



Wastes



In This Chapter You Will Learn :

- ▶▶ Some common wastes
- ▶▶ Recycling waste
- ▶▶ What can we do to minimise the harmful effects of plastics.
- ▶▶ Classification of wastes

INTRODUCTION

Materials which are discarded by us as useless and unwanted are known as wastes. Wastes include solid, liquid and gaseous wastes. But in this chapter we will discuss about solid as well as liquid wastes and the ways of their proper disposal. You will also study about some common waste materials which can be reused and recycled.

8.1 SOME COMMON WASTES

A lot of wastes are produced in every household. Can you remember the types of wastes generated in your home everyday ? Write the wastes generated in your home in the following columns.

| Solid wastes | Liquid wastes |
|--------------|---------------|
| | |
| | |
| | |
| | |

Solid wastes

Solid wastes includes the following :

Food wastes : Food wastes include fruit and vegetable peels, left over food, residues of meat, fish, etc. These wastes are generated in homes, restaurant and hotels.

Ash : Ash is produced from burning of wood, coal, coke, etc. Ash is produced mainly in factories, thermal power plants, iron and steel industries.

Rubbish : Paper, plastics, rubber, wood, glass, metallic wastes, polythene bags, cardboard, etc. are called rubbish. These wastes are generated from homes industries, offices, schools, etc.

Liquid wastes

Liquid wastes include wastes discharged from kitchen and bathrooms which contain soap, oil, detergent, human excreta. Besides, a large amount of liquid wastes or effluents

is also discharged from industries which contain chemicals, metals wastes.

Gaseous wastes

Harmful gases, smoke and metal particulate come in this category. These wastes are produced by motor vehicles, industries and thermal power plants.

8.2 CLASSIFICATION OF WASTE

1. Biodegradable waste : This type of waste can be broken down into similar substances by the natural action of micro-organisms and thus disappear into the environment.

This includes paper, wheat, biogas, cattle dung, leather, vegetable waste, rice husk, tea leaves, wool, silk, domestic waste, etc.

2. Non-biodegradable waste : Type of waste which cannot be broken down into non-toxic substance by action of micro-organisms. This includes plastic, DDT, glass bottle, aluminium foil, pesticides, etc.

8.3 RECYCLING WASTES

Of all the components of garbage, only a few, such as metal wastes, glass, paper, certain plastics can be recycled by simple processes.

- Recycling conserves not only the non-renewable resources but some renewable resources also.

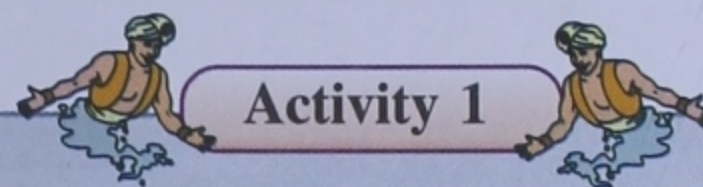
For example, recycling of paper waste saves trees.

- Recycling of metals, glass, etc. saves energy and natural resources.

For example, recycling of metal wastes saves energy used for extracting metals from their ores.

Things which can be recycled are — Empty toothpaste tubes (of aluminium), newspaper waste, electric bulb, empty oil tin, empty glass bottles, PVC shoes, etc.

Recycling of paper : Only the paper used in newspapers, magazines, books, notebooks, etc. can be recycled.



Activity 1

Make recycled paper at home —

Make recycled paper at home, collect the paper from old books, newspaper. Tear out all the paper into small pieces and put them into a bucket overnight. Remove the extra water make a paste of paper by pounding it. Spread this pulp on a fine wire mesh and press it to squeeze out the excess water. Move a roller over the pulp to remove extra amount of water and put some weight on it. Leave the pulp for drying for several hours. After drying your hand made recycled paper is ready.

8.4 PLASTIC — A BOON OR A CURSE

We are living in the plastic age. Plastics are versatile materials for use in our daily life and industry. Plastics are light in weight and are not attacked by moisture and micro-organisms. Plastics last longer.

