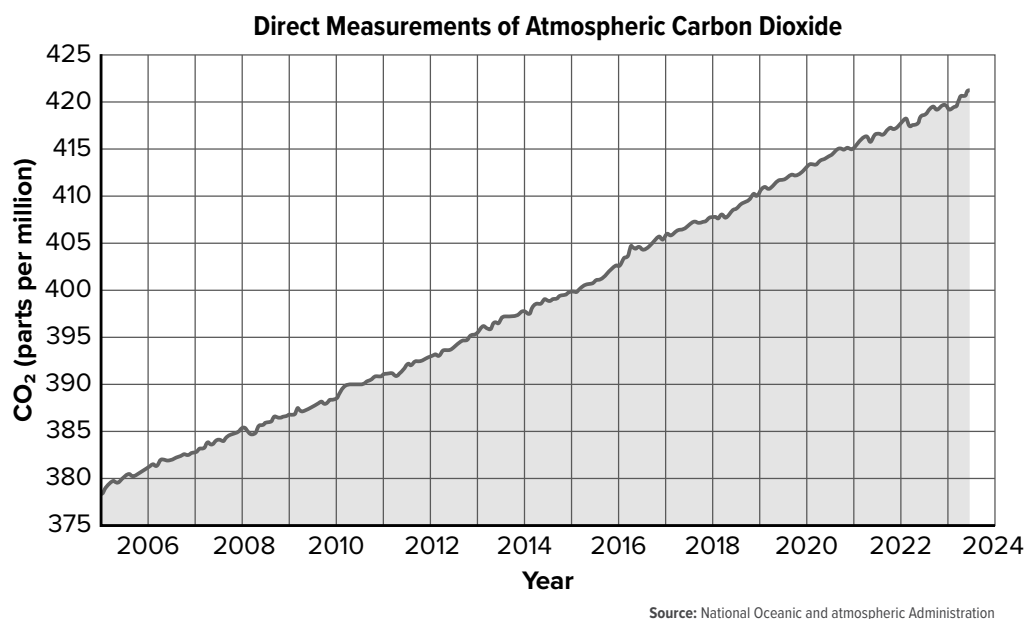


Chapter: Human Impact on the Environment

Answer the questions that follow.

1. Jamal has been tasked with asking questions to identify evidence of the factors that have caused global warming over the past century. He is presented with the following data on changes in atmospheric carbon dioxide.



Which question would **best** identify evidence of the effect atmospheric carbon dioxide has on global warming?

- (A) Why are atmospheric carbon dioxide levels increasing?
- (B) What is happening to levels of other greenhouse gases?
- (C) How do scientists gather data about levels of carbon dioxide?
- (D) How did global temperatures change over the same period?

For questions 2 and 3, refer to the following passage.

In this group of questions, you will use your knowledge about water supplies and water quality to answer three questions.

Finding Solutions to Water Issues

A city's population is increasing due to its good climate and natural surroundings. Beyond the city stretches miles of farmland. It includes several different types of produce like oranges, peaches, and alfalfa. The city uses freshwater from a local aquifer. The water is also utilized for crop irrigation. Due to the rise in population, farmers have been increasing their crop production to meet the higher demand for produce.

The increase in population and crop production has led to a huge decline in the water level of the aquifer. The city must enforce water restrictions, so they need to find a cost-effective but quick solution to this problem. Two solutions have been suggested.

Solution 1: Raise the rates for irrigation. This will encourage farmers to invest in technologies that will minimize their water usage. It will also bring in extra income to the city. However, it may take some time for the results to be realized.

Solution 2: Partner with local plumbing companies. Give property tax rebates to households that install low-flow showerheads and toilet mechanisms. Amend the local building code to require these in all new construction.

2. Which solution would **most** effectively suit the city's needs?

- (F) Solution 1 would be most effective because it would quickly stop people from wasting water and allow the water level in the aquifer to recover.
- (G) Solution 1 would be most effective because it would immediately lead to decreased crop production, and crops could be grown elsewhere.
- (H) Solution 2 would be most effective because it would be the fastest way to slow down the population increase and refill the aquifer.
- (I) Solution 2 would be most effective because it could immediately be put into effect, and it would save homeowners money.

3. At a meeting of the city council, a resident points out that it has been raining for the past three days. The resident thinks that the aquifer should be refilled as a result and argues that there is no need for either option.

Is the resident correct? Why or why not?

- (A) Yes; the rain will pass through the soil and fill the aquifer.
- (B) Yes; the aquifers will naturally refill with groundwater from nearby areas.
- (C) No; a few days of rain does not provide enough water to refill an aquifer.
- (D) No; there is still water in the aquifer, so it is not necessary to decide immediately. Both options should be discussed in the future.

4. The development of cities can affect water sources nearby.

Which outcome is NOT a likely environmental problem related to urbanization?

