

Ecology Note

Towards a Clean and Green
Mandalay City



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Introduction

Solid Waste Management (SWM) has become one of the most serious environmental and public health issues confronting cities in developing countries. Mandalay, the third city and the last royal capital of Myanmar is not an exception. Rapid urbanisation, economic growth and changes in lifestyles and consumption patterns have resulted in a remarkable increase of waste volume and diversity during the past few decades. According to the Mandalay City Development Committee (MCDC), daily waste generation has increased from 259 tonnes in 2005 to 975 tonnes in 2015. In addition, associated costs of SWM are also rising, related environmental degradation is occurring, and controversies are arising over the location of new landfills and incinerators. Aiming to overcome this fast growing issue, MCDC is planning to implement a sound solid waste management system integrating 3R practices (reduce, reuse and recycle). In this new system, there aims

to be an understanding and active participation of all stakeholders including school children, who are the next generation of decision-makers. This environmental learning booklet has been prepared based on the experiences of Kitakyushu City, one of the leading environmental model cities in Japan, to provide information, tools and guidelines emphasising reducing the amount of waste we produce; reusing, recycling and composting whatever we can and using landfills or other technologies to dispose of the rest in a more environmentally sound manner. The learning materials in this booklet also provide students with valuable lifelong tools, like critical thinking and encourages the students to be active citizens by making small changes in their everyday lives to make a difference in society. Furthermore, it gives ideas on how to incorporate solid waste management into other subjects in the classrooms, including science, social studies, economic, art and maths and so on.

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BEHS No.4



BEHS No.14



BEHS No.26



Let's Find Out the Present Solid City and the Challenge of the

Our lives and waste

How much waste is produced around us?

The amount of waste generated per day in the Mandalay City as a whole is about **975** tons.

1ton = 1000kg

● This is the same as the total weight of **32,500** 10 year old students.

In terms of volume, it is the same as the volume of **40** class rooms per day.

The volume per year will be equal to that of **390** gymnasiums.

That much solid waste is generated in only one day.
What do you think will happen if this situation continues?



Landfill sites will be filled with our waste.

(It is said that landfill sites in Mandalay City have already filled with waste and finding new sites is difficult due to lack of land.)



Resources on the earth may disappear.

(If we keep using oil, coal, and other resources, they will decrease fast.)



Aim

When we throw away our waste, it is usually collected and ends up in landfill. Every time when we throw something away we throw with it the energy, the money, the raw materials, and the water it took to make. This section encourages student to think what will happen to our environment if we all keep continuing throw things away . We call this type of society a Throw-Away-Society (Mottai Nai Society in Japanese).

Waste Management in Our Throw-Away Society



What can we do?

Do you know about the 3Rs?

First Reduce
Reduce waste

Then Reuse
Use things repeatedly

Lastly Recycle
Make waste resources

Try not to generate waste, by using things with care as much as possible.

- Use your own shopping bag and "my bag" and try not to ask for supermarket plastic shopping bags.
- Ask for things you have bought to be wrapped as simply as possible.

Use things again and again by remaking or repairing them.

- Repair toys and clothes instead of throwing away.
- Give old clothing and toys to others when you don't need them.

Recycle waste into different things to use them again.

- Remake old newspaper and milk paper cartons into new newspaper and toilet paper.
- Make compost from kitchen waste in a compost treatment container.

Check your "eco" level

Tick the circles of what you are doing. How many circles can you tick?

- I eat meals without leaving anything behind.
- I separate PET bottles and cans.
- I give old clothing and toys to someone who wants them or use them differently without disposing of them.
- I use old newspaper for wrapping.
- I use my own bag and don't ask for plastic shopping bags.
- I turn off the TV when doing other things.
- I don't let the water run when washing my face or brushing my teeth.



Aim

This exercise encourages students to understand new values of doing things without just throwing things away in order to reduce the waste generation, through such actions related to waste reduction, reuse and recycling. It also helps students gain new knowledge and skills to improve our environment.

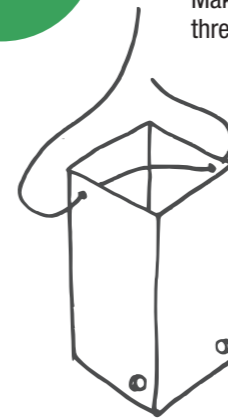
Ideas for reducing waste

You can still use them.
Let's try to make
new things
from old materials.



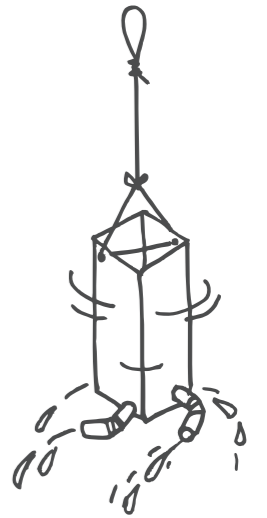
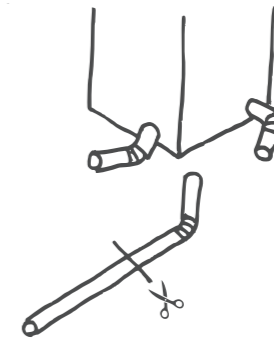
Spinning shower

Cut off the upper portion of a milk paper carton.
Make holes and pass the thread through the holes.



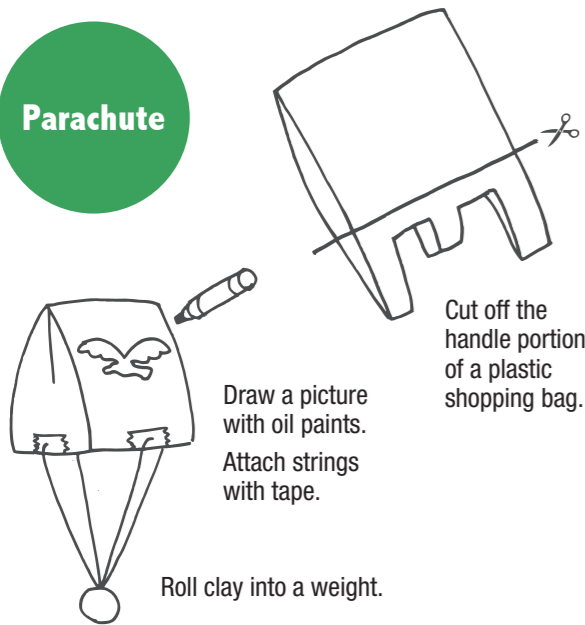
Make four holes in the bottom part.

Cut a straw to insert into the holes.



It spins when water runs on it.

Parachute

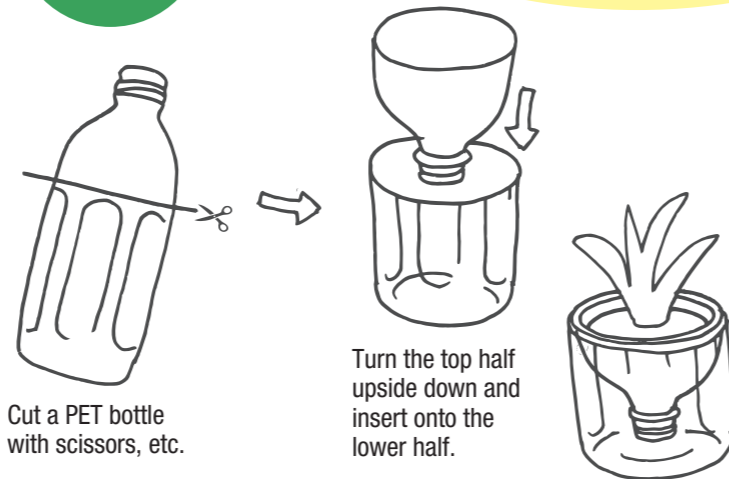


Draw a picture with oil paints.
Attach strings with tape.

