Basic Education Level

Waste Awareness Teachers Handbook

Gulf of Mottama Project

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HELVETAS MYANMAR

Network Activities Group

IUCN

About Project Organizers

The Basic Education Waste Awareness Teachers Handbook was created by student organizers who attended the 2020 academic year of Wide Horizons Organizational Development Program. This tool kit was prepared with financial support from the Gulf of Mottama Project

Wide Horizons Organizational Development Program opened in Mae Sot, Thailand in 2006. In 2017, Wide Horizons moved to Mawlamyine in Myanmar. This program's goal is to build the capacity of youth within Myanmar and the Thailand Myanmar border to become agents of positive change for their organizations and communities.

The program lasts for two years: the first year is an academic year where the students earn about Community Development, English, and Computer. In this first year, they also implement projects in community to gain experience of the project cycle. In the second year, the students return to their host organizations and complete a work placement year.

Waste Campaign project is organized by student organizers who come from different organizations and regions across Myanmar:

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Table of Contents

Acknowledgement

This waste management curriculum is supported by the Gulf of Mottama Project (GoMP). Our goal was to understand the waste management situation in schools in Gulf of Mottama region and produce a toolkit to help teachers educate the youth on waste management issues and solutions.

We would like to acknowledge the Gulf of Mottama Project (GoMP) for financial support to do research about waste and to create book. Many individuals and groups actively participated in the research for the waste management book. We would like to acknowledge the support of the people who had been actively involved for this waste management book, which more specifically were Assistant of Education Minister who give permission to do research about waste from Chaungzon.

Wide Horizons student organizers conducted interviews with the headmaster/ headmistress of each school focusing on the strengths and weakness of the current waste management system in their school. Also, there were interviews with the school committee members about the situation of the community and school in July and August 2020. We would like to thank those headmaster/ headmistress, teachers and students who were from Muritkalay High school, Kwan Lar Middle school and Se Pa La primary school for giving chance to do research in their school and participating for interview, focus group discussion.

Thant Myanmar Organization advised the writers and designed supplementary activities with the support of ToT training. WH students would like to thank those people who were participated during two days training. On the first day, 14 teachers (2 Male and 12 Female) from Kwan Lar secondary school were participated over Zoom. On the second day, 8 participants from Se Pa La primary school and 10 participants from Muritkalay high school attended the training. The ToT training demonstrated inclusive community campaign/lesson activity, discussions, and question answer sessions.

In 2021, WH students did a pilot training to develop waste management book to gather participant's feedback from Darah Learning Center. We also acknowledge the participation of the Darah Learning center's Headmaster, Teachers and students. Besides, Thant Naing who is a curriculum development trainer, Andrea Jones, Grey Tyrosvoutis and teachers from Wide Horizons for providing feedback to help develop this toolkit book.

How to use this book?

This Basic Education Waste Awareness Teachers Handbook is written to assist teachers in middle and high schools to teach waste management issues to their students. Environmental pollution is one of the biggest issues facing the world today as garbage causes major damage to peoples' health, water, air and soil. It is vital that waste management should be studied in schools and good waste management practices are taught. We need to start systematically sorting and disposing our waste to help restore the environment. It is essential that environmental issues are taught to children and it is at the foundation of their learning.

The purpose of this book is to share the impact of plastic waste that we face in daily life and show waste management practices that we can use in our daily lives. It hopes to increase our appreciation of the environment and to raise the standard of living in our communities.

This book provides the basic knowledge about the garbage. It was written after the student organizers did a needs assessment at three schools in Chaung zone Township, Se pa lar, Kwan lar, Muritkalay. The student organizers also collected information from journals/bulletins compiled by Pyo Khin Thar, Thant Myanmar and Helvetas Myanmar. Some pictures/images in this book have been downloaded from internet.

Waste awareness book is written in five chapters, covering seven basic topics that you should know about garbage.

Chapter (1) Systematic sorting and disposal of waste

Chapter (2) Disadvantages of undisciplined dumping

Chapter (3) Reducing and rejecting plastic waste

Chapter (4) Recycling and Innovating the Garbage

Chapter (5) Making natural waste into compost

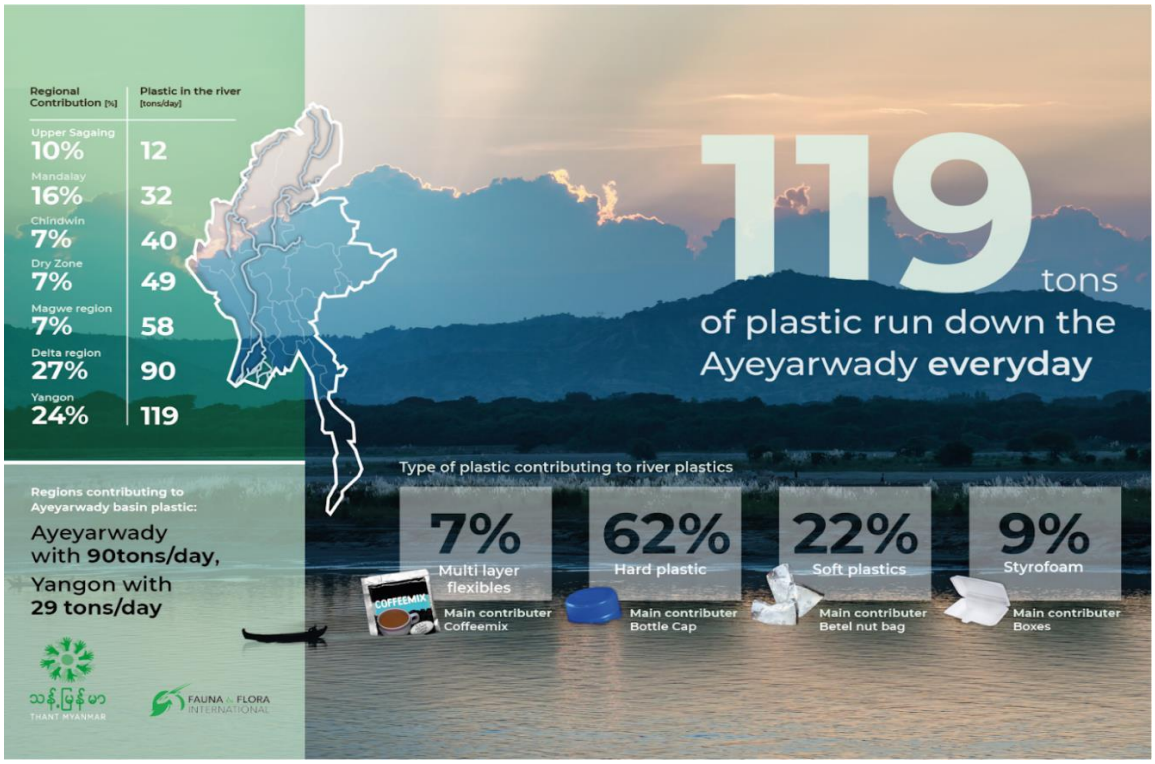
The methodology is designed to be interactive. While teaching the topics, the teachers should discuss with the students, asking open-ended questions, showing ideas visually and spending time practicing the techniques. Questions are written from easy to difficult and can be used to test the students' knowledge. This book is designed to make teaching waste management easier and provide materials to assist the learning process. Some lessons come with a sample dialogue to make it easier for teachers to teach students, however teachers should feel free to adapt the conversation and interact with the students naturally. This book contains illustrations to support the content of textbook, and songs and poems to be sung with the children.

