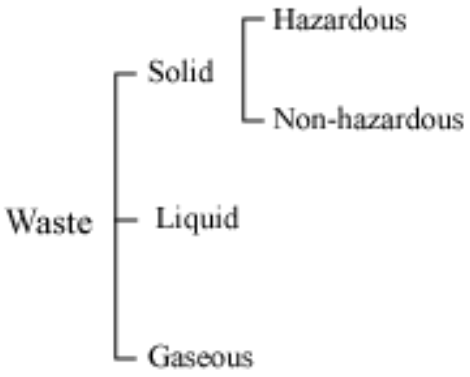
Waste Generation and Management

Waste, is any unwanted, unused, and rejected material. Waste can be categorized according to its source – municipal, agricultural, industrial etc.

In general, wastes are of three types – **liquid, gaseous, and solid.**



Management of solid wastes

Waste management includes collection, transport, processing, and disposal of waste materials.

Measures for waste management

- Separate bins (blue and green) can be used for disposing non-biodegradable and biodegradable wastes respectively.
- Reduction in the use of non-biodegradable products like plastic.
- Separation of material, which can be reused or recycled.

The 7 principles of solid waste management i.e. Reuse, Refuse, Recycle, Rethink Reduce, Research, Regulation and public awareness should be followed.

How can we reduce waste production?

Use of recyclable material reduces the generation of wastes to a large extent. Reduced usage of materials, reusing of materials, and using recycled material will reduce the generation of wastes.

- **Biodegradable wastes-**
    - Wastes that can be broken down by biological processes are called Biodegradable.
    - They are mainly produced mainly from plant and animal sources.

Decomposition of waste is accomplished by enzymes released by microbes in order digest this organic waste and consume it.

- **Non-biodegradable wastes**
    - Wastes that cannot be broken by biological processes.
    - They are usually man-made like plastic, metal etc.

- **Recycling of materials**
    - Some materials such as newspaper, notebooks, envelopes, etc. can be easily recycled to form useful products.
    - Some other materials such as plastics can cause health hazards and environmental problems. Therefore, the use of plastics should be minimized.

- **Dealing with garbage**
    - Minimise the use of plastic bags.
    - Use jute or paper bags.
    - Never burn plastic bags and dried leaves.
    - Use vermicomposting, to deal with domestic waste.
    - Do not waste paper.

1. **Waste:** Any unused or unwanted material is called waste. Waste material can be categorized as; biodegradable and non- biodegradable. These two different types of wastes should be separated for affective waste management.

2. **Biodegradable waste:** It includes wastes mainly from plant and animal sources, which can be broken down by living organisms.

3. **Non- biodegradable waste:** It includes wastes such as plastic, metal, broken glass etc., which cannot be broken down by living organisms.

4. **Difference between biodegradable and non-biodegradable waste:**

Biodegradable	**Non- biodegradable**
The wastes decompose naturally in the environment.	The wastes do not decompose naturally.

They are safe for the environment.	They are harmful to the environment and create pollution.
The wastes are made up of natural ingredients.	The wastes are made up of synthetic materials.
Biodegradable substances persist for small time interval in the environment.	Non biodegradable substances persist for longer time in the environment.
Example – waste papers, wood crumbles.	Example – plastic bags, cans, disposable bottles.

5. Methods of solid waste management
(i) Composting **:** Solid waste obtained from plants and animals when mixed with soil in a pit gets converted into a useful substance called manure or compost and its preparation is called (ii) Vermicomposting: It is a type of composting in which earthworms are in which earthworms are involved.
(iii) Landfills: A landfill is a specially designed facility for the burial of municipal solid waste.
(iv) Pyrolysis: It is another suitable municipal method for the solid waste management. It is the chemical decomposition of solid waste by **heat**. The end products of pyrolysis are used to produce **steam** and **electricity**.
(v) Incineration: It is the method of burning the waste to reduce its volume and weight. The toxic substances are also removed in the process. The left over product contains ash that can be easily dumped into landfills.

6. Waste water management: The industrial and municipal effluents are first treated in effluent treatment plants and then disposed off into water bodies. This treatment involves primary treatment, which removes solid debris through sedimentation, secondary treatment, which uses microbes to decompose the organic matter present in the water, and tertiary treatment, in which dissolved metals and chemicals are removed. The secondary treatment produces sludge that can be used as manure. The treated water is now safe to be disposed into the water bodies or to be used for irrigation purposes.

7. Removal of air pollutants
(i) Through scrubbers: Gaseous and particulate air pollutants are removed by trapping in the wet packing material.
(ii) Through electrostatic precipitators: The particulate air pollutants are removed by attracting them to electrically charged plates.