



SCIENCE

EDUCATO
LEARNING STUDIO

Chapter 16: GARBAGE IN, GARBAGE OUT

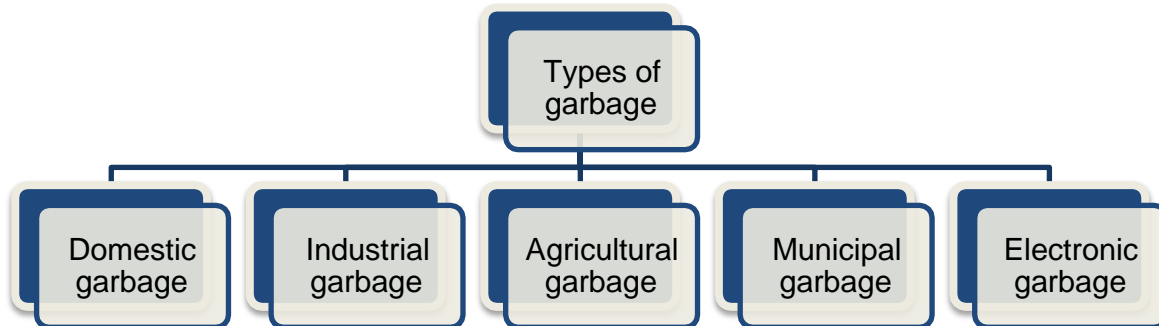


GARBAGE IN, GARBAGE OUT

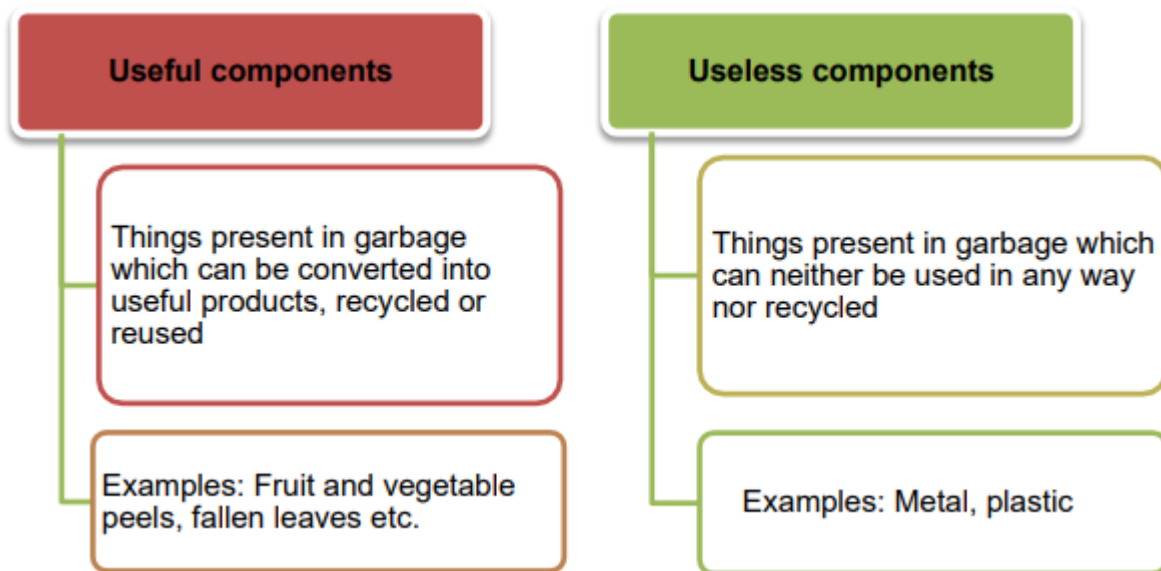


Garbage

- The household waste or rubbish produced in our day-to-day life is called **garbage**.
- Garbage includes spoilt food, vegetable peels, leaves, wood, grass, paper, leather, cotton, cattle dung, metals, fibre, paper, rubber etc.



