

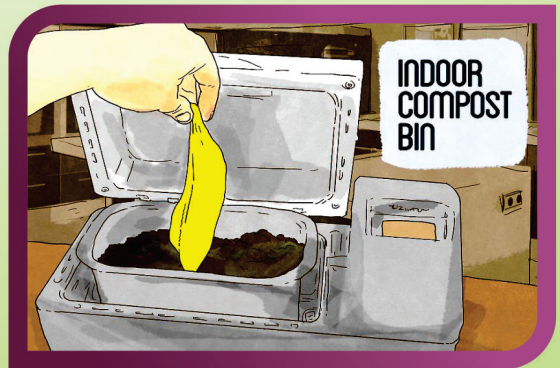


ENHANCING CIVIC  
ENGAGEMENT

# WASTE MANAGEMENT

STUDENT BOOK

Std - VI



State Council of Educational Research and Training  
Government of Goa



# Contents

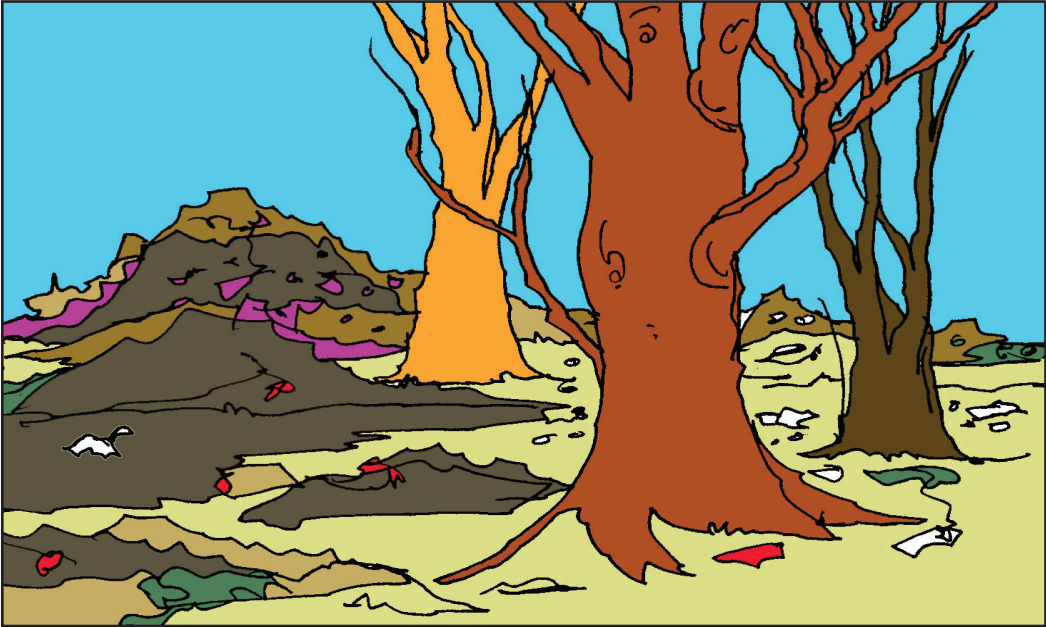
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## Note for Teacher

