Ch-18- Wastewater Story

1. Fill in the blanks:

(a) Cleaning of water is a process of removing _____.

(b) Wastewater released by houses is called _____.

(c) Dried sludge is used as _____.

(d) Drains get blocked by _____, _____,_____, _____, and _____

Answer:

(a) Cleaning of water is a process of removing **pollutants**.

(b) Wastewater released by houses is called **sewage**.

(c) Dried sludge is used as **manure**.

(d) Drains get blocked by **tea leaves, solid food remains, soft toys, cotton,** and **sanitary towels .**

2. **What is sewage? Explain why it is harmful to discharge untreated sewage into rivers or seas.**

Answer :

Sewage is a liquid waste. It released by homes, industries, hospitals, offices and other users. It has a complex mixture of containing suspended solids, organic and inorganic impurities, diseases cause bacteria and other microbes. If this untreated sewage is discharged into rivers or seas, it may cause water pollution and soil pollution in which both the surface water and groundwater get polluted. Groundwater is a source of water for wells, tube wells, springs and many rivers. Therefore if it gets polluted, it becomes the most common route for water borne diseases. They include cholera, typhoid, polio, meningitis, hepatitis and dysentery.

3. Why should oils and fats be not released in the drain? Explain.

Answer:

Cooking oil and fats should not be thrown down the drain. They can harden and block the pipes. In an open drain the fats clog the soil pores reducing its effectiveness in filtering water. Also they may kill microbes that help purify water. Therefore oil and fats should be always discharged after taking due care in the dustbin or if possible in some suitable dumping place.

4. Describe the steps involved in getting clarified water from wastewater.

Answer:

The steps involved in getting clarified water from wastewater involves physical, chemical, and biological processes, which remove physical, chemical and biological matter that contaminates the wastewater. The following steps are involves:

1. Bar Screens: Wastewater is passed through bar screens. Large objects like rags, sticks, cans, plastic packets, napkins are removed.

2. Grit and sand Removal: Water then goes to a grit and sand removal tank. The speed of the incoming wastewater is decreased to allow sand, grit and pebbles to settle down through sedimentation.

3. Clarifier tank (first): The water is then allowed to settle in a large tank which is sloped towards the middle. Solids like faces settle at the bottom by sedimentation and are removed with a scraper. This is the sludge. A skimmer removes the floatable solids like oil and grease. Water so cleared is called clarified water. The sludge is transferred to a separate tank where it is decomposed by the anaerobic bacteria. The biogas produced in the process can be used as fuel or can be used to produce electricity.

4. Aerator: Clarified water is then passed through an aerator tank where air is pumped into the water. It helps aerobic bacteria to grow which decompose organic matter like human water.

5. Clarifier tank (second): After several hours, the suspended microbes settle at the bottom of the tank as activated sludge. The water is then removed from the top. The activated sludge is about 97% water. The dried activated sludge is used as manure.

6. Chlorination: The water is removed from top and is stored in a tank. The treated water has a very low level of organic material and suspended matter. It is discharged

into a sea, a river or into the ground. Sometime it is disinfected through chemicals like chlorine and ozone and then distributed to towns.

Waste Water Treatment Plant

5. What is sludge? Explain how it is treated.

Answer:

Sludge is human waste in waste water left during the sewage treatment. Since it is organic waste, it is used to produce biogas and manure.

This process of removing pollutants from wastewater is commonly known as wastewater treatment" or "Sewage Treatment". It takes place in several stages. Sludge is one of the By-products of wastewater treatment along with biogas.

During the "Sewage Treatment", after filtrations of floating solid objects through bar screen, the speed of wastewater is decreased to allow sand, grit and pebbles to settle down .The water is then allowed to settle in a large tank which is sloped towards the middle. Solids like faeces settle at the bottom and are removed with a scraper. This is the sludge. The sludge is transferred to a separate tank where it is decomposed by the anaerobic bacteria. The biogas produced in the process can be used as fuel or can be used to produce electricity. Air is pumped into the clarified water to help aerobic bacteria to grow. Bacteria consume human waste, food waste, soaps and other unwanted matter still remaining in clarified water. After several hours, the suspended

microbes settle at the bottom of the tank as activated sludge. The water is then removed from the top. Dried sludge is used as manure, returning organic matter and nutrients to the soil.

