NOTES

CLASS 7
SCIENCE

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CHAPTER-16

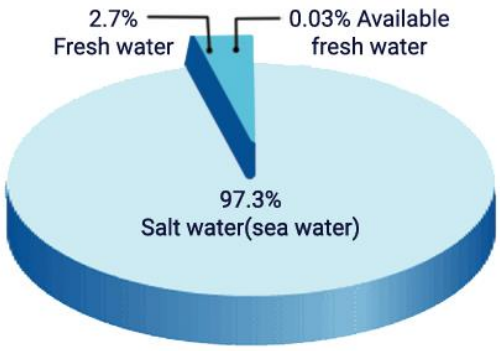
WATER-A PRECIOUS RESOURCE

Water is one of the most common and useful substances around us. Water is essential for the existence of allforms of life.

After knowing the importance of water, awareness is being created by different organisations of the world.22nd March is celebrated as World Water Day to attract the attention of everybody towards the importanceof conserving water. The year 2003 was recognised as 'International year of freshwater'.

Water Available for Use

If we take a picture of earth from outer space, it appears blue because of presence of water in the form of sea and ocean. About 71% of surface of the earth is covered with water. Of the total water present on earth, 97.4% is in the seas and oceans but it is not fit for human consumption. Fresh water in a usable form is present in just a small fraction of all water present on the earth.



Most of us assume that there is plenty of water all over the earth. But infact this all water is not suitable for human consumption, not even fit for plants and other forms of life.

Different Forms of Water

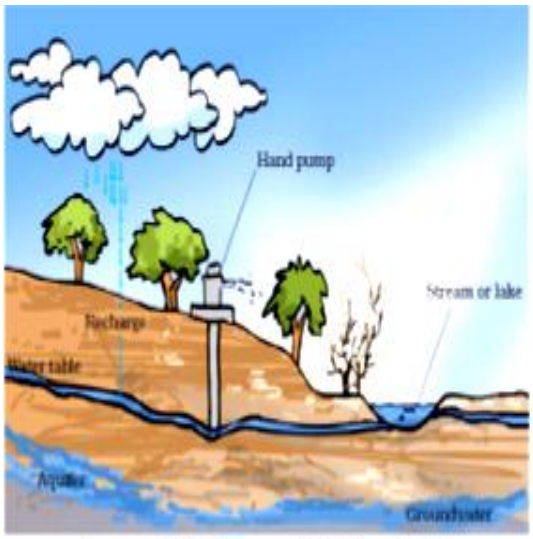
Water exists in three forms. These three forms of water are as follows:

- Snow or ice (solid) exists on the earth in the form of ice caps at the poles of the earth, glaciers andsnow covered mountains. These are the main sources of water on earth.
- Water (liquid) is present in oceans, lakes, rivers and even underground water in the earth's upper layers.
- Clouds (gas) are found in the form of water vapour present in the atmosphere. On condensation, itturns into droplets and precipitates on earth's surface in the form of rain.

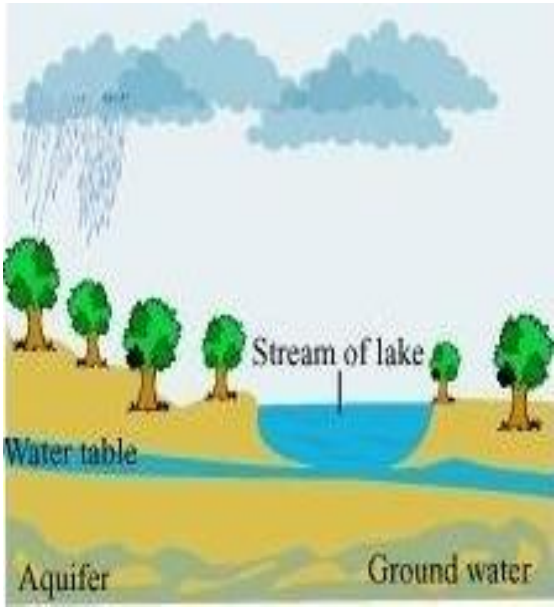
The continuous recycling of these forms of water takes place and the amount of water on the earth is maintained of constant. Most of the urban areas have a system of water supply whereas underdeveloped/undeveloped areas depend on resources like rivers, lakes, ponds, handpumps, etc.

