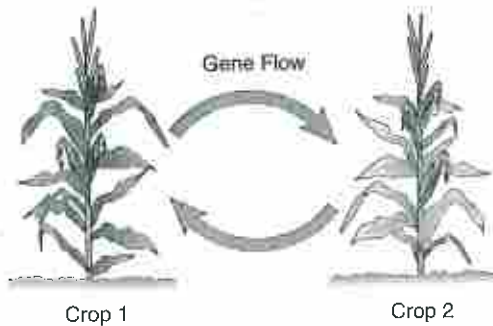


**Unit 3****Ecology**

1. Genetically modified (GM) crops have become important in agriculture. GM crops have genes from other organisms that give the crops such traits as resistance to pests and weed-killing chemicals. One example of a GM crop is called Bt corn. The Bt corn is genetically engineered to contain a gene from a bacterium that produces a toxin. The toxin can kill the European corn borer, a pest that causes major damage to corn crops. Based on the information above, which of the following represents a potential concern associated with using Bt corn?
- A The Bt corn will be more susceptible to damage from the corn borer.
  - B The Bt corn will require more irrigation, which will cost farmers more money.
  - C The Bt corn may kill other insects that eat the corn, affecting the ecosystem in the area.
  - D The Bt corn will grow much more quickly than other corn crops, outcompeting native plants.

2. The diagram below illustrates the concept of gene flow.



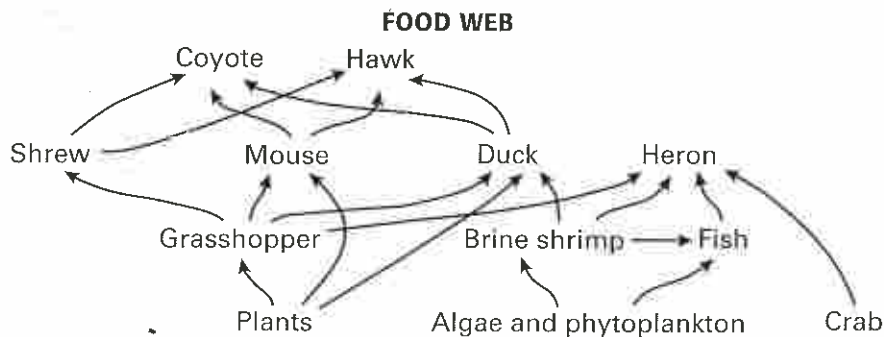
What type of problem might be caused by gene flow from a crop plant engineered to be resistant to herbicides?

- A Drug-resistant bacteria may evolve.
  - B Genetically engineered plants may cause the evolution of weeds that are immune to weed-killing chemicals.
  - C New species of poisonous insects may evolve.
  - D Genetically engineered plants could not cause any type of environmental problem.
3. A volcanic island experienced an eruption that doubled its size. Which of the following would you expect to observe on the new land within a few months of the eruption?
- A the presence of pioneer species
  - B the lack of pioneer species
  - C an increased growth of trees and large plants
  - D the presence of rich organic soil

**Unit 3** *continued***Ecology**

4. When a nonnative bird species appears in an ecosystem, which of the following will not be a likely change in the ecosystem?
- A Birds that share the same niche as the new species will have more competition for food resources.
  - B Bird predator species will temporarily have more available prey.
  - C Native bird species will immediately migrate to another area.
  - D Each food chain in the ecosystem will adjust over time to include the new species of bird.

5. Look at the diagram below.

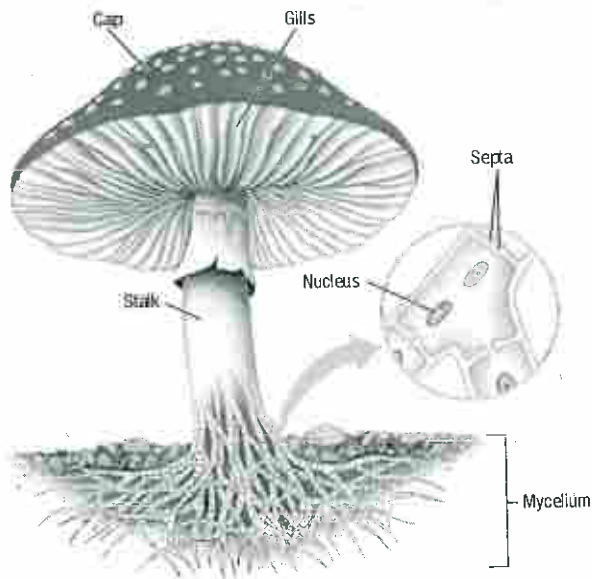


Which of the following is the correct flow of energy?

- A The crab gets energy from eating plants.
  - B The heron gets energy from eating plants.
  - C The crab gets energy from eating the heron.
  - D The heron gets energy from eating the crab.
6. Which of the following is an example of how a change in climate can affect the equilibrium of an ecosystem?
- A When the climate change involves a decrease in temperature, more tropical plants can invade an ecosystem.
  - B The species diversity of the insects in an ecosystem will remain constant as the temperature increases.
  - C A change in temperature will likely affect the ability of native species to withstand infectious diseases.
  - D With increasing storms, additional energy is available for photosynthesis.

**Unit 3** *continued***Ecology**

7. Mold and mushrooms are organisms that help recycle materials within an ecosystem.

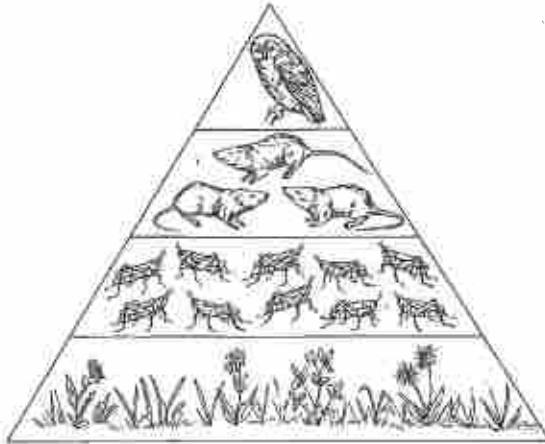


How would an ecosystem with few recycling organisms be affected?

