributed to the problem of soil depletion because many of these methods

- A) require smaller amounts of trace minerals
- B) interfere with natural cycles of elements**
- C) use many varieties of grafted plants
- D) depend on the practice of strip cropping

115. Base your answer to the following question on the information below.

The Long Island pine barrens is a natural woodland that once covered more than a quarter of a million acres. The dominant tree in this woodland is the pitch pine. Plant and animal distribution and abundance are controlled by fire and soil conditions. Dry, sandy soils encourage frequent wildfires, which periodically consume all or part of the vegetation. Fires are natural and important in maintaining the pine barrens. Pine barrens plants and animals must be fire adapted; that is, they must have the ability to survive fires or to colonize burned areas rapidly. Some pine barrens insects, for example, escape fire by burrowing deep into the ground during times of the year when fires are likely to occur.

Which event normally takes place *after* a fire in the pine barrens?

- A) ecological succession, which helps reestablish the pine barrens**
- B) hibernation of the insects in the ground
- C) increased mutations in the pitch pines
- D) rapid interbreeding of animal species that survive the fire

116. Base your answer to the following question on the information below and on your knowledge of biology.

Decomposition of the Ozone Layer

The Earth has long been protected from the harmful radiations of the Sun by a layer of the atmosphere known as the ozone layer. This layer absorbs ultraviolet light. Recent evidence indicates that this protective layer is starting to decompose and "holes" are being formed.

The first "hole" was observed in 1983 over Antarctica. Now there is evidence of a second "hole" over Norway. It is believed that the atmosphere has had an annual ozone loss of three percent.

Some scientists believe that the "holes" are linked to the use of certain chemicals such as chlorofluorocarbons (CFC's). CFC's are found in some aerosol sprays, refrigerants, and even in styrofoam. When CFC's are exposed to sunlight, chlorine is released from the CFC's. This chlorine acts as a catalyst in the breakdown of ozone. Other scientists believe that the "holes" are related to solar activity, changing weather patterns, and volcanic activity.

Whatever the cause, scientists agree that the potential dangers are significant. The Environmental Protection Agency (EPA) estimates that a one percent drop in global ozone could cause an additional 20,000 cases of skin cancer in the United States. Increases in ultraviolet radiation could also increase the mutation rate in plants, animals, and microorganisms, endangering the existence of some life forms.

Decomposition of the ozone may lead to an increase in mutations because

- A) plants can only utilize visible light for photosynthesis
- B) it allows more ultraviolet rays to penetrate the atmosphere**
- C) changing weather patterns act as selecting agents
- D) more free oxygen will be available, causing a decrease in carbon dioxide

117. Base your answer to the following question on the information below, and on your knowledge of biology.

Tracking the Big Horn

Bighorn sheep, *Ovis canadensis*, are a majestic symbol of the mountainous West. They browse at high altitudes and in steep, rocky areas from Texas to British Columbia. Rams' horns curl around their eyes and grow up to 45 inches long. Males butt horns to establish dominance during the fall rut [mating season]. Ewes [females] sport shorter, spiked horns similar to a mountain goat's. From their first days of life, bighorns are surefooted enough to scale cliffs too steep for most predators to follow

Two centuries ago, an estimated 1.5 million to 2 million bighorn sheep lived in North America; today, a mere 28,000 remain. Diseases caught from domestic sheep, competition from livestock for forage, and trophy hunting for their horns caused populations to plummet [drop rapidly]. Bighorns graze in mountain meadows, habitat that is being lost to expanding forests, which are growing beyond their historic boundaries in part because the wildfires that are used to hold them in check have been suppressed. Glacier National Park, home to 400 to 600 bighorn sheep, lists the animals as a "species of concern," that is, at risk of becoming endangered

Source: Becky Lomax, *Smithsonian Magazine*, March, 2008

"Tracking the Big Horn"

The feeding activity of the bighorn sheep is best described as

- A) consumers feeding on autotrophs
- B) decomposers feeding on consumers
- C) autotrophs feeding on decomposers
- D) autotrophs feeding on heterotrophs

118. The data table below contains information on the growth of eight white pine trees, planted in eight different locations, after a period of time.

Data Table

Tree Number	Trunk Diameter 1.2 Meters Above Soil Surface (m)	Soil pH	Elevation Above Sea Level (ft)
1	0.54	4.0	1,200
2	0.79	6.5	1,650
3	0.64	4.5	1,400
4	1.04	5.0	1,350
5	0.96	5.0	1,350
6	0.82	4.5	1,250
7	0.80	5.5	1,400
8	0.52	5.0	1,600

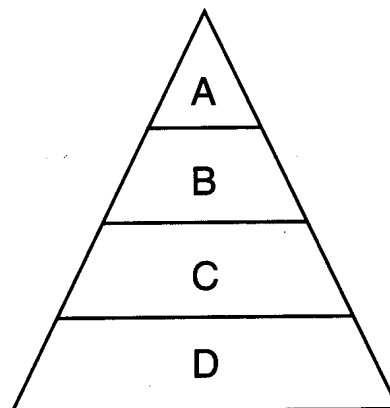
Which statement is best supported by the data in the table?

- A) White pines grow best at higher elevations.
- B) White pines are not found at elevations below 1,000 feet.
- C) White pines have a long life span.
- D) White pines can grow in acidic soil.

Date:

119. Base your answer to the following question on the data table below and on your knowledge of biology. The table contains information about glucose production in a species of plant that lives in the water of a salt marsh.

Temperature (°C)	Glucose Production (mg/hr)
10	5
20	10
30	15
40	5



How much oxygen will plants that live in water at 10°C most likely produce?