Each chapter has detailed explanation with examples, so the teachers need to follow the instructions of each chapter. However, the teachers can give different examples related to the topic and adapt the lesson plans to make the suitable for their students. Moreover, every chapter has activities our games for each lesson to assess students' understanding; the teachers also can create some role play or performance for each lesson to teach each lesson effectively. The teachers are encouraged to use both pictures and real object or materials such as rice bags, plastic bottle, or coffee packs. However, the teachers should not use any materials that can create more plastic waste.

In addition, after teachers teaching every single lesson, an assessment should be done by the teachers so that the teachers can know whether the results meet the lesson objectives given at the beginning of every lesson. Most importantly, if the learning outcome and assessment outcome are not the same, the teachers should not teach a new chapter. Finally, chapter five should be a practical

lesson that requires real composting activities so need to do a practical activity; then, if teachers are able can show with video by using phone to all students to get more ideas.

Amount of waste generated in Myanmar



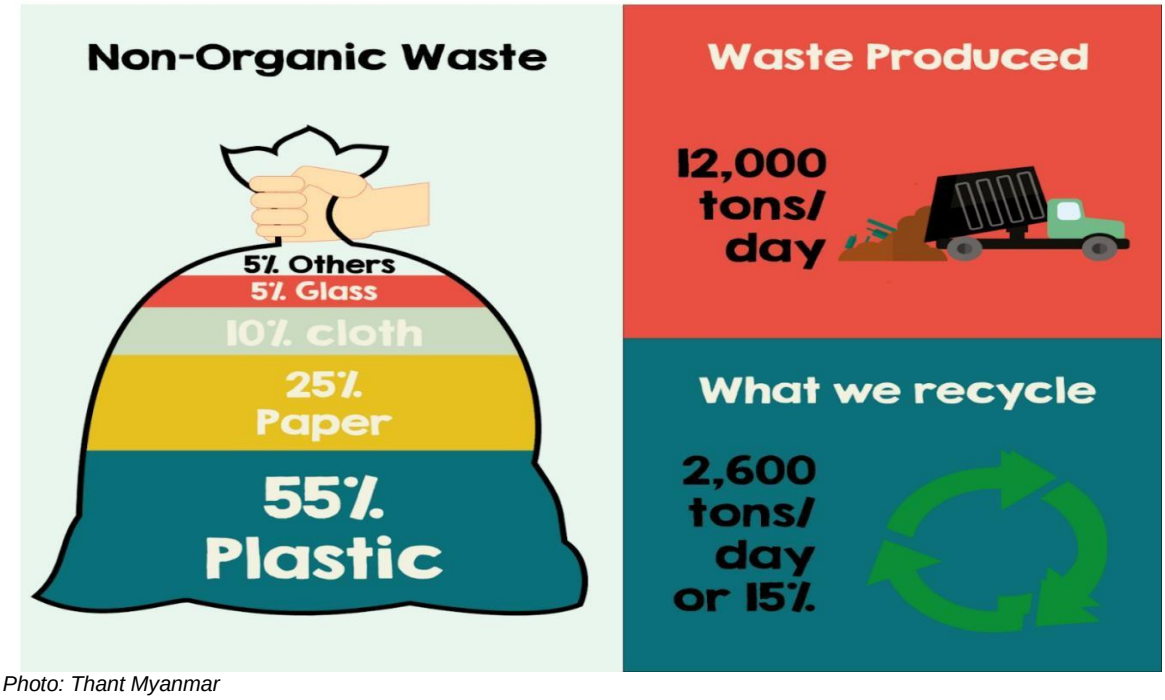


Photo: Thant Myanmar

အရေးကြီးဆုံးအချက်ကတော့ လူတိုင်းလူတိုင်းဟာ

မိမိကြောင့် သူများတွေ အနှောင့်အယှက်မဖြစ်စေရဘူး၊

မိမိအမှိုက်ကြောင့်သူတစ်ပါးစိတ်မညစ်စေရဘူး၊

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မိမိပစ်လိုက်သောအမှိုက်တစ်စကြောင့်၊

မိမိထွေးလိုက်တဲ့ကွမ်းတံတွေးတစ်ကွက်ကြောင့်

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အမှိုက်ထွက်ရှိမှုစစ်တမ်း

ရန်ကုန်မြို့(၂၀၁၄)

လူဦးရေ-၇သန်း ၃ သိန်းကျော်

အမှိုက်ထွက်ရှိမှု ပိသာချိန်၁ သန်း ၅ သိန်းကျည်

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(အမှိုက်တစ်တန်= ၆၂၂ ပိသာ)

လူ ၁ ယောက် - ၃၀ ကျပ်သားနီးပါး (0.41 kg)

Source: YCDC, 2014

Photo: ဟိုးခင်းသာ

Chapter (1)

Sorting and disposal of waste

1.1 Classification of waste

1.	Topic	How to segregate waste.
2.	Learning Outcome	Students will know how to segregate waste and type of waste.
3.	Time frame	4 hours
4.	Teaching Methods	Brainstorming Visual instruction Group Discussion Practical Demonstration Sing and dance the song concerning to garbage Practice segregation waste by going to community or school compound
5.	Teaching Materials	Pen, Marker and books Pictures/ Flipchart and A4 paper Two rubbish bins for game activity Four rubbish bins for picking up waste in reality. Cardboard

Brainstorming

Asking question to students or divide students (3 or 4 group) for group discussion by using flipchart. (15 Minutes)

1. What kinds of things does it make your environment pollution?
2. What is garbage? Who throws it?
3. How do you dispose of waste? Where does the waste go?
4. Do you know how to segregate waste?
5. Why must waste be separated?

Explanation

Waste is unwanted and unusable materials. Waste can also be classified as biodegradable and non-biodegradable.

Brainstorming

Asking question by following question to all students

- What is biodegradable and non-biodegradable?

Biodegradable

Biodegradable means that an item can be disintegrate into its base elements by bacteria, fungi, or some other biological process. Biodegradation is just the process of nature breaking down materials into their component parts. (Krosofsky, 2020)

Non- biodegradable

Non-Biodegradable can be defined as a kind of substance which cannot be broken down by natural organisms and acts as a source of pollution. Non-biodegradable wastes are those who cannot be decomposed or dissolved by natural agents. They remain on earth for thousands of years without any degradation.

During teaching lesson, teachers ask and discuss questions with the students, and divide students (3 or 4 group) for making group discussion by drawing follow table on flipchart based on following question. (15 minutes)

Which types of waste is biodegradable or non-biodegradable?

Biodegradable	Non-biodegradable
?	?