- A It would be able to support more life.
  - B It would have more materials and resources available.
  - C It would have fewer materials available to organisms.
  - D It would contain more plants.
- 
8. By drilling sediment cores from the ocean floor and studying them, scientists have learned much about ancient carbon dioxide levels and climate. A study in 2004 found that the waters around the North Pole 55 million years ago were as warm as the waters in today's tropics. The researchers also found that the concentration of carbon dioxide 55 million years ago was 2,000 parts per million (ppm), whereas today, the concentration is 380 ppm. Which hypothesis does this finding support?
- A High levels of atmospheric carbon dioxide result in global warming.
  - B Earth's climate does not change.
  - C Many erupting volcanoes gave off huge quantities of carbon dioxide 55 million years ago.
  - D Today's levels of atmospheric carbon dioxide are not a cause for concern.

**Unit 3** *continued***Ecology**

9. Examine the energy pyramid shown below.

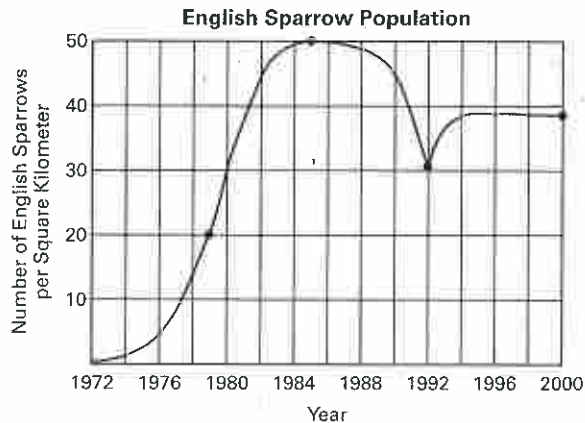


Each level of the energy pyramid above contains about 90% less energy than the level below it. The energy that is not passed on to the organism above it is used in the life processes of the organism or released into the environment. A certain sample of plants contains 490 joules (J) of energy. Based on the energy pyramid above, approximately how much of that energy remains in the level containing rats?

- A 4.90 J  
B 49.0 J  
C 490 J  
D 4,900 J
- 
10. Three species of finches are in competition for the limited resources of an ecosystem. One species prefers fruit to seeds. The second species prefers seeds to fruit. The third species will eat fruit or seeds with equal preference. If the third species is removed from the area, how will the ecosystem change?
- A Resources will be more abundant.  
B The climate of the ecosystem will change.  
C Fruit and seed resources will become less abundant.  
D Water will become more available.
-

**Unit 3** *continued***Ecology**

11. Examine the graph below.

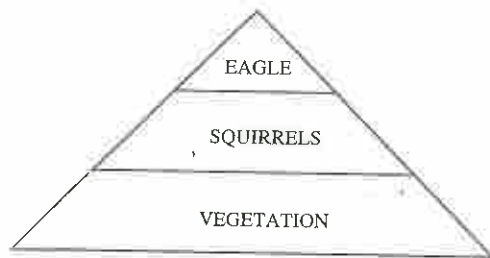


In 1988, a large shopping mall was built in the area where the sparrows lived. According to the information in the graph, how did this affect the sparrow population over a period of time?

- A The sparrow population increased because humans fed the sparrows.
  - B The sparrow population was unaffected by the shopping mall.
  - C The sparrow population increased because predators were taken away.
  - D The sparrow population decreased because of habitat destruction.
- 
12. Noxious weeds are weeds that invade ecosystems and grow very quickly and aggressively. Infer how noxious weeds might affect the biodiversity of an ecosystem.
- A They increase the biodiversity, because they increase the total energy of the producers.
  - B The biodiversity increases slightly, because they represent another species in the area.
  - C The biodiversity usually decreases greatly as the noxious weeds outcompete the local plants.
  - D The biodiversity is not affected at all, because the noxious weeds simply replace the dominant plant in the ecosystem.
- 
13. Which of the following is a nonenvironmental factor that might cause a population to increase in size?
- A emergence of disease resistance
  - B increased availability of a food source
  - C decreased predation
  - D increased competition

**Unit 3** *continued***Ecology**

14. Look at the energy pyramid below.



Which of the following is the correct flow of energy?

- A The vegetation gets energy from the squirrels.
  - B The eagle gets energy from eating plants.
  - C The squirrels get energy from eating the eagle.
  - D The eagle gets energy from eating the squirrels.
- 
15. Mistletoe grows on trees. It sends its roots into the tree and uses the nutrients that could otherwise be used by the tree. If mistletoe benefits from the relationship and the tree is harmed, what kind of relationship exists between the two organisms?
- A commensalism
  - B mutualism
  - C parasitism
  - D predation
- 
16. Which human activities are thought to be responsible for creating an ozone hole in the upper atmosphere?
- A burning sulfur-rich coal and increasing levels of greenhouse gases
  - B increasing human population and clearing forests
  - C producing and releasing chemicals called chlorofluorocarbons (CFCs)
  - D burning fossil fuels and the related increase in atmospheric CO<sub>2</sub>
- 
17. Which of the following environmental effects CANNOT be attributed to acid rain?
- A damage to trees and a decline of forest communities
  - B an increase in CO<sub>2</sub> in Earth's atmosphere
  - C damage to historic buildings and monuments
  - D death of aquatic organisms in lakes and streams