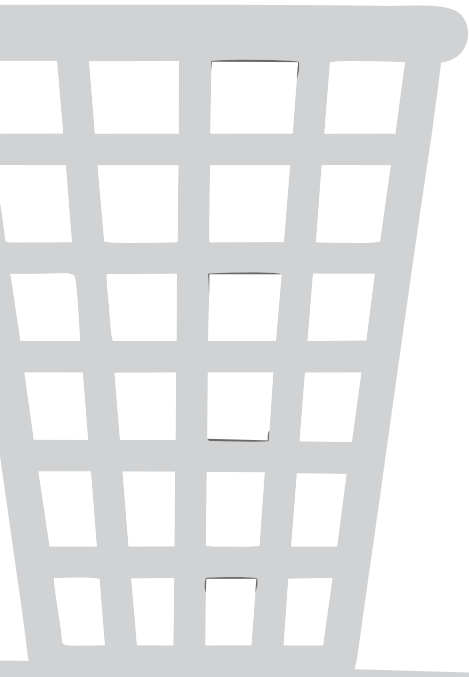


Litter Less



6-8
Years



Lesson Plans for Teachers



MARS WRIGLEY
Foundation

CEE
Centre for Environment Education

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About CEE

Centre for Environment Education (CEE) was established in August 1984 as a Centre of Excellence in environmental education, supported by the Ministry of Environment and Forests, Government of India. CEE develops innovative programmes, educational material and builds capacity in the field of education and communication for sustainable development.

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Introduction

Litter Less Campaign is a joint initiative of the MARS Wrigley Company Foundation and Foundation for Environmental Education (FEE). The Litter Less Campaign is being implemented through the Eco-Schools (ES) and/or Young Reporters for the Environment (YRE) programmes. The Campaign aims to engage and educate children and young people on the issue of litter, and encourage them to make positive choices. It aims to reduce litter and affect long-term behaviour change amongst youth globally.

In order to reduce litter and affect long-term behaviour change, an attempt has been made to create a set of Lesson Plans. The Lesson Plans in this document have been developed to enable teachers to guide classroom and outdoor learning on the wider challenge of litter and its linkages with our lifestyles. Lesson Plans have been developed with the following objectives:

- To raise awareness about litter and waste and its effect on the local environment and wider community.
- To increase students' knowledge and change attitudes for preventing and managing litter and waste.
- To influence students' behaviour in preventing and managing litter and waste.
- To promote and improve waste management in schools and student's sphere of influence.
- To assess the waste literacy of students
- To enable students to disseminate and exchange examples of work achieved in the context of litter and waste management.

Lesson plans have been organised/ categorized

1. under different strands and substrands
2. with clear indication of the different learning outcomes which will be achieved through individual lesson plans
3. based on the methodology of one of the programmes: Eco-Schools
4. age group (6-