Pollution of Air and Water

1. What are the different ways in which water gets contaminated?

Answer:

Water gets contaminated by the addition of:

(i) Sewage wastes: Waste materials from kitchens, toilets, and laundry sources are also responsible for contaminating water.

(iI) Agricultural chemicals: Farmers use excessive amounts of pesticides and fertilizers to increase crop production. These chemicals get carried away to the water bodies due to rains and floods which lead to water pollution.

(iiI) Industrial wastes: Industries release harmful chemical wastes into water sources, thereby polluting them.

2. **At an individual level, how can you help reduce air pollution?**

An individual can reduce air pollution by:

(i) Use of automobiles should be minimized. Do not use vehicles for short distances.

(ii) Use of crude oil should be avoided and use of high quality fuels, unleaded petrol, bio-diesel and compressed natural gas(CNG) should be recommended.

(iii) Always disposing the garbage properly and not burning it.

(iv) Industrial smokes must be filtered before releasing into the atmosphere.

3. **Clear, transparent water is always fit for drinking. Comment.**

No. Clear and transparent water is not always fit for drinking. Water might appear clean, but it may contain some water borne disease and other dissolved impurities. Hence, it is advised to purify water before drinking. Purification can be done by water purifying systems or by boiling the water.

4. **You are a member of the municipal body of your town.**

Make a list of measures that would help your town to ensure the supply of clean water to all its residents.

Answer:

To ensure the supply of clean water to all residents the following steps must be taken:

(i) The main water source must be built in clean surroundings and should be maintained properly.

(ii) Chlorination must be used for purifying water before the supplying of water.

(iii) The area around water pipes must also be clean. There is no linkage in the pipe.

5. **Explain the differences between pure air and polluted air.**

Answer:

Pure air contains around 78% nitrogen, 21% oxygen, 0.03% carbon dioxide and other gases such as argon, methane, ozone, and water vapours are also present in small quantities. When this composition of air is altered by the addition of harmful substances or gases such as nitrogen dioxide, sulphur dioxide, carbon monoxide, and particulate matter, then the air is said to be polluted.

6. Explain circumstances leading to acid rain. How does acid rain affect us?

Burning of fuels such as coal and diesel releases a variety of pollutants such as sulphur dioxide and nitrogen dioxide into the atmosphere. These pollutants react with water vapours present in the atmosphere to form sulphuric acid and nitric acid respectively. These acids come down in form of the rain, thereby resulting in acid rain.

Effects of acid rain:

(i) Acid rains damage crops, to kill the aquatic animals .

(ii) Acid rains corrode monuments like Taj Mahal , which made of marble.

7. Which of the following is not a greenhouse gas?

(a) Carbon dioxide

(b) Sulphur dioxide

(c) Methane

(d) Nitrogen

Answer:

(d) Nitrogen

8. Describe the 'Greenhouse Effect' in your own words.

Answer:

We know that the sun's rays warm the earth's surface. A part of the radiation that falls on the earth is absorbed by it and a part is reflected back into space. A part of the reflected radiation is trapped by the atmosphere. The trapped radiations further warm the earth. The trapped heat warms the green house. The trapping of radiations by the earth's atmosphere is similar. That is why it is called the greenhouse effect. Without this process, life would not have been possible on the earth. But now it threatens life. The green house gases are CO_2, methane and water vapour leads to increases the earth temperature.

9. Prepare a brief speech on global warming. You have to deliver the speech in your class.

Global warming is an increase in the average temperature of the Earth's surface. It occurs as a result of an increased concentration of greenhouse gases in the atmosphere. The greenhouse gases include carbon dioxide, methane, and water vapour. These gases trap solar radiations released back by the Earth. This helps in keeping our planet warm and thus, helps in human survival. However, an increase in the amount of greenhouse gases can lead to an increase in the Earth's temperature leading to global warming.

For example :

Carbon dioxide (CO_2) is continuously being released because of human activities. On the other hand, area under forests is decreasing. Plants utilize CO_2 from the atmosphere for photosynthesis, thereby decreasing the amount of CO_2 in the air. Deforestation leads to an increase in the amount of CO_2 in the air because the number of trees which consume CO_2 is reduced. Human activities, thus, contribute to the accumulation of CO_2 in the atmosphere. CO_2 traps 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.

10. Describe the threat to the beauty of the Taj Mahal.

Answer:

Acid rain is a major threat to the beauty of the Taj Mahal. When acid rains fall on the monument (that is completely made of marble), they react with marble to form a powder-like substance ($CaSO_4$) that is then washed away by the rain. This

phenomenon is known as marble cancer. Also, the soot particles emitted from the Mathura oil refinery located near Agra is leading to the yellowing of the marble.

11. Why does the increased level of nutrients in the water affect the survival of aquatic organisms?

Answer:

An increase in the level of nutrients in a water body leads to an excessive increase in the population of algae in the water body. When these algae die, they serve as food for decomposers. A lot of oxygen is utilised in this process, consequently leading to a decrease in the level of oxygen dissolved in the water body. This in turn causes fishes and other aquatic organisms to die.