Types of biodegradable waste

There are three types of biodegradable waste in our daily life. They are leftover food waste, kitchen waste and garden waste.

Leftover food waste (i.e., leftover rice and curry) and kitchen waste (i.e., the stems of roselle, garlic/onion peel, dried flowers left at the Buddha image/shrine, the stems of water spinach), and waste materials from home/school grounds (e.g., dry leaves, branches, twigs, paper) are biodegradable waste. Also, most of paper are biodegradable it is made from wood, especially soft paper (i.e., newspaper, office paper, colored paper, magazines, catalogues. (Footprint, 2020). Biodegradable materials can be waste from the yards can be composted and used as fertilizer for plant seedlings. In addition, the leftover food waste can be fed to animals (i.e., dogs, cats, pigs, chickens and birds), composted or replanted.

Types of non-biodegradable waste

Non-biodegradable waste is plastic waste, cloths, metal, glass etc... The various types of plastic waste left from the home/school environment (e.g., plastic bag, pen, correction pen, Styrofoam box, plastic cans, pipe, snack bags, cover of ballpoint pen, etc.) is called non-biodegradable waste. By the way, paper that has been waxed is non-biodegradable. (Ecogradable, 2020) The plastic waste produced at home can be reused many times but you should clean it before reusing.

Biodegradable waste materials

Scraps _ Photo© Khin Aye / Wide Horizons

Animal can be fed on scraps _Photo© Khin Aye / Wide Horizons

Kitchen waste _ Photo© Khin Aye / Wide Horizons

Waste from the yard _ Photo© Khin Aye / Wide Horizons

Biodegradable waste turns into compost _ Photo© Bochashi Myanmar 2021

Non- biodegradable waste materials

Plastic Trash _ Photo© Khin Aye / Wide Horizons

Sing and dance the following song together with students with actions.

Sorting and Disposal of Waste Game

1.	Teaching materials	(2) or (3) Rubbish bins, image card of biodegradable and non-biodegradable or take game materials around school compound
2.	Time needed	20 minutes
3.	Participants(students)	Divide 2 groups

In this game students distinguish between biodegradable and non-biodegradable waste materials. Students can also distinguish between waste material that can be sold from non-returnable waste items, or recyclable and non-recyclable materials.

The students can also play with activity cards (or) waste materials they found for within school compound

How to play the game step by step

- Firstly, place two rubbish bins or two containers and label the bins as biodegradable and non-biodegradable waste material.
- Give the students a pile of activity cards or take biodegradable and non-biodegradable waste material that related to students' school compound.
- Ask the students to divide the types of waste into biodegradable and nonbiodegradable
- Tell the students to put biodegradable into one rubbish bin and nonbiodegradable waste material into the other bin.
- During the activity, the students do not have to explain why.
- After that, the teacher checks pictures in the container to see if they are correct or incorrect.
- Then teachers should explain the pictures that are correct and the pictures that are in the incorrect bin to the students.
- Sort the pictures and put them back into the correct container.

Brainstorming

Divide students (3 or 4 group) for group discussion by using flipchart based on following question. (15 Minutes)

Describe everything that you know about the disadvantage of littering.

1.2 Systematic sorting and disposal of plastic waste

The non-biodegradable plastic waste should be dumped in a systematic manner. For the non-biodegradable can be segregated for 3 bins. The reusable empty-bottles, purified drinking water bottles, plastic cans, metal cans, soft drink cans should put in one bin. And then plastic bag, snack packets, the disposal Styrofoam box and disposable cups should be properly sorted and put in another bin. In addition, glass also should put in another bins.

If you do not have enough rubbish bins, you can use cloth sacks or rice sack as rubbish bins.

How to choose a rubbish bin?

- Should be readily available locally.
- Should be easy to replace.
- Should be cheaper.
- Should have a water outlet. There should be no plastic bag in the rubbish bin.
- Do not use containers that are damaged by the harmful effects of the sun.
- Local resources can be used such as Bamboo basket, fishing net, old sack of rice (or) sack of onion (mesh)
- By the way, bags should be hung to prevent termites and dogs getting into the rubbish, and Iron hooks require to attach or hold sack of rice or fishing nets.





The various types of waste bins that can be used for sorting and separating waste _ Photo© Thant Myanmar

1.3 Benefits of sorting and disposing of waste separately

Sorting and disposing of waste has many benefits for human beings and it also has many benefits for their environment. There are many benefits to sorting your waste such as reducing environmental pollution, reducing odor, being able to sell empty-bottles, being able to reuse items, learning to manage environmental pollution, incinerating is quicker and easier and reducing air pollution.

Incinerating a mixture of wet garbage and dry garbage without sorting the waste materials causes prolonged exposure of smoke. The added moisture can increase air pollution, increasing more toxic chemicals into the environment and generates a foul odor. In addition, by mixing wet and dry waste, it can cause a lot of mosquitoes and flies as the biodegradable waste takes longer to breakdown. Therefore, sorting and separating waste reduces our environmental pollution but also raises living standard.

Installing Bins for Segregation

Go and practice by picking up waste around school compound or community village.

Materials needs: Three bins for segregation waste (first bin for Plastic, second bin for cans and third bin for glass)

Progress Check

Give the following table to each student by choosing correct answer and select the following words, after ticking the box below what kind of waste they are and answer.

Leftover rice, Torn shoe/slipper, leftover curry, banana peel, plastic bag, dry leave, empty-can, empty-can of soft drink, twig, paper, sack of bread, stem of roselle, garlic/onion peel, flower wither left at Buddha image/shrine, disposable Styrofoam box, stem of water spinach, disposable cup, tree branch.

No.	Type	Biodegradable			Non-biodegradable waste
		Leftover food waste	Kitchen waste	Garden waste	Plastic waste
1	Leftover rice	✓			
2	Torn shoe/slipper				
3	Leftover curry				
4	Banana peel				
5	Plastic bag				

6	Dry leave				
7	Empty-can				
8	Empty-can of soft drink				
9	Twig				
10	Paper				
11	Sack of bread				
12	Stem of roselle				
13	Garlic/onion peel				
14	Flower wither left at Buddha image/shrine,				
15	Disposable Styrofoam box				
16	Stem of water spinach				
17	Disposable cup,				
18	Tree branch				

Discussion of progress through group discussion

Question Discussion Time (20 minutes)

Divide up the students into groups and give each group some paper so that it can take notes.

Ask them to discuss the following questions and share them as a group to the rest of the class.

Note: This question is a test of progress and a pre-assessment for the next lesson.

1. What are the consequences of mixing different types of waste?
2. What is the best way to solve problems caused by waste?
3. How can increasing waste affect the socio-economic situation? Why?
4. How can increasing use of plastic change your environment in the next fifteen years?
5. How can waste dumped by humans affect other humans?