Cut off the handle portion of a plastic shopping bag.

Roll clay into a weight.

Plant pot of PET bottle

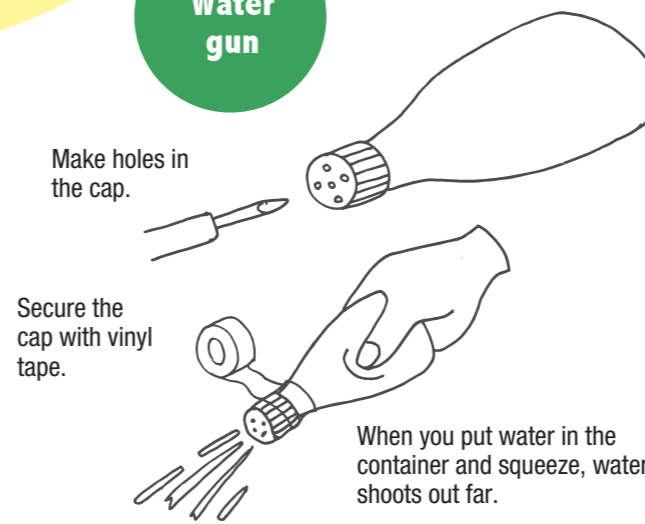


Cut a PET bottle with scissors, etc.

Turn the top half upside down and insert onto the lower half.

Water gun

Empty plastic container of mayonnaise or ketchup.



Make holes in the cap.

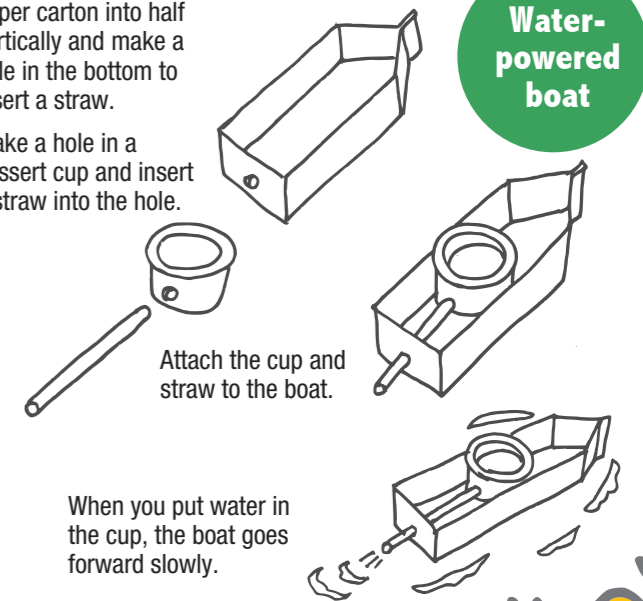
Secure the cap with vinyl tape.

When you put water in the container and squeeze, water shoots out far.

Water-powered boat

Cut an empty milk paper carton into half vertically and make a hole in the bottom to insert a straw.

Make a hole in a dessert cup and insert a straw into the hole.

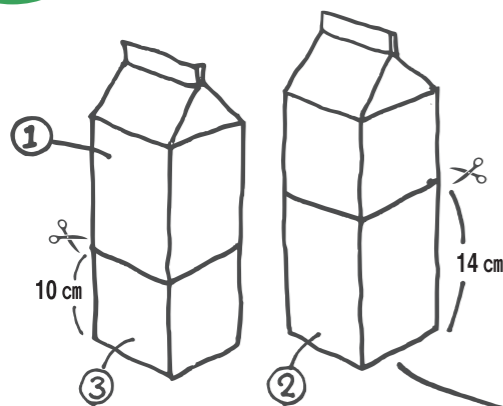


Attach the cup and straw to the boat.

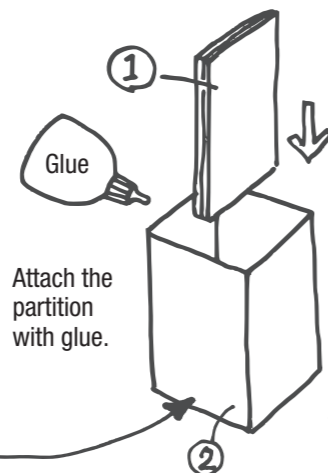
When you put water in the cup, the boat goes forward slowly.

Pencil holder

Prepare two empty milk paper cartons and cut one carton at the height of 10 cm from the bottom and the other carton at the height of 14 cm from the bottom.

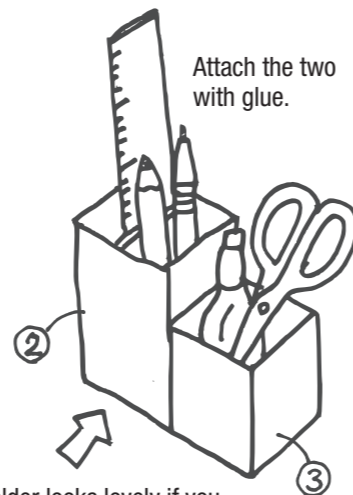


Use ① to make a partition.



Attach the partition with glue.

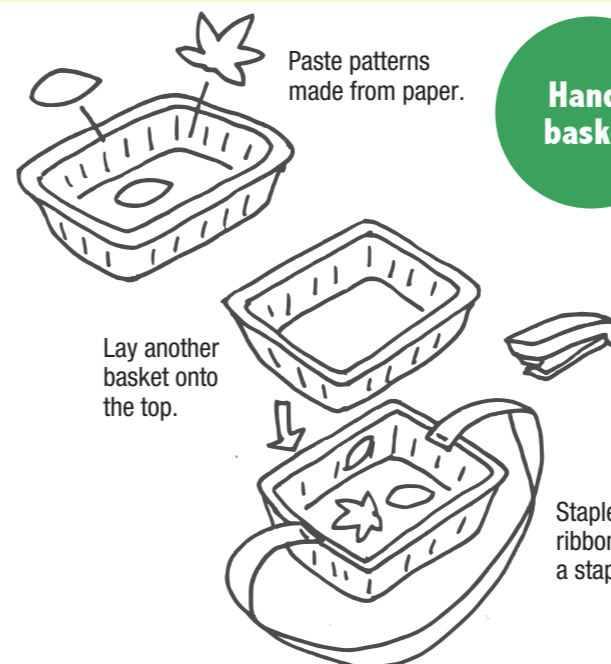
Attach the two with glue.



The holder looks lovely if you paste colored paper, etc. on it.

Hand-basket

Paste patterns made from paper.



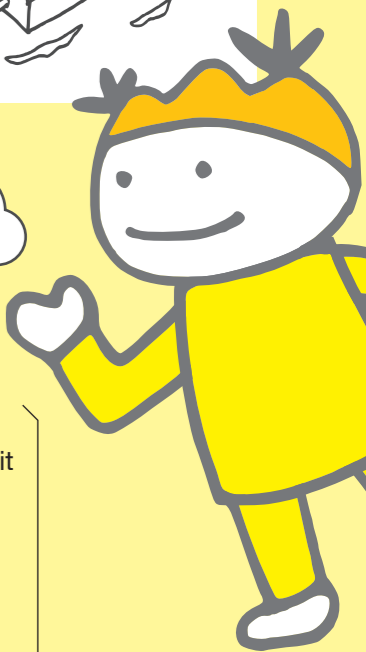
Lay another basket onto the top.