Components of Garbage



Biodegradable and Non-biodegradable Wastes

Biodegradable Wastes

- These wastes can be broken down into non-poisonous substances by the action of microorganisms such as bacteria and earthworms.
- Examples: Spoilt food, vegetable peels, tea leaves, wood, grass, paper, leather, cotton, cattle dung etc

Non-biodegradable wastes

- These wastes cannot be broken down into harmless substances by any biological processes.
- Examples: Glass bottles, metal cans, polythene bags, synthetic fibres, radioactive wastes, plastics and pesticides like DDT



Disposal of Garbage

- Disposal of garbage means to get rid of garbage.



Methods of Disposal of Garbage

Composting

- The rotting and conversion of organic waste into manure is known as composting. The product formed after composting is called compost.
- Household garbage such as fruit and vegetable peels, egg shells, waste food, tea leaves as well as farmland wastes such as dried leaves, husk and parts of crop plants from fields after harvesting can all be converted into useful compost.
- The use of compost improves the fertility of the soil as it provides nutrients to the soil.

- Dry composting toilets are a hygienic and cost-effective solution to dispose of human wastes.
- A major drawback of composting is that due to lack of adequate knowledge most people do not segregate wastes in their homes which hampers the process of composting.



Vermicomposting

- The method which involves the use of worms to decompose wastes is called **vermicomposting**.
- The product formed after vermicomposting is called **vermicompost**.
- Earthworms can degrade or decompose wastes such as domestic waste, cow dung, coconut thresh etc. in a few days.
- The manure generated through vermicomposting is highly nutritious and useful for good growth of garden plants and even for agricultural purposes.
- Making vermicompost is quite cheap.
- Vermicompost is a natural manure which does not harm the soil.
- Vermicomposting is a very valuable technique for converting solid waste into useful compost or manure.

Recycling

- Separation of waste materials from refuse and then reprocessing them for reuse is known as reclamation of waste or recycling.
- Most waste materials such as scrap metals, paper, rubber, synthetics, glass and plastic can be reused.
- Waste paper is sent to paper mills where it is repulped and reprocessed to form new paper again.
- Waste materials such as glass can be crushed, remelted and made into new containers.

Reuse

- Reuse means not to throw old goods away, but to use the same goods again and again.
- The demand for new goods is reduced due to reuse.
- For example:
 1. Plastic jars of jams, pickles, oils, ghee etc. can be reused for storing salt, spices, sugar etc.
 2. A diary can be made from old invitation cards.

Landfill

- Large-scale disposal of solid waste is carried out by putting the waste in low areas of the ground and then covering it with earth. This is called a landfill.
- Landfill is one of the traditional methods used to dispose of hazardous waste and is mainly practised in urban areas.
- Landfill uses a large amount of land and very often produces a foul smell.
- If wastes such as batteries etc. are dumped in a landfill, then toxic substances percolate

into the earth and pollute the groundwater.

Green-coloured bins:

The waste like stale food, fruit and vegetables peels, and garden litter collected in the green-coloured bins.

- **Blue-coloured bins:** Recyclable waste like plastic, metal and glass are collected in the blue-coloured bins.
- **Red-coloured bins:** Toxic waste materials like syringes, expired medicines and batteries are collected in the red-coloured bins.



Figure 5: Waste Segregation.

Plastics - Boon or Curse?

- Plastic is an organic polymer.
- A large number of items such as bags, bottles, toys, buckets, combs, water pipes as well as parts of radios, television sets, automobiles, refrigerators etc. which we use in our day-to-day life are made of plastic.

Problems due to Excessive Use of Plastics



Some kinds of plastics can be recycled, but not all.

All types of plastics emit harmful gases on heating or burning which can cause health problems and even cancer in humans.

Plastic bags thrown carelessly on roads can enter the drains and the sewer system, choking them and causing floods during heavy rains.

Low-quality plastic does not decompose easily and persists in the environment for a longer period of time.

Stray animals looking for food end up swallowing plastic bags containing food. This can result in death of the animal.