Chapter (2)

Waste disposal and its negative effects

How to dispose of waste and its negative effects

1	Topic	How to dispose of waste and its negative effects
2	Learning Outcome	The purpose of this lesson is to teach the students about the negative effects from burning waste, rubbish heaps, landfills and dumping waste into the water. The students will learn the disadvantages of waste after learning the lesson.
3	Teaching Time	6-hours
4	Teaching materials	Book, pencil, ballpoint pen, maker, flip chart, crayon
5	Teaching and learning methods	brainstorm, demonstration, lecture

Questions to Brainstorm

Divide 3 or 4 Groups. Distribute a flip chart and a question paper each group. Please, discuss it in group. After that, sharing it the other groups. (10- minutes)

- Where do people dispose their waste?
- How can people dispose of waste not to affect their environment?
- Is waste harmful to humans? If so, describe the consequences.

2.1 Four ways of waste disposal

People usually dispose of waste in four ways.

1) Burning Waste

2) Rubbish heaps

3) Landfills

4) Dumping Waste into the water

Those four methods can cause the unexpected and innumerable problems and risks for the natural environment (land, water and air) and all living things (animals and humans). These will be learned in the following lessons.

Burning Waste_ Photo© iStock 2019

Rubbish Heap_ Photo© dramstime 2000-2021

Landfill_ Photo© Wide Horizons 2021 students

Dumping waste in a River_ Photo© deepoceanfacts

2.2 Burning Waste

Questions to brainstorm

Divide 3 or 4 Groups. Contribute a flip chart and a question paper each group. Please, discuss it in group. After that, sharing it the other groups. (10- minutes)

1. Do you burn waste in and around your home?
2. Why do you burn waste?
3. Do you think that burning waste is good or bad? Why?
4. Where do people around you burn waste?

Burning waste_ Photo© iStock 2019

What is burning waste?

The burning of waste to reduce amount of waste and unnecessary things in our immediate environment. (Journal, 2021). There are two ways we can burn the waste which are burning with the incinerator and open burning of garbage. which is much more harmful to your health and the environment.

Disadvantages of Burning plastic waste on Health

Burning plastic waste can cause a lot of harm to us and all living things, because burning plastic waste emits toxic fumes. Inhaling the smoke from burning waste may be harmful to our health.

1. Respiratory disease
2. Cancer
3. Dizziness
4. Headache
5. Heart disease
6. Male impotence
7. Infertility in women
8. Miscarriage in women

In addition, the fumes emit highly toxic gases called dioxin. This dioxin toxic substance stays in the air for a long time and can stay in the environment for many years. Therefore, burning waste is not good for us.

Disadvantages of Burning on Environment

Burning plastic affects not only humans, but also the planet that we live in. When the plastic is burned, it produces smoke and liquid that contain many chemicals. These fumes are released into the air, and the liquid chemical seeps into the ground. The following effects can be caused for the planet:

1. Damage to soil and fertilizers
2. Dehydration
3. Damage of groundwater
4. Drying of plants
5. Climate changes
6. Formation of methane gas
7. Ozone depletion
8. Global warming
9. Air pollution

A major cause of global warming of burning waste is that, if waste is burned, cardon dioxide and carbon monoxide gas is produced. These gases gradually deplete the ozone layer and the sun's rays increasingly heat the earth. The consequences are:

- Drought
- Flood
- Melting glaciers
- Rising water level

Drought_ Photo© UNDRR 2021

Flooding_ Photo© The Indian Express 2021

Melting glacier_ Photo© New York Post 2018

Rising water level_ Photo© Yoyarlay 2021

Natural Disasters caused by Pollution

2.3 Rubbish Heaps

Question to brainstorm

Divide 3 or 4 Groups. Distribute a flip chart and a question paper each group. Please, discuss it in group. After that, sharing it the other groups. (10- minutes)

- Do you throw waste in heap on the ground around your home?
- Do you think that waste heaps are good or bad? why it is good or bad?
- What can the effects on you and the environment from rubbish heap?

Rubbish Heap_ Photo© dramstime 2000-2021

Disadvantages of rubbish heaps on the ground

Rubbish heaps have many harmful effects on living beings and the environment. Dogs, cats, chickens, pigs, cows and cattle come to the waste heaps in search of food. These animals spread the waste around the environment. In addition, waste heaps on the ground can cause a lot of harm to humans. These disadvantages are:

1. Generating the foul odors
2. Growth of bacterium
3. Diarrhea

4. Dizziness
5. Headache
6. More mosquitoes and flies
7. Environmental pollution

The bad smells, fumes, and diseases from waste dumps can infect us with various diseases through pets/animals that are bred at home.

2.4 Landfills

Questions to brainstorming

Divide 3 or 4 Groups. Contribute a flip chart and a question paper each group. Please, discuss it in group. After that, sharing it the other groups. (10- minutes)

- Do you bury waste in and around your home?
- Do you think that burying waste is good or bad? Why?

Landfill_ Photo© Wide Horizons 2021 students

What is landfill?

Landfills are locations where disposable materials are sent, which are then buried underground. During this process, precautions are taken to prevent the waste from reaching and potentially contaminating any groundwater. (Systems,2016).

Disadvantages of land filling waste

People bury the plastic in the ground when there is no place to dump it. The burying plastic waste can cause a lot of harm to the earth. Plastic is made of various chemicals and do not decompose in the soil for a long time. The disadvantages of burying plastic waste are:

1. Erosion of the soil
2. Soil Dehydration
3. Insufficient water of plants
4. Chemicals pollute water supply
5. Damage of natural resources

2.5 Dumping waste into the water

Questions to brainstorm

Divide 3 or 4 Groups. Distribute a flip chart and a question paper each group. Please, discuss it in group. After that, sharing it the other groups. (10- minutes)

- Do you throw waste into the water in and around your home?
- Do you think that dumping waste into the water is good or bad? Why?
- What kind of disadvantages by dumping rubbish in the water?

Dumping waste into the water_ Photo© condor ferries 2021

Dumping waste into the water_ Photo© deepoceanfacts

What is Dumping waste into the water?

Dumping waste into the water is throw waste into the water to disappear from our environment.

Disadvantages of dumping into the water

People throw waste not only on the ground but also into the water. Dumping plastic waste into the water pollutes the water and may cause damage to aquatic animals. Just as the waste is made of various chemicals and stays in the ground for a long time, it does not decompose for a long time in water and plastic particles causes lasting damage to the marine life. The disadvantages of dumping waste into the water are:

1. Water pollution
2. Loss of aquatic creatures' habitats
3. The aquatic species eat the waste
4. Decreased number of aquatic species
5. Decline in fisheries
6. Increase of endangered animals
7. Outbreak of diseases
8. Bad fumes

Moreover, because the aquatic animals eat the waste, and humans catch and eat the fish, the waste ends up being eaten by humans. The consequences of dumping waste into the ocean are that the number of aquatic species living in water are declining day by day and affecting fisheries.

Negative Effect: Progress Check

Coloring each color concern with under the topic. (15-minutes)

Note: Give paper for each or group. Let's paint a color.