6. Untreated human excreta is a health hazard. Explain.

Answer:

Untreated human excreta are a home for many pathogens and disease causing microbe. If left untreated, it will health hazard and also cause for water borne disease like cholera, typhoid, polio, meningitis, hepatitis and dysentery. It may cause water pollution and soil pollution. Both the surface water and groundwater get polluted.

7. Name two chemicals used to disinfect water.

Answer:

Chemicals like chlorine and ozone are commonly used to disinfect water.

8. Explain the function of bar screens in a wastewater treatment plant.

Answer :

Bar Screens: Wastewater is passed through bar screens. Large objects like rags, sticks, cans, plastic packets, napkins are removed.

9. Explain the relationship between sanitation and disease.

Answer:

There is a direct relationship between sanitation and disease. Poor sanitation and contaminated drinking water is the cause of a large number of diseases. Under poor sanitation people may resort to defecate in the open, on dry riverbeds, on railway tracks, near fields and many a time directly in water. It may cause water pollution and soil pollution. Both the surface water and groundwater get polluted. Groundwater is a source of water for wells, tubewells, springs and many rivers due to this, it becomes the most common carrier for water borne diseases. They include cholera, typhoid, polio, meningitis, hepatitis and dysentery.

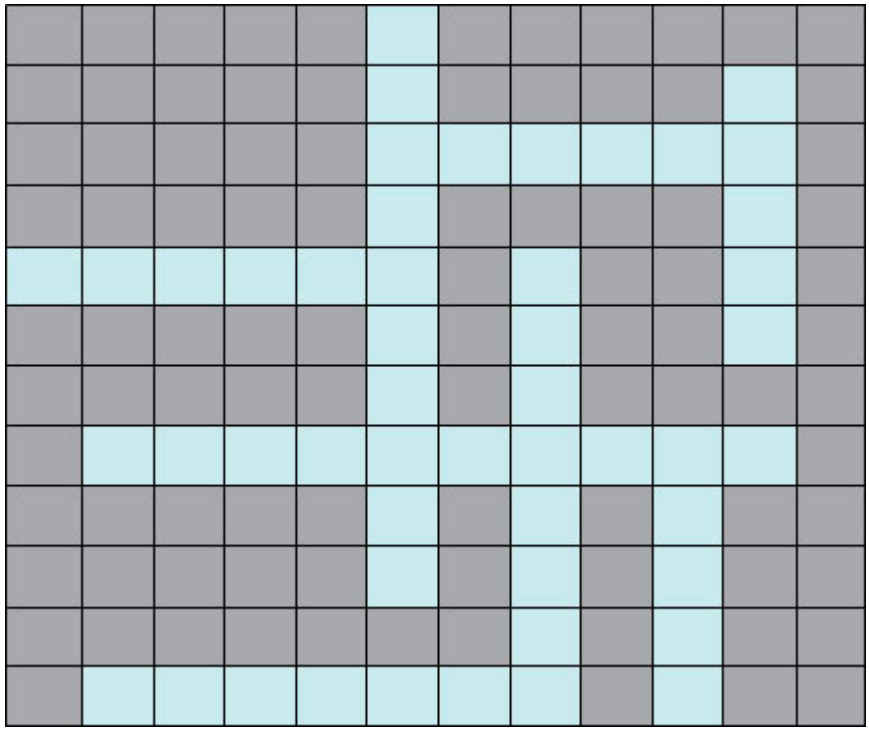
10. Outline your role as an active citizen in relation to sanitation.

Answer:

- We can contribute in maintaining sanitation at public places.

- We should not scatter litter anywhere. If there is no dustbin in sight, we should carry the litter home and throw it in the dustbin.
- We must realize our responsibility in maintaining the water sources in a healthy state.
- We should adopt good sanitation practices as way of life.
- A small initiative as an agent of change on our part will make a great difference.

11. Here is a crossword puzzle: Good luck!



Across

3. Liquid waste products

4. Solid waste extracted in sewage treatment

6. A word related to hygiene

8. Waste matter discharged from human body

Down

1. Used water

2. A pipe carrying sewage

5. Micro-organisms which causes cholera

7. A chemical to disinfect water

Answer:

12. Study the following statements about ozone:

(a) It is essential for breathing of living organisms.

(b) It is used to disinfect water.

(c) It absorbs ultraviolet rays.

(d) Its proportion in air is about 3%.

Which of these statements are correct?

(i) (a), (b) and (c)

(ii) (b) and (c)

(iii) (a) and (d)

(iv) All four

Answer : b and c