Staple ribbons with a stapler.

Be careful not to hurt yourself when cutting materials or making holes.

Aim

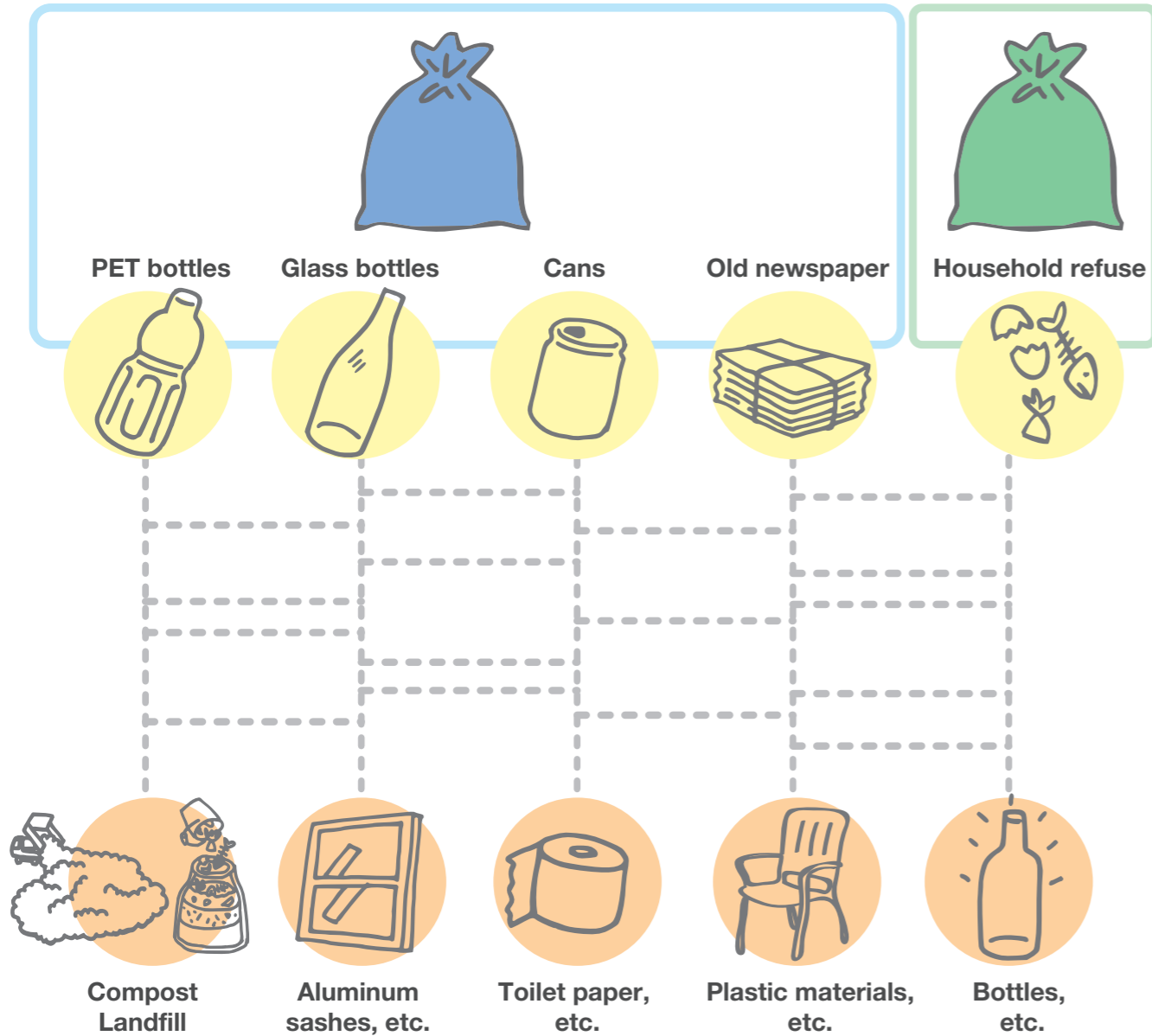
When we reuse or recycle materials, it helps to reduce the amount of solid waste that we throw away. This also empowers students to pro actively participate in waste reduction and reuse by encouraging simple actions to reuse materials rather than throwing them away or buying new ones.



Let's Promote Waste Separation and Recycling



What will happen to the following materials will be changed after separation and recycling? Let's find and connect with a line.



Let's start to separate waste at home with your family members.



Aim

We generate a great amount of waste daily. The waste that we generate at households can be broadly divided into three categories, (i) recyclable materials (paper, plastic, bin, can etc), (ii) biodegradables (left-over of vegetables and fruits), and (iii) other waste that must be disposed in landfill sites. MCDC is planning to collect them using two different colour bags: (i) blue bag (recyclable materials), and (ii) green bag (kitchen waste and others). Students will learn the differences between these items and their disposal methods. Students are also encouraged to separate waste at home with their family members.

Let's think about the waste flow and learn about what happens to the waste that we throw away.

Do you know who collects your waste?

Do you know where it goes after collection?

Do you know what happens in the end?

Let's challenge a quiz to find out how much you know about eco-friendly lives.

Please read the following sentences and mark if correct and if not correct in , and then connect with an appropriate tip on the right.

| | | | |
|--------------------------|--|-----------------------|--|
| <input type="checkbox"/> | The more you use detergent, the more dirt and stains are cleaned. | <input type="radio"/> | We can use our used kitchen water for gardening rather throwing away. |
| <input type="checkbox"/> | It's better to use an iron by turning the switch on and off frequently. | <input type="radio"/> | Even if you use too much detergent, the way dirt or stains are cleaned is same. Please keep the proper usage amount. |
| <input type="checkbox"/> | If you use used water for gardening, they are not cleaned well. | <input type="radio"/> | You use a lot of electricity when turning the switch on and off. |
| <input type="checkbox"/> | It's better to wrap a gift for someone neatly in a layered manner. | <input type="radio"/> | If you buy because things are cheap, you may buy those that may not be used. So, buy only necessary things. |
| <input type="checkbox"/> | When things are on sale, you'd better also buy those things that you won't use soon. | <input type="radio"/> | Wrapping paper will become refuse after opening. So try not to increase refuse. |
| <input type="checkbox"/> | You'd better throw away clothes and toys after using. | <input type="radio"/> | Things made from paper can be used only once, and will become refuse after use. |
| <input type="checkbox"/> | It's better not to put on a lid when boiling water. | <input type="radio"/> | Try not to throw away used clothes and toys. You can give them to your family members or friends to use again. |
| <input type="checkbox"/> | It's good to use paper cups and paper plates rather use your own dishes. | <input type="radio"/> | You can heat water quicker if the lid is on, because heat is kept. |
| <input type="checkbox"/> | A piece of soap will be thrown away because It's not easy to use up. | <input type="radio"/> | Vegetables grown in organic fertiliser are the best. |
| <input type="checkbox"/> | Vegetables grown using chemical fertiliser are better because they look nice. | <input type="radio"/> | A small piece of soap can become large if it is joined with other small pieces. |

Let's Learn How Waste Can Be Changed into Resources

Are you and your family separating waste at source?
Do you know what kinds of waste are converted into resources?
Let's write the correct number of resources that are reused by looking at page 13.



| | | |
|--|--|----------------------|
| <p>Cans and bottles</p> | <p>Plastic containers and packages</p> <p>Cups and packs Bottles Bags and wrappings</p> <p>Tubes Foamed polystyrene, etc. Plastic caps</p> | <input type="text"/> |
| <p>PET bottles</p> | <p>Pans, kettles, frying pans, bicycles, etc.</p> | <input type="text"/> |
| <p>Newspapers Corrugated boards Magazines, etc.</p> <p>Paper cartons/packs</p> | <p>Household refuse</p> | <input type="text"/> |
| <p>Fluorescent tubes</p> | | <input type="text"/> |



Aim
There are different recycling methods and industries available to convert waste into resources. Students can learn about the different recycling methods and industries in Mandalay City. They can also find out how their waste can become a resource for making a valuable product again.

