Short-Term & Long-Term Effects of Chemical Pollution

Chemical pollution introduces chemicals into the natural environment, **negatively** affecting the air, water and soil. Such pollutants can come from a **wide** variety of sources. When chemical pollutants are **concentrated** or in an area for period, they can **adversely** affect the **ecosystem** and those who live in the area

Short-Term Effects on the Environment

When a chemical pollutant enters a body of water, it can impact **surrounding wildlife**, **watershed** and **residents**. For example, if chemicals **get into** to a **freshwater** supply that people and/or animals rely on for drinking, it may no longer be safe for consumption or sanitation **purposes**. Toxic releases from industrial plants into the environment and agricultural **runoff** can **threaten** water supplies in the short term.

Long-Term Effects on the Environment

Fertilizers or **sewage** can introduce chemicals containing nitrate or phosphate into bodies of water. Nitrate and phosphate are food for the **algae** in water. An **overload** of these chemicals will cause the algae **to bloom**. As the **excess** algae die and decay, dissolved oxygen is **used up** and the overall quality of the water is degraded. Aquatic life dies from oxygen **deprivation**. When emissions from industrial plants like sulfur and nitrogen oxides enter the atmosphere, they can produce acid rain. Acid rain can weaken plant life, stress marine animals and cause the soil to leach toxic metals. In some cases, chemical pollution can kill populations of **beneficial** species that support ecosystems, like bees. When long-term **exposure** to chemical pollutants cause native **species** within an ecosystem to die, the area experiences a loss of **diversity** and becomes more **vulnerable** to **invasive** and **undesirable** species.

Global Warming

The class of chemical pollutants called greenhouse gases may **contribute** to global warming. Greenhouse gases released as a result of human activities include carbon dioxide, methane, nitrous oxide and fluorinated gases. Methane and nitrous oxide are released mostly through agricultural activities. The burning of fossil fuels and deforestation release carbon dioxide. Many industrial processes release fluorinated gases. The effects of global warming include accelerated ice melt at the Earth's poles, rising sea levels, and loss of species who are unable to **adapt**.

Effects on Health

Chemical pollution can affect animals -- including humans -- when **ingested**, breathed in or absorbed through the skin. Short-term exposure to some chemical pollutants can **impair** the immune, **endocrine** and reproductive systems. Pollutants may cause **lesions**, alter liver function or darken the skin. Chemical pollutants may also **trigger** asthma symptoms in those diagnosed with the disease. Exposure to chemical pollution can also lead to headaches, upper respiratory infections, dizziness and nose, throat or eye irritations. According to the World Health Organization,

developing fetuses are among the most sensitive to some types of chemical pollution, as the **toxins** can affect the development of organ systems and growth.

Vocabulary comprehension.

a) Use an English language dictionary and explain the words in bold in the text in full sentences.
b) Use the following words in sentences from your own style.
affecting, rely on, beneficial, diversity, pollutant, contribute.
c) From the text find the words that refer to the following definitions

i. is an anion, salt, functional group or ester derived from a phosphoric acid
a compound of nitrogen and oxygen naturally found in air, soil, water, and some food. Plants and animals require it for their survival and growth, and the human body also produces this compound. In industry, it is used as fertilizers for crops and lawns

ii. nonmetallic chemical element belonging to the oxygen group odorless, tasteless, light yellow solid. It is a reactive element that given favorable circumstances combines with all other elements except gases, gold, and platinum.

iii. atmospheric gases such as carbon dioxide (CO_2), methane (CH_4), and water vapor (H_2O) that absorb and re-radiate heat, which warms the lower atmosphere and Earth's surface.

iv. is a chemical compound made up of molecules that each have one carbon atom covalently double bonded to two oxygen atoms. It is found in the gas state at room temperature and at normally-encountered concentrations it is odorless.

v. a gas that is found in small quantities in the atmosphere. Methane is the simplest hydrocarbon, consisting of one carbon atom and four hydrogen atoms. Methane is a powerful greenhouse gas

vi. is an odorless, colorless, non-flammable gas. While it is not flammable, it will support combustion to the same extent as oxygen. It leads to a state of euphoria, explaining its nickname, 'laughing gas.

vii. the most potent and longest lasting type of greenhouse gases emitted by human activities. There are four main categories of these gases—hydrofluorocarbons (HFCs), perfluorocarbons (PFCs), sulfur hexafluoride (SF_6), and nitrogen trifluoride (NF_3).

viii. hydrocarbons comprised primarily of the following elements: carbon and hydrogen and some sulfur, nitrogen, oxygen, and mineral matter. Mineral matter turns into ash when burnt.

Understanding the Text

1. What is chemical pollution, and how does it affect the environment?
2. What are some common sources of chemical pollutants?
3. How can chemical pollution impact water supplies in the short term?
4. What happens when fertilizers and sewage introduce nitrate and phosphate into bodies of water?
5. How does acid rain form, and what are its effects on ecosystems?
6. What are some examples of beneficial species that chemical pollution can harm?
7. How do greenhouse gases contribute to global warming?
8. What are some consequences of global warming mentioned in the text?

9. In what ways can chemical pollution affect human health in the short term?
10. Why are developing fetuses especially vulnerable to chemical pollution?

Comprehension Questions TYPE 2

From the multiple-choice answers, choose the best one.

1. What is chemical pollution, and how does it affect the environment?

A) A type of pollution caused by sound waves
B) The introduction of chemicals into the natural environment, negatively affecting air, water, and soil
C) A process that improves air and water quality
D) The natural breakdown of chemicals in the soil

2. What are some common sources of chemical pollutants?

A) Industrial plants, agriculture, and deforestation
B) Only natural disasters
C) Recycling and composting
D) Solar and wind energy production

3. How can chemical pollution impact water supplies in the short term?

A) It can make water unsafe for drinking and sanitation
B) It can make water taste better
C) It increases oxygen levels in the water
D) It helps plants grow more efficiently

4. What happens when fertilizers and sewage introduce nitrate and phosphate into bodies of water?

A) They make the water cleaner
B) They cause algae to grow excessively, leading to oxygen depletion
C) They increase the number of fish in the water
D) They help purify water for drinking

5. How does acid rain form, and what are its effects on ecosystems?

A) It forms when sulfur and nitrogen oxides enter the atmosphere and can weaken plants, harm marine life, and leach toxic metals into the soil
B) It is caused by too much carbon dioxide and helps plants grow faster
C) It forms naturally and has no harmful effects on the environment
D) It is produced by increased oxygen levels in the atmosphere

6. What are some examples of beneficial species that chemical pollution can harm?

A) Bees and other pollinators
B) Mosquitoes and ticks

C) Weeds and invasive plants
D) Snakes and sharks

7. How do greenhouse gases contribute to global warming?

A) By increasing oxygen levels in the air
B) By trapping heat in the Earth's atmosphere
C) By making the environment colder
D) By removing carbon dioxide from the air

8. What are some consequences of global warming mentioned in the text?

A) Increased plant growth and biodiversity
B) Rising sea levels, accelerated ice melt, and species loss
C) Decreased temperatures and stronger storms
D) More freshwater availability and cleaner air

9. In what ways can chemical pollution affect human health in the short term?

A) It can cause dizziness, respiratory infections, and skin irritation
B) It makes people stronger and healthier
C) It reduces the chances of asthma attacks
D) It improves liver function and immune response

10. Why are developing fetuses especially vulnerable to chemical pollution?

A) Because their organ systems and growth are still developing
B) Because they have stronger immune systems
C) Because they can detoxify pollutants more efficiently
D) Because they are not exposed to pollution