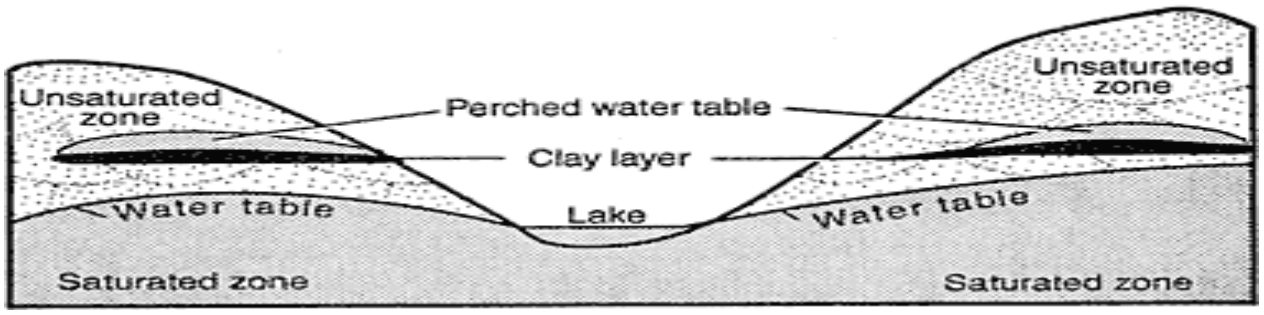
Groundwater as an Important Source of Water

The wells, tubewells and handpumps are the main sources of water for many people. The water in these sources is the groundwater. It is the upper level of underground water which occupies all the spaces in the soil and rocks and form a water table as shown in the figure below:



Ground Water and Water table





The upper limit of groundwater is called water table. It represents the depth of water filled area at a given place. The water table rises and falls depending upon the amount of rainwater that seeps into the groundwater and how much groundwater is drawn out for irrigation and industry. The seeping down of rainwater into the groundwater is called infiltration. The groundwater thus gets recharged by this process.

At some places, the groundwater is stored between layers of hard rock below the water table. This is aquifer which contains the groundwater usable by tubewells and handpumps. These sources however, have limited sources of water and may get exhausted if used excessively.

Depletion of Water Table

Water drawn from underground water gets replenished by seepage of rainwater. The water table does not get affected as long as we draw the same amount of water as is replenished by natural resources like rain.

However, there is a number of factors which cause depletion of water table at a very fast rate which is really a matter of concern for every one of us. Increase in population, industrial and agricultural activities are somecommon factors affecting water table. Scanty rainfall, deforestation and decrease in the effective area for seepage of water may also deplete the water table.

Increasing Population

Rise in population also increases use of water. This results in depletion of groundwater level to alarmingly low levels (in many cities).

Increased Industrialisation

Water is used by all industries. Almost everything that we use needs water somewhere in its production process. The number of industries is increasing continuously. Most of the water used in the industries is drawn from groundwater. This results in depletion of water.

Agricultural Activities

In our country, farmers depend on rain, canal water or groundwater for irrigation. Canals are found only at a few places. Since rain is often irregular, canals also suffer frequently from lack of water. Therefore, farmers have to use groundwater for irrigation. This results in depletion of groundwater.

Deforestation

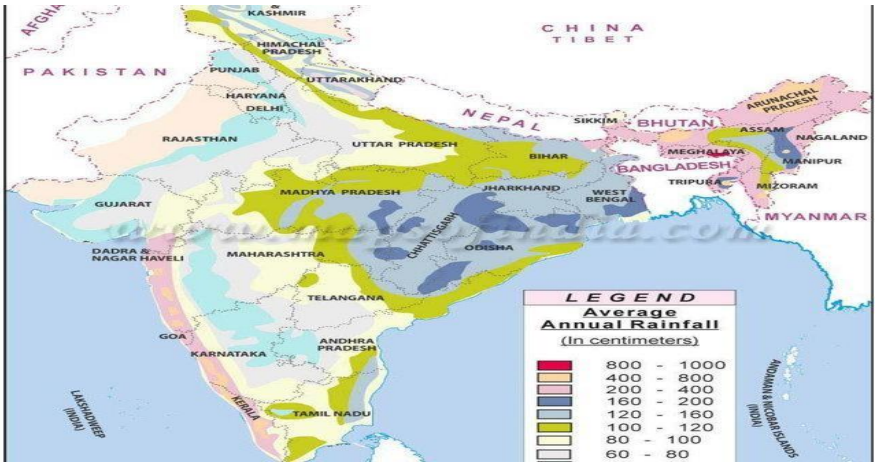
Large scale deforestation has occurred to accommodate the growing population to grow food for them and toprovide space for industries. Overgrazing by our animals has also destroyed large amount of vegetation. Thegreen coverage of vegetation slows down the flow of water on land and increases the absorption of water by the soil. Cutting down of trees and vegetation, therefore interferes with the natural processes by which seepage takes place and the groundwater is recharged and causes depletion of water

