16. Water

Can you recall ?

1. What happens when a spoonful of sugar, sawdust and soil are added to a glass of water ?
2. Which are the three states of water ?
3. What is done to make drinking water clean and safe ?

Pollution of water

Try this.

While it is raining, collect some of the rainwater directly in a clean container placed in the open. Also collect some of the rainwater that is flowing over the ground. Observe and compare the two.

What difference do you see ? What is the reason for that ?

When other substances get mixed with water, it becomes impure. Some of these substances float in the water. So, the water looks unclean or muddy. Some substances dissolve in the water and we cannot see them. If the substances that have got mixed with the water are harmful for living things, we say that the water has become polluted. Rivers, lakes are our sources of water. How does their water get polluted ?

Can you tell ?

List the substances that are mixed in the waste water drained out of the kitchen and bathroom in your house.

Disposal of waste water

The waste water of a city or town is collected and let into a water body at a convenient location. The waste water from residential buildings as well as from factories and industries contains many kinds of impurities. Some of these dissolve in the water while some do not.

A polluted water body

Sewage water can carry micro-organisms that spread diseases. Waste water from industries is more likely to contain poisonous substances. If all this waste water is let into water bodies as it is, the water bodies become polluted and that is dangerous. Such water cannot be used for drinking or for any other purposes. That is why, it is compulsory for factory-owners to treat the water before letting it out. Similarly, sewage and other waste water of towns and cities is processed for purification before letting it into a water body. This helps to prevent pollution of water.

Flowing water of rivers gets purified to some extent by natural processes also.

Before water is supplied to a town or city, it is purified.

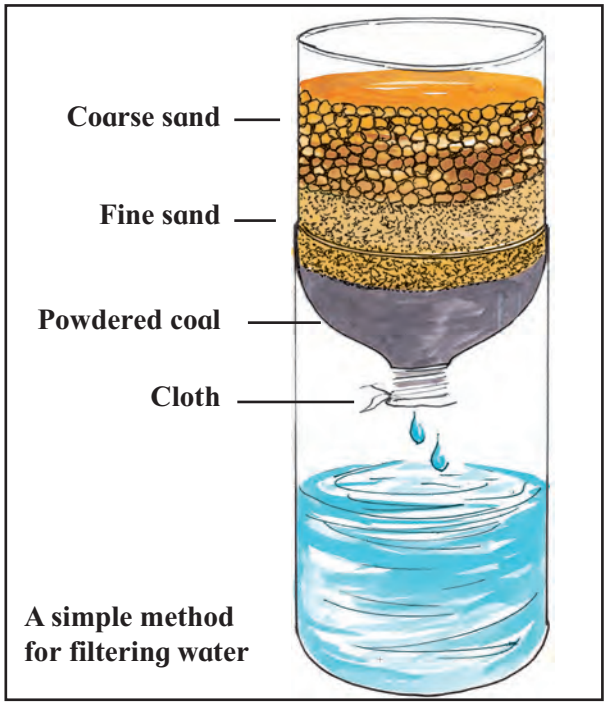
Do you know?

If large quantities of impurities get mixed with river water, the natural process of purification cannot keep pace. The proportion of oxygen dissolved in the water is reduced. And this is a threat to the aquatic living things.

Purification of water

Try this.

Take a plastic bottle. Tie a clean piece of cloth over its mouth. Cut off the base of the bottle. Hold the bottle upside down. Pour some powdered coal into it. Then add fine sand, and, lastly, coarse sand to make three different layers inside the bottle as shown in the diagram.



A simple method for filtering water

Place the bottle on its lower cut off portion as shown in the figure. Now, pour some muddy water containing some rubbish, slowly into this bottle.

Observe the water that flows into the base of the bottle. It appears clean. Of course, you have learnt that there could be micro-organisms in it.

Water-works

Visit the nearest water-works along with your teacher. Obtain permission to interview an official there to learn about the purification process. You may ask the following questions.

1. What source of water is used for the public water-supply system?
2. How many litres of water are purified every day?
3. What processes are used to make the water clean, transparent and germ-free?
4. In what order are these processes carried out?
5. What is done to rid the water of bad smells?

Do you know?