- A) twice the amount of oxygen produced at 20°C
- B) the same amount of oxygen produced at 40°C**
- C) the most oxygen produced at any temperature
- D) more oxygen than is produced at 30°C

Date:

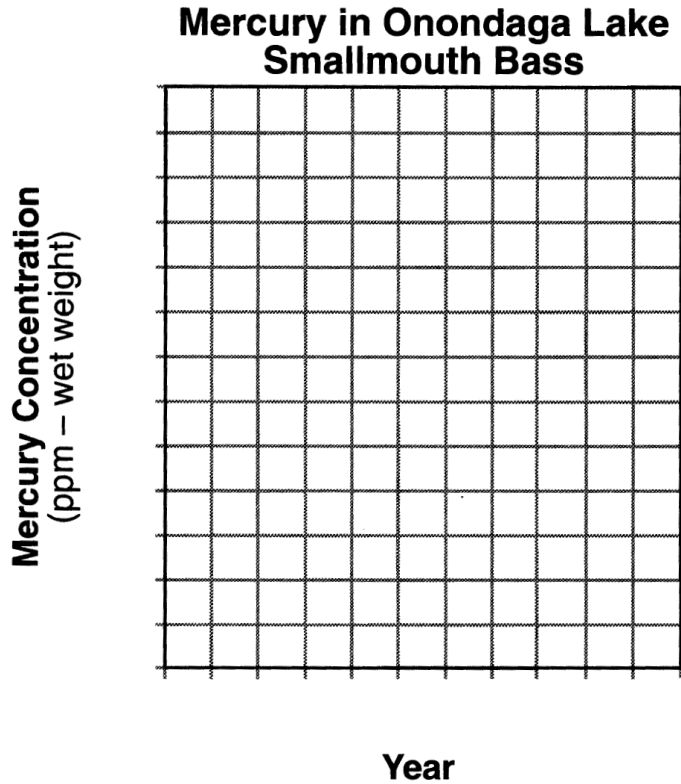
120. Base your answer to the following question on the information and data table below and on your knowledge of biology.

Onondaga Lake is a small lake located near Syracuse, New York. Industrialized municipal wastes have been polluting the lake for decades. Eating fish from the lake has been banned due to mercury concentrations in the fish. The data table below indicates the mercury concentrations in smallmouth bass taken from Onondaga Lake. Smallmouth bass eat smaller fish, which feed on aquatic plants.

At each feeding level in the food chain, more mercury accumulates. The older and larger the fish, the greater the concentration of mercury.

**Mercury in Onondaga Lake
Smallmouth Bass**

Year	Mercury Concentration (ppm – wet weight)
2000	1.5
2001	2.0
2002	1.75
2003	1.0
2004	2.5
2005	2.25



Mark an appropriate scale, without any breaks in the data, on each labeled axis.

- ___ 121. Base your answer to the following question on the information below and on your knowledge of biology.

In the 1980s, global deforestation was estimated at 17 to 20 million hectares per year, an area the size of Great Britain. Today, the area affected by deforestation has decreased significantly in some regions of the world through the use of sustainable forest management. However, there are still regions of the world affected by wide-scale deforestation, because of the short-term economic benefits. The harmful effects of deforestation on regional and worldwide climate and ecology continue as forest areas are destroyed.

Explain how deforestation decreases biodiversity.

Date:

122. Base your answer to the following question on the quotation below and on your knowledge of biology.

“Today I planted something new in my vegetable garden — something very new, as a matter of fact. It’s a potato called the New Leaf Superior, which has been genetically engineered — by Monsanto, the chemical giant recently turned “life sciences” giant — to produce its own insecticide. This it can do in every cell of every leaf, stem, flower, root, and (here’s the creepy part) spud [the potato].”

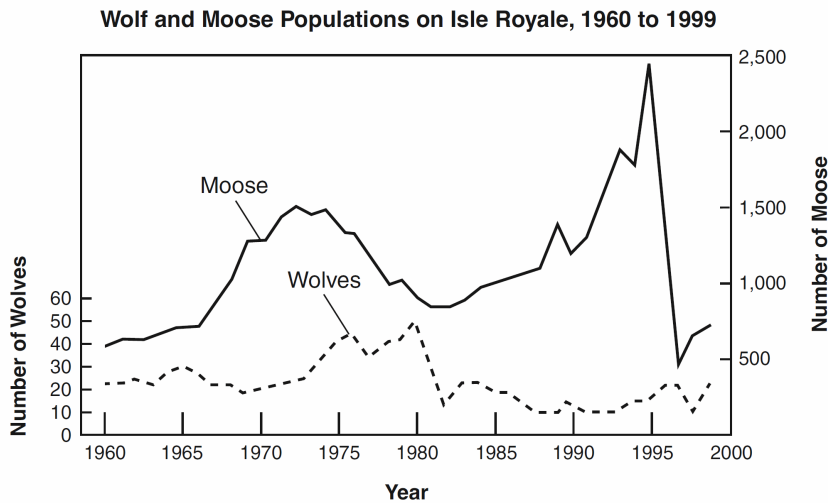
Source: *New York Times*

Sunday Magazine,

Michael Pollan, 10/25/98

Explain why every cell in the New Leaf Superior potato plant is able to produce its own insecticide.

123. Base your answer to the following question on the graph below and on your knowledge of biology. The graph shows interactions of moose and wolf populations on Isle Royale.



State *one* possible reason for the change in the moose population between 1995 and 1997.

Base your answers to questions 124 and 125 on the information and graph below.