Reborn resources



| | | |
|---|--|--|
| <p>1</p> <p>Plastic chairs and bags, etc.</p> | <p>2</p> <p>Steel cans and aluminum cans</p> | <p>3</p> <p>Iron and other products</p> |
| <p>4</p> <p>Toilet paper and recycled paper</p> | <p>5</p> <p>Raw materials for plastics</p> | <p>6</p> <p>Glass products, metal raw materials, new fluorescent tubes, etc.</p> |

You can transform waste at home.

7 Compost

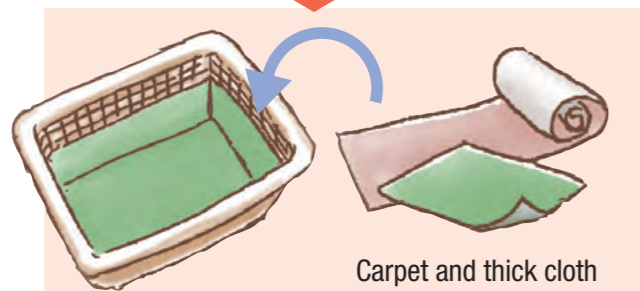
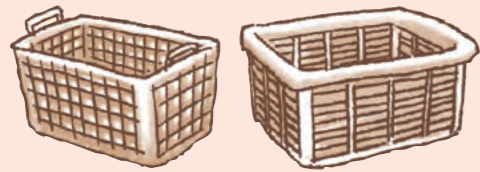
Household waste. Put kitchen waste in the container. Add soil over it. Then compost will be produced from the bottom. You can use produced compost for vegetable and flower gardens.

Let's Try Making Compost

Step 1 What You Need

Containers

★ Use an aerated container



Carpet and thick cloth

Don't let insects get in!
Stop the inside getting wet!

Fermented liquid

★ Sugar

★ Water

★ Fermented foods

Yoghurt, Miso, Sake, Natto, Yeast, Kimchi, etc.



The More Fermented Foods the Better!



Put sugar, water and fermented foods into the container and mix together.

Step 2 Growing the Micro-organisms

Fill up a vinyl bag



Fermented liquid

Rice and rotten leaves soil

Squeeze into a ball shape, it's ok if there is water left in

★ Rotten Leaves Soil (15 litres)

★ Rice (2 cups)

Move all of the contents of the vinyl bag to the box. Mix it once a day. Do this for a week!



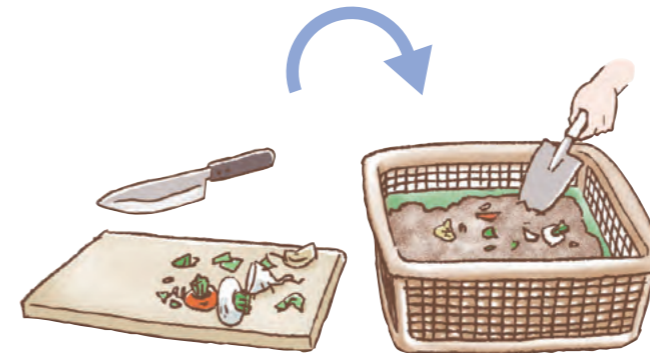
Aim

Composting is a natural way of recycling organic material. Decomposition will occur whether we help it or not. But since we produce so much waste we get paid back when we help to speed up the composting process. Composting turns our organic waste into valuable products that improve over gardens. The insects, worms, bacteria and fungi found in your compost pile do the work of making compost. Whether you compost kitchen waste or yard and green waste there are a few basic steps to follow. This helps student gain basic knowledge and skills about how to make compost at home with their families.

Once preparations are finished, we can make the compost!

Step 3 Putting the organic waste into the box

Cut the organic waste into small pieces, put into the container and mix well.



Mix it well once a day!

Make sure insects cannot get in



Put the cover over the basket



Step 4 Maturing the compost

Take compost out and keep it for maturing



By filling up half the box with compost and waiting 2 to 3 weeks, it can be used for flowers and vegetables.

Finished!



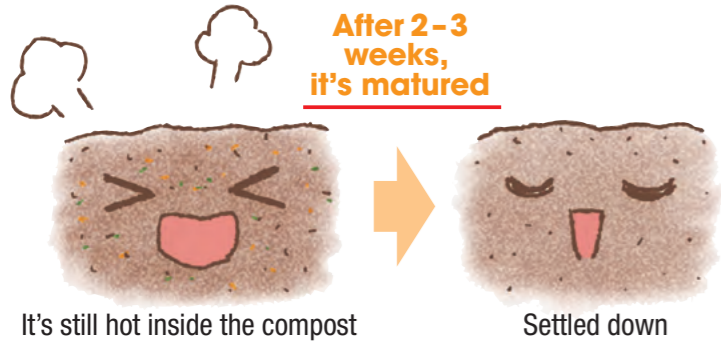
※ In addition, if you keep the warm compost inside the plastic bag for several months, it will mature removing any unpleasant odours. Using it this way, vegetables and flowers can grow up healthily.

Wow!

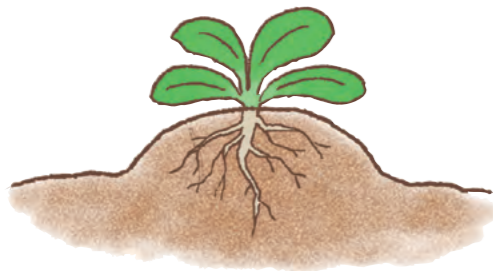


How to Use Compost

Compost is mixed with the soil



It takes 2-3 weeks for the compost to mature and be ready for planting.



Spread the compost on the whole area of a field, and plough it to a depth of about 10 cm.

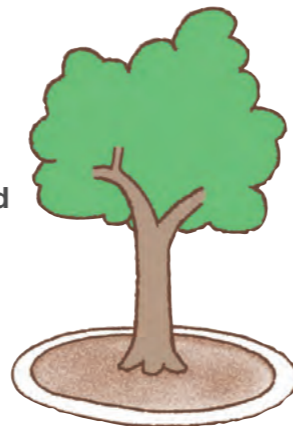
※ This method has the effect of improving the topsoil as well as softening the entire field.

When applying the compost in the planting area

Cover the soil with the compost after planting crops (Mulching).



Cut a 10cm deep circular furrow around the tree (ahead of its root tips) and put the compost in.