Distribution of Water

The distribution of water over the globe is quite uneven due to the number of factors. Some places have a good amount of rain. On the other hand, these are deserts which have scanty rainfall. Some regions have excessive rains which cause floods while some others have very little rainfall which causes drought. India is a vast country and the rainfall is not the same everywhere. Therefore, some regions in our country may havefloods while others may suffer from droughts at the same time.

Water Resources in India

India receives a lot of precipitation (rain and snow) in comparison to the rest of the world. The average annual precipitation in India is 1170 mm as compared to the world's average of 700 mm. The rain map of India showing average rainfall in the different parts of our country.



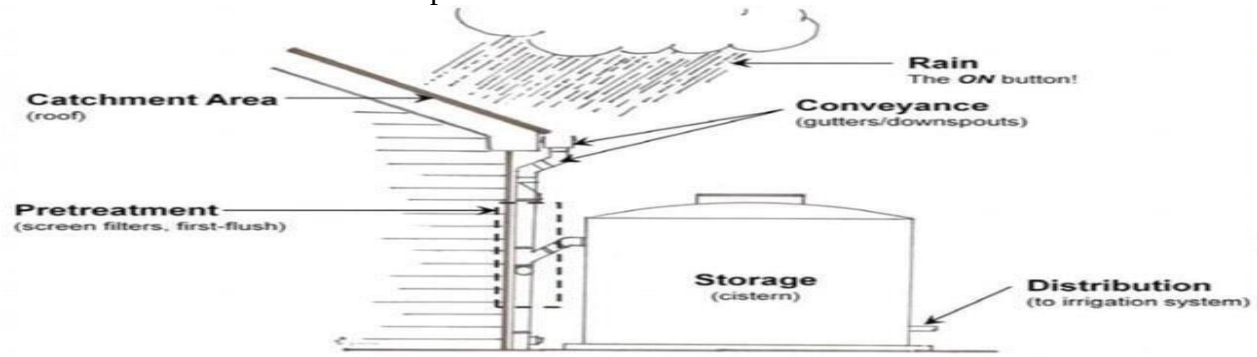
Water Management

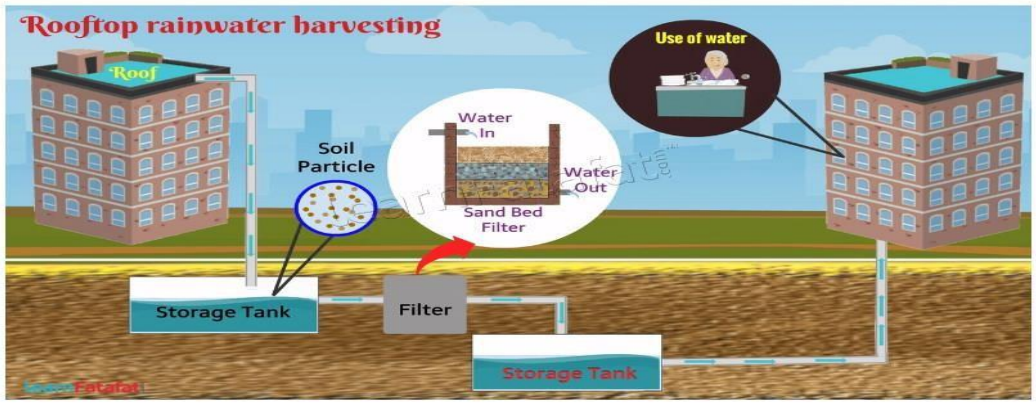
It is the activity of planning, developing, distribution and managing the optimum use of water resources. It is a subset of water cycle management. Water supply pipes leaking and a lot of water gushing out of the pipes are the wastage of water. It is the responsibility of the civic authorities to prevent such wastage of precious water. Mismanagement or wastage may also take place at the level of individuals also. All of us knowingly or unknowingly waste water, we should also take care for it. Some of the steps which can be taken for the proper management of water are given below:

1. Rainwater harvesting
2. Bawris
3. Drip irrigation

1. Rainwater Harvesting

Most of the rainwater just flows away. This can be skillfully used to recharge the groundwater. The modern buildings of schools, offices, homes can install a rainwater harvesting system, so as to store rainwater in their own premises for future use.