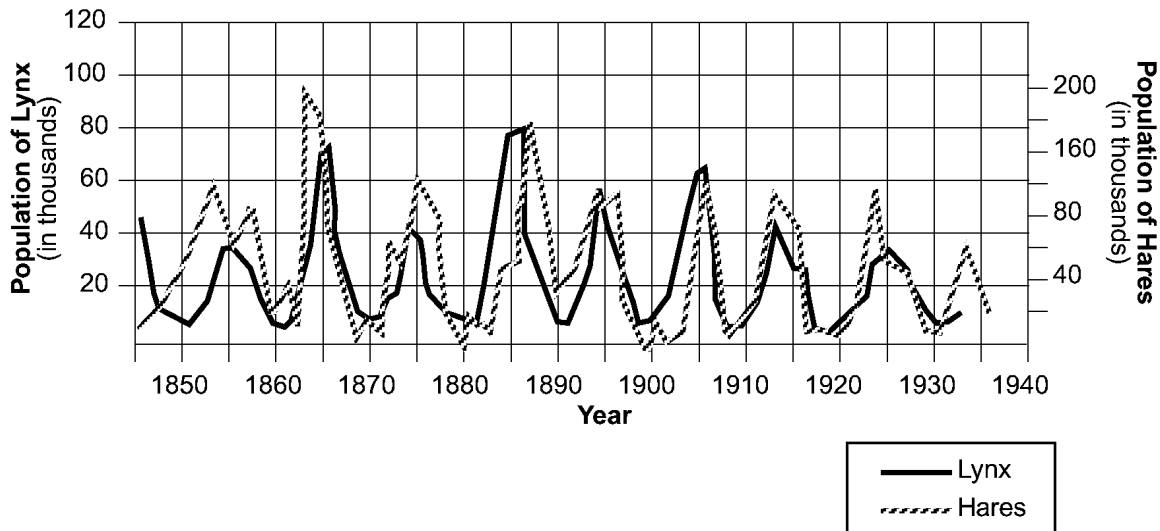
A Closer Look at Cycles in Predator and Prey Populations

Scientists have hypothesized that the populations of both lynx and snowshoe hares should show cyclic changes with increases in the predator population size lagging behind increases in prey population size, if the assumption is made that snowshoe hares are eaten only by lynx.

Does this out-of-phase population cycle of predators and prey actually occur in nature? A classic example of such a cycle was observed by counting all the fur pelts (skins) from northern Canada lynx and snowshoe hares purchased by the Hudson Bay Company between 1845 and 1935. Population cycles of snowshoe hares and their lynx predators, based on the number of pelts received by the Hudson Bay Company, are shown in the graph below.

As with any field investigation, many variables could influence the relationship between hare and lynx. One problem is that hare populations have been shown to fluctuate even without lynx present, possibly because the carrying capacity of their environment had been exceeded.

To test this hypothesis about population cycles more scientifically, investigators turned to controlled laboratory studies on populations of small predators and their prey.



124. Identify *two* variables other than the size of the lynx population that can affect the size of the hare population.

125. Why would scientists want to have a laboratory study on populations of different predators and their prey?

Date:

- _____ 126. Base your answer to the following question on the passage below and on your knowledge of biology.

Ocean-dwelling (marine) iguanas and land iguanas inhabit the Galapagos Islands. Some scientists believe that both types of iguanas diverged from a common ancestor. Marine iguanas eat algae. Land iguanas feed on cacti. Algae are more abundant in the ocean than cacti are on the islands. Both species lay their eggs in the sand.

Rats, cats, and goats have been introduced to the islands by humans. Rats feed on iguana eggs, cats eat baby iguanas, and goats eat cacti.

Identify the process by which ancestral iguanas developed into the present-day marine iguanas and land iguanas of the Galapagos Islands.

Process: _____

- _____ 127. Base your answer to the following question on the information below and on your knowledge of biology.

Head Start for Hellbenders

The hellbenders (a species of large salamander) at the Bronx Zoo are now approximately seven inches in length and will grow to full size in about five years. Once they are about two-and-a-half years old, they will be returned to the wild in western New York State. Hellbender populations are declining due to several factors including over-collection for the pet trade, disease, pollution, and habitat destruction. Juvenile hellbenders in the wild currently face great difficulties in reaching adulthood, so the "head start" provided by the reintroduction of the 41 animals will help boost local populations..

Source: Wildlife Conservation Society, *Members News*

May/June 2011

Describe *one* potential ecological effect, other than the loss of the hellbender from western New York State, of the hellbender population continuing to decline.

Date:

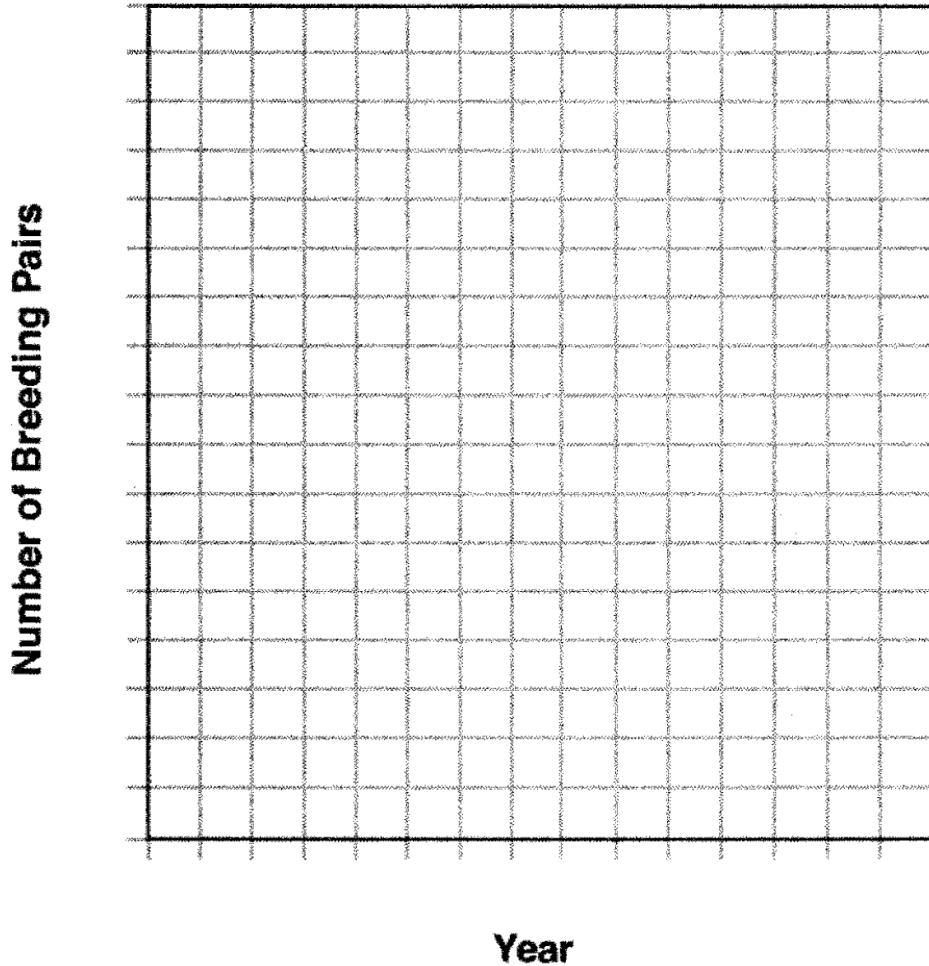
128. Base your answer to the following question on the data table below and on your knowledge of biology. The data table shows the number of breeding pairs of bald eagles in New York State from 1991 to 2003.

Date:

**Number of Breeding Pairs of
Bald Eagles in New York State from 1991 to 2003**

Year	Number of Breeding Pairs
1991	15
1993	20
1995	25
1997	35
1999	45
2001	65
2003	75

**Number of Breeding Pairs of Bald Eagles
in New York State from 1991 to 2003**



State *one* possible reason for the increase in the number of breeding pairs of bald eagles in New York State.

Date:

129. Describe the role of scavengers in an ecosystem.

Date:

130. Base your answer to the following question on the information and data table below and on your knowledge of biology.

A student grew two separate cultures of single-celled organisms. One culture contained *Paramecium caudatum* and the other contained *Paramecium aurelia*. The cultures were grown under the same conditions and the number of paramecia (per drop) in each culture was estimated every 2 days for a period of 16 days. The results are shown in data table 1 below.

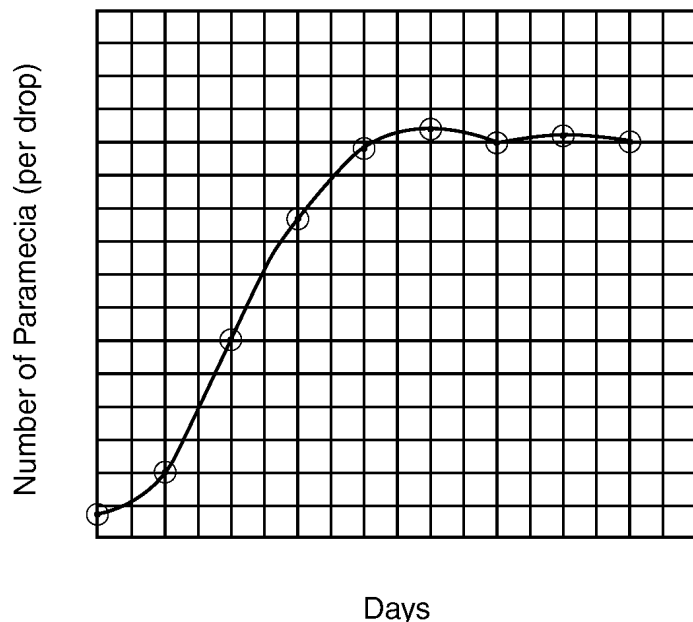
Date:

Data Table 1: Growth of *Paramecium aurelia* and *Paramecium caudatum* in Individual Cultures

Days	Number of <i>Paramecium caudatum</i> (per drop)	Number of <i>Paramecium aurelia</i> (per drop)
0	4	4
2	10	10
4	30	46
6	48	66
8	58	70
10	62	69
12	60	71
14	61	71
16	60	71

Example: 

Growth of *Paramecium aurelia* and *Paramecium caudatum* in Individual Cultures



Key:
○ = *Paramecium caudatum*
△ = *Paramecium aurelia*

Plot the data for *Paramecium aurelia* on the grid. Surround each point with a small triangle and connect the points.

