



INDIAN SCHOOL AL WADI AL KABIR

Class: VIII	Department: SCIENCE – 2020 - 2021	
Handout	Topic: Pollution of air and water	Note:A4 File format
Name of the student:	Class & Section:	Roll No.

Air and water are two of the most important natural resources. Both are necessary for the survival of all living organisms. But however, various human activities have contaminated air and water.

Pollution: The contamination of natural resources, like air and water by the addition of harmful substances is called pollution.

Pollutant: Any substance that causes pollution is called a pollutant.

Air pollution: The contamination of air by impurities which may have a harmful impact on the living organisms and the non-living components.




Air pollutant: The harmful and unwanted substances which contaminate the air are called air pollutants. E.g.: Sulphur dioxide, carbon dioxide.

Sources of air pollutants: Industries, factories, power plants, vehicles, automobile exhausts burning of firewood and dung cakes are some sources of air pollutants.

Natural sources: Dust storm in deserts, smoke and dust from forest fires and grass fires, volcanic eruptions etc.

Natural Air Pollutants

- Sand
- Dust storms
- Forest fires





Dust Storm Approaching Spokane, Idaho
April 19, 1935

Sources of Air Pollutants:

There are Two main sources:-

1- Natural Sources:
Forest fires, volcanic eruptions, wind erosion, pollen dispersal, evaporation of organic compounds, and natural radioactivity.



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<u>Pollutants</u>	<u>Source</u>	<u>Effects</u>
Carbon monoxide	It is a colourless poisonous gas produced by incomplete combustion of fuels.	It combines with haemoglobin of blood and reduces oxygen carrying capacity as it forms carboxyhaemoglobin.
Smog (smoke + Fog)	Smoke may contain oxides of nitrogen which combine with other air pollutants and fog to form smog. These gases are formed when fuels are burnt.	Smog reduces visibility and causes a haze similar to fog, but very different in composition. It decreases the capacity of the lungs, causes shortness of breath, pain when inhaling deeply, wheezing and coughing .It can cause eye and nose irritation.
Sulphur dioxide	It is produced by combustion of fuels like coal in power plants.	It can cause respiratory problems, including permanent lung damage.
Chlorofluorocarbons (CFCs)	These are used in refrigerators, air conditioners, and aerosol sprays.	The earth's atmosphere is covered with a layer of ozone gas all around. This ozone gas prevents the dangerous ultraviolet rays of the sun from reaching the surface of the earth. CFCs deteriorates the ozone layer. Exposure to UV radiation causes skin cancer, eye damage etc.
Suspended particulate matter(SPM)	Such particles are produced during industrial processes like steel making and mining and also when fuels are burnt.	These particles reduce visibility and also cause breathing problems.

HUMAN ACTIVITIES

Acid rain: It occurs when sulphur dioxide and nitrogen dioxide produced from burning fossil fuels combine with water vapour in the atmosphere to form sulphuric acid and nitric acid .These acids drop down with rain making the acid rain. It causes damage to water, forest soil resources and human health. It can react with marble and corrodes all buildings, monuments and statues made of marble. This phenomenon is called Marble cancer.

Greenhouse Effect: The phenomenon whereby the earth's atmosphere traps solar radiations because of the presence of gases like carbon dioxide, water vapour, methane and CFCs is called greenhouse effect.




Global warming: Carbon dioxide is one of the components of air, it is important for plants but excess of carbon dioxide in air act as a pollutant .Carbon dioxide is continuously released because of human activities Plants use carbon dioxide for photosynthesis thereby decreasing the amount of carbon dioxide in the air but due to deforestation amount of carbon dioxide is increasing. Carbon dioxide traps sun's heat and does not allow it to escape into space. As a result, the average temperature of the earth's atmosphere is gradually increasing .This is called global warming.

Steps to check air pollution:

1. Switching to cleaner fuels like CNG (Compressed Natural Gas) and LPG (Liquefied Petroleum Gas) can lead to decreased air pollution.
2. Using alternate sources of energy like solar energy, wind energy etc.
3. Enforcing smoke emission test and certification to all motor vehicles.
4. Growing more trees to absorb carbon dioxide.
5. Building factories away from cities.

Water pollution - It is the contamination of water bodies by discharge of undesirable substances that are toxic and poisonous.

Sources of water pollution

<p><u>Domestic sewage</u></p> 	<p>Waste generated in homes, food wastes plastic wrappers, soaps and detergents.</p>	<p>Microorganisms present in the wastes multiply and reduce the concentration of oxygen in water bodies leading to death of aquatic lives.</p>
<p><u>Agricultural runoff</u></p> 	<p>Excess use of fertilizers, pesticides etc., seep into ground water.</p>	<p>Causes eutrophication,(a condition in which water bodies get enriched with nutrients that allow rapid growth of algae that utilize dissolved oxygen leading to oxygen depletion in water making it unfit for other aquatic forms to survive) which leads to growth of weeds in water bodies that use up almost all the oxygen present in water.</p>
<p><u>Industrial waste</u></p> 	<p>Waste water and chemicals from industries.</p>	<p>Chemicals like arsenic, lead and fluorides lead to toxicity in aquatic life. It affects the nervous system and causes skin diseases in humans.</p>

Effects of water pollution

All types of water pollution are harmful to the health of humans and animals. It may not damage the health immediately but can be harmful in the long term exposure. Microbial pollutants from sewage often result in water borne disease like typhoid, cholera and jaundice.

Steps to prevent water pollution:

1. Conserve water by turning off the tap when not in use.
2. Do not throw litter into rivers, lakes or oceans.
3. Excessive use of chemical fertilisers and pesticides should be avoided and wherever possible should be replaced by biofertilisers and biopesticides.
4. Many sewage treatment plants should be built to prevent sewage mixing with water.

Potable water: Water fit for consumption by humans and other animals. It is also called as drinking water.

The basic properties of potable water:

- It should be colorless and odourless.
- It should be free from any suspended impurities, germs and pathogens.
- Should contain essential amounts of dissolved mineral salts of sodium, calcium and magnesium essential for physiological processes.
- Should contain dissolved gases.

Purification of water: The water that is obtained from various resources contains soluble and insoluble impurities. It has to be purified before it is used for drinking and other domestic needs.

Methods to purify water at home:

1. Boiling: can be used for small quantities of water, and kills germs.
2. Chemical treatment: by adding disinfectants like potassium permanganate and bleaching powder. The water thus treated has to be boiled before drinking
3. Water purifying gadgets: Modern purifying gadgets involve use of ceramic candles with fine pores for removing suspended impurities. Some purifiers use activated charcoal and ultraviolet rays along with ceramic filters to purify water.

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