Subject Linkages Sheet for Waste Management Std-VI		
No.	ECE Activities	Subject Linkages Chapter Number, Name & Page No
	<b>Topic 1. Impact on environment and community</b>	<b>Science</b>
1	Lesson/Activity plan: Concept teaching - Impact on environment and community	Chapter 9 - The Living Organisms and Their Surroundings - Page - 79
2	Activity 1 - Discussion and speech	
3	Activity 2 - Posters and slogans for waste management awareness	
4	Activity 3 - "Who cares?" - Skit/Role-play	
5	Activity 4 - Chart making - Harmful effects of waste on natural resources/environment	
	<b>Topic 2. e-Waste</b>	<b>Science</b>
1	Lesson/Activity plan: Concept teaching - Impact on environment and community	Chapter 12- Electricity and Circuits- page no. 116-124
2	Activity 1- Phone recycling drive in class	
3	Activity 2 - Collage/scrapbook on e-Waste management	
4	Activity 3 - Success story and discussion	
	<b>School-level activities/events</b>	
1	Litter-free zone in school	1. Chapter - 16 - Garbage in, Garbage out 2. (To be planned in the school yearly plan as part of exposure visits/eco clubs/ science committees/value education/art & craft period/work experience period/scouts & guides, science exhibition/science experiments or on Special day like 15th August or 26th January)
2	"Joy of giving" event	
3	Jumble sale	
4	"Carry a bag, not carry bag!" campaign	
5	Observe the recyclable vs. non-recyclable waste	
	<b>Community-level projects</b>	
1	Community drive	1. Chapter - 16 - Garbage in, Garbage out 2. (To be planned in the school yearly plan as part of exposure visits/eco clubs/science committees/value education/art & craft period/ work experience period/scouts & guides, science exhibition/science experiments or on Special day like 15th August or 26th January)
2	Signature campaign	
3	Guest speaker	

# Topic 1 - Impact of waste on the environment and community

- 1.1 Harmful effects of waste on the environment, health and economy
- 1.2 Waste management practices of community



## 1.1 Harmful effects of waste on the environment, health and economy

Hazardous wastes are materials considered harmful or potentially harmful to human health and the environment. Hazardous wastes are poisonous, flammable, or corrosive, or they react with other substances in a dangerous way.

### 1. Effects on the environment

- a) **Surface water contamination:** Waste that ends up in water bodies causes water pollution. Such polluted water causes harm to the plants and animals that consume it.
- b) **Ocean pollution and contamination:** Beaches littered with plastic waste is not a rare scene these days. Besides the large chunk of industrial waste, plastic waste is a big



source of pollution too as it slowly leads to adverse effects. Materials like plastic are non-biodegradable which means they cannot be absorbed back into the environment/decomposed. When sea creatures or birds consume plastic unknowingly, they choke on it and die. This causes a steady decline in their population.

- c) **Soil contamination:** Hazardous chemicals that get into the soil can harm the plants that grow in it. If humans eat plants and animals that have come into contact with such polluted soil, there can be a negative impact on their health.
- d) **Land and air pollution:** Bad waste management practices can result in land and air pollution. Both of these can cause respiratory problems and other adverse health effects as they release harmful gases. These contaminants enter our body through lungs.
- e) **Leachate:** Leachate is the liquid that drains or 'leaches' from a landfill. It forms a very harmful mixture of chemicals that can enter the surface water, groundwater or soil.
- f) **Impact on forests:** Waste dumping can adversely affect many native species of plants and animals. If animals consume waste from these dump sites near forests, it can cause serious health problems in them and even death. The toxins from waste can leach into the surroundings, killing plants and destroying the food source of local animals. Since plants and animals form a part of the food chain, humans, especially the tribal population living in the forest, can be harmed when they consume these plants and animals.

## 2. Economic effects

- a) **Municipal well-being:** Everyone wants to live in and visit places that are clean, fresh and healthy. A smelly city with poor sanitation and waste matter littered all over the place does not attract people, investors and tourists. Such cities tend to have poor living standards. If villages and cities are





kept clean, people will not fall sick too often and plants and animals will also be healthy.

- b) Recycling revenue:** Cities that do not invest in recycling and proper waste control miss out on the revenue from recycling. They also miss out on the job and business opportunities that come with recycling and composting.

### 3. Health hazards



- a) The municipal workers are the most affected people by the occupational danger (hazard) of waste handling; they suffer from illnesses like eye problems, respiratory problems, gastric troubles and skin problems.
- b) The waste collectors also suffer from various health problems like respiratory problems, headache, diarrhoea, fever, cold and cough as they are directly in contact with contaminated materials and inhale toxic particles or touch such materials.



- c) Lack of solid waste management and improper disposal techniques can cause various diseases (and even death) in animals, especially cows and stray dogs and even birds, who rummage through the waste for food.
- d) Consumption of waste food affects the quality and quantity of the milk produced by milch animals.
- e) Due to uncollected waste and improper disposal techniques, drains get clogged which leads to mosquitoes and mosquito-borne diseases like malaria, chikungunya, viral fever, dengue, etc. This adversely affects the health of people.