Date:

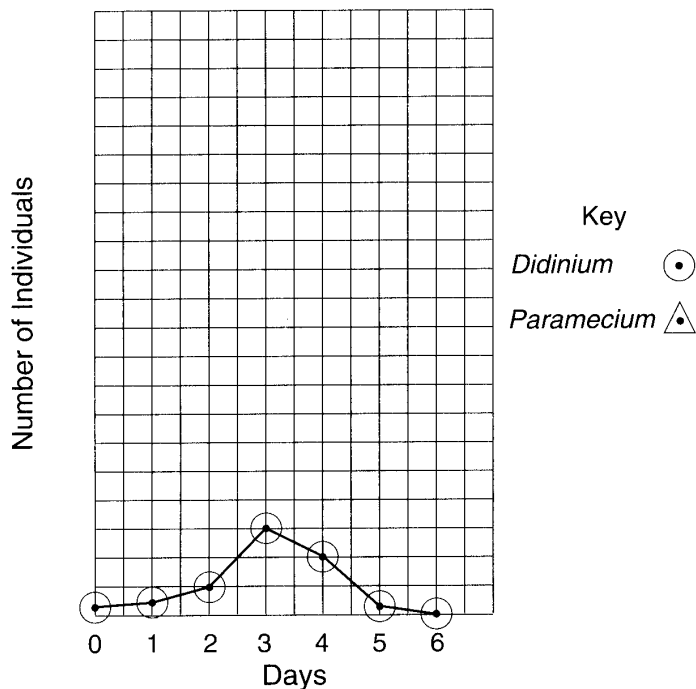
131. Base your answer to the following question on the information and data below and your knowledge of biology.

A student added two species of single-celled organisms, *Paramecium caudatum* and *Didinium nasutum*, to the same culture medium. Each day, the number of individuals of each species was determined and recorded. The results are shown in the data table below.

Culture Population

Day	Number of <i>Paramecium</i>	Number of <i>Didinium</i>
0	25	2
1	60	5
2	150	10
3	50	30
4	25	20
5	0	2
6	0	0

Culture Population

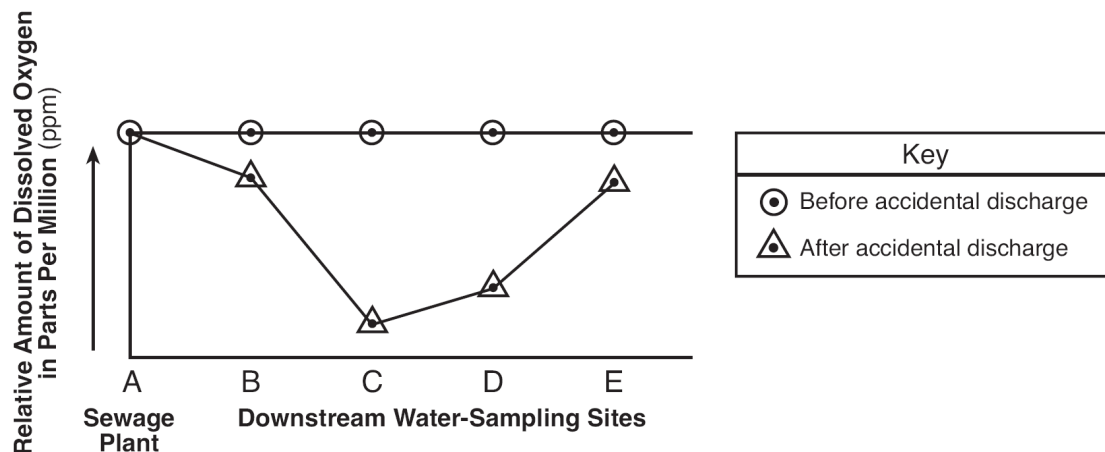


What evidence in the data indicates that *Didinium* could be a predator of the *Paramecium*?

Date:

132. Base your answer to the following question on on the information below and on your knowledge of biology.

Untreated organic wastes were accidentally discharged into a river from a sewage treatment plant. The graph below shows the dissolved oxygen content of water samples taken from the river at specific distances downstream from the plant, both before, and then three days after the discharge occurred.

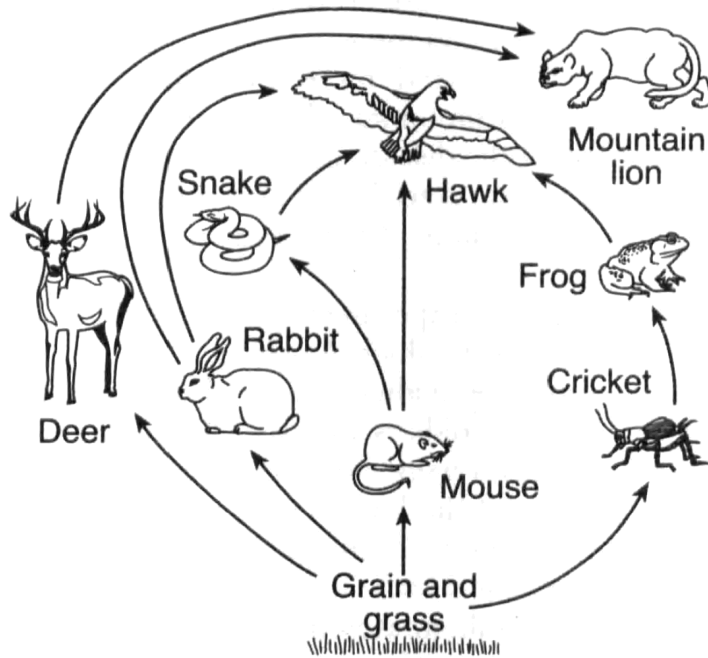


State why this accident would be expected to benefit the decomposers in the river below the sewage plant.

Date:

133. Base your answer to the following question on the information and food web below and on your knowledge of biology.

The organisms in the food web below live near large cattle ranches. Over many years, mountain lions occasionally killed a few cattle. One year, a few ranchers hunted and killed many mountain lions to prevent future loss of their cattle. Later, ranchers noticed that animals from this food web were eating large amounts of grain from their fields.



