

Critical Reading: Natural Resources and Climate Change

Name _____ Class _____ Date _____

Read these passages from the text and answer the questions that follow.

The Atmosphere

The atmosphere plays an important part in maintaining Earth's freshwater supply. It is part of the water cycle. It refills lakes and rivers with precipitation. The atmosphere also provides organisms with gases needed for life. It contains oxygen for cellular respiration and carbon dioxide for photosynthesis.

Air Pollution

Earth's atmosphere is vast. However, it has been seriously polluted by human activities. **Air pollution** consists of chemical substances and particles released into the atmosphere, mainly by human actions. The major cause of outdoor air pollution is the burning of fossil fuels. Power plants, motor vehicles, and home furnaces all burn fossil fuels and contribute to the problem (see **Table below**). Ranching and using chemicals, such as fertilizers, also cause air pollution. Erosion of soil in farm fields and construction sites adds dust particles to the air as well. Fumes from building materials, furniture, carpets, and paint add toxic chemicals to indoor air.

Pollutant Problems

Pollutant	Example/Major Source	Problem
Nitrogen oxides (NO _x)	Motor vehicle exhaust	Acid Rain
Carbon monoxide (CO)	Motor vehicle exhaust	Poisoning
Carbon dioxide (CO ₂)	All fossil fuel burning	Global Warming
Smog	Coal burning	Respiratory problems; eye irritation
Ground-level ozone	Motor vehicle exhaust	Respiratory problems; eye irritation

In humans, air pollution causes respiratory and cardiovascular problems. In fact, more people die each year from air pollution than from automobile accidents. Air pollution also affects ecosystems worldwide by causing acid rain, ozone depletion, and global warming. Ways to reduce air pollution from fossil fuels include switching to nonpolluting energy sources (such as solar energy) and using less energy. What are some ways you could use less energy?

Ozone Depletion

There are two types of ozone. You can think of them as bad ozone and good ozone. Both are affected by air pollution.

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- Bad ozone forms near the ground when sunlight reacts with pollutants in the air. Ground-level ozone is harmful to the respiratory systems of humans and other animals.
- Good ozone forms in a thin layer high up in the atmosphere, between 15 and 35 kilometers above Earth's surface. This ozone layer shields Earth from most of the sun's harmful UV radiation. It plays an important role in preventing mutations in the DNA of organisms.

Unfortunately, the layer of good ozone is being destroyed by air pollution. The chief culprits are chlorine and bromine gases. They are released in aerosol sprays, coolants, and other products. Loss of ozone has created an **ozone hole** over Antarctica. Ozone depletion results in higher levels of UV radiation reaching Earth. In humans, this increases skin cancers and eye cataracts. It also disturbs the nitrogen cycle, kills plankton, and disrupts ocean food webs. The total loss of the ozone layer would be devastating to most life. Its rate of loss has slowed with restrictions on pollutants, but it is still at risk.

Questions

1. Describe two important roles of the atmosphere.
2. What is air pollution? What is the major cause of air pollution?
3. List three pollutants the burning of fossil fuels adds to air. What are the sources of these three pollutants?
4. What is good ozone?
5. What are the major effects of the ozone hole?