While travelling, we often buy bottled drinking water. The bottles are available at places like bus stands and railway stations. Read the information about the water given on the bottle and tell others about it, too.

The date of bottling and the period for which the water can be safely used is printed on the bottle. It is important to read this information when buying a bottle. Once you have opened it, the water should not be kept for very long. The empty bottle must be crushed and thrown into a garbage bin, so that it cannot be reused.

Can you tell?

If, at some place, it did not rain for a very long period of time, what would be its effect on the life of the people there?

Water purification processes at the water-works

Settling- The water from the water source is allowed to stand in large tanks. Alum is also used to help the process of settling.

Filtration : Water is filtered using a filtration machine.

Oxygenation : Air and water are allowed to mix with the help of pumps. This causes oxygen from the air to dissolve in the water.

Chlorination : Chlorine is mixed in the water to kill the germs in it.

Photographs Courtesy :
Parvati Water-works. PMC, Pune.

Famine

Water evaporates continuously. That is why, places where it does not rain for a long time, experience a drought. At such places, the water level falls in rivers, wells, lakes, bunds and dams. Some of these may even go dry. The land also dries up due to evaporation. Humans and animals suffer from scarcity of water. There is no water for agriculture. This condition is called a famine. A famine is a natural disaster.

Grain and fodder become scarce during a famine. You may have read about a famine in our State, or country or in another part of the world. People living there have to face a lot of hardship. Animals and plants in those parts also suffer.

The government temporarily moves people and animals from famine-stricken areas to safe places where they can be provided with water, foodgrain and fodder. Fodder camps are set up to take care of domestic animals.

What's the solution ?

Your class will be visiting a lake which is far away from the city. Arrangements have to be made for the day's drinking water.

Water management

Rain brings us water again and again. But, we get rain for only four months in a year. If rainwater is not stored, we will not have water for our daily needs after the rains.

To meet the whole year's need for water, rainwater must be stopped. When it is stopped, it percolates into the soil. As the ground water storage increases, trees get water. Wells, too, get enough water and the land can be cultivated.

Several methods are used to make rainwater seep into the soil. Large dams can be built. But that may not be possible in all places. In that event, the government and the people come together to undertake several works such as building smaller reservoirs, contour bunding, stopping the water of the smaller streams by constructing bunds or *bandharas*, etc.

Continuous contour trenches (CCT)

In some places, wells are dug in river beds to allow water to collect in them. Rainwater falling on roofs of houses is drained into large tanks placed beside the building. Using all such methods helps us to store as much water as possible.

A bund on a stream

It is very important to use water carefully, to stop rainwater from flowing away, to make it seep into the ground or to collect it in tanks.

Taking steps to ensure that rainwater will be available even in the period after the rainy season is called 'water management'.

Storing rainwater in tanks

Making rainwater seep into the soil

Obtain information and discuss –

What methods of water management are being used in your surroundings?

Always remember –

Water is life. Use it judiciously.

What we have learnt –

- When substances that are harmful for living things get mixed with water, it becomes polluted.
- Before waste water is let into water bodies, it is processed in many ways to prevent their pollution.
- Before the water is supplied to the public, the dissolved and undissolved substances in it are separated at the water-works and the germs in it are destroyed.
- If it does not rain for a long time, it leads to drought and famine.
- Famine conditions affect humans as well as animals and plants of that region.
- Water management means stopping or storing water or letting it percolate into the ground to make it available even after the rainy season.

Exercises

1. What's the solution?

Soil in a garden gets washed away with the water due to the slope of the land.

2. Use your brain power!

How should roads and footpaths be built to make rainwater seep into the ground?

3. Answer the following questions.

(a) What conditions prevail during a famine?

(b) What works are undertaken to make water available even after the rainy season?

(c) Why is it necessary to stop rainwater?

(d) What is meant by water management?

4. True or false? Correct the wrong statements.

(a) We get rainwater throughout the year.

(b) During a famine, the government moves people and animals temporarily to safe places.

Activities

1. From your friends or elders, or from newspapers, find out in which year a famine had occurred in our State and what measures were undertaken to tide over that period.
2. Collect pictures of flowing water and stagnated water.

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