Identify *two* specific populations that most likely increased in number after the mountain lion population *decreased*. Support your answer.

Date:

134. Base your answer to the following question on the information below and on your knowledge of biology.

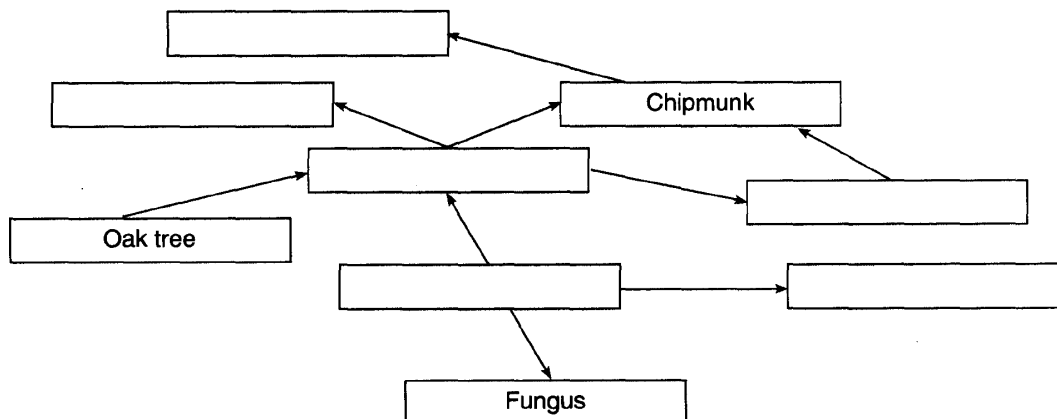
An ecologist made some observations in a forest ecosystem over a period of several days. Some of the data collected are shown in the table below.

Observations in a Forest Environment

Date	Observed Feeding Relationships	Ecosystem Observations
6/2	<ul style="list-style-type: none">• white-tailed deer feeding on maple tree leaves• woodpecker feeding on insects• salamander feeding on insects	<ul style="list-style-type: none">• 2 cm of rain in 24 hours
6/5	<ul style="list-style-type: none">• fungus growing on a maple tree• insects feeding on oak trees	<ul style="list-style-type: none">• several types of sedimentary rock are in the forest
6/8	<ul style="list-style-type: none">• woodpecker feeding on insects• red-tailed hawk feeding on chipmunk	<ul style="list-style-type: none">• air contains 20.9% oxygen
6/11	<ul style="list-style-type: none">• chipmunk feeding on insects• insect feeding on maple tree leaves• chipmunk feeding on a small salamander	<ul style="list-style-type: none">• soil contains phosphorous

Date:

On the diagram below, complete the food web by placing the names of *all* the organisms in the correct locations.



135. Base your answer to the following question on the information and data table below and on your knowledge of biology.

Birds colliding with aircraft either on the ground or in the air create problems for the Air Force. An organization known as BASH (Bird Aircraft Strike Hazard) studied the impact of birds colliding with aircraft. In 2001, there were 3854 bird collisions reported at a total cost to the Air Force of over 31 million dollars in damage—approximately eight thousand dollars per collision. August, September, and October were the busiest months with 1442 collisions. Nearly 50% of all these collisions occurred in the airfield environment, an environment that can most easily be controlled.

The top five species of birds involved in these collisions are listed in the data table below.

Top Five Bird Species Involved in Collisions in 2001

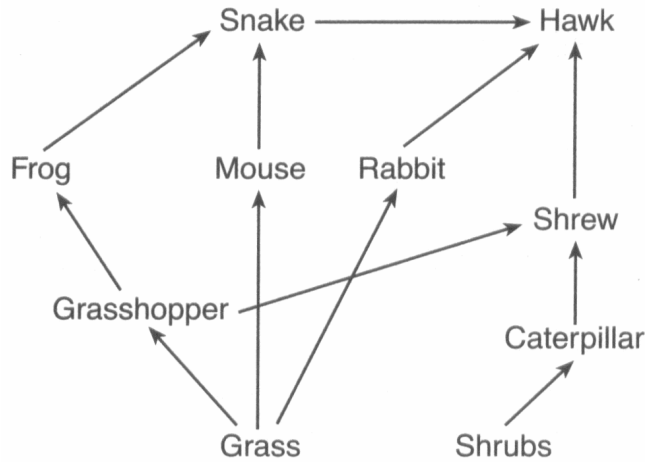
Type of Bird	Number of Collisions
American mourning dove (species A)	123
horned lark (species B)	100
barn swallow (species C)	83
American cliff swallow (species D)	55
American robin (species E)	55

Source of data: Bird Aircraft Strike Hazard by Matt Granger, <http://www.find.articles.com>

Mark an appropriate scale on the axis labeled "Number of Collisions."

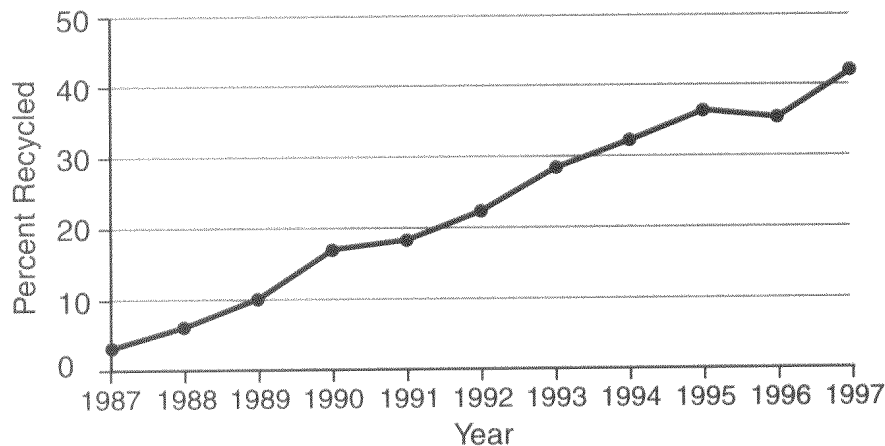
Date:

136. Base your answer to the following question on the diagram below that shows some interactions between several organisms located in a meadow environment and on your knowledge of biology.