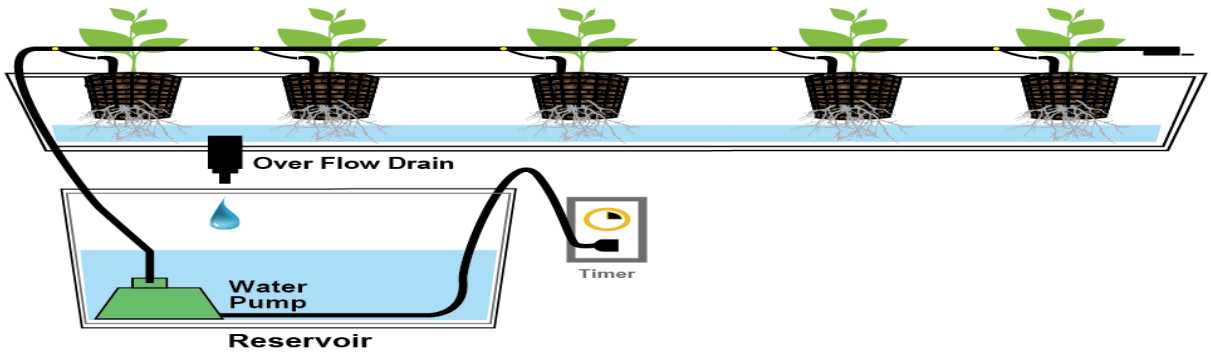
1. Bawris

The bawris is age old method of collecting water. These structures are still found in old buildings, palaces and forts. With time, the bawris fell into disuse and garbage started piling in these reservoirs. However, because of the acute shortage of water, the bawris are being revived. Today the situation is that inspite of scanty rains those places are managing their water needs well.



2.Drip Irrigation

It is a method of watering plants by use of narrow tubings which deliver water directly to the base of a plant.This minimizes wastage of water. The mechanism of drip irrigation is shown in the figure given below:



Role for Saving Water

You can be a leader to show people about water management skills. If any pipeline and tap water is leaking there, immediately report to authorities like 'JAL BOARD' (in Delhi) to prevent water loss. Educate people about water wise habits which can be developed gradually and will last life long once developed.

Water-wise Habits

- Turn off the tap while brushing, shaving and washing hand. Open when need. This will check the excess flow of water into drains.
- Use mug and water in the bucket for bathing instead of using showers.
- Mop the floor instead of washing.
- Irrigate potted plants with used water for washing rice and dal in the kitchen while cooking.

Check no tap or pipe is leaking

Effect of Water Scarcity on Plants

We grow many plants in pots in our homes. These are called potted plants. The potted plants are watered regularly. If the potted plants are not watered even for a few days, the plants will 'wilt' (become limp) and ultimately 'dry up'. If potted plants are not given water for a considerable time, they will die. Thus, sufficient water is essential for maintaining the life of plants. Plants need water to obtain nutrients from thesoil and to make food by the process of photosynthesis.

The various effects of water scarcity on plants are

- Water scarcity will affect nutrient uptake from soil by the plants.
- The rate of photosynthesis will decline, so oxygen evolved will be less.
- Rate of transpiration will also decline, so water vapours released in the atmosphere by transpiration will be less, it will disturb the water cycle.

So, in brief, we can say the shortage of water will lead to a shortage of food, shortage of oxygen and shortage of rain also.

MULTIPLE CHOICE QUESTIONS

Question 1. On which day the world water day is celebrated?
(a) 23rd March (b) 22nd March (c) 21st March (d) None of these

Question 2. Which year was observed as International Year of Fresh Water?
(a) 2003 (b) 2004 (c) 2006 (d) 2002

Question 3. Which of the following does not show water shortage?
(a) Taps running dry
(b) Long queue for getting water
(c) Marches and protests for demand of water
(d) A family gets three buckets of water per person per day

Question 4. Seas and oceans are full of water on earth. However, a very small percentage of water present on earth is available for us. This percentage is roughly
(a) 0.006% (b) 0.06% (c) 0.6% (d) 6%

Question 5. Which of the following is a way to use water economically?
(a) construction of bawris (b) Rainwater harvesting

(c) Drip irrigation (d) Infiltration

Question 6: Which of the following does not show water shortage?