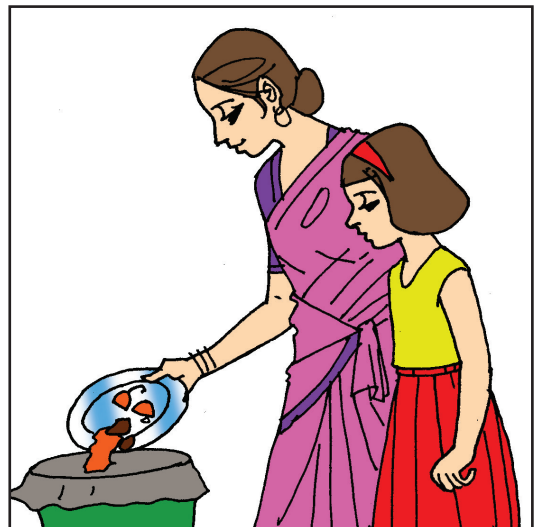
## 1.2 Waste management practices of community

Reducing waste is the responsibility of each one of us and it will help make a difference in our environment every day. Whether you are at home, on the go, in school or public places, there are many opportunities to go green by reducing, reusing and recycling (using the 3 'R's). Community attitude also plays a very important role in decisions about waste management.

Citizens in every community can do many activities together and reduce waste. Each of us can make a difference by reducing, reusing, and recycling materials in our community, and encourage our neighbours to do the same.

These simple steps can help:

1. Donating used (but still functioning) electronics like computers, radios, televisions, phones, etc. as their reuse extends the lives of valuable products and keeps them out of the waste stream for a longer period of time.



2. Before replacing a computer that no longer fits your needs, consider enhancing the computer's capacity by upgrading the hard drive or memory. This can save you money too.
3. On Earth Day, April 22, show your commitment to a clean environment by volunteering for a cleanup effort in your community.
4. Organise a recycling drive in your neighbourhood or school. Collect bottles, glass, plastic, newspapers or books and take them to your local recycling centre or a charity in need.
5. Set up a composting programme for your neighbourhood or school. It only takes a small amount of land space to turn organic waste into a compost pile.
6. People should form the habit of segregating waste at source in their own houses and deposit such waste into the municipal system only. Domestic waste should not be thrown in the neighbourhood, on the streets, roadside open spaces, vacant lands, drains or water bodies.
7. The community should find ways and means to cut down on or reduce domestic waste.
8. At an individual level, people should try to dispose of domestic waste by digging pits in their yards, putting biodegradable waste into a pit, and shielding it from rain water. This can be used as compost/manure.
9. People should use things for a long time and not just use and throw them.





## Worksheets and Handouts

- 1.1 Harmful effects of waste on the environment, health and economy
- 1.2 Waste management practices of community

### Record sheet: Activity 1 - Discussion and speech

Write a short paragraph on “Harmful effects of poor waste management” -


What can you do about it? What is your responsibility?




## Record sheet: Activity 3 - “Who cares?” - Skit/Role-play

Prepare a short play in groups depicting the waste disposal problem of your area and write the script here:



## Worksheet 1 - Write a letter to your Principal

Assume there is a huge dump yard on your way to school, creating lots of problems. Write a letter to your school Principal about the waste dump and its harmful effects on the surroundings. Ask for his/her support to talk to local authorities and resolve the problem.

Date: .....

Respected Ma'am/Sir,

Subject - .....

.....

.....

.....

.....

.....

.....

.....

.....

Yours sincerely,

Name of the student .....

Student of class .....



## Worksheet 2 - Word search: Environment

Search the given words in the word puzzle and make one sentence each related to waste management.