A rapid *decrease* in the frog population results in a change in the hawk population. State how the hawk population may change. Support your answer.

137. The graph below shows the percentage of solid wastes recycled in New York State between 1987 and 1997.



Discuss the impacts of recycling. In your answer be sure to:

- explain what recycling is and provide one example of a material that is often recycled
- state one specific positive effect recycling has on the environment
- one specific reason that the percentage of solid wastes recycled increased between 1987 and 1997

_____ 138. Base your answer to the following question on the information below and on your knowledge of biology.

Bisphenol-A (BPA), is an industrial chemical commonly added to disposable, plastic water bottles to make them sturdier. BPA has been shown to inhibit the development of tadpoles into frogs. Some tadpoles exposed to high levels of BPA develop into frogs without legs. Others, when exposed to the chemical as tadpoles, fail to reabsorb their tails and thus grow into frogs with significantly long tails.

State *one* specific way humans can help decrease the exposure of animals to bisphenol-A.

_____ 139. Base your answer to the following question on the article below which was written in response to an article entitled "Let all predators become extinct."

Predators Contribute to a Stable Ecosystem

In nature, energy flows in only one direction. Transfer of energy must occur in an ecosystem because all life needs energy to live, and only certain organisms can change solar energy into chemical energy.

Producers are eaten by consumers that are, in turn, eaten by other consumers.

Stable ecosystems must contain predators to help control the populations of consumers.

Since ecosystems contain many predators, exterminating predators would require a massive effort that would wipe out predatory species from barnacles to blue whales. Without the population control provided by predators, some organisms would soon overpopulate.

Explain why an ecosystem with a variety of predator species might be more stable over a long period of time than an ecosystem with only one predator species.

_____ 140. Base your answer to the following question on the information below and on your knowledge of biology.

You are the owner of a chemical company. Many people in your community have been complaining that rabbits are getting into their gardens and eating the flowering plants and vegetables they have planted. Your company is developing a new chemical product called Bunny Hop-Away that repels rabbits. This product would be sprayed on the plants to prevent the rabbits from eating them. Certain concerns need to be considered before you make the product available for public use.

State *two* environmental concerns that should be considered before the product is sold and used by the public.

Date:

- _____ 141. Base your answer to the following question on the information below and on your knowledge of biology.

Due to the negative effects on the environment of burning coal and oil, society is looking for alternate energy resources that are renewable.

Identify *one* renewable resource that can be used to generate energy.

- _____ 142. Base your answer to the following question on the information below, and on your knowledge of biology.

New York State relies on natural gas for 24% of its energy supply. It is estimated that large deposits of natural gas are located in New York State. It is possible to extract the gas via high-volume hydraulic fracturing (hydrofracking). Hydrofracking involves freeing the natural gas by using a large amount of water treated with chemicals, which produces large quantities of waste products. Some people are in favor of hydrofracking, while others are against it. One side is concerned about the negative effect it will have on the environment. The other side points out the potential benefits it might provide.

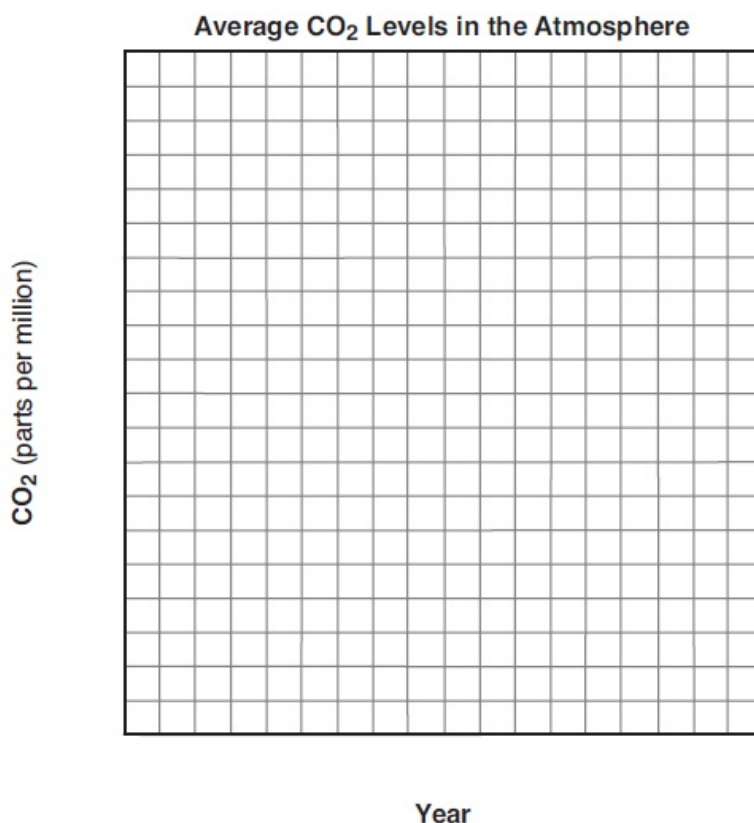
Describe a trade-off that must be considered in the decision whether to move forward with hydrofracking.