[A]. Taps running dry [B]. Long queues for getting water

[C]. Marches and protects for demand of water [D]. A family gets three buckets of water per person per day

Question 7. The amount of water recommended by the United Nations for drinking, washing, cooking and maintaining proper hygiene per person per day is a minimum of
(a) 5 litres (b) 15 litres (c) 30 litres (d) 50 litres

Question 8. "Every Drop Counts" is a slogan related to
(a) counting of drops of any liquid (b) counting of water drops
(c) importance of water (d) importance of counting

Question 9. Water cycle does not involve which of the following?
(a) Evaporation (b) Condensation (c) Formation of clouds (d) Rainwater harvesting

Question 10. Which of the following inhibits the seepage of rainwater into ground?
(a) A pukka floor (b) playground(c) Grass lawn (d) Forest land

HIGHER ORDER THINKING SKILL QUESTIONS

Question 1. Sachin lives in an area where on and off water scarcity is there. He gave a thought to the problem and planned to get a solution. He decided to harvest rainwater in his village. He made efforts to convince the people of his area, built some drainage system and water tanks where rainwater could be collected.
(a) Name few structures he might have built.
(b) Name the process of water cycle, Sachin will use for harvesting water.
(c) Write the methods, Sachin will tell the people to use water wisely. (Value Based Question]
Answer:
(a) Sachin has build up cemented drainage channels in the elevated area and tanks where these channels will collect water.
(b) Sachin is planning to harvest rainwater.
(c) Sachin will educate people to use water judicially in the following way
(i) Use mug for brushing, shaving and bathing.
(ii) Water plants with drip irrigation.
(iii) Use and reuse water in home activities.

Question 2. Some definitions are given which can be corrected by changing one word. Correct them.
(a) Aquifer is groundwater stored between layers of hard rock above the water table.
(b) The process of evaporation of water in the ground is called infiltration.
(c) The evaporation of water from oceans and its arrival back into oceans is called vapour cycle.

Answer:
(a) Aquifer is groundwater stored between layers of hard rock below the water table.
(b) The process of seeping of water in the ground is called infiltration.
(c) The evaporation of water from oceans and its arrival back into oceans is called water cycle.