Type of disadvantages	Burning waste	Rubbish Heaps	Landfill	Dumping waste into the water
cancer				
environmental pollution				
Pneumonia				
foul odour				
loss of fisheries				
Global warming				
Shortage of drinking water				
air pollution				
Climate changes				
loss of aquatic animals				
plants not getting enough water				
economic downturn				
drought				
groundwater pollution				
skin cancer				
blocking the river				

Assessment by group discussion (Middle and High School level)

Give paper each group to take note. Sharing a point of discussion after discussion about follow the questions) Timing for discussion – 20 minutes

Answer the following questions.

1. How do people dump waste in your environment?

2. What kind of thing are coming out if we burn the waste?

3. Write/ Describe two kinds of the disadvantages of burning the waste?

4. Why is global warming happening?

5. Describe what the disadvantages of heaping waste on the ground are.

6. By rubbish heaps, what kind of disadvantages are coming out?

7. Step by step, explain as much as you can think about why shortage of drinking water can be a problem.

8. Write down as much as you can know about the disadvantages of health due to inhaling smokes/fumes.

9. What kind of disadvantages are coming out dumping with rubbish heaps?

10. By throwing rubbish in the water, what kind of way can affect from aquatic animal to human?

Process- Painting

Students can be grouped together and give each person an A4 sheet of paper. Take a topic of your choice from “rubbish heap”, burning garbage, dumping waste into the water”. Give a prize to the best group. (15-minutes)

Chapter (3)

Refusing and reducing the use of plastic waste

Say no to plastic _ Photo © Jonathan O'Donnell,2021

3.1 Refusing the use of Plastic

1	Topic	Refusal to use plastic
2	Learning outcome	To reduce the use of plastic at home and at school To learn to refuse the use of plastic
3	Time needed	60 minutes
4	Teaching materials	Waste materials from environment (Ask children to bring materials from home)

Learning activities

Before starting the lesson, the following questions should be asked and the topics will be discussed.

1. Have you ever been market?
2. When you went market, which materials you used to put your ingredients.
3. When you go shopping, do you take a plastic bag from the store or do you refuse?

What is refuse?

Refuse is not using plastic. It simply means say no to use plastic for any reason. For example, instead of plastic bags for shopping, using reusable basket, paper bags.

Recycling Bags _ Photo © Charlieaja 2020

Why should we refuse the use of plastic?

Plastic is everywhere. It is strong, light, cheap and very versatile. The majority of plastic waste does not get reused or recycled and experts believe that 50% of plastic is single-use, meaning it is used once before being discarded. Single-use plastic includes plastic water bottles, plastic packaging, plastic grocery bags etc., the production process is a leading cause of carbon emissions contributing to global warming. It takes a lot of energy and resources to make plastic, with more than 90% being produced from fossil fuel resources. Experts believe that if current trends continue, in 30 years' time 20% of global oil consumption and 15% of global carbon emissions will be associated with plastic production. Here are 9 reasons why we should refuse it.

1. Plastic is made from fossil fuels
2. It leaves a huge carbon footprint
3. It will still be here in hundreds of years
4. Only a tiny percentage of plastic is recycled
5. It leaches toxins into food and drink
6. It causes hormone disruptions and cancers
7. It pollutes our oceans
8. Plastic kills marine animals and birds
9. Plastic enters our food chain

(brightvibes, 2018)

How to refuse the use of plastic

We can refuse the plastic by bringing reusable items from home and taking them to the shop, the excessive use of plastic can be refused. For example: When shopping, bring a shopping basket from home, durable bags, oil bottles, or food carrier. We can refuse to take new plastics from the shop and therefore use as little as possible. It's time to reassess our obsession with convenience, and priorities sustainable choices that respect our planet. Here are 9 tips for living with less plastic:

1. Bring your own reusable shopping bag
2. Carry a reusable water bottle
3. Bring your own cup
4. Pack your lunch in reusable containers

5. Say no to disposable straws and cutlery
6. Avoid plastic produce bags
7. Slow down and dine in
8. Store leftovers in glass jars
9. Share these tips with your friends

(brightvibes, 2018)

Reusable bag _ Photo ©Wide Horizon, 2021

Reusable bottle _ Photo ©Wide Horizon, 2021

Reusable container _ Photo ©Wide Horizon,2021

What are the benefits of refusing plastics?

Humans are very good at inventing things that make life easier, and plastic is one of them. Its incredible strength, durability and lightness makes it ideal for a huge variety of products, from simple food and liquid packaging, to complex space station components. Disposable plastic has proven to be an ecological disaster, with the material found from the isolated reaches of Antarctica, to the abyss of the Mariana Trench. It's estimated that by 2050, there'll be a tone of plastic for every tone of fish.

Here are some of the most important reasons for you to reduce your disposable plastic consumption, and some plastic waste facts that may shock you.

1. Less plastic = Less carbon dioxide
2. Consuming less plastic saves animals
3. Consuming less plastic saves humans
4. Less plastic makes water cleaner
5. Less plastic makes our food, air safer
6. Reducing the amount of plastic waste, make your environment clean and beautiful
7. Cancer and other diseases can be reduced
8. Reduce spending extra money.
9. There are benefits such as conservation of climate and natural resources.

(Cutterskip, 2020)

3.2 Reducing the use of Plastic

1	Topic	Reducing the use of plastic
2	Learning outcomes	to understand the benefits of reducing the use of plastics. to understand why plastics must be reduced to practice how to reduce plastics (to be able to reduce plastic)
3	Time needed	60 minutes
4	Teaching materials	A song about reducing plastics, Replaceable items' picture (sample)
5	Learning and Teaching methods	Ask question interact open discussion/visual discussion

Discussion questions

1. What does reduce mean?
2. Why should we reduce the use of plastic?
3. How to reduce the use of plastic?
4. What are the benefits of reducing plastics?

What is Reduce?

Reduce is using some plastic but minimizing the amount we use. E.g., Instead of using ten plastics bags, you will only use one plastics bag.

Why should we reduce the use of plastics?

Reducing the use of plastic is important because plastic production requires an enormous amount of energy and resources. This causes carbon emissions and contributes to global warming. Plastic takes a very long time to decompose and are also a very difficult for objects to breakdown. Moreover, the plastics have many properties that can destroy nature and have the potential to cause many negative effects on human health.

Plastic pollution also puts more than 700 marine animal species in harm's way. But marine creatures are not the only ones at risk of being harmed by or consuming plastic waste — humans also unknowingly digest microplastics, which have been found in table salt and poop.

1. Since the 1950s, around 8.3 billion tons of plastic have been produced worldwide.
2. In some parts of the world, using plastic is already illegal.
3. 73% of beach litter worldwide is plastic.
4. A million plastic bottles are bought around the world every minute.
5. Worldwide, about 2 million plastic bags are used every minute.

6. 90% of plastic polluting our oceans is carried by just 10 rivers.
7. Plastic is killing more than 1.1 million seabirds and animals every year.
8. The average person eats 70,000 microplastics each year.
9. Over the past 50 years, world plastic production has doubled. (givingcompass, 2021)

Plastic waste _ Photo © Robin J. Roth

How to reduce the use of plastic?