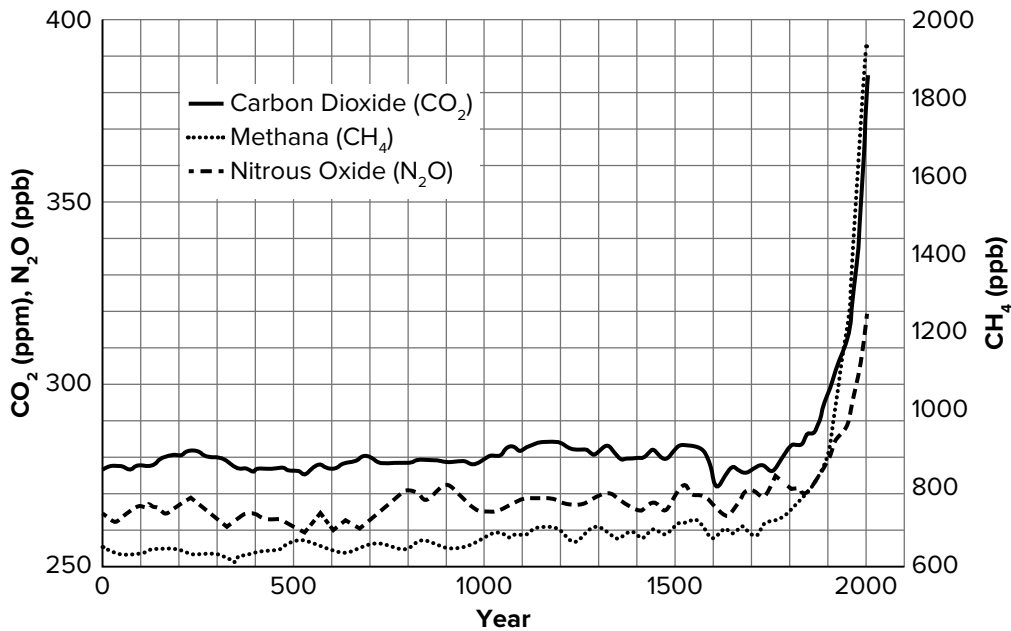
- Ⓕ increase in waste production
- Ⓖ increased use of mass transportation
- Ⓗ pollution of water supplies near the city
- Ⓘ loss of forests or other natural habitats for wildlife

5. Which is **one** reason that people rebuild degraded coastal marshes?

- Ⓐ to provide more land for development
- Ⓑ to increase water supplies for nearby cities
- Ⓒ to establish a better habitat for marine animals
- Ⓓ to reduce emissions of carbon dioxide and other greenhouse gases

6. Why is it important to focus on preventing water pollution before it happens?
- Ⓕ Water stays in the water cycle for billions of years, so any polluted water will affect many different parts of the cycle.
 - Ⓖ Water is only in the water cycle before it leaves Earth, so the pollution can affect other natural systems beyond Earth.
 - Ⓗ Pollution doesn't move from one part of the water cycle to other parts, so it can become highly concentrated and difficult to remove.
 - Ⓘ The water cycle can eliminate all pollution on its own by continuously recycling Earth's water, but it is still important to prevent pollution.

7. Atmospheric greenhouse gas concentrations naturally rise and fall over time. The graph shows how the concentrations of three greenhouse gases have changed over the last 2000 years.



Why are greenhouse gases a cause for concern?

- (A) Earth would be much colder than it is now without them.
- (B) Scientists now have the tools to measure their concentrations.
- (C) Their concentrations are rising at a much faster rate than in the past.
- (D) Some greenhouse gas concentrations are decreasing, while others are increasing.

8. The quality of the water in a stream affects the organisms that live there. Macroinvertebrates are organisms without backbones, such as crayfish, snails, and riffle beetles. Their presence can be used to determine the health of a stream. For example, the riffle beetle is only in streams where dissolved oxygen is high and the stream is healthy.

In 2015, a new housing development was built near a particular stream. The table shows the conditions in this stream.

Table 1: Conditions of a Stream Over Several Years

Year	Water Temperature (°C)	Dissolved Oxygen Concentration (ppm)	Riffle Beetle (adults)
2013	10.4	11.5	9.8
2014	11.0	10.5	9.3
2015	12.7	8.0	7.9
2016	13.3	7.5	6.2
2017	14.1	6.5	4.4
2018	15.2	5.5	2.6

How did the new housing development **most likely** affect the stream?

- (F) It made the stream healthier by increasing the water temperature.
- (G) It did not affect the health of the stream because there is still a beetle population.
- (H) It made the stream increasingly unhealthy, as indicated by the decrease in the riffle beetle population.
- (I) It made the stream unhealthy at first, as shown by the beetle population, but then it became healthier, as shown by a decrease in dissolved oxygen.

9. The table compares the estimated lifetime greenhouse gas emissions for processes of both a gasoline-powered car and a 2020 model electric vehicle with a 300-mile electric range.

Table 2: Comparison of Greenhouse Gas Emissions

Process	Gasoline Car (grams/mile)	Electric Vehicle (grams/mile)
Battery manufacturing	0	27.0
Other manufacturing and end-of-life	33.75	25.5
Feedstock and fuel	63.75	97.5
Vehicle in use	277.5	0

What conclusion can be drawn from the data in the table?

- (A) Driving an electric vehicle could help curb global warming because it produces lower total greenhouse gas emissions over its lifetime.
- (B) Driving a gasoline-powered vehicle is better for the environment because manufacturing batteries for electric cars produces greenhouse gases.
- (C) Driving an electric vehicle is better for the environment because the electricity used to charge electric cars does not emit greenhouse gases.
- (D) Driving a gasoline-powered vehicle could help curb global warming because it produces lower total greenhouse gas emissions over its lifetime.