Efforts to Minimise the Use of Plastics

Avoid storing eatables in plastic bags.

Ensure that plastic bags given to us by shopkeepers have not been used earlier for some other purpose.

Never dispose of garbage in plastic bags and throw them away.

Reuse plastic bags whenever possible. Make use of paper, cloth or jute bags for shopping.

Do not throw plastic bags all over the place after use.

Do not burn plastic bags or plastic items.

- **Bioplastics** are a form of plastic which are made from renewable biomass sources such as plants like potatoes, corn starch, pea starch, vegetable oils or other agricultural products owing to the action of certain microorganisms.

Some of the Ways to Reduce the Generation of Garbage

Disposal of kitchen garbage by vermicomposting to obtain high-quality manure for plants.

Making full use of paper by writing on both sides.

Used newspapers, magazines and notebooks should be recycled.

Usage of cloth, jute or paper bags for shopping instead of plastic bags.

Recycle old and useless objects made of glass and metals and plastics.



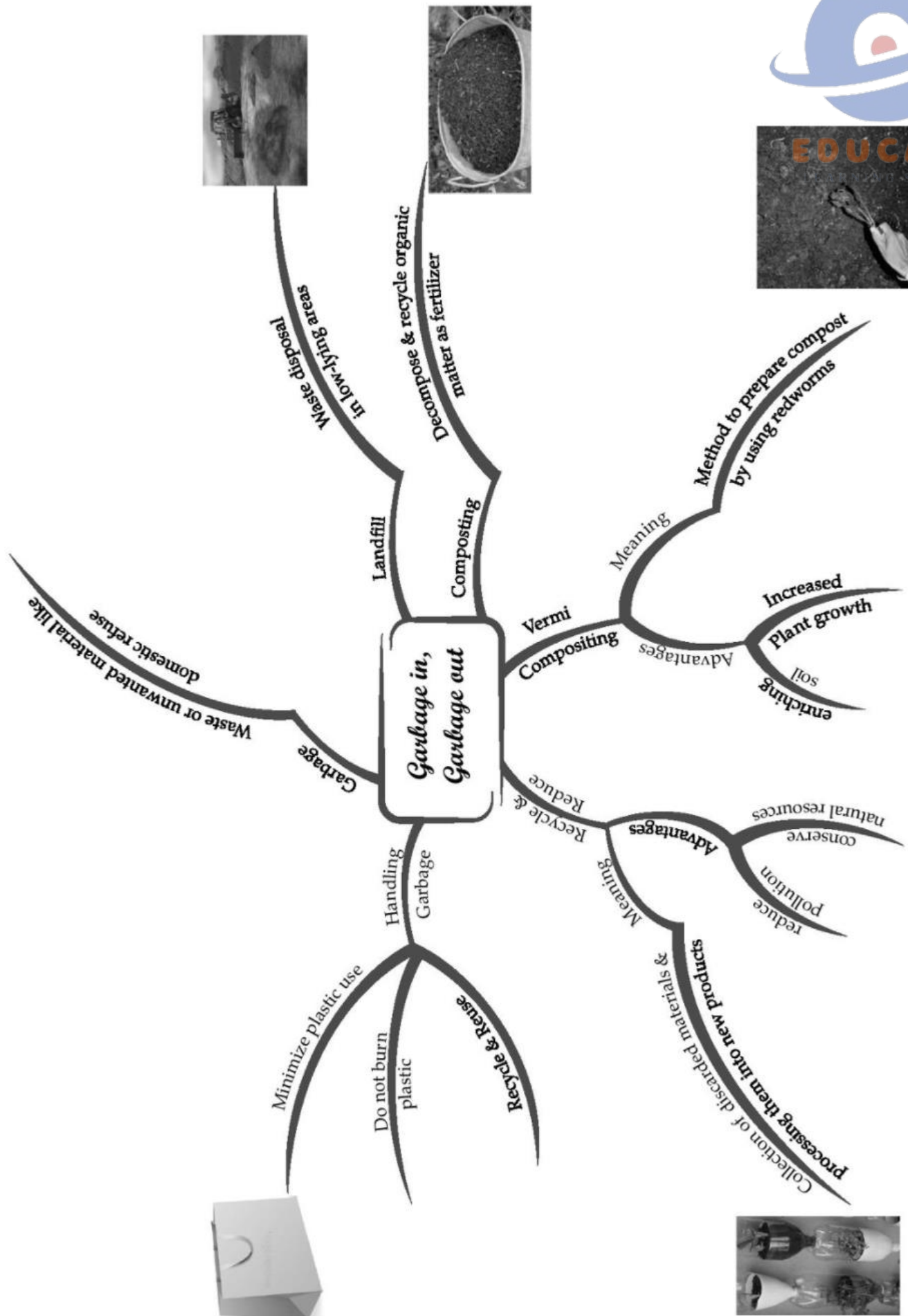
Toxic Wastes

The waste released from harmful substances such as expired medicines, syringes, and batteries is called toxic waste. These wastes are harmful because of their cancer-causing ability. Moreover, these substances carried by the water into the water bodies that are consumed by the animals and plants disturb the food chain cycle.

Doing Away from Plastic Bags

In ancient times, plastics were widely used all over the planet. On the contrary, the overuse of plastics creates a serious problem because they can emit harmful toxic gases like dioxins while burning, which can increase the risk of causing cancer. Therefore, the maintenance of plastic bags becomes important. We can handle and manage plastic bags in the following ways:-

- We should use reusable bags instead of plastic bags.
- Collect the plastic bags at a specific location where they can be recycled easily.
- Reuse the plastic bags as far as possible many times before disposing of them.