Approx. 10cm deep

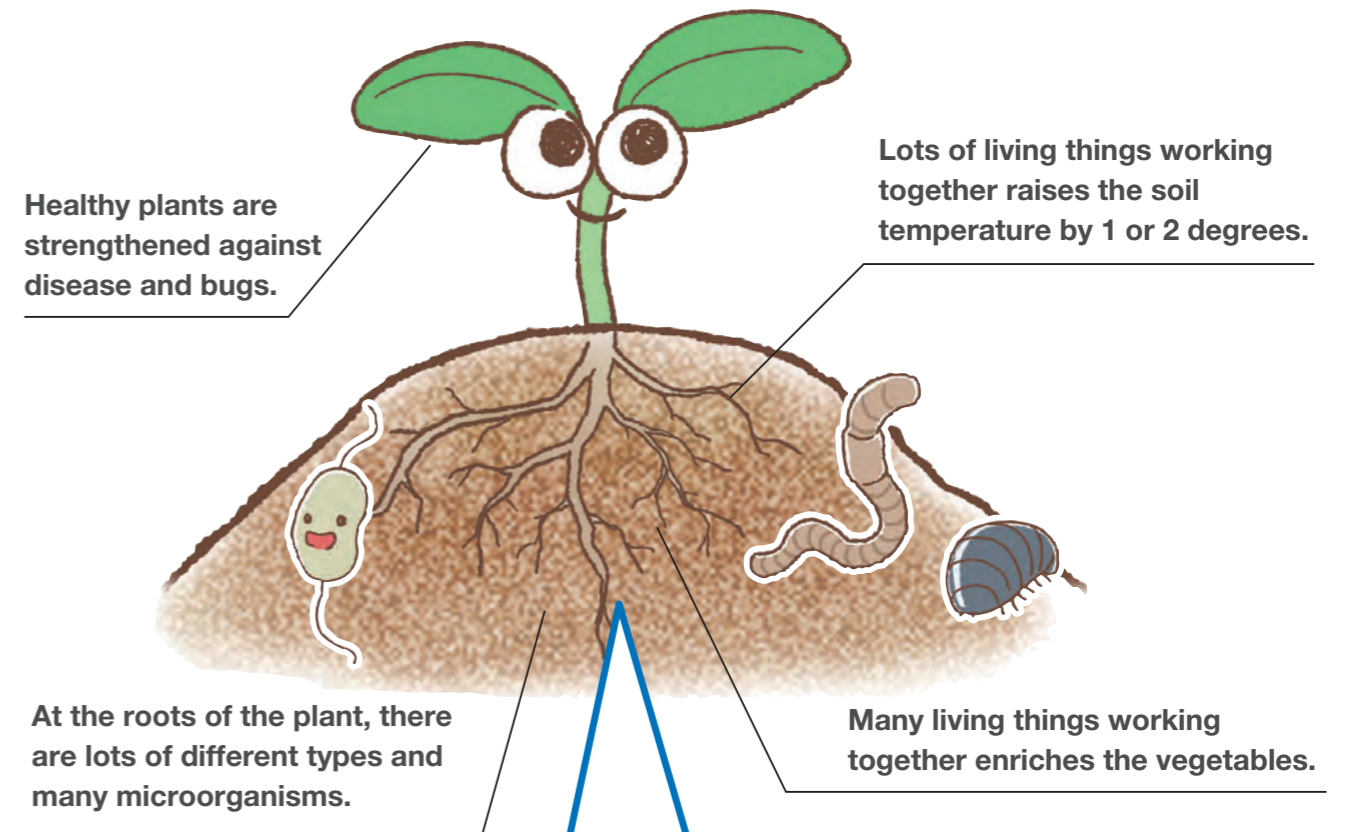
※ The decomposition of the compost gets stimulated which gradually brings about the effect.



Aim

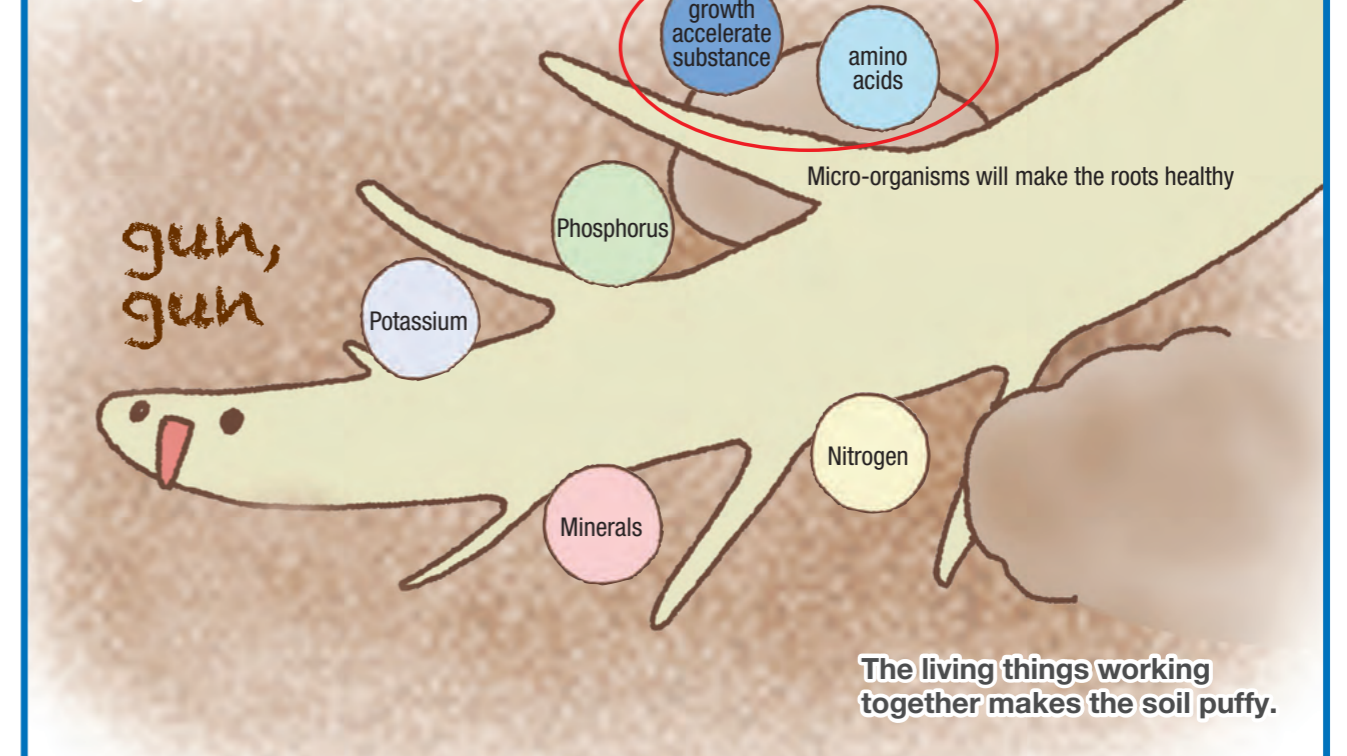
Healthy soil makes for healthy plants and vegetables. Students can learn how they can grow a healthy plants using the compost that they make using organic waste. They can also learn the difference between the chemical fertiliser and composting. It also increase students knowledge and skills on eco-friendly farming.

How Compost Helps the Plants Grow



At the roots of the plant, there are lots of different types and many microorganisms.