Date:

143. Base your answer to the following question on the information below and on your knowledge of biology. The average level of carbon dioxide in the atmosphere has been measured for the past several decades. The data collected are shown in the table below.

Average CO₂ Level in the Atmosphere

Year	CO₂ (in parts per million)
1960	320
1970	332
1980	350
1990	361
2000	370



Identify *one* specific human activity that could be responsible for the change in carbon dioxide levels from 1960 to 2000.

Date:

Base your answers to questions **144** and **145** on the information below and on your knowledge of biology.

There has been an increase in the number of dead birds found on the beaches of the Great Lakes. These birds were poisoned by a bacterial toxin in the lake water. The birds do not ingest enough water to become sick directly from the toxin found in the lake water. Scientists think that the cause of the increasing bird deaths lies with an invasive species the zebra mussel. This freshwater organism was introduced into the Great Lakes accidentally by humans, and has become well established in the Great Lakes. Zebra mussels filter out microscopic organisms, as well as the toxins found in the lake water. The toxins become concentrated in the zebra mussels, which are eaten by small fish called gobies, and the gobies are eaten by the birds. The concentration increases in each level of the food chain. It appears that the introduction of the zebra muscles into the Great Lakes has resulted in a new food chain that increases the concentration of the naturally occurring toxins and passes dangerous levels on to these top-level predators. This process is known as bioaccumulation.

_____ 144. How has bioaccumulation resulted in the deaths of large numbers of birds even though the toxin level in the lake water is not high enough to make them sick?

_____ 145. Why are the accidentally introduced zebra mussels referred to as an invasive species?

Answer Key

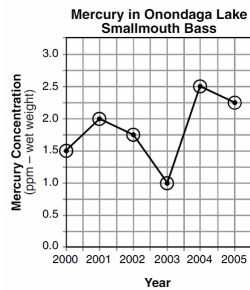
Ecology Regents Review

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Answer Key

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120.



121. — organisms lose habitats — many different species are removed — some species may become extinct

122. *Examples:* — All cells have the same genetic information. — All cells have common DNA. — Genetic information in one cell is passed to other cells through cell division.

123. — Disease killed large numbers of the moose. — The moose population overgrazed its habitat, resulting in starvation. — The moose population exceeded the carrying capacity of the environment. — overhunting — severe winter

124. *Examples:* — food supply — humans — habitat — diseases — competition — environmental factors — carrying capacity

125. Scientists would want to have a laboratory study on populations of different predators and their prey in order to eliminate unwanted variables or to generalize about the relationship between predators and prey.

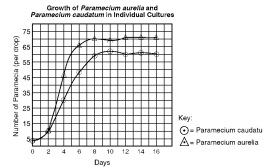
126. — evolution/natural selection — adaptive radiation — speciation

127. — The population size of organisms that feed on the hellbender will decline. — The population size of organisms that the hellbender feeds upon will increase. — The biodiversity of this western New York ecosystem will decrease, causing instability. — disruption of the food chain/web

128. — decreased pesticide use — decreased human impact on their environment — more food available — They were protected by laws. — Breeding programs were established.

129. *Examples:* — Scavengers remove dead organisms from the environment — Scavengers break down dead organisms

130.



131. *Examples:* — Changes in the size of *Didinium* population lag behind changes in the *Paramecium* population. — The predator population is usually smaller than the prey population. — *Didinium* died out after the *Paramecium*, implying that the *Didinium* ran out of food.

132. *Example:* large increase in their food supply

133. *Examples:* — rabbit and deer — They have fewer predators.

134.



135. scale on the axis labeled "Number of Collisions."

136. *Examples:* — The hawk population will decrease because there will be fewer snakes since there are fewer frogs for them to eat. — The hawk population will increase because there will be more grasshoppers for the shrews to eat and more shrews for the hawks to eat.

137. *Example:* Recycling involves the use of materials such as glass, plastic, and aluminum cans to produce other products. The trend may be due to the awareness of the need to recycle to improve the environment. Recycling has decreased the amount of solid wastes being dumped into landfills.

Answer Key
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138. – use reusable water bottles not made with BPA, – pass legislation that outlaws the manufacturing of products with BPA, – ensure that water bottles are not littered in the environment, – recycle disposable water bottles, – use metal/glass containers, – control the disposal of industrial waste
139. *Examples:* — Different populations of prey in an ecosystem are controlled by different kinds of predators. — More biodiversity in an ecosystem provides more stability.
140. *Examples:* –The chemical may not be biodegradable. –The chemical may interfere with food webs.–The chemical may pollute the environment.–The product may be toxic to humans and wildlife.
141. wind *or* running water *or* the Sun/solar energy *or* geothermal
142. – The decision involves balancing the economic gains and the possible environmental damage. – Fracking will provide people with more natural gas but might damage the environment. – There might be more jobs, but there is a possibility for increased water pollution.
143. *Example:* - increased burning of fossil fuels - more motor vehicle use - increased levels of deforestation - increase in human population
144. – The concentration of the toxin increases in each level of the food chain until it is high enough to kill top-level predators.-- The birds eat gobies that have accumulated toxins.-- The food chain increases the concentration of naturally occurring toxins by passing dangerous levels on to top-level predators.
145. – They outcompete native species. – They harm/negatively affect native species. – They were introduced to the Great Lakes by humans. – They interfere with the ability of other organisms to function in the environment. – They are not native to the Great Lakes.