- Use plastic bags only when reusable bags are not available.



Important Questions



Multiple Choice Questions:

Question 1. Which one of the following will add to garbage?

- (a) Wrapper of a biscuit pack
- (b) Tin of a cold drink
- (c) Syringe used by a doctor
- (d) All of these

Question 2. Which one can be used for making manure?

- (a) Earthworms
- (b) Houseflies
- (c) Eagle
- (d) Crow

Question 3. Leaves falling from trees should be disposed by

- (a) burning
- (b) making compost by boiling and drying them
- (c) making compost by vermicomposting
- (d) any of these methods

Question 4. Garbage from cities is collected at

- (a) landfill areas
- (b) riversides
- (c) inside the ponds and lakes
- (d) near every colony

Question 5. Which of the following can be recycled?

- (a) Waste paper
- (b) Leather shoes
- (c) Animal waste
- (d) Kitchen waste

Question 6. Out of these, which one is a non-biodegradable waste?

- (a) Paper
- (b) Faecal matter
- (c) Aluminium foil
- (d) Cotton

Question 7. 3'R' means

- (a) reduce, reuse and recycle
- (b) rain, reuse and recycle
- (c) rotting, reduce and reuse
- (d) recycle, rain and rotting

Question 8. Which among the following will not pollute the soil?

- (a) Aluminium foil
- (b) Plastic
- (c) Thermo Col
- (d) Bread

Question 9. Rotting is carried out by

- (a) microbes
- (b) insects
- (c) ants
- (d) amoeba

Question 10. Materials that can be recycled are collected in

- (a) Red bins
- (b) Blue bins
- (c) Yellow bins
- (d) White bins

Very Short Question:

1. What is a landfill?
2. What are blue coloured bins used for?
3. Give example of material that can be used again.
4. What type of garbage is thrown in green bins?
5. Define composting.
6. Explain the term vermicomposting.
7. What are redworms?

Short Questions:

1. We should not add wastes containing salts, pickles, oil, vinegar, meat and milk products in vermicomposting pit to feed the redworms. Why?
2. How can the non-useful component be reused?
3. What do we do to the useful components (biodegradable) of the garbage?
4. What do you mean by composting?