Plastics can be given any colour and shape of your choice. Plastics are not affected by soil, water, air and micro-organisms. Thus, plastics are non-biodegradable and cause many environmental problems.

8.5 WHAT CAN WE DO TO MINIMISE THE HARMFUL EFFECTS OF PLASTICS

- (1) Use plastic bags to the minimum. If possible reuse the plastic bags.
- (2) Ask the shopkeeper to use paper bags.
- (3) Carry a cloth or a jute bag while going out to the market for shopping.

- (4) Do not store eatables in plastics bags.
- (5) Do not throw used plastic bags here and there. Empty plastic bags choke the drainage system.
- (6) Never burn plastic waste. Burning plastics give off toxic gases.
- (7) Do not put the domestic garbage into plastic bags while disposing it into the garbage dump.

OBJECTIVE TYPE QUESTIONS

1. Answer the following questions.
 - (a) Define wastes.
 - (b) Write two differences between biodegradable and non-biodegradable waste.
 - (c) How can you recycle paper ?
 - (d) Why should we reduce the usage of plastics ?
2. Write **true** or **false** for the following statements:
 - (a) Recycling of waste materials help in saving space and to make old products.
 - (b) Paper waste, leaves, food waste and domestic waste can be recycled
recycled
 - (c) Polythene bags are very dangerous for the environment
dangerous for the environment
 - (d) Gaseous wastes are generated mainly from motor vehicles and factories
mainly from motor vehicles and factories

MULTIPLE CHOICE QUESTIONS

1. Which of the following is not a domestic waste ?

| | |
|----------------|----------------|
| (a) food waste | (b) edible oil |
| (c) paper | (d) chemicals |
2. Which of the following is not a biodegradable waste ?
 - (a) peels of vegetables
 - (b) clothes
 - (c) polythene bags
 - (d) left over food
3. Which of the following cannot be recycled ?

| | |
|-----------|-------------|
| (a) wood | (b) iron |
| (c) glass | (d) plastic |
4. Which of the following is biodegradable ?

| | |
|-------------|-----------|
| (a) mercury | (b) glass |
| (c) cotton | (d) iron |

GLOSSARY

1. **Acid** : A substance which liberates H^+ ions when dissolved in water.
2. **Alkali** : A base which is soluble in water.
3. **Alloy** : A homogeneous solid mixture of two or more metals.
4. **Anion** : A negatively charged ion.
5. **Atom** : The smallest particle of an element, which can take part in a chemical reaction. It preserves the essential properties of an element. It is electrically neutral and may or may not exist independently in nature.
6. **Atomic number** : The number of protons present in one atom of an element.
7. **Atomicity** : The number of atoms present in one molecule of an element is called atomicity of the element.
8. **Base** : A substance which reacts with acids to form salt and water as the only product.
9. **Brass** : An alloy of copper (80%) and zinc (20%).
10. **Bronze** : An alloy of copper (80%), zinc (10%) and tin (10%).
11. **Carbogen** : A mixture of oxygen (95%) and carbon dioxide (5%) used for reviving patients having breathing problems.
12. **Cation** : A positively charged ion.
13. **Chemical bond** : The binding force between two or more atoms of a molecule.
14. **Chemical change** : A change in which the substance loses its identity or changes its composition. Further, it is a change which is not reversible.
15. **Chemical equation** : A statement that describes a chemical change in terms of symbols and formulae.
16. **Chemical formula** : Represents the composition of the molecule of a substance in terms of symbols of the elemental atoms present in the molecule.
17. **Chemical reaction** : Involves the change of matter into a new substance or substances which take place during a chemical change.
18. **Compound** : A substance formed by the chemical union of two or more elements, united in a definite proportion by mass.
19. **Decomposition reaction** : A process of breaking down a substance into two or more simpler substances.
20. **Detergent** : A synthetic cleansing agent which can be used in soft water as well as in hard water.
21. **Distillation** : A process of getting a pure liquid from a crude liquid by boiling it and then condensing the vapours.
22. **Dry ice** : Solid carbon dioxide in the form of fine white powdery mass.
23. **Ductility** : The property by which materials can be drawn into wires.
24. **Duplet** : The condition when two electrons are present in the outermost shell of the helium atom.
25. **Electron** : A negatively charged particle found in the atoms of every element.
26. **Element** : A pure substance which cannot be decomposed into simpler substances by ordinary chemical means.
27. **Freezing point** : It is a temperature at which water changes from liquid to solid.
28. **Fertilizers** : Artificially prepared chemicals which are rich in plant nutrients. They help in healthy growth of crops and increase the yield.
29. **Glass** : A supercooled liquid formed from molten silicates of sodium and calcium.
30. **Green house effect** : The trapping of solar heat energy in earth's atmosphere due to the presence of carbon dioxide, methane, water vapour, etc.
31. **Hard water** : Water which does not lather easily with soap and hence wastes much soap. The hardness is due to soluble salts of calcium and magnesium in the form of chlorides and sulphates.
32. **Indicators** : The substances which change colour on coming in contact with acids or alkalis.

