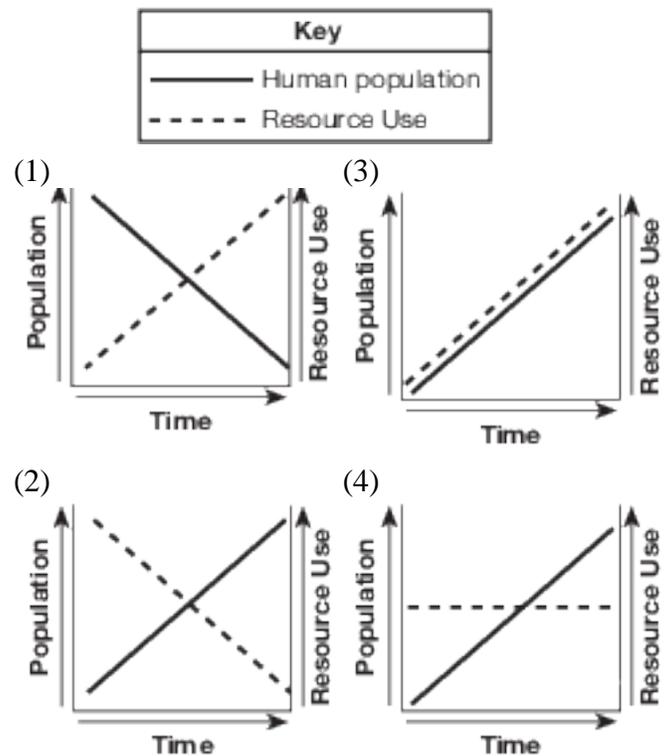


## Changes In The Environment Induced By Human Activity

- As water flows downhill, its energy can be used to generate electricity. Later, this water may evaporate, fall as rain, and be used again to generate electricity in the same way. This explains why electricity generated with water is considered
  - a source of water pollution
  - a renewable form of energy
  - more expensive than nuclear energy
  - responsible for global warming
- The fast food industry in the United States buys many russet potatoes from farmers. Therefore, most potato farmers grow russet potatoes. If farmers continue to plant the same crop in the same fields year after year without putting additives into the soil, the end result could be
  - smaller yields in future years due to the loss of nutrients
  - larger potatoes because they will adapt to the soil
  - new varieties of potatoes because they will reproduce sexually
  - genetically engineered potatoes that are resistant to disease
- Many scientists are worried about some of Earth's finite resources because humans are
  - using carbon dioxide faster than it is being produced
  - placing industrial wastes in landfills
  - interfering with energy flow from consumers to producers
  - using large amounts of some materials that cannot be renewed
- Many beverage companies are required to recycle bottles and cans because this activity directly reduces
  - air pollution and destruction of the ozone shield
  - overpopulation and soil erosion
  - solid waste and depletion of resources
  - thermal pollution and extinction of wildlife

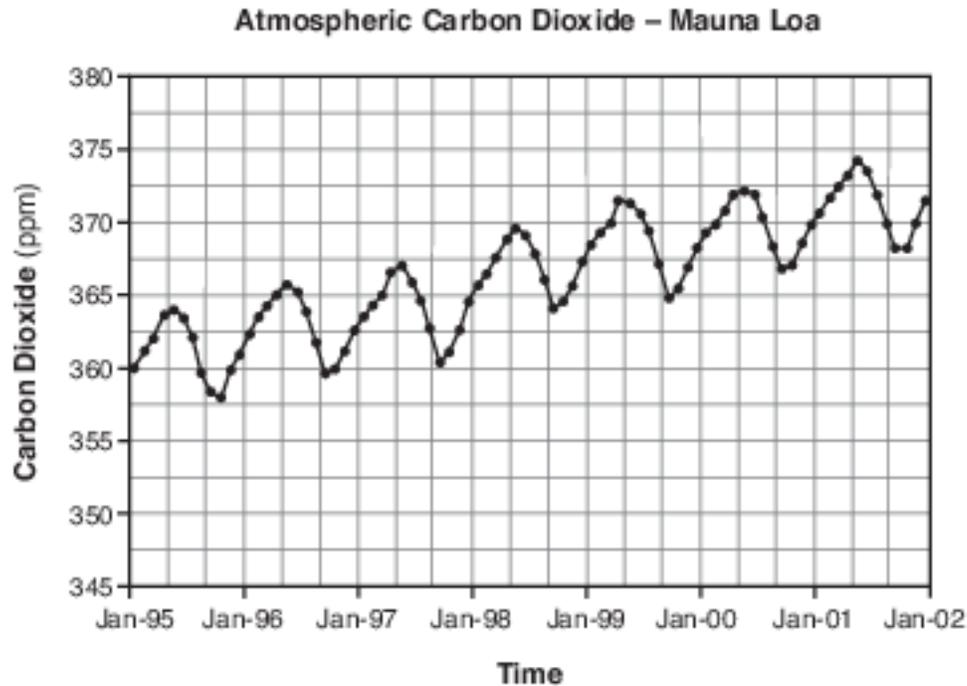
- Nonrenewable resources are
  - not finite and are not depleted over time
  - not finite and are depleted over time
  - finite and are not depleted over time
  - finite and are depleted over time
- According to scientists, ocean waves could be a source of energy. Devices are being designed to capture the energy from waves and supply electricity to coastal areas. A direct benefit of utilizing this technology to produce energy would be the
  - destruction of habitats near the devices
  - decreased use of nonrenewable resources
  - release of gases needed for photosynthesis
  - increased use of finite resources
- Which graph best shows the changes in global human population and natural resource use over the past 500 years?



- 8 The burning of fossil fuels has harmed the environment by
- (1) decreasing acid rain in the northeast United States
  - (2) adding carbon dioxide to the atmosphere
  - (3) increasing biodiversity in the lakes and ponds of the Adirondacks
  - (4) depleting the ozone shield directly over western New York State
- 9 New York State charges consumers a fee when purchasing beverages sold in aluminum cans and plastic bottles. This money is returned to purchasers when they return these items for recycling. Programs such as these are an attempt to
- (1) encourage people to spend more money on their beverages
  - (2) conserve the resources these containers are made from
  - (3) reduce the amount of carbon dioxide produced by deforestation
  - (4) totally eliminate the use of reusable containers
- 10 Humans deplete the most resources when
- (1) using wind energy as a power source
  - (2) generating power by using fossil fuels
  - (3) using water power to generate electricity
  - (4) recycling glass and plastics
- 11 The finite resources of Earth are often affected by increasing human consumption. These finite resources are
- (1) not renewable over a short period of time
  - (2) the products of rapid human population growth
  - (3) the result of deforestation
  - (4) needed to degrade ecosystems

Base your answer to question 12-15 on the information and graph below and on your knowledge of biology.

At an observatory in Mauna Loa, Hawaii, scientists have been measuring and collecting data related to changes in the atmosphere since the 1950s. The remote location of the observatory makes it ideal for studying atmospheric conditions that can cause climate change. One specific measurement taken is the amount of atmospheric carbon dioxide. Information for a 7-year period is shown in the graph below.



Source: [www.mlo.noaa.gov](http://www.mlo.noaa.gov)

12-15 Analyze the data shown in the graph. In your answer, be sure to:

- state the overall relationship between time and carbon dioxide levels [1]
- state one possible cause for the overall change in the carbon dioxide levels shown in the graph [1]
- identify the biological process that might account for the decreases in carbon dioxide levels [1]
- identify two actions carried out by humans that could lower carbon dioxide levels [1]

16 State why fossil fuels are considered a finite resource. [1]

Base your answers to questions 17 on the information below and on your knowledge of biology.

### Decline in the Amphibians

Declines in amphibian species, such as frogs, toads and salamanders, might affect the ways in which ecosystems function. Amphibians prey on many types of small organisms that survive by consuming leaf litter (leaf material on the ground of ecosystems). These small organisms include animals such as earthworms, centipedes, millipedes, pill bugs, and many species of insects. In turn, amphibians are preyed on by fish, herons, chipmunks, turkeys, foxes, coyotes, and other animals.

Human activities often cause a reduction in the size of amphibian populations. As amphibian populations are reduced, the organisms that are preyed on by amphibians increase in number. As the populations of small forest organisms increase, the amount of leaf litter decreases. The decrease in the amount of leaf litter on the forest floor may have negative effects on the forest ecosystem.

- 17 Identify one human activity and describe how that activity could directly or indirectly lead to a reduction in amphibian populations. [1]

Base your answers to questions 18 on the information below and on your knowledge of biology.

Mosquito Technologies of New York, Inc., has developed a Mosquito Killing System (MKS) to help control the mosquito population and reduce the transmission of West Nile Virus. The MKS works by taking advantage of the natural hunting strategies of mosquitoes, such as heat sensing and carbon dioxide detection. Beneficial insects do not use the same hunting strategies. The MKS unit produces heat and releases carbon dioxide in cycles, mimicking the breathing and body temperatures of humans, pets, and other warm-blooded animals. This attracts the mosquitoes to the device and, once inside, a vacuum pulls them in, where they pass through an electrocution grid, killing them. The mosquito remains are then returned to the environment through the bottom of the unit.

The unit contains a solar-powered photocell that turns the device on at dusk and turns it off at dawn.

- 18 State one positive effect the use of this MKS device has on the environment. [1]

## Answer Keys

1 2

2 1

3 4

4 3

5 4

6 2

7 3

8 2

9 2

10 2

11 1

12-15 The student's response to the bulleted items in the question need not appear in the following order.

- 12. Allow 1 credit for stating the overall relationship between time and carbon dioxide levels.
- Acceptable responses include, but are not limited to:
  - — As time increased, the levels of carbon dioxide increased.
  - — As time went by, the amount of carbon dioxide increased.
  - — Carbon dioxide production fluctuated with the seasons.
- 13. Allow 1 credit for stating one possible cause for the overall change in the carbon dioxide levels shown in the graph. Acceptable responses include, but are not limited to:
  - — increase in human population
  - — fewer photosynthetic organisms
  - — deforestation
  - — increased use of fossil fuels
  - — increased volcanic activity
- Note: Do not accept just “pollution” without a source or explanation.
- 14. Allow 1 credit for identifying the biological process that might account for the decreases in carbon dioxide levels. Acceptable responses include, but are not limited to:
  - — photosynthesis
  - — autotrophic nutrition
- 15. Allow 1 credit for identifying two actions carried out by humans that could lower carbon dioxide levels. Acceptable responses include, but are not limited to:
  - — planting more trees
  - — reducing the use of fossil fuels
  - — car pool/use public transportation/reduce driving
  - — recycling
  - — using alternative energy sources

16 Allow 1 credit. Acceptable responses include, but are not limited to:

- — Fossil fuels are not renewable.
- — Fossil fuels will run out one day.
- — Fossil fuels take millions of years to form.

17 Allow 1 credit. Acceptable responses include, but are not limited to:

- — Building in the area destroys the habitat.
- — Deforestation reduces the area where animals can find food and shelter.
- — Burning fossil fuels leads to acid rain, resulting in the death of organisms.
- — Introducing nonnative species increases competition for resources and could cause the loss of an organism to an area.
- Note: Allow credit for a human activity, not the product of activities, not just “pollution” without an explanation.

18 Allow 1 credit. Acceptable responses include, but are not limited to:

- — It doesn't use or produce any harmful chemicals.
- — Mosquito remains are returned to the environment.
- — It does not harm beneficial insects.
- — It reduces the transmission of Wet Nile virus.