Compost enriches the roots



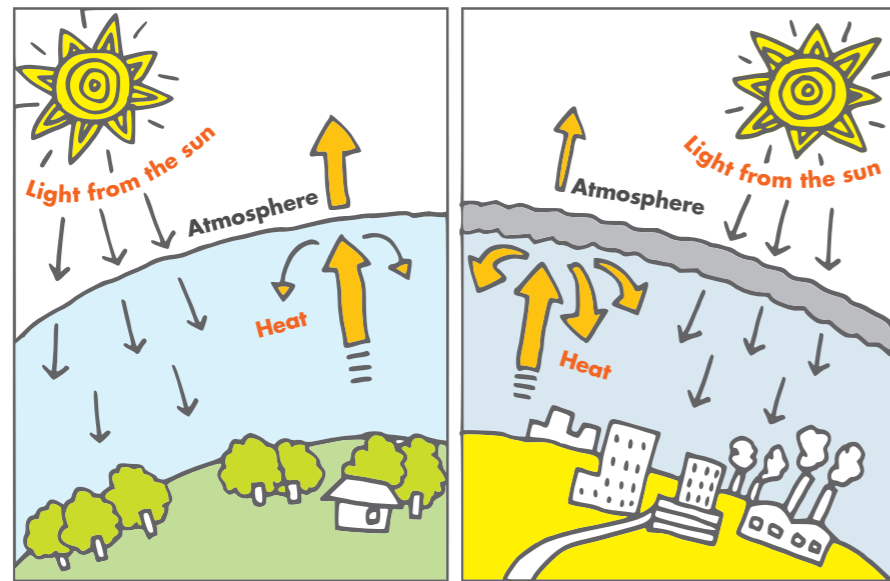
The living things working together makes the soil puffy.

Let's Think About Global Warming and Climate Change

Global Warming

What is global warming?

The rise in the temperature worldwide is called "global warming." The cause of global warming is, simply put, the atmosphere surrounding the earth. The atmosphere wraps around the earth like a blanket. Thanks to the blanket, the earth catches heat given from sunlight and makes the temperature comfortable for our lives. But more isn't always better. Now, the blanket of atmosphere is getting too thick. The reason for the atmosphere getting too thick is that the gas warming the earth is increasing too much.



The earth maintains the proper temperature by wearing the blanket of the atmosphere (without the blanket of the atmosphere, the average temperature would become 19 degrees below zero).

Now the blanket of atmosphere becomes too thick, because the gas warming the earth has increased excessively. This causes global warming.



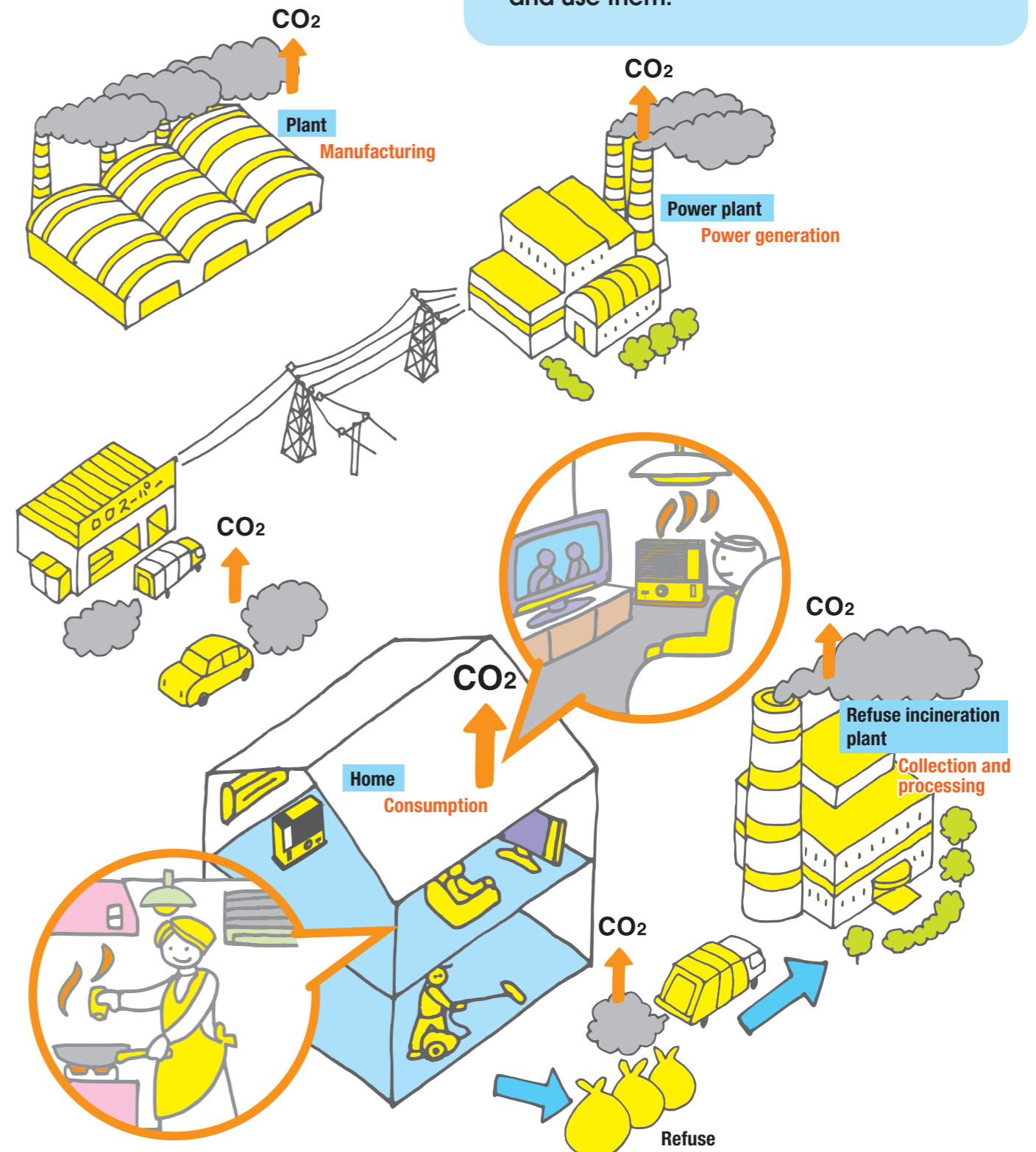
Aim

This lesson increases students awareness of global warming and climate change issues are increased and local environmental pollution which results in global environmental issues.

On what occasions is CO₂ emitted?

CO₂ is emitted when we burn things and we exhale. What's more, we actually emit CO₂ in various ways in our lives.

We lead our lives by emitting CO₂ even when we generate electricity and heat and use them.



Looking Back on Our Lives

A great mission of reducing CO₂ by one kg per day per person!

In the "To present" column, please mark the circle if relevant by recalling your everyday life before implementing the eco checks.

In the "Challenge Days" column, write down the date you took the challenge and mark the circle on the item you challenged.

| Eco check items | Mark the circle if you are trying to do it in your daily life. Also, mark the circle if you don't have an electric appliance mentioned in each item. | To present | The day you challenged | | |
|-----------------|--|------------|------------------------|-----|-----|
| | | | / | / | / |
| 1 | Turn off the TV when not watching. | 80 | 80 | 80 | 80 |
| 2 | Pull the TV or PC cord out of the wall before you go to bed. | 20 | 20 | 20 | 20 |
| 3 | Do not leave the air-conditioner or fan turned on. | 60 | 60 | 60 | 60 |
| 4 | Turn off the lights of the rooms not being used. | 40 | 40 | 40 | 40 |
| 5 | Try not to put too many things in the refrigerator and try not to overcool. | 110 | 110 | 110 | 110 |
| 6 | Put boiled water into the flask after you boiled water using an electronic pot. | 110 | 110 | 110 | 110 |
| 7 | Don't waste water when you shower. | 80 | 80 | 80 | 80 |
| 8 | Don't let water run when you wash your face or brush your teeth. | 10 | 10 | 10 | 10 |
| 9 | Family members should take a bath one after the other using the same water. | 220 | 220 | 220 | 220 |
| 10 | Bring your own bag and try not to ask for supermarket plastic shopping bags. | 70 | 70 | 70 | 70 |
| 11 | Sort out refuse in accordance with disposal rules of the City and reduce refuse. | 30 | 30 | 30 | 30 |
| 12 | Walk or use a bicycle instead of using an automobile when you go out or go to work. | 170 | 170 | 170 | 170 |

If all items are marked with a circle, you can achieve CO₂ reduction by one kg per day per person!

