

PARAGON CONVENT SCHOOL

SECTOR : 24 B, CHANDIGARH

LESSON - 18

POLLUTION OF AIR AND WATER

Summary :

- Contamination of air with harmful substances is called air pollution.
- Air is polluted by burning of fuels in automobiles, in factories and in power plants.
- Chlorofluorocarbons damage the ozone layer.
- Excess of carbon dioxide in air is causing global warming.
- Harmful gases and smoke cause many respiratory diseases and breathing disorders.
- Acid rain damages the crops, kills aquatic organisms, and damages the buildings and monuments made up of marbles and limestone.
- Air pollution can be reduced by making efforts to reduce fuel consumption and by treating the smoke released from factories.
- Water is polluted by sewage and industrial waste.
- Water polluted by sewage can cause waterborne diseases like cholera, jaundice etc.
- Water polluted by industrial waste contains toxic chemicals which harm the skin and other body organs of humans and kill the aquatic organisms.
- Mixing of agricultural wastes in water bodies causes eutrophication.

Multiple Choice Questions (Page No. 268)

1. (d) 2. (b) 3. (a) 4. (a) 5. (a)

Multiple Choice Questions (Page No. 269, 270)

1. (a) 2. (b) 3. (c) 4. (d) 5. (a)

SECTION A

Oral questions

Q1.- Name any two natural sources which causes air pollution.

Ans.- Coal and petroleum / dust

Q2.- Why chlorine is added to the filtered water before supplying it to the city?

Ans.- Chlorine added to the water kills all the disease-causing microorganisms present in water.

Q3.- Name three green house gases.

Ans.- Carbon dioxide, methane and water vapour

Science quiz

Q1.- Name four air pollutants produced by burning of fossil fuels.

Ans.- Carbon dioxide, sulphur dioxide, carbon monoxide, oxides of nitrogen.

Q2.- What is meant by water pollution?

Ans.- The contamination of water with harmful, unwanted substances like domestic sewage, toxic industrial wastes and chemicals like pesticides and fertilizers, which cause harmful effects on both living and non-living objects is called water pollution.

Q3.- What is acid rain?

Ans.- The rainwater containing large amount of dissolved acids is called acid rain.

WORKSHEET A

Tick (✓) the correct options

1. (b) 2. (c) 3. (a) 4. (c)

Fill in the blanks

1. carbon dioxide 2. temperature 3. Chlorofluorocarbons

Match the following

1. (b) 2. (d) 3. (a) 4. (c)

SECTION B

Multiple Choice Questions

1. (b) 2. (c) 3. (d)

Very Short Answer Questions

Q1.- What is the loss of dissolved oxygen from water in water bodies called?

Ans.- Eutrophication

Q2.- Name a clean source of energy for producing electricity.

Ans.- Solar energy

Q3.- What causes acid rain?

Ans.- The oxides of sulphur and nitrogen and unburnt hydrocarbons produced due to burning of fossil fuels causes acid rain.

Short Answer Type-I Questions

Q1.- What is global warming?

Ans.- Global warming is the rise in average temperature of the atmosphere of the earth due to the increase in greenhouse effect.

Q2.- Write any two methods to control air pollution.

Ans.- Methods to control air pollution-

(i) Use catalytic converters in automobiles which convert the harmful gases into harmless gases.

(ii) We should grow more plants and trees to reduce carbon dioxide concentration in the air.

(iii) Replace use of wood, coal or kerosene with LPG for domestic use.

(iv) Encourage the use of public transport.

Q3.- Write the steps involved in treatment of water in water treatment plants.

Ans.- The steps involved in treatment of water in water treatment plants are :
Sedimentation, loading, filtration, chlorination and storage

Q4.- List two ways of reducing water pollution.

Ans.- (i) Excessive use of fertilizers and pesticides should be discouraged.

(ii) Washing clothes, cleaning utensils or taking bath near water bodies should be restricted.

(iii) Dead bodies should not be disposed of in a river or a lake.

(iv) Domestic sewage should be treated before being released into water bodies.

Short Answer Type-II Questions

Q1.- What are the damaging effects of ozone layer depletion?

Ans.- Damaging effects of ozone layer depletion are:

i) Harmful ultraviolet radiations reaching the earth cause various diseases in human beings such as cataract, skin cancer, dimming of eyesight, etc.

ii) Harmful ultraviolet radiations can bring about changes in the gene structure leading to mutations.

iii) Harmful ultraviolet radiations cause damage to early developmental stages of fishes, crabs and other animals.

Q2.- What are the main causes of water pollution?

Ans.- The main causes of water pollution are :

- (i) Industrial sewage: The discharge of untreated industrial sewage directly into water bodies is one of the main cause of water pollution.
- (ii) Domestic sewage: Liquid wastes from domestic activities, such as kitchen and toilets, are discharged into rivers through sewage systems causing water pollution.
- (iii) Human activities: Bathing of human beings and animals in lakes, rivers, etc., pollutes the water bodies.
- (iv) Agricultural wastes: In modern agriculture, we use large quantities of pesticides and fertilizers than required by the plants. Excess of these inorganic chemicals find their way to water bodies which results in water pollution.
- (v) Oil spill: Oil spills from huge tankers is one of the major cause of water pollution which affects the marine plants and animals.

Q3.- Discuss the damaging effects of acid rain.

Ans.- The damaging effects of acid rain are:

- (a) Acid rain increases the acidity of soil and thus, affects the plant and animal life living in it. It leads to the loss of soil fertility.
- (b) Acid rain makes the water of lakes and rivers acidic leading to destruction of aquatic plants and animals.
- (c) Acid rain destroys monuments and buildings.
- (d) Acid rain promotes corrosion of metallic objects like railway bridges and gates.

Q4.- Mr. Mehta has a CNG fuelled car. But due to this, he has to stand in a long queue. He is also in favour of regular pollution check in vehicles and uses catalytic converters in his car, while Mr. Singh uses petrol in his car and also advises Mr. Mehta to shift to petrol instead of CNG to get rid of the queue problem.

- a) Do you think Mr. Mehta should shift to petrol instead of CNG? Why / Why not?
- b) Is it right to use catalytic converters in the car? Why / Why not?

Ans.- (a) No, Mr Mehta should not shift to petrol instead of CNG because CNG is a cleaner fuel and is good for the environment as it produces less pollutants than coal, petrol, etc.

(b) It is right to use catalytic converters in the cars because they convert the harmful gases into harmless gases.

Long Answer Questions

Q1.- Discuss the harmful effects of air pollution.

Ans.- Harmful effects of air pollution are as follows:

(i) Carbon monoxide is a very poisonous gas. When inhaled in excess, It can kill a person without warning as it is a colourless and odourless gas.

(ii) Oxides of sulphur (sulphur dioxide and sulphur trioxide) cause respiratory problems and damage lungs.

(iii) Oxides of nitrogen cause lung congestion.

(iv) Fumes coming out of chemical industries cause irritation in our nose and throat.

(v) Particles of lead oxide present in the automobile exhausts can affect the brain of children and cause mental disorder.

(vi) Particles of dust in air can cause bronchitis.

Q2.- Explain eutrophication and biological magnification, with examples.

Ans.- Eutrophication: Washing away of fertilizers into water bodies causes increase in growth of algae and other weeds in water bodies. Due to respiration carried out by algae, a large amount of dissolved oxygen in the water is consumed. Death of algae further reduces the amount of oxygen in the water. This is because microorganisms use the oxygen for the decomposition of dead algae. Once the level of dissolved oxygen falls, fishes and most other aquatic animals die due to suffocation. This loss of dissolved oxygen from water in water bodies is called eutrophication.

Biological magnification: Pesticides and insecticides like DDT are poisonous chemical substances which are used in large quantities to kill pests and protect the

plants from diseases. Excess of pesticides find their way to water bodies through rainwater. The pesticides enter the food chain at the producer level (plants) and get accumulated in the body of organisms in increasing concentrations along the food chain. In an aquatic food chain, phytoplanktons are consumed by zooplanktons which are further consumed by small fishes. The small fishes are consumed by large fishes, which in turn are eaten by fish-eating birds. At each level, the concentration of pesticides increases. This increase in the concentration of harmful chemical substances like pesticides in the body of living organisms at each trophic level of a food chain is called biological magnification.

Q3.- a) What is the greenhouse effect? Name two greenhouse gases.

b) Discuss global warming and its harmful effects.

Ans.- (a) The phenomenon due to which the earth's atmosphere traps solar radiations because of the presence of gases like carbon dioxide, water vapour, methane and chlorofluorocarbons is called green- house effect. Carbon dioxide, CFC (chlorofluorocarbons) and methane are the greenhouse gases.

(b) Global warming is the rise in average temperature of the atmosphere of the earth due to the increase in greenhouse effect.

Harmful effects of global warming are:

(i) Polar caps would melt and water would flow into the seas. If the level of water in the seas increases, low lying areas near the coasts would be submerged.

(ii) Climate and rainfall pattern would change.

(iii) It affects agriculture and the production of food.