The fight against plastic waste starts with individual action. These are some simple steps to seriously reduce your plastic use right now.

1. Carry Reusable Shopping Bags
2. Drink Your Coffee from a Reusable Cup
3. Avoid Bottled Water
4. Steer Clear of Plastic Straws (If You're Able)
5. Switch to Plastic-Free Chewing Gum
6. Shop at a Farmers Market
7. Avoid Buying Clothes Made with Plastic
8. Compost Food Waste

What are the benefits of reducing the use of plastics?

Plastic is everywhere. In 2019, humans produced nearly 350 million tons of plastic waste throughout the world — and about half went to the garbage. This has truly become a plastic generation, and it's a shame that most of the plastic isn't recycled.

Although human plastic consumption has gotten a bit out of hand, plastic was invented for a purpose. Its intent is to make life more comfortable, no doubt. You can go to the store and grab a bottle of water in a durable container. You can use plastic shopping bags to carry your groceries. You can purchase safely-wrapped food products.

The complexities of plastic make it usable almost anywhere, but that's where the problem starts. Microplastics entered the food you eat and have even been found at the highest peaks and deepest depths. It's hard to reduce the amount of plastic waste produced when plastic is all around. However, the benefits of reducing plastic waste are numerous. Most importantly, it helps the environment.

1. Fewer carbon dioxide Emissions
2. Safer Environment for wildlife
3. Better Human Health
4. Saves Money
5. Reduce pollution around Ecosystems
6. Consumes less energy and protects the natural resources
7. Save depleting landfill space
8. Ease demand of fossil fuel consumption
9. Promotion of sustainable living
10. Reducing the waste
11. Reduction in greenhouse gas emission

(Environment, 2019)

Waste Decomposition Game

1	Topic	Amount of time of Waste Decomposition
2	Purpose	to make students aware of the duration and amount of damage to the garbage to throw garbage properly and systematically
3	Time	60 minutes 20 minutes
4	Teaching material	All various garbage, paper, Pen, Maker pen

Instructions

- Firstly, students must collect all kinds of garbage from school (or) can use the picture cards.
- Choose five students and each person should hold a piece of paper written in five different time periods.

- Students pick one of the garbage from the pile
- Students estimate the how long that piece of garbage takes to breakdown
- Students stand behind the students holding the cards showing his/her estimated decompose time and the student should explain why?
- Finally, teachers must go through the correct answers.

Waste Decomposition Times _ Photo© Andrew Lisa

Tin cans _ Photo ©Andrew Lisa / Stacker

water bottle _ Photo ©Andrew Lisa / Stacker

Plastic Bottle cap _ Photo ©Andrew Lisa / Stacker

Plastic Bag _ Photo ©Andrew Lisa / Stacker

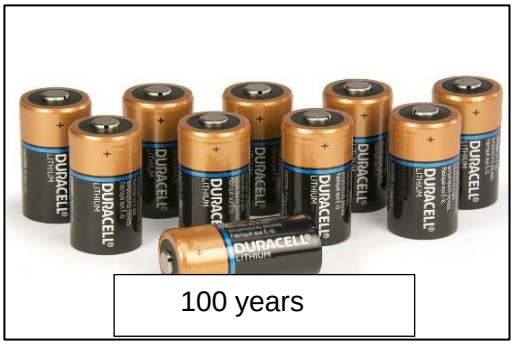
Styrofoam _ Photo ©Andrew Lisa / Stacker

Tin _ Photo ©Andrew Lisa / Stacker

Banana Peel _ Photo ©Andrew Lisa / Stacker

Orange Peel _ Photo ©Andrew Lisa / Stacker

Cigarette _ Photo ©Andrew Lisa / Stacker



Battery _ Photo ©Andrew Lisa / Stacker

Straws _ Photo ©Andrew Lisa / Stacker

Fishing Line _ Photo ©Andrew Lisa / Stacker

Tires _ Photo ©Andrew Lisa / Stacker

Coffee cup _ Photo ©Andrew Lisa / Stacker

Waste Items	Decomposition Time
Plastic bags (ပလပ်စတစ် အိတ်)	10-1000 years
Plastic cups (ပလပ်စတစ် ခွက်)	50 years
Plastic bottles (ပလပ်စတစ် ဘူး)	450 years
Straws (ပိုက်တံ)	200 years
Wet wipes (Tissue အစို)	100 years
Tin (စည်ဗူး ခွံ)	50 years
Tires (တာယာ)	2000 years
Fishing nets (ငါးဖမ်း ပိုက်)	40 years
Cotton T-Shirt	6 months
Aluminium Cans (အလူမီနီယံ ဘူးခွံ)	200-500 years
Vegetables (ဟင်းသီးဟင်းရွက်)	5 days- 1 months
Hairspray bottles (ဆံပင် ဖြန်းဆေးဗူး)	200 to 500 years
Cotton ropes (နှိုင်လွန်ကြိုး)	3-14 months
Cotton gloves (ဝါဂွမ်း လက်အိတ်)	3 months
Latex gloves (ရာဘာ လက်အိတ်)	5 years
Paper wastes (စက္ကူ)	2-6 months
Irons (သံ)	100 years
Food wastes (အစားအစာ)	5 days- 1 months
Shoes (ရူးဖိနပ်)	25- 40 years
Paper towels	2-4 weeks
Waxed milk cartons (ပဲနို့ဘူး)	3 months
Non-waxed cartons	5 years

Rubber bands	1 years
Plywood's (သုံးထပ်သား)	1-3 years
Batteries (ဓာတ်ခဲ)	100 years
Leathers (လေသာ)	50 years
Glass (မှန်)	1 million + years
Aluminium foils (အလူမီနီယံ အပြား)	Never
Styrofoam's (ဖောဲ့ဘူး)	500 years
Cigarettes (ဆေးလိပ်ဗူး)	18 months – 10 years
Fishing lines (ငါးမျှားကြိုး)	600 years
Wool socks (ဝါဂွမ်းခြေအိတ်)	1-5 years
Synthetic fabrics (နက်ကတိုင် ကြိုး)	100 + years
Orange peels (လိမ္မော်သီး အခွံ)	6 months
Banana Peels (ငှက်ပျောခွံ)	6 months
Cardboards (ကဒ်ထူ)	2 months
Disposable diapers (ကလေးသေးခံ)	500 years
Apples (ပန်းသီး)	2 months
Polyurethan seat cushions (ဆိုဖာခုံ)	1000 years
Plastic mask (နှာခေါင်းစည်း)	450 years
Plastic toothbrush (သွားတိုက်တံ)	500 years
Rubber Slippers (ရော်ဘာ ဖိနပ်)	50-80 years
Eggshells (ကြက်ဥအခွံ)	1 years
Take away coffee cup (တစ်ခါသုံး ကော်ဖီ ခွက်)	50 years

(Andrew Lisa, 2020)

Chapter (4)

Reusing and Recycling Waste

4.1 Reusing Waste

Reusing Waste _Photo© Dawn Gough

Reusing Waste _Photo© Dawn Gough

1	Topic	Reusing
2	Learning outcome	to be able to systematically reuse materials from their environment, home and school and to maintain the environment
3	Time needed	2 hours and 30 minutes
4	Teaching materials	waste materials, scissors, penknife, seed, compost, fertilizer, photos.
5	Learning and Teaching method	Practical demonstration, observation and study, discussing to reuse, showing photos, Drawing activity.