Write down the total amount of CO₂ emissions circled. →

/1000g /1000g /1000g /1000g

* The values shown above are rough values.

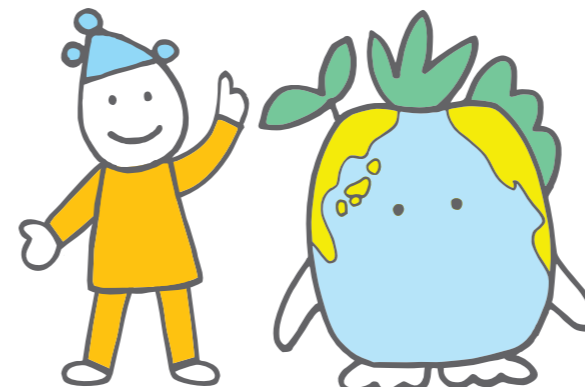


Aim

Awareness about global warming and climate change issues are increased and students are encouraged to take simple actions in their daily life to reduce CO₂.



Think about the earth and ideas for reducing CO₂ in our lives



"Environmental issues, prevention of global warming, reduction of CO₂..... I do understand the global environment but the scale of issues are too large to see what I should begin with." For such a person, the following are methods of global warming prevention you can do right now and the amount of CO₂ you can save per year.

Ideas in our lives CO₂ amount that can be saved per year

In the living room

Heating/cooling

- **Temperature** If cooling temperature is raised by one degree (28 degrees) and warming temperature is lowered by one degree(20 degrees) CO₂ 29.2kg
- If an air filter is cleaned once or twice per month CO₂ 11.2kg

Energy-saving lighting

- If lights are replaced with compact fluorescent lights CO₂ 29.4kg

TV

- If the use is reduced by one hour per day
 - 25-inch CRT CO₂ 5.9kg
 - 20-inch LCD CO₂ 19.8kg
 - 32-inch plasma CO₂ 9.5kg
 - 5-inch CRT CO₂ 53.2kg

PC

- If the use is reduced by one hour per day
 - Desktop CO₂ 11.0kg
 - Laptop CO₂ 1.9kg

In the bathroom

Water heater (reheating feature)

- Taking a bath without intervals CO₂ 87.0kg

Shower

- Not letting water run unnecessarily CO₂ 29.1kg

In washing

Washing machine

- Washing clothing collectively Reducing washing frequencies based on the machine capacity CO₂ 2.1kg

In the toilet

Toilet seat with a warm-water shower feature

- Close the lid when being not used CO₂ 12.2kg
- Lower the warm water temperature CO₂ 9.2kg

In the kitchen

Electric refrigerator

- Adjust to the optimum temperature If the temperature is adjusted from high to low CO₂ 21.6kg
- Install behind the wall by allowing appropriate space CO₂ 15.8kg

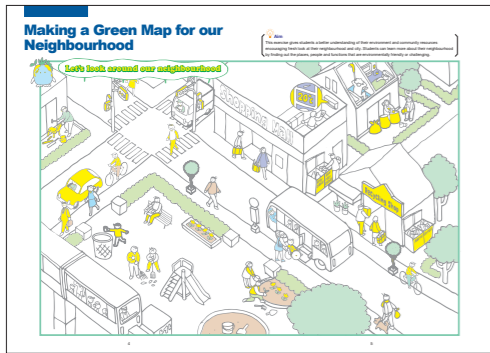
Dishwasher-dryer

- Wash dishes collectively when the machine is used If dish washing is changed from manual washing to machine washing CO₂ 37.6kg

Microwave oven

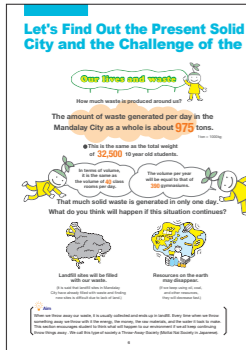
- Use microwave oven for preparing vegetables CO₂ 15.4kg

Source:The Energy Conservation Center Japan, 2012



Lesson 1: Making a Green Map for your Neighbourhood (2 class period)

- Required materials: map of the neighbourhood (a small area around the school), drawing papers, pencils, camera (if possible).
- Procedure: / Divide students into groups (maximum 5) / Ask them to walk their neighbourhood with the map and identify the eco resources (dustbins, recycling shops, bike lanes), people (farmers, waste collectors) and places (agriculture land, greenspace) along with cultural sites that make their neighbourhood a special place / Ask them to take notes, sketch or photo these places / In the class room, they draw a map of the area / Different groups can present their maps to other groups and discuss their importance.
- Follow-up: / Display the map on a bulletin board or similar / Write a report about their neighbourhood using this information / Take it home and share with the family and present to the community.
- Subject area: Social Studies, Science, Art, Agriculture



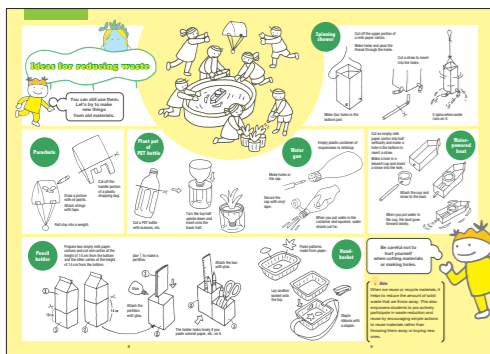
Lesson 2: Let's think about Waste Management Issues in your Neighbourhood (2 class period)

- Required materials: papers, pencils
- Procedures: Ask students to think about how much garbage they, their family and city produce daily, weekly, monthly or annually. (Average daily waste generation in Mandalay city is: (i) 640 grams per person (ii) 3,200 grams or 3.2 kilograms per typical family of 5 persons (iii) 975 tonnes or 975,000 kilograms in the city as a whole) / Discuss what happens to our environment if we keep continuing throwing garbage using simple questions such as : if you throw one piece of paper on the ground of your classroom, would that make a big difference? Suppose everyone in the classroom does this at once, what would it look like then? How about if you do this once a week or once a month? Why? / Students can be shown waste collection points in their neighbourhood or the final disposal site to show them the real situation and discuss the negative effects garbage has on their neighbourhood
- Follow-up: Produce a bulletin board or display the results of the information from the questions / Write a report or fact sheet using this information / Take it home and share with the family
- Subject areas: Social Studies, Science, Maths



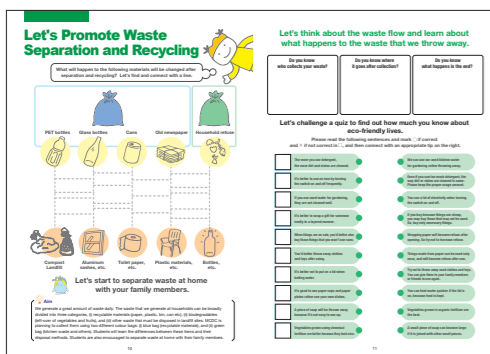
Lesson 3: Let's Discuss What Students Can Do to Reduce Waste (1 class period)