### Word Search



RUBBISH    POLLUTION    WASTE    PLANET  
 CANS    BOTTLES    PAPER    SMOKE  
 REPAIR    REUSE    RECYCLE    TRAFFIC  
 ENVIRONMENT

1. Environment - .....
2. Recycle - .....
3. Paper - .....
4. Reuse - .....
5. Pollution - .....
6. Waste - .....



## Topic 2 - e-Waste

- 2.1 Meaning and categories of e-Waste
- 2.2 Sources of e-Waste
- 2.3 Hazardous effects on the environment
- 2.4 e-Waste management

### 2.1 Meaning and categories of e-Waste

Electronic waste, or e-Waste, is a term for electronic products that are unwanted, non-working or obsolete/outdated, and have essentially reached the end of their useful life.

We are living in a world where the electronic gadget you buy today is deemed obsolete/out of fashion/outdated in less than a year and you feel compelled to replace it by another with more “advanced” capabilities.

Smartphone makers, for example, launch a new model every year with new features.



#### Categories of e-Waste -

1. Large household appliances	2. Small household appliances
3. IT & telecommunication equipment	4. Consumer equipment
5. Lighting equipment	6. Electrical and electronic tools
7. Toys and sports equipment	8. Medical devices
9. Monitoring and control instruments	10. Automatic dispensers





## 2.2 Sources of e-Waste

Home	Hospitals	Government	Private sectors (Restaurants, industries)
PC and laptop	PC and laptop	PC and laptop	PC and laptop
Television and radio	Monitors	CPU	Boilers
Cell phone	ECG device	FAX machine	Mixer
Washing machine	Microscope	Photocopy machine	Signal generator
Microwave oven	Incubator	Scanner	Incubator
CD player		Fan	
Fan		Tubelight	
Electric iron		Air conditioner	

### How do things become e-Waste?

Reasons:

1. Advancement in technology
2. Changes in style, fashion and status
3. Nearing the end of their useful life
4. Not taking precautions while handling electronic items



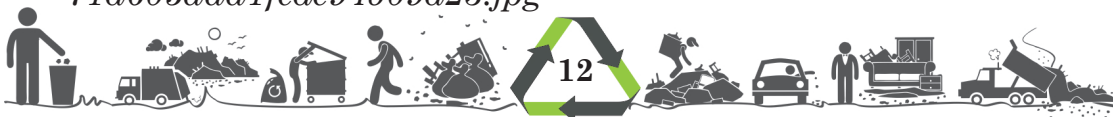
## 2.3 Hazardous effects on the environment

The exact effects of improper disposal of e-Waste on the environment are little known. Nonetheless, e-Waste poses very real threats and dangers to the global environment at large. It results in air, water and soil pollution. e-Waste contains heavy metals which, if not disposed of properly, can mix with soil, meet the water bodies or, if incinerated, generate hazardous gases which impact the health of humans and animals.



Picture courtesy:

1. <https://i.pinimg.com/736x/c5/53/0a/5530a539ae9a8205a485c9ae95e1aeb--e-waste-recycling-maxine.jpg>
2. <http://thetechnologicalcitizen.com/wp-content/uploads/2010/04/roadside-e-waste-dump-in-lagos-nigeria-basel-action-network-sml.jpg>
3. <https://i.pinimg.com/originals/d4/bf/1d/4bf1de7cf71a605ddd1fcac94b09a23.jpg>



## 2.4 e-Waste management

### Effective e-Waste management practices

1. Donating electronics for reuse extends the lives of valuable products and minimises waste. But care should be taken while donating such items, i.e., the items should be in working condition.
2. Reuse, in addition to being an environmentally preferable alternative, also benefits society.
3. e-Waste should never be disposed of with other household wastes. It should be segregated and sold or donated to various organisations.
4. While buying electronic products, opt for those that:
  - a. Are made with fewer toxic constituents
  - b. Use recycled content
  - c. Are energy efficient
  - d. Are designed for easy upgrading or disassembly
  - e. Utilise minimal packaging
  - f. Offer leasing or take-back options
  - g. Have been certified by regulatory authorities
5. Customers should opt to upgrade their computers or other electronic items to the latest versions rather than buying new ones.




