**W ATER**

Water is one of the most essential necessities of our daily life.

All living things on earth depend upon water.

Water is also a habitat for a large number of aquatic plant and animals.

**Uses**

**1.For sustenance of life**:

* All living organisms require large quantities of water to sustain life.
* Water helps in dissolving food materials in the body.
* Water is main constituents of blood.

**2. A medium of transportation:**

* Boats and ships ply on river and seas, carrying passengers and materials from one place to another.

**3.For** domestic **use:**

* We need a lot of water for bathing, washing and cooking food. Water used for drinking (potable water)be free from harmful salt and bacteria.

**4. For Therapeutic purpose:**

* Water has medicinal values in addition to its normal use.

**5. For generation of electricity:**

* The potential energy of water which is stored in the big reservoir by building dams on the rivers is used for generating electricity. Fast moving water falling from a height has a lot of energy. It is made to fall on a water wheel called turbine. This in turn is used by generator to provide electricity.

**6. Water is also a medium of aquatic animal and plant life**

**7. For Agriculture:**

No plant can grow without water . We require large quantities of water to grow crops for our food.

**8. As coolant:**

Water also acts as a cooling fluid in generation of power from fossils and nuclear fuels.

**9. For Propagation of Plants:**



Seeds of several plants are dispersed by flowing waters of rivers and streams. The seeds fall in the water and are carried to far off places. Several varieties of plants have spread from one place to another in this manner.

**10. For sports and recreational activities :**

Water also provides as a medium for sports and recreation.



**11. For fire fighting :**



Firefighting units throw water over the burning objects. It cools the burning objects and provides a cover of water vapour. This cuts off the supply of oxygen to the burning out the fire.

**STATES OF WATER**

Water exists in 3 states,namely:

* Solid state: Ice- Below 0OC



* Liquid state: Water- b/w 0oC & 1000C



* Gaseous state: Steam/ Water Vapour- Above 100oC



**Ice (Solid) Heating Water(Liquid) Boiling Steam (Gas)**



**Freezing Condensation**

**SOURCES OF WATER**

1. **Oceans:**Oceans contain 97.4% of total Earth’s water but it is not fit for use

by many living organisms as it is salty. It is containing about 3.6%

of dissolved salt by mass

1. **Rainwater:** Rainwater is the purest form of water and is one of the major sources of water. Rainwater is obtained in nature by the process of evaporation and condensation of water vapour rising from the oceans, seas, rivers, land etc
2. **Surface Water:** A part of rainwater runs on the Earth’s surface and is called surface water. This water goes into drains and then into ponds, streams, rivers, lakes, canals and springs
3. **Ground Water:** A part of rainwater that seeps into the ground through soil and collects over non-porous rocks is called the groundwater. This water forms a sort of large water body like a lake and becomes an important source of H2O. Ground water is a major source of water supplies in towns and cities for domestic and industrial use. The level of ground water below the surface of the Earth at any given place is known as **WATER TABLE**

**KEY TERMS**

* **Evaporation:** The process of conversion of water into water vapour is called Evaporation
* **Conditions for Evaporation:**

1. High Temperature(for increased rate)
2. Large Surface Area
3. Fast Breeze

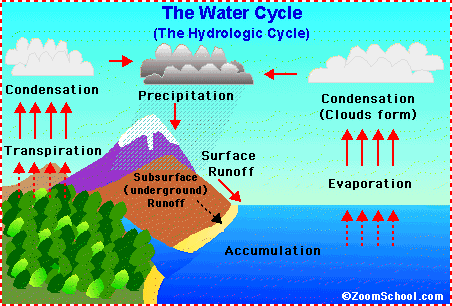
* **Condensation:** The process of cooling of water vapour to such an

extent that it changes from vapour (gas) to liquid is known as condensation

* **Precipitation:** When the droplets of water in the clouds become large

and heavy, they fall to the ground and the process is

known as precipitation. It may fall as rain, hail or snow

**WATER CYCLE**

* Water in the lakes,rivers and oceans evaporates due to the heat of the sun
* Plants use a part of water to make their food and retain some of it in their

different parts

* Rest of the part of the water is released by plants into the air as water

vapours through the process of transpiration

* Water vapours present in the air, when move up to a height where the

temperatures very low, they condense to form tiny drops of water called

droplets

* These droplets form clouds and these clouds form rain
* The cycle of loss of water through evaporation and gain of water through rainfall is known as Water cycle
* **Formation of clouds**: When the air rises up, it gradually and automatically becomes cooler and cooler . At sufficient heights, the air becomes so cool that the water vapour present, condenses to form tiny droplets of water. these droplets join together to form the clouds.
* **Floods**: Floods occur when soil and vegetation cannot absorb all the water (when it rains, hail or snow) and the water runs on the land in quantities that cannot be carried in river channels or retained in natural ponds or in reservoirs behind dams
* Periodic floods occur naturally in many rivers forming an area known as flood plains
* Flash floods rise and fall rapidly with very little or no advance warning. These floods are usually a result of intense rainfall over a relatively small area
* **Effects of Floods:** Floods not only damage property and endanger the lives of humans and animals, but also have other effects, such as:

1. Rapid run off causes soil erosion and sediment deposition problems
2. Spawning grounds for fish and other wildlife habitats are often destroyed
3. Prolonged high floods delay traffic and interfare with drainage and economic use of land
4. Bridges, bank lines and other structures in the flood ways are damaged
5. Navigation and hydroelectric power are often impaired
6. Financial losses due to the floods commonly amount to crores of rupees each year

**DROUGHTS**

Drought is a condition of abnormally dry weather within a geographic region where some rain is usually expected.

The term drought is generally referred to a period in which an unusual scarcity of water due to no rain causes a serious hydrological imbalances like emptying of water supply reservoirs, drying up of wells and crops getting damaged

The severity of a drought is measured by the degree of water deficiency,its duration and the size of the area affected

If the drought is brief, it could be considered a dry spell or partial drought. A dry spell is usually defined as more than 14 days without adequate precipitation, whereas a drought may last for years

* **Effects of Droughts**

1. Acute water crisis
2. Crop Failure
3. Fall in production, especially being timber and fishery
4. Spread of diseases and in worst cases,epidemics take a toll on millions
5. Widespread Unemployment
6. Loss of life in all forms due to starvation
7. Ground water depletion
8. Migration of people from drought affected areas
9. Conversion of regions into desert lands, permanent or temporary depending upon the severity of drought

* **Water Conservation:** The demand for water is increasing day by day and changing lifestyles have increased the amount of water being consumed or wasted
* **Rainwater Harvesting:** It is a method of storing rainwater when it falls down then it is stored for use during the non-rainy season.
* **Need for rainwater harvesting:**

1. Surface water is inadequate to meet our needs and hence, we have to depend on ground water
2. Due to rapid urbanization, infiltration of rain water into the subsoil has decreased drastically and recharging of ground water has diminished
3. Due to constructional activities in and around the city is resulting in the drying up of under ground water

* **Rainwater Harvesting Method**

1. **Storage of Rainwater on surface**: It is a method in which the structures used are underground tanks, check dams, rivers and ponds
2. In this method, rainwater is collected from the roof tops
3. Water is allowed to go deep into a storage tank through pipes
4. Water from the roof contains impurities, therefore, we should filter this water before use
5. This water then seeps into the soil to refill or recharge the groundwater
6. **Recharge to ground water**: In this method, water is allowed to go into the ground directly from the drains that collect rainwater. It is a new method and the structures used are pipes, dug wells, recharge wells, recharge shafts