- Required materials: papers, pencils
- Procedures: Ask students to think about variety of household items that are thrown into the garbage / Discuss which of the items can be reduced, used again (reuse) or recycled / Motivate students to take simple individual actions using a check list of eco-actions and discuss how these simple actions can protect our environment
- Follow-up: Develop a checklist to motivate students to take eco-actions at schools, homes and neighbourhoods / Ask them to present what activities they have taken / Produce a bulletin board or display the results of the information / Write a report or fact sheet using this information / Take it home and share with the family
- Subject areas: Social Studies, Science, Maths



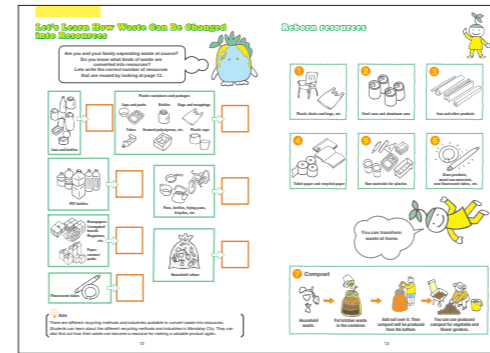
Lesson 4: Promote ideas for reducing waste (multiple activities)

- Subject areas: science, biology, agriculture, social studies
- Required materials: (i) trash collected from home (plastic bottles, milk cartons, newspapers, aluminium pie plate etc.) (ii) craft items (glue, scissors, tape, string, paint, wire etc.)
- Procedure: Ask students to bring in a piece of trash collected from their homes (a plastic bottle, a milk carton, an aluminium pie plate, a container or other reusable materials) / Set up a table to use as a project centre. Make sure to supply extra trash items for those students who need them / Instruct the students to design and build items using their trash / Let the students display their completed products and explain them to the class
- Follow-up: Discuss with students that they have just done something important for the environment as well as for society. Instead of throwing their trash away, they have reused the trash. Just imagine, if every piece of trash we used a second time, we could cut the amount of solid waste we throw away in half / Encourage students to think about what other items that could be reused at homes and share their new ideas to the class / Exhibit the students' products at school events or MCDC events
- Subject areas: Art, Science



Lesson 5: Educate Students About Waste Separation at Source (1 class period)

- Required materials: A sample of waste collected from households or classroom
- Procedure: Collect samples of waste which accumulate in the classroom after one day or ask the students to bring from their houses / Take 3 boxes and place them at the end of the room and ask the students to label them as recyclable, biodegradable or left-over for disposal / Setup two teams and let them sort the garbage by taking one item at a time and placing it in a container / After the students have sorted the garbage, go through the bins and ask why items were placed in certain boxes. Some items may appropriately fit into more than one box. The answers are not always clear, depending on options available in your community / This can also be done on paper by drawing lines between the items and the containers on a handout called "Where Does This Trash Belong?"
- Follow-up: Discuss the idea of waste reduction. Ask (i) what items are not needed in the first place (ii) if durable products could be used rather than disposal ones (iii) if products with less packaging could be purchased
- Subject areas: Science, Social Studies



Lesson 6: Let's Understand What Happens After Collection (2 class period)

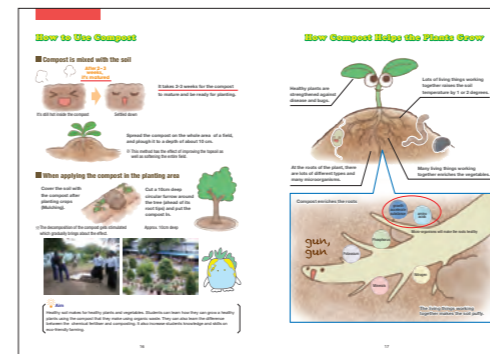
- Required materials: map of town/city, paper, pencil, place (landfill, incineration plant, recycling facility, composting facility, other waste facility)
- Procedure: Identify all the waste disposal options in your community / List up and mark them on a map / Decide where various types of garbage can go. Each item may have several options / Think about what recycling and composting options are available in your community.
- Follow-up: Are there any other options that would be desirable to manage your garbage. If so make a list of recommendations / Use the information you gather to write a report on waste disposal or create a bulletin board or exhibit / Share them with your family and MCDC
- Subject areas: Social Studies, Home Economics, Maths



Lesson 7: Learn How to Make Compost from Bio-Waste (multiple class period)

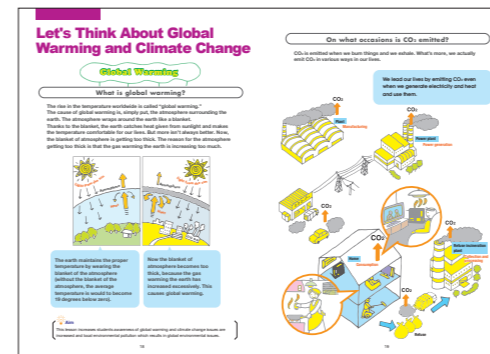
- Required materials: fresh sample of kitchen waste, cardboard box (if you want to make it in a box) or safe location, glass slide or petri dish, hand lens or microscope, paper, pencil
- Procedure: Place kitchen or yard waste into the composting bin / Chop or shred the organic materials if you want them to compost quickly / Spread seed compost or soil or pre-made compost over the compost pile. This contains the microorganisms and soil animals that do the work of making compost / Adjust the moisture in your compost pile. Add dry straw or sawdust to soggy materials or add water to a pile that is too dry / The compost should be damp to touch, but not so wet that drops come out when you squeeze it / Allow the pile to ferment. It should heat up quickly and reach the desired temperature of 90f to 140f or 32c to 60c in four to five days / Stir your compost as it ferments by turning it with a pitch fork or shovel if you want to speed up the process. If you mix or turn your pile every week, it should be ready to use in one to two months / Your compost should look like dark crumbly soil mixed with small pieces of organic materials. It should have a sweet and earthy smell / The insects (worms, bacteria, fungi) found in your compost pile do the work of making compost. If you don't see live organisms, take a fresh sample from the compost and check with a hand lens or microscope.

- Follow-up: Use your compost to feed the plants by mixing with soil/ Draw a pictures of the insects that you see in the compost piles / Take a field trip to see a compost pile and bring a hand lens to do on-site investigations
- Subject area: Science, Agriculture, Biology



Lesson 8: Let's Try to Use Compost: Plants from Trash

- Required materials: containers for plants, soil with compost, seeds, pits, fruit or vegetable parts that they throw away, and a little tender loving care
- Procedure: Discuss the different types of plants propagation, such as plants from seeds (peanuts, beans), plants from plants part (pineapple, potato), plants from exotic fruits (mango, avocado) / Ask students to collect them from the waste at home and bring to the classroom / Encourage to plant and take care by individually or as a group
- Follow-up: Monitor the progress of their growing / Share the product with others and encourage to grow more plants
- Subject areas: Science, Biology, Agriculture, Social Studies



Lesson 9: Let's Study Global Warming and Climate Change Issues (1 class period)

- Required materials: paper, pencils, checklist
- Procedure: Discuss what you know about global warming and discuss we emit CO2 / Discuss what kinds of things will begin to occur if global warming advances / Let's think about and write down what we can do at school / Let's think and write down what we can do at home.
- Follow-up: Motivation to take action to reduce the CO2 at home with the family using the checklist / Calculate how much reduction can be achieved from their simple actions and motivate to practice environmentally-friendly life-style / Discuss your ideas with others about their ideas.
- Subject areas: Science, Social Studies

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