5. Why should we not burn dried plant leaves and husk? What is the best way to get rid of them?
6. List waste products produced from an industry.
7. What will happen if garbage is left open in bin?
8. Waste may contain the following things:



Long Questions:

1. List the biodegradable and non-biodegradable waste products in your school. What are the best ways to get rid of this garbage?
2. What are the uses of plastic?
3. What are the demerits of plastic?
4. What suggestions will you give to members of locality to solve the problem of waste material?
5. Why should we be careful in using plastic bags to store cooked food items?
6. List the steps for preparing vermicompost.

Answer Key-

Multiple Choice Answers:

1. (d) All of these
2. (a) Earthworms
3. (c) making compost by vermicomposting
4. (a) landfill areas
5. (a) Waste paper
6. (c) Aluminium foil
7. (a) reduce, reuse and recycle
8. (d) Bread
9. (a) microbes
10. (b) Blue bins

Very Short Answers:

1. Answer: A low-lying open area is called landfill.
2. Answer: Blue bins are used for collecting materials that can be recycled.
3. Answer: Plastics, metals and glass.
4. Answer: Kitchen and other plants or animals wastes.
5. Answer: The rotting and conversion of some materials into manure is called composting.
6. Answer: The method of preparing compost with the help of redworms is called

vermicomposting.

7. Answer: Redworms are a type of earthworms which help in preparing compost from the kitchen wastes and parts of plants or animals.



Short Answer:

1. Answer: Addition of substances such as salts, oil, pickles, vinegar, meat and milk products to vermicompost pit causes growth of disease-causing small organisms. They may cause harm to redworms and hinder in preparation of vermicompost.
2. Answer: The non-useful components of the garbage are separated by Safai Karamcharis. This separated non-useful components of garbage is spread over the landfill and then covered with a layer of soil. Once the landfill is completely full, it is usually converted into park or a playground. For the next 20 years or so, no building is constructed on it.
3. Answer: Generally, useful components of the garbage are used to make compost. Compost are usually developed near the landfill.

(i) For preparing compost, waste materials like fruit and vegetable peel, egg shells, used tea leaves, waste food, dry leaves, newspapers etc. should be dumped in a pit.

(ii) The pit is covered with soil.

(iii) After 20-25 days, observe the garbage. If the garbage is rot, turned black in colour and no foul smell is emitted, it means rotting of garbage is complete and compost is ready to use.

4. Answer: The garbage containing plant and animal wastes, waste food, when left as such in pits or heaps is acted upon by bacteria, fungus-like organisms causing rotting. Rotting leads to the formation of manure. It is conversion of complex molecules into simple molecules which can be used by plants for growth and development. Thus, rotting and conversion of some organic materials into manure is called composting.
5. Answer: Burning of dried leaves, husk and other plant parts produces smoke and gases that are harmful to our health. Dried leaves, husk and other plant parts can be used for preparing compost.
6. Answer: The waste products produced from an industry are:
 - Chemicals
 - Smoke
 - Ash
 - Empty containers such as glass bottles, plastic articles, wrappers.
 - Plastic bags
 - Broken things, iron or other metals

7. Answer:

(i) Garbage will rot and bad smell will spread all around the surroundings.

(ii) Garbage will become breeding spot for flies, mosquitoes and other disease-causing small

organisms.

(iii) Due to flies, mosquitoes and other organisms many diseases will spread in the community.

(iv) Rotting garbage may cause air pollution and spread of respiratory disease such as breathing problems.



8. Answer:

- Empty bottles
- Syringe
- Needles
- Ampute
- Used cotton
- Injection bottles
- Used bandages
- Pieces of plaster
- Tablet wrapper
- Empty paper boxes
- Polythene bags
- Left over food items
- Peels of fruits and vegetables.

