

Pollution of Air and Water

Pollution

- The presence of unusually high concentrations of harmful or poisonous substances in the environment is called **pollution**.
- An unwanted and harmful substance which contaminates the environment is called a **pollutant**.
Examples: Carbon monoxide, Sulphur dioxide, smoke, dust.

Air Pollution

- The contamination of air with harmful gases such as carbon monoxide, sulphur dioxide and nitrogen oxide is called **air pollution**.

Sources of air pollution	<ul style="list-style-type: none">○ Ash from volcanic eruptions, dust from storms, forest fires, exhaust given out by automobiles, gases released from industries and factories, mining activities, accidental emissions of radioactive elements, pesticides and insecticides, burning of garbage, burning of fossil fuels and deforestation.
Major air pollutants	<ul style="list-style-type: none">○ Carbon monoxide (CO), carbon dioxide (CO₂), chlorofluorocarbon, nitrogen oxide (NO), Sulphur dioxide (SO₂), particulate matter and hydrocarbons



Effects of air pollution

- Acid Rain: Sulphur dioxide and nitrogen dioxide combine with the moisture present in the clouds and form sulphuric acid and nitric acid, respectively. These acids fall on the Earth along with rain as acid rain.
- Smog: Smog is formed when heat and sunlight react with particles suspended in air.
- Greenhouse Effect and Global Warming: Gases such as carbon dioxide, methane, nitric oxide and nitrous oxide in the atmosphere act as greenhouse gases. Their increased concentration in the atmosphere prevents the escape of heat, which warms the air.
- Ozone Depletion: Compounds such as CFCs (Chlorofluorocarbons) have damaged the ozone layer. Ozone depletion often leads to sun burns, skin cancers and mutations.
- Health Problems: Eye irritation, respiratory disorders, bronchitis and asthma, headaches, dizziness, nausea, decreased oxygen-carrying capacity of the blood, anaemia, liver, kidney and brain damage, abnormal fertility and pregnancy, silicosis, byssinosis, asbestosis and black lungs.



Measures to control air pollution	<ul style="list-style-type: none"> ○ Minimise the use of fossil fuels and use cleaner sources such as CNG. ○ Use public transport or car pooling. ○ Industries must fix tall chimneys fitted with electrostatic precipitators and filters. ○ Garbage and plastics should not be burnt in the open. ○ Nuclear wastes should be disposed off safely. ○ Smoking in public places should be prohibited. ○ Plants and trees should be grown along the roadside. ○ Laws and penalties should be enforced for those who break laws amended to control air pollution.
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Water Pollution

- The contamination of water sources such as rivers, lakes, oceans and groundwater with unwanted and harmful substances is called **water pollution**.

Sources of water pollution	<ul style="list-style-type: none"> ○ Household detergents, sewage, industrial waste, domestic waste, oil spills, fertilizers, pesticides and herbicides.
Major water pollutants	<ul style="list-style-type: none"> ○ Sewage, fertilisers, pesticides and industrial wastes.
Effects of water pollution	<ul style="list-style-type: none"> ○ Brain and nerve damage, cholera, dysentery, jaundice, typhoid, diarrhea, malaria, dengue, fever and yellow fever, intestinal parasitism leading to anaemia and weakness, skin disorders and cancer, kidney and liver damage, diarrhea in children, methemoglobinemia, respiratory diseases and lung cancer, oil spills, eutrophication and biomagnification.
Measures to control water pollution	<ul style="list-style-type: none"> ○ Sewage, industrial and domestic waste should be treated in order to make them harmless. ○ Use of chemical pesticides must be minimized. ○ Washing utensils, clothes and bathing cattle in water bodies must be avoided. ○ Garbage and other domestic waste should not be thrown in water bodies. ○ Leakage in drainage pipes must be repaired. ○ Laws should be formulated to control water pollution.



Conservation of Water

Fix leaks and dripping taps at once.

Do not leave the tap open while applying soap or brushing your teeth.

Use a bucket to have a bath instead of a shower.

Instead of using a hosepipe, use a bucketful of water to wash your car.

Use the water that is used for washing vegetables, dals and cleaning utensils for watering plants.

Collect rainwater and use it for watering plants, cleaning the floor etc.

Avoid wastage of water by recycling it.

Potable Water

- **Potable water** is safe for drinking.
- It is free from disease-causing germs and harmful chemicals.

Methods to Make Water Potable

Boiling	Water can be boiled at 100°C for several minutes to make it germ-free.
Candle filter	Water can also be passed through a porcelain candle filter where most of the bacteria are trapped.



Ultraviolet filter	An ultraviolet filter has ultraviolet light which kills the germs present in the water.
Chlorination	Water can be chlorinated by adding chlorine tablets to it. As chlorine is a disinfectant, it kills the harmful germs present in water.
Treatment with lime	Excess fluoride in water can be removed by treating water with lime.
Potassium permanganate crystals	Well water can be disinfected by adding few crystals of potassium permanganate to it. Potassium permanganate is a germicide. It kills the germs thereby making the water safe for drinking.