# Worksheets and Handouts

- 2.1 Meaning and categories of e-Waste
- 2.2 Sources of e-Waste
- 2.3 Hazardous effects on the environment
- 2.4 e-Waste management

## Handout 1 - e-Waste

India is generating e-Waste at an alarming speed and the measures to keep a check on it are limited



Source: <https://economictimes.indiatimes.com/img/51538634/Master.jpg>





## Handout 2 - e-Waste disposal methods



# Harmful e-Waste Disposal Methods

What do I do with the empties?

Individuals and industries use three common methods for disposing of e-Waste, but these are harmful to the environment and the health of human beings, plants and animals.



- **Open Dumping:**

Waste is dumped along shorelines, thrown in dump yards or strewn on the roadside. This is the most common disposal method that causes land, air and water pollution.

- **Land Filling:**

Waste is buried in a landfill. This method pollutes the land and water surrounding the landfill. It could also cause a fatal accident due to the production of methane gas.

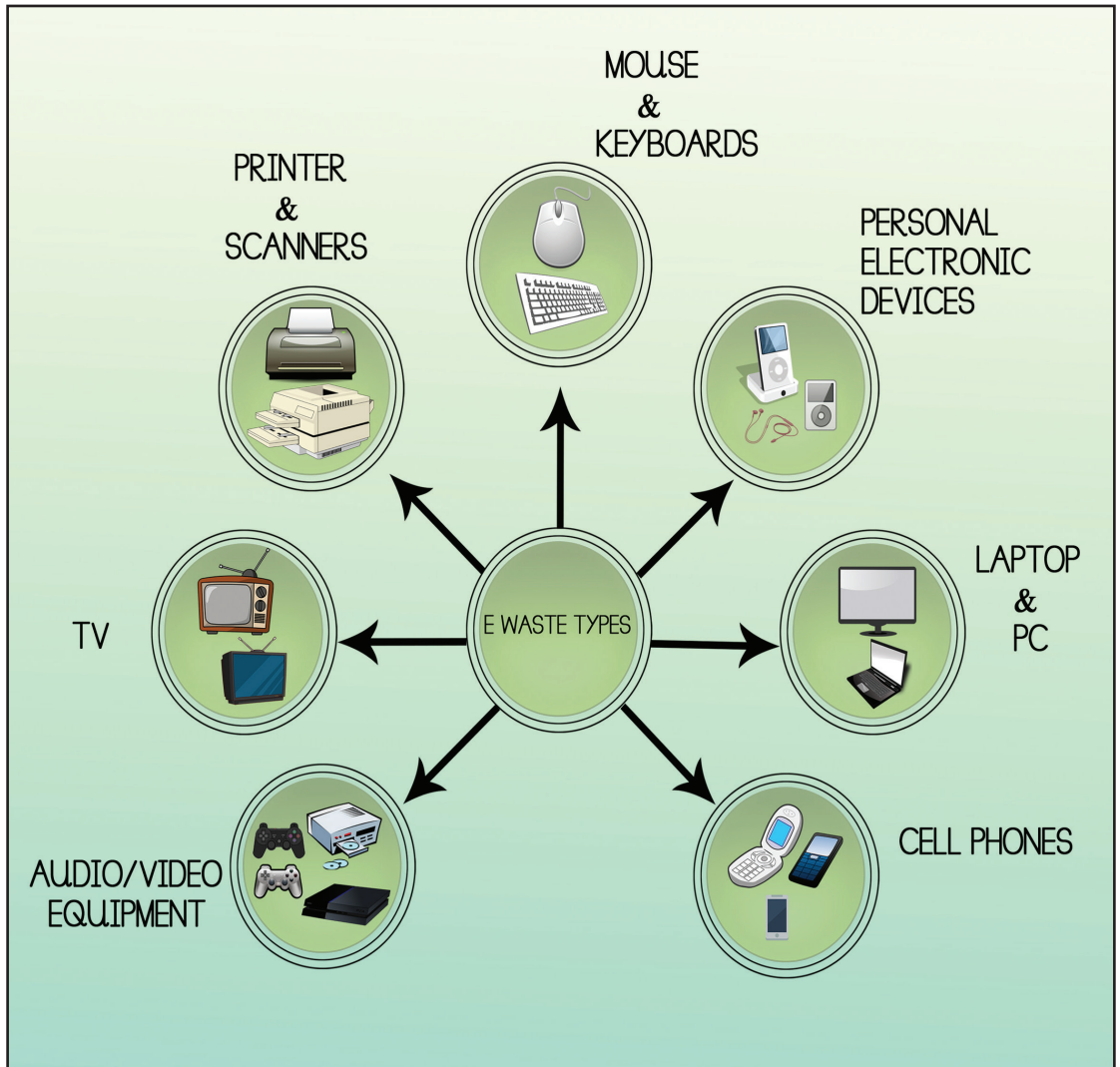
- **Incineration:**

Waste is burnt at high-temperatures, leading to the combustion of its constituents, and resulting in ash, gas and heat. If untreated, these by-products can pollute the atmosphere.





## Handout 3 - e-Waste types



## Handout 4 - e-Waste collection centres in Goa

### List of e-Waste Collection Centres in Goa

The collection centres are organised by a number of individuals and NGOs working together for the cause.

e-Waste such as computers, laptops, printers, mobile phones, PCB and other electronic waste will be accepted at one of the below-mentioned collection centres in Goa.

**1) Saligao - Head office**

Group Tenplus, Abreo Vaddo,  
Saligao, Bardez, Goa.  
**Ph: 9373521448,**  
**9823118321**

**5) Calangute**

Jubin Dhime, Near  
Vrundawan Hospital, Naika  
Vaddo, Calangute, Bardez,  
Goa 403516.  
**Ph: 9763216533**

**2) Bicholim**

Devine Computers,  
Opp. Municipality,  
Shetye Resicom, Bicholim.  
Contact person: Johnson -  
**Ph: 9422448900**

**6) Mapusa**

Artspace, Gr. Floor, Hotel  
Shradha, Nr. Xavier's  
College, Mapusa.  
**Ph: 9326111333**

**3) Benaulim**

Vrecycle waste management  
Services. Shalom 201/1 River  