Brainstorming Question

Ask the follow questions

- What is reusing something?
- What is a reusable material?
- How can it be reused?

What is reuse?

Reuse means using of the materials again and again for the same purpose or different purpose without altering the form of the product.

The reusable material

The reusable materials are: glassware, the empty fibre boxes, the empty gallon containers, the empty plastic boxes, newspapers, magazines and envelopes, clothes, face towels, bedcovers, and plastic bags.

reusable materials _ Photo© Caesar/Wide Horizons

Examples of reusing

- Glass pot, tumbler, glass bottles can be used as oil bottles, vases and so on.
- The empty fibre box, the empty gallon containers can be cut as needed and used as water-bucket and water-cup as needed.
- The paper bags are made from newspapers and magazines.
- The plastic bags can also be packaged again and replaced.

Note: Drawing activity can do to understand more clearly. Like how we can create new design and also can show images.

Reusing waste_ Photo© Independent

Reusing waste_ Photo© Nacion

Reusing waste_ Photo© Zero waste

Reusing waste_ Photo© Dawn Gough

Why should they be reused?

It also significantly reduces increased waste materials, and water and air pollution. It can also save on money. Replacing saves on money, energy and resources

Practicing with the children as follows by collecting the recyclable materials around home and school

Note: Firstly, students collect and store the empty bottles of purified drinking water. (For activity)

1. The collected empty bottles will be cut with scissors to make them look good.
2. Put soil into the bottles.
3. Plant the favorite seeds of children in that fertilizer.
4. Water and check daily, the seedlings will sprout and grow for a few days.

These reusable waste materials are discussed with children, if understood; they will be able to reuse waste material in their environment.

Reusing Plastic Bottles for Plants Pots_ Photo© Boredpanda

Reusing Plastic Bottles for Plants Pots_ Photo© Boredpanda

Progress check

The students pick items and think of how to reuse the items and teacher also can guide.

Torn cloths, empty bottle of purified drinking water,

plastic packet of bread, old newspaper, pipe of juice,

plastic bags, glass bottle, empty Styrofoam box, bamboo chopsticks,

fiber spoons, empty soft drink can

Type of item	Reusable waste material
E.g., Torn cloth	Reusable (To sweep the floor, to use as hand towel, etc.…

Note: Check that the children understand the methods of the reusing materials

4.2 Recycling waste materials

1	Topic	Recycling waste materials
2	Learning outcome	To understand the benefits of recycling and innovation. To know why waste material should be reused and how to innovate and use
3	Time needed	1 hour
4	Teaching Materials	Waste bin, some waste materials
5	Learning and Teaching method	Teaching, discussing, question and practical demonstration.

Brainstorming Question

Ask the following question

- What is recycling waste material?
- What can we recycle?
- What are the benefits of recycling waste materials?

What is recycling waste material?

Recycling waste material is the process of transforming the used items into the new items and the new objects.

What can we recycle?

Recycling waste materials provides occupations for people as people can collect the recyclable waste material and sell them to a recycling company. For example, systematically collecting and selling the used bottles, bags and boxes to the recycling companies so they can be turned into new materials.

Activity: students collect plastic bottles and store them at the school and sell them to the recycling company. Then they can buy something for the school.

What are the benefits of recycling waste materials?

It reduces the amount of waste materials on the land, and in the rivers and streams by recycling waste materials and to sustain the environment by using less raw materials.

How to collect the recyclable waste materials systematically?

Recyclable waste materials must be collected separately with bags and buckets. The material must be clean and not be contaminated by food waste. Therefore, the recyclable waste materials should be divided into biodegradable and non- biodegradable.

Edit by: Khin Aye/ Wide Horizons in October 25, 2021

Chapter (5)

Composting

1	Topic	Composting with waste
2	Learning outcome	To be able reduce waste in your home to learn about composting. To get good soil by make fertilizers. To be able to share the knowledge of composting with their parents.
3	Time needed	6 hours
4	Teaching materials	Posters, pictures, papers, marker pens, needed materials for composting
5	Learning and Teaching methods	Showing with Photos Brainstorming Build composting bin

Brainstorming

Ask questions to the students to understand about their current knowledge about waste.

(Note: Discuss in groups. It can be discussed in groups of 6 (or) 8 people each. Write down the answers that the students understand on a piece of paper and each one of each group must come out and explain.)

Questions

1. What is the composting?
2. Have you ever seen or done composting in your community?
3. Why is composting important?
4. What kind of waste can be composted?

5.1 Compostable waste

Two types of waste are biodegradable and non-biodegradable. Biodegradable are leftover food waste, vegetable waste from kitchen and waste from the garden. Non-biodegradable is plastic waste, materials waste and glass bottle waste.

Leftover food waste_ Photo © Yuri / Wide Horizons

Vegetable waste from kitchen_ Photo © Yuri / wide Horizons

Garden waste_ Photo © Yuri / Wide Horizons

Before composting, explain to the students to collect biodegradable waste and how much they need to collect for the demonstration, and the teachers must first demonstrate.

Brainstorming question

1. How do you manage leftover food waste in your home?

Leftover food waste

Most of people are feeding leftover food waste to the animal. However, we can also make the fertilizer from the leftover food waste

Tread to the dog from the leftover food waste_ Photo © Khin Aye / wide Horizons

Composting process from the leftover food waste step by step

1. Drain the leftover food waste and dispose of the water separately.
2. Do not mix with any other waste (eg, plastic and so on.)
3. To store food, dig a hole around 6 feet in length, width, and depth.
4. The leftover food waste must be stored in the hole.
5. Cover the hole with a waterproof lid to prevent odours.
6. Store for 1 or 2 months for it to change into compost.

(Note: Depending on the weather, it may take 1 or 2 months to dry. For example, in the summer, it takes one month, during the rainy season about two months.)

Making composting with leftover food waste process

Leftover food waste, cover and digging style_ Photo © Cliparkey 2019

Vegetable waste from the kitchen and garden waste

Most people do not know how to make the fertilizer from the kitchen waste and garden waste. Instead of throwing and burning, we can make the cool natural composting to get the fertilizer.

Making the cool natural composting process

- Choose the shady place to store compost.
- First, wire mesh, bamboo mesh or wooden mesh should be used as a fence.
- The bamboo poles must be tied with the zinc wire to strengthen the wire mesh.
- The bottom must be lined with bricks and a board of wood.
- Pipe must be inserted to allow ventilation inside.
- The holes must be drilled on the pipe.
- Add the brown materials (70%).
- The green materials (30%) must be added on top of that.
- Wate after all the steps have been completed.