Long Answer:

1. Answer:

Biodegradable wastes:

- (i) Paper container
- (ii) Chalk boxes
- (iii) Pencil scraps
- (iv) Faeces and urine
- (v) Loose and tom waste paper of exercise notebooks and diaries
- (vi) Dropout leaves and twigs
- (vii) Fruit peels and flower wastes

Non-biodegradable wastes:

- (i) Broken glass wares
- (ii) Plastic and geometrical instruments
- (iii) Plastic and polythene containers

(iv) Wrappers of toffee, aluminium foil

(v) Broken iron wire pieces

Disposal of Wastes:

Biodegradable garbage can be put in a pit made in one corner of the school compound. Cover the garbage with soil, spray some quantity of water. When this pit is full of degradable items cover it with a mixture of dung and clay for a few weeks.

After a few weeks when an odour stops coming out from the pit. It indicates that all the degradable material has been converted into compost manure.

The non-biodegradable garbage can be sold to Kabari or can be dumped in a landfill.

2. Answer: Uses of plastic are as follows:

(i) Plastic container can be used to store edible goods.

(ii) Goods packed in plastic pack can be taken anywhere easily and are water proof.

(iii) Plastic containers or articles are good-looking, light in weight, cheap and durable.

(iv) Plastic containers such as bottles can be used to store chemicals. No chemical effects on it.

(v) Plastic can be recycled.

3. Answer: Demerits of plastic are as follows:

(i) Plastics give out harmful gases upon heating or burning. These gases may cause many health problems, including cancer in humans.

(ii) Some people often fill garbage in plastic bags and throw it away in open. When stray animals look for food in these bags, they swallow plastic bags along with food. Sometimes, they die due to this.

(iii) The plastic bags thrown away carelessly on roads and other places get into drains and the sewer system.

These plastic bags choke the drains. As a result dirty water spills on road. It causes spread of bad smell and diseases.

4. Answer: I will suggest the member of my locality to use biodegradable waste in preparing compost.

To take people in confidence, you should make efforts to show the path for preparing compost:

(i) You should select a corner of your locality.

(ii) Dig a pit at open place and ask all the residents to throw their kitchen waste in this pit. Cover the biodegradables in the pit with layers of soil.

(iii) Cover the pit with the mixture of soil and dung.

(iv) After 5-6 weeks, open the pit and show it to the resident of your colony. Also explain that their disposed off material has converted into compost manure.



(v) You can convince RWA (Resident Welfare Associations) to use this manure for colony parks and also in plant pots kept in individual houses for, beautification.

5. Answer:

(i) Sometimes the plastic bags may not be suitable for keeping eatables. Consuming food packed in such plastic bags could be harmful to our health.

(ii) Many a time shopkeepers use plastic bags that have been used earlier for other purpose.

(iii) Sometimes bags collected by rag pickers are also used after washing them. Use of such recycled plastic bags to keep food items could be harmful for our health. So, shopkeepers can be stressed upon the use of plastic bags approved by the authorities.

6. Answer:

(i) Dig a pit about 30 cm deep or select a wooden box.

(ii) Spread a net or chicken mesh at the bottom .of pit or box. You can also spread 1 to 2 cm thick layer of sand.

(iii) Spread some vegetable wastes including peels of fruits over the sand layer. You can use green leaves, husk or pieces of newspaper, dried stalks of plants and dried animal dung.

(iv) Sprinkle some water to make the layer wet. Do not

(a) Use excess of water

(b) Press layer of leaves or waste so that it has sufficient air and moisture,

(v) Now, buy some redworms and put them in the pit.

(vi) Cover them loosely with a gummy bag or an old sheet of cloth or a layer of grass.

(vii) Redworms need food. So you can provide them as food—vegetable and fruit peels, coffee and tea remains and weeds from the field or garden. Bury this food about 2-3 cm inside the pit.

(viii) Do not put salt, pickles, oil, vinegar, meat and milk preparations. This may cause growth of disease-causing organisms. Redworms do not survive in very hot or very cold surroundings.

(ix) After 3-4 weeks, put some waste food in one corner of the pit. Most of the worms will shift towards newly added food.

(x) Remove the compost from the vacated part and dry it in the sun for a few hours. The vermicompost becomes ready for use.