sal Estate, Pul Vaddo,  
Benaulim Goa.  
Contact person: Clinton Vaz.  
**Ph: 9890936828**

**7) Mapusa**

BYTZ shop no g1, Aarkay  
pearl bldg. nr. Yamaha  
showroom dealer, Mapusa  
Contact person: Allwin -  
**Ph: 0832-2264195 /**  
**9822175989**

**4) Margao**

Vrecycle waste management  
Services. Plot no 135, Margao  
Industrial estate, Opp APC  
Siemens factory, Margao.  
**Ph: 9890936828**

**8) Cuncolim**

Lorna Fernandes (goacan)  
**Ph: 9011864429**  
**E-mail:**  
**cuncolimconsumerforum@**  
**gmail.com**



## Record sheet - Activity 3 - Success story and discussion

Write a short paragraph on Nishant's story here -



Four horizontal lines for writing a paragraph, each consisting of a solid top line and a dotted bottom line.

Message/Key learning from the story -

Four horizontal lines for writing a message or key learning, each consisting of a solid top line and a dotted bottom line.



## Worksheet 1 - e-Waste

Q: How many computers, mobiles and other electronic devices do you have at home?

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Q: What electronic devices do you find essential in your life?

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Q: How long do you usually keep electronic devices including computers and mobiles?

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Q: How do your parents dispose of obsolete/non-working electronic devices?

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Q: What are the harmful effects of poor disposal of computers, mobiles and other electronic devices?

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Q: In your opinion, what should we do with old mobiles when we purchase new ones?

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## Worksheet 2 - Letter to Gram Panchayat

Write a letter to the Gram Panchayat to set up an e-Waste collection centre in your village by briefing him/her about the problem of e-Waste in your village.

Date - .....

To,  
Shri/Smt .....

Gram Sarpanch, ..... Village,

.....

**Subject - Setting up an e-Waste collection centre in our village**

Dear Sir/Madam,

.....

.....

.....

.....

.....

.....

Thanking you,

Your faithful citizen

.....

Name and address

.....

.....