Making the composting bin

Step 1

Step 2

Step 3

Step 4

Step 5

Step 6

Making composting process_ Photo © Yuri / Wide Horizons

How to Maintain the composting bin

Do's	Don'ts
• Water regularly (depending on dryness) • Place under the shady tree to balance the temperature • Add Green and brown items in proportion • Remove plastics if they get in	• Do not add leftover food. • Do not add non-biodegradable waste. • Do not leave too dry. • Do not add the combustible waste material (eg, cigarette end)

How to take a fertilizer after composting

1.Open the composting store, take the compost from the final layer.

2. Put on the wire netting that has 8mm hole.

3. Take off the stone, leaves and tree branches in the compost.

4. Shake the wire netting and filter the compost.

5.Finally, you can get the natural fertilizer.

Step 1

Step 2

Step 3

Step 4

Step 5

Step 6

Step 7

Step 8

Step 9

Take the fertilizer from the composting bin_ Photo © Thant Myanmar

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Resources

Table of Contents

Chapter (1)

Sorting and disposal of waste

1.1 Sorting and Disposal of Waste Game

1.	Teaching materials	(2) or (3) Rubbish bins, image card of biodegradable and non-biodegradable or take game materials around school compound
2.	Time needed	20 minutes
3.	Participants(students)	Divide 2 groups


DURACELL
LITHIUM


GEELY


MONDAY
THURSDAY

Wide Horizons Organizational Development Program


CHEESE & ONION FLAVOUR
SALT & VINEGAR FLAVOUR
WALKERS
FRESH TASTE GUARANTEED
Roast Chicken
RIDGE CUT
SALT&MALT VINEGAR


Photo: ST

Wide Horizons Organizational Development Program

Wide Horizons Organizational Development Program

1.3 Sorting and Disposal of Waste: Progress Check

No.	Type	Biodegradable			Non-biodegradable waste
		Leftover food waste	Kitchen waste	Garden waste	Plastic waste
1	Leftover rice	✓			
2	Torn shoe/slipper				
3	Leftover curry				
4	Banana peel				
5	Plastic bag				
6	Dry leave				
7	Empty-can				
8	Empty-can of soft drink				
9	Twig				
10	Paper				
11	Sack of bread				
12	Stem of roselle				
13	Garlic/onion peel				
14	Flower wither left at Buddha image/shrine,				
15	Disposable Styrofoam box				
16	Stem of water spinach				
17	Disposable cup,				
18	Tree branch				

Chapter (2)

Waste disposal and its negative effects

2: Negative Effect: Progress Check

Coloring each color concern with under the topic. .

Type of disadvantages	Burning waste	Rubbish Heaps	Landfill	Dumping waste into the water
cancer				
environmental pollution				
Pneumonia				
foul odour				
loss of fisheries				
Global warming				
Shortage of drinking water				
air pollution				
Climate changes				
loss of aquatic animals				
plants not getting enough water				
economic downturn				
drought				
groundwater pollution				
skin cancer				
blocking the river				

Chapter (3)

Refusing and reducing the use of plastic waste

3.2: Waste Decomposition Game

1	Topic	Amount of time of Waste Decomposition
2	Purpose	to make students aware of the duration and amount of damage to the garbage to throw garbage properly and systematically
3	Time	60 minutes 20 minutes
4	Teaching material	All various garbage, paper, Pen, Maker pen

Instructions

- Firstly, students must collect all kinds of garbage from school (or) can use the picture cards.
- Choose five students and each person should hold a piece of paper written in five different time periods.
- Students pick one of the garbage from the pile
- Students estimate the how long that piece of garbage takes to breakdown
- Students stand behind the students holding the cards showing his/her estimated decompose time and the student should explain why?
- Finally, teachers must go through the correct answers.

3.2.1: Types of Waste

Plastic bags
(ပလပ်စတစ် အိတ်)

Plastic cups
(ပလပ်စတစ် ခွက်)

Plastic bottles
(ပလပ်စတစ် ဘူး)

Straws
(ပိုက်တံ)

Wet wipes
(Tissue အစို)

Tin
(စည်ဗူး ခွံ)

Tires
(တာယာ)

Fishing nets
(ငါးဖမ်း ပိုက်)

Cotton T-Shirt

Aluminium Cans
(အလူမီနီယံ ဘူးခွံ)

Vegetables
(ဟင်းသီးဟင်းရွက်)

Hairspray bottles
(ဆံပင် ဖြန်းဆေးဗူး)

Cotton ropes
(နှိုင်လွန်ကြိုး)

Cotton gloves
(ဝါဂွမ်း လက်အိတ်)

Latex gloves
(ရာဘာ လက်အိတ်)

Paper wastes
(စက္ကူ)

Irons
(သံ)

Food wastes
(အစားအစာ)

Shoes
(ရှူးဖိနပ်)

Paper towels

Waxed milk cartons (ပဲနို့ဘူး)

Non-waxed cartons

Rubber bands

Plywood’s (သုံးထပ်သား)

Batteries
(ဓာတ်ခဲ)

Leathers
(လေသာ)

Glass
(မှန်)

Aluminium foils
(အလူမီနီယံ အပြား)

Styrofoam's
(ဖောဘူး)

Cigarettes
(ဆေးလိပ်ဗူး)

Fishing lines
(ငါးမျှားကြိုး)

Wool socks
(ဝါဂွမ်းခြေအိတ်)

Synthetic fabrics
(နက်ကတိုင် ကြိုး)

Orange peels
(လိမ္မော်သီး အခွံ)

Banana Peels
(ငှက်ပျောခွံ)

Cardboards
(ကဒ်ထူ)

Disposable diapers
(ကလေးသေးခံ)

Apples
(ပန်းသီး)

Polyurethan seat cushions
(ဆိုဖာခုံ)

Plastic mask
(နှာခေါင်းစည်း)

Plastic toothbrush
(သွားတိုက်တံ)

Rubber Slippers
(ရော်ဘာ ဖိနပ်)

Eggshells
(ကြက်ဥအခွံ)

Take away coffee cup
(တစ်ခါသုံး ကော်ဖီ ခွက်)

3.2.1: Duration

10-1000 years

50 years

450 years

200 years

100 years

50 years

2000 years

40 years

6 months

200-500 years

5 days- 1 months

200 to 500 years

3-14 months

3 months

5 years

2-6 months

100 years

5 days- 1 months

25- 40 years

2-4 weeks

3 months

5 years

1 years

1-3 years

100 years

50 years

1 million+ years

Never

500 years

18 months – 10 years

600 years

1-5 years

100+ years

6 months

6 months

2 months

500 years

2 months

1000 years

450 years

500 years

50-80 years

1 years

50 years

Chapter (4)

Reusing and Recycling Waste

4.1 Reusing Waste Progress check

The students pick items and think of how to reuse the items and teacher also can guide.

Torn cloths, empty bottle of purified drinking water, plastic packet of bread, old newspaper, pipe of juice, plastic bags, glass bottle, empty Styrofoam box, bamboo chopsticks, fiber spoons, empty soft drink can

Type of item	Reusable waste material
E.g., Torn cloth	Reusable (To sweep the floor, to use as hand towel, etc.…