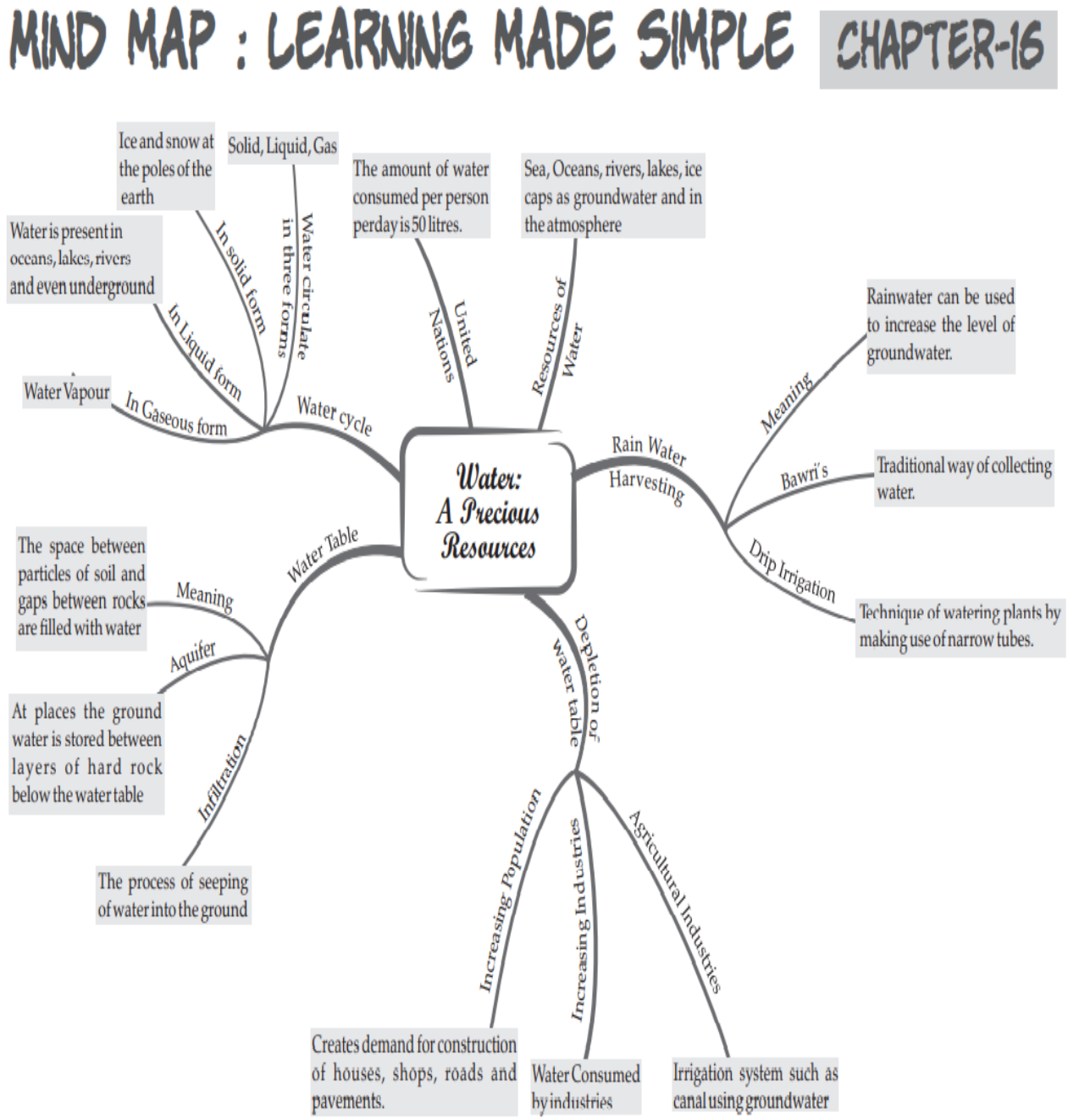
Question 3. Shishir returned from school and found his mother busy in the kitchen. He noticed that she is making his favourite dosa. Shishir rushed to his mother as he was feeling hungry and found that the tap in the kitchen was leaking. He told his mother to replace it as leaking taps lead to the wastage of water. His mother smiled and ensured him to do the same.
(a) What is water management?
(b) Why should we save water?
(c) What values are shown by Shishir? [Value Based Question]
Answer:
(a) Minimum wastage of water is called water management.
(b) We should save water to prevent water crisis.
(c) Shishir is sincere, responsible and has capability of applying knowledge practically.

Question 4. Certain pattern of the rainfall in our country leads to scarcity of water. Explain that pattern. Which part of the country gets rainfall twice a year?
Answer: We face shortage of water mainly because water is not evenly distributed by the nature on the earth. Some places such as North East India get so much rains, so that it gets flooded almost every year. On the other hand, Thar desert in Rajasthan may get rains rarely in the monsoon season. This uneven pattern of rains causes water scarcity in India at some places.

Question 5. A number of problems can be faced due to shortage of water. List some of them.
Answer: The number of problems that can be faced due to shortage of water are as follows

- Less amount of pure drinking water will be available.
- Lack of equal distribution of water.
- Drought.

MIND MAP


MIND MAP : LEARNING MADE SIMPLE
CHAPTER-16
Water: A Precious Resources
Water cycle
Water circulate in three forms
Solid, Liquid, Gas
In solid form
Ice and snow at the poles of the earth
In Liquid form
Water is present in oceans, lakes, rivers and even underground
In Gaseous form
Water Vapour
United Nations
The amount of water consumed per person perday is 50 litres.
Resources of Water
Sea, Oceans, rivers, lakes, ice caps as groundwater and in the atmosphere
Rain Water Harvesting
Meaning
Rainwater can be used to increase the level of groundwater.
Bawri's
Traditional way of collecting water.
Drip Irrigation
Technique of watering plants by making use of narrow tubes.
Water Table
Meaning
The space between particles of soil and gaps between rocks are filled with water
Aquifer
At places the ground water is stored between layers of hard rock below the water table
Infiltration
The process of seeping of water into the ground
Depletion of water table
Increasing Population
Creates demand for construction of houses, shops, roads and pavements.
Increasing Industries
Water Consumed by industries
Agricultural Industries
Irrigation system such as canal using groundwater

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