33. **Ions** : Electrically charged atoms or group of atoms formed by losing or gaining electrons.
34. **Malleability** : The property by which materials can be beaten into sheets.
35. **Mass number** : The sum of the number of protons and neutrons present in one atom of an element.
36. **Metals** : Elements which show metallic properties.
37. **Mixture** : Made up of two or more elements or compounds mechanically mixed together in any proportion, such that it retains the properties of those of its constituents.
38. **Molecular formula** : A chemical formula which gives the number of atoms of its constituent elements in one molecule of a compound.
39. **Molecule** : The smallest particle of a substance (an element or a compound) which can exist independently in nature and retains all the properties of that substance.
40. **Negative valency** : The valency of all non-metals.
41. **Neutron** : A neutral particle found in the nucleus of an atom.
42. **Noble gases** : A class of elements which are chemically inert.
43. **Non-metals** : The elements which do not have metallic properties. Non-metals are non-conducting, non-ductile, non-malleable and brittle and dull in appearance. Their atoms tend to gain electrons in chemical reactions to form negative ions.
44. **Nucleons** : Togetherness of protons and neutrons.
45. **Nucleus** : A small positively charged part at the centre of the atom where almost the entire mass of the atom is concentrated.
46. **Octet** : The condition when 8 electrons are present in the outermost shell of an atom.
47. **Orbits or shells** : The fixed circular paths along which electrons revolve round the nucleus.
48. **Physical change** : It is a temporary change in which no new substance is formed and the composition of the substance is not altered. It undergoes only change in physical behaviour. It is reversible.
49. **Polymer** : A material formed by the simple molecules to form a bigger molecule when the simple molecules join to form a long chain.
50. **Positive valency** : The valency of all metals and hydrogen.
51. **Products** : The substances formed as a result of a chemical change.
52. **Proton** : A positively charged particle found in the atoms of all elements.
53. **Radicals** : A group of atoms of different elements behaving as a single unit.
54. **Reactants** : The substances which take part in a chemical reaction.
55. **Relative atomic mass** : The mass of an atom of an element compared to the standard atomic mass unit.
56. **Rust** : The brown powdery mass of hydrated ferric oxide formed in the presence of moist air.
57. **Rusting** : The slow oxidation of iron into hydrated ferric oxide, in the presence of moist air.
58. **Salt** : A substance other than water formed by the neutralisation of an acid with a base.
59. **Silicones** : A compound of silicon used to prepare waterproof materials, electrical insulators and non-stick pans.
60. **Soap** : Sodium or potassium salt of higher fatty acids formed by the reaction between vegetable oils or fats and alkaline solutions.
61. **Solute** : The dissolved substance in a liquid.
62. **Solution** : A homogeneous mixture containing a substance (solid, liquid or a gas) in dissolved state in a liquid.
63. **Solvent** : A liquid in which the solute is dissolved.
64. **Symbol** : A short form for the full name of an element which represents an atom of that element.
65. **Valence shell** : The outermost shell of an atom.
66. **Valency** : The combining capacity of the atom of an element to form chemical bonds.