

## OUR ENVIRONMENT

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1. **ENVIRONMENT** is a sum total of all external factors, substances, living beings, and conditions that surrounds an organism and influence the same without becoming part of it.
2. All the interacting organisms in an area together with the non-living constituents of the environment form an **ECOSYSTEM**. an ecosystem consists of biotic components comprising living organisms and abiotic components comprising physical factors like temperature, rainfall, wind, soil and minerals.
3. Organisms can be grouped as **PRODUCERS**, **CONSUMERS** and **DECOMPOSERS** according to the manner in which they obtain their sustenance from the environment.
  - (i) Organisms which can make their own food like sugar and starch from inorganic substances using the radiant energy of the Sun in the presence of chlorophyll are called **PRODUCERS**.  
Eg. all green plants and certain bluegreen algae .
  - (ii) Organisms which cannot produce their own food but depend on the producers either directly or indirectly for their sustenance are called **CONSUMER**. Consumers can be classed variously as herbivores, carnivores, omnivores and parasites.
  - (iii) Micro organisms that obtain energy from the chemical breakdown of dead organisms or animals or plant wastes are called **DECOMPOSERS**. Thus decomposers help in the replenishment of the natural resources. Eg. Bacteria and fungi
4. **BIOTIC COMPONENT**: It means the living organisms of the environment – plants, animals, human beings and microorganisms like bacteria and fungi, which are distinguished on the basis of their nutritional relationship.
5. **ABIOTIC COMPONENT**: It means the non-living part of the environment – air, water, soil and minerals. The climatic or physical factors such as sunlight, temperature, rainfall, humidity , pressure and wind are a part of the abiotic environment.
6. **BIODEGRADABLE SUBSTANCES** are those substances which are broken down into simpler, harmless substances in nature with due course of time by the biological processes such as action of microorganisms like certain bacteria. Examples: Domestic waste products, urine and faecal matter , sewages, agricultural residue, paper wood, cloth and cattle dung.
7. **NON-BIODEGRADABLE SUBSTANCES** are those substances which cannot be broken down into simpler, harmless substances in nature. These substances may be in solid , liquid or gaseous form and may be inert and accumulate in the environment or may be concentrated in food chain and harm the organisms. Eg. DDT, plastics, polythene bags, insecticides, pesticides, mercury, lead, arsenic, aluminum, radioactive wastes, etc.
8. **ECOSYSTEM**. It is the structural and functional unit of biosphere, comprising of all the interacting organisms in an area together with the non-living constituents of the environment. It consists of biotic or biological components comprising of living organism and the abiotic components comprising of physical environmental factors eg. Ponds, Aquarium.
9. A garden is an example of ecosystem. Other types of ecosystems are forests, ponds and lakes. These are **NATURAL** ecosystems while gardens and crop-fields are human made(**ARTIFICIAL**) ecosystems.

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10. **FOOD CHAIN** refers to an arrangement of different biotic groups in a sequence of energy transfer. These biotic groups are producer herbivores and carnivores.
11. **TROPHIC LEVELS:** These are the various steps or levels in the food chain where transfer of food or energy takes place. The producers or autotrophs are the first trophic level, the herbivores or primary consumers are the second trophic level, the carnivores or secondary consumers are the third trophic level and the large carnivores or tertiary consumers are the fourth trophic level of the food chain.
12. **TROPHIC LEVEL RULES:**
  - a) The green plants in a terrestrial ecosystem capture about 1% of the energy of sunlight that falls on their leaves and convert it into food energy.
  - b) When green plants are eaten by primary consumers, a great deal of energy is lost as heat to the environment, some amount goes into digestion and in doing work and the rest goes towards growth and reproduction. An **average of 10%** [also called **10% Law**] of the food eaten is turned into its own body and made available for the next level of consumers.
  - c) Since 10% of energy is available for the next level of consumers, food chains generally consist of only three or four steps. The loss of energy at each step is so great that very little usable energy remains after four trophic levels.
  - d) There are generally a greater number of individuals at the lower trophic levels of an ecosystem, the greatest number is of the producers.
  - e) The flow of energy is unidirectional. The energy that is captured by the autotrophs does not revert back to the solar input and the energy which passes to the herbivores does not come back to autotrophs.
  - f) As Energy moves progressively through the various trophic levels it is no longer available to the previous level.
13. **FOOD WEB:** the food chains are inter-connected with each other forming a web like pattern, which is known as food web. Eg. Grass may be eaten by grass hopper as well as rabbit or cattle and each of these herbivores may be eaten by many carnivores such as frog, bird or tiger depending on their food habits.

#### 14. Food Chain and Food Web:

##### **Food chain**

A food chain is a linear sequence of organisms in which each organism is eaten by the next member in the sequence. This interaction among organisms involves the transfer of energy from one organism to another.

It generally include 3-4 levels.

##### **Food web**

Food web is the network of many food chains which are interlinked together and forms a multitude of feeding connections among different organisms of a biotic community

The levels of food web cannot be calculated as one organism is eaten by many different organisms.

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15. **BIOLOGICAL MAGNIFICATION** also known as bio-magnification refers to the increase in the concentration of toxic substances like DDT, chemicals, heavy substances etc. with each successive trophic level of the food chain. The concentration of these toxic substances is highest at the highest trophic level.
16. **OZONE** (O<sub>3</sub>) is a molecule formed by three atoms of oxygen. It shields the surface of the earth from ultraviolet (UV) radiation from the Sun. This radiation is highly damaging to organisms, for example, it is known to cause skin cancer in human beings. The amount of ozone in the atmosphere began to drop sharply in the 1980s. This decrease has been linked to synthetic chemicals like chlorofluorocarbons (CFCs) which are used as refrigerants and in fire extinguishers. In 1987, the United Nations Environment Programme (UNEP) succeeded in forging an agreement to freeze CFC production at 1986 levels.
17. The decline of Ozone layer thickness in Antarctica was first observed in 1985 and was termed as **OZONE HOLE**.
18. The different methods of solid wastes disposal commonly used around the world are.
  - a) **Open dumping** : A conventional method in which solid wastes dumped in selected areas of a town. It actually cause pollution
  - b) **Land fillings** : Wastes are dumped in low living area and are compacted by rolling with bulldozers
  - c) **Composting** : Organic wastes are filled into a compost pit (2m × 1m × 1m). It is then covered with a thin layer of soil. After about three months the same garbage filled inside the pit changes into organic manure.
  - d) **Recycling** : The solid wastes is broken down into its constituent simpler materials. These materials are then used to make new items. Even non –bio egradable solid wastes like plastic, metal can be recycled.
  - e) **Reuse** : A very simple conventional technique of using an item again & again. For Eg. paper can be reused for making envelopes etc.
19. **MANAGEMENT OF SOLID WASTES:** Waste management includes collection, transport, processing, and disposal of waste materials.
20. **MEASURES FOR WASTE MANAGEMENT:**
  - a) Separate bins (blue and green) can be used for disposing non-biodegradable and biodegradable wastes respectively.
  - b) Reduction in the use of non-biodegradable products like plastic.
  - c) Separation of material, which can be reused or recycled.

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