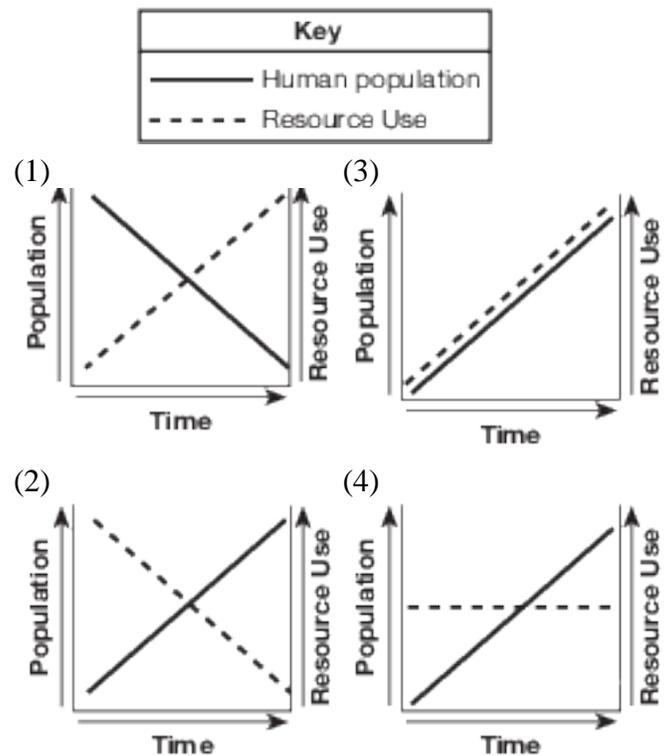


Human Influences On The Environment

- 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

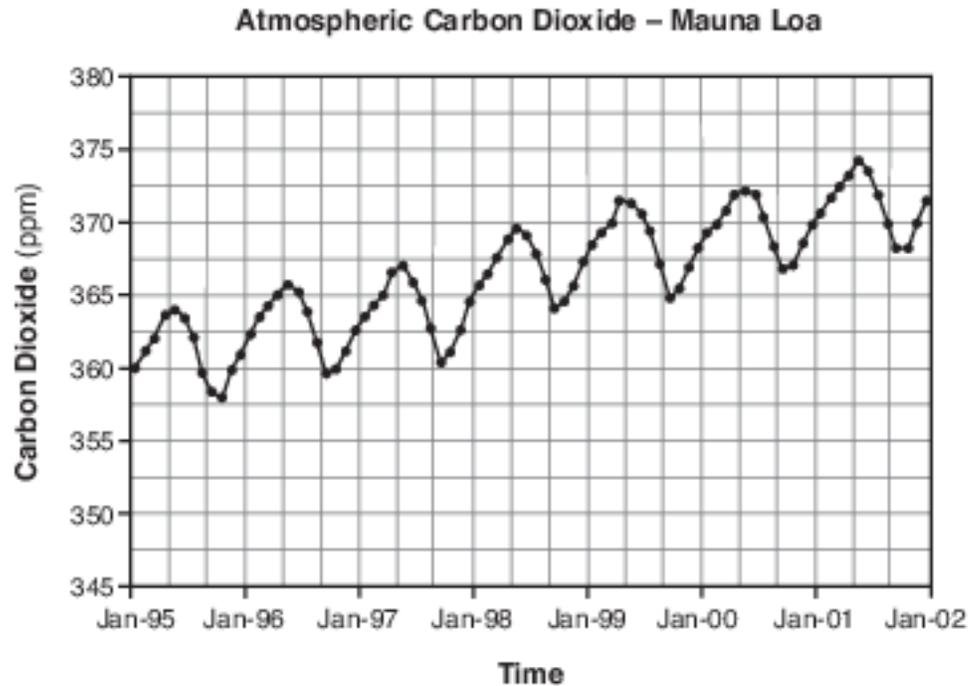
- Nonrenewable resources are
 - not finite and are not depleted over time
 - not finite and are depleted over time
 - finite and are not depleted over time
 - finite and are depleted over time
- According to scientists, ocean waves could be a source of energy. Devices are being designed to capture the 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

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.

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.

- 17 Identify one renewable alternative to natural gas as an energy source that New York State could use and describe the advantage of using this source, other than it is renewable. [1]

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

Green Algae Could Help Clean up Radioactive Nuclear Waste

Recent studies have shown that the uses of green algae are boundless. First, scientists at R.I.T. used algae to synthesize biofuel, and recently scientists at Northwestern University and Argonne National have found that freshwater algae can remove strontium 90 from radioactive wastewater. These developments can significantly aid the future effort to clean up radioactive waste at the Fukushima Daichi Plant [a nuclear power plant in Japan]. Scientists discovered that the process begins when the green algae first absorb strontium, calcium and barium from water. The strontium and barium form crystals inside each algae cell. The crystals remain inside the cells, but the algae filters out and excretes calcium and other minerals that may be present. The strontium is then isolated, and thus able to be treated.

Researchers are still figuring the best way to harness the algae's capabilities. Since algae doesn't differentiate between radioactive and inactive strontium (they are chemically identical), it is not known how the algae would hold up in a highly radioactive environment. But the good news is that they have been able to manipulate the algae's process to be more strontium-selective, thus removing as much as possible....

Source: <http://inhabitat.com/green-algae-could-help-clean-up-radioactive-nuclear-waste/algae-ed01/>

- 18 State one specific way that radioactive wastes from nuclear fuels can be harmful to humans. [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:

- — solar energy – Energy from the Sun is free.
- — wind energy – no air pollution
- — geothermal – no carbon dioxide released
- — hydroelectricity – Energy is generated locally.

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

- — Radioactive wastes can cause mutations that can be harmful to humans.
- — Radiation from them can cause cancer.
- — Their radiation can lead to death.
- — Radiation can lead to birth defects.
- — People will suffer from radiation poisoning.