

Introduction

- Our environment used to be very pure where fresh air and clean water was available.
- Now the quality of environment is falling down which affects our life.
- People suffering because of many waterborne diseases and poor air quality.
- Water and air are of great importance in human lives in many ways but the harmful changes in the surroundings affect the human life in a very bad manner.

Air pollution

- Human beings cannot survive without air even for a few minutes.
- Air is the mixture of gases. oxygen and nitrogen are the major components of air that contribute about 98% in the air.
- Water vapours and other gases are present in very small quantities.

➤ Activity 1

1. Sometimes we experience smoke near any industries and in busy roads and started coughing.
 2. Compare the quality of air of the following places on the basis of your experience.
 - i. A park and a busy road
 - ii. A residential area and an industrial area
 - iii. A busy traffic in early morning, afternoon, and evening
 - iv. A village and a town
- The addition of unwanted substances such as smoke and dust make the air contaminated which has an adverse effect on both living and non-living is called air pollution.

How does air get polluted?

- Air pollutants like smoke and dust come from forest fires, volcanic eruption, vehicles, factories contaminate the air.
- Air pollution causes many respiratory problems.
- Carbon monoxide, carbon dioxide, nitrogen oxides and smoke produced by vehicles are major pollutants which pollute air.
- Because of incomplete burning of fuels such as petrol and diesel carbon monoxide is produced which is a poisonous gas and reduces the oxygen carrying capacity of the blood.
- During winter we notice a thick fog like layer this is called smog. When oxides of nitrogen from smoke combine with other pollutants and fog it makes smog.
- Breathing difficulties such as asthma, cough and wheezing in children are caused by smog.

- Air pollution is caused by many industries. Major sources of gaseous pollutants are oil refineries. They produce gaseous pollutants like sulphur dioxide and nitrogen dioxide which can damage lung permanently.
- Chlorofluorocarbons are the other kind of pollutant which are present in refrigerators, aerosol sprays and air conditioners. The ozone layer which protects us from the harmful UV rays is getting destroyed by CFCs.
- Apart from these harmful gases tiny particles that remain suspended in air and pollute the atmosphere also produced by automobiles, steel making industries and power plants.

Case study- The Taj Mahal

- Air pollutants are discolouring the white marble of the taj mahal.
- Taj mahal is center of attraction for tourists but the increasing pollution has become a matter of concern.
- Not only living being but non-living things also get affected by the pollutions.
- The industries in and around Agra are the main reason for the increment of pollutants like sulphur dioxide and nitrogen dioxide in the air.
- The acids drop down with the rain forming the acid rain corrodes the marble of building. The phenomenon is called as “marble cancer”.
- Pollutants emitted by the Mathura oil refinery are the main reason for the yellowing of the marble.
- Several steps have been taken by supreme court. It has ordered industries to use CNG and LPG.

Greenhouse effect

- The reflected radiation of the sunlight by the earth surface gets trapped the atmosphere in the space these radiations warm the earth.
- Earth's atmosphere traps the sun's heat just like the greenhouse traps the sun's heat that is why this is known as the greenhouse effect.
- This process is very important for the existence of life on earth.
- Now a days this effect threatens life.
- CO₂ is one of the important components of air but the excess of this gas is acts as a pollutant.
- Human activities and deforestation lead to the increase of CO₂ in the atmosphere which traps the heat and increases the temperature of the earth's surface.
- This increment in the temperature of the earth's surface known as global warming.
- Other greenhouse gases are methane, nitrous oxide and water vapour.
- Global warming has become a topic of concern for the government worldwide.
- Many agreements have been made by some counties to reduce the emission of greenhouse gases. One such agreement is Kyoto protocol.

- A little increase in the earth temperature can have a serious effect. Melting of glacier is one of the effects of global warming.

What can be done

- There are many ways in which we can reduce air pollution.
- Like we can use CNG and unleaded petrol for our vehicles.
- For our energy requirement we can switch to alternative fuels instead of fossil fuels.
- We should plant trees to reduce the quantity of carbon dioxide in the atmosphere.

Water pollution

- We use water for our daily activities and make it dirty.
- Wastewater is the dirty water that goes down the drains from sinks, toilets, laundries which is rich in lather, mixed with oils.
- We can reuse this dirty water by removing pollutants from it.
- Water pollutants are the substances that pollutes the water.

How does water get polluted?

Case study

- Most of the northern, central and eastern Indian population is sustained by the most famous river the Ganga.
- In a recent study by the world-wide fund for nature (WWF) it is found that the Ganga lies in the list of most endangered rivers in the world.
- The reason for the increment of pollution in the river is mismanagement of water and untreated sewage and garbage that flows through the water.
- Ganga action plan is the plan to save the water this plan was launched in 1985.
- The water of Ganga at Kanpur in Uttar Pradesh is most polluted because of the human activities like bathing and washing clothes near the bank of the river and because of the fertilizers, leather and paint industries that discharge toxic chemical wastes into the river.
- Chemical contamination of water caused by many industries like oil refineries, paper factories, textiles, sugar mills and chemical factories.
- The chemicals discharged by these industries includes arsenic lead and fluorides that dissolve in water and are washed into water bodies this water also seeped by the soil and pollute the groundwater as well.
- The sewage and impurities can be treated in the water treatment plant and then can be reused.

➤ **Activity 2**

1. Sewers are the network of big and small pipeline which in our home and public buildings that carry out wastewater.

2. These sewers form the sewerage.
3. Sewerage carries the sewage from the point of production to the point of disposal that is to the sewage treatment plant.
4. In the sewerage at the junction of the 2 or more sewers manholes are located. Sewage from these
5. Sewage from the sewerage is taken to the water treatment plant and get filtered there.

What is potable water and how is it purified?

- Potable water is the water that is suitable for drinking.
- Even water that looks clean may contain microorganisms and dissolved impurities that can cause many diseases.
- It is very important to filter the water before drinking.
- A candle type filter is common type of household filter.
- Boiling of filter also filters the impurities from water.
- Chlorination is also used to purify the water but we should not use chlorine tablets more than specified.
- As an individual we should make a continuous effort in the direction of saving water. Our main motto should be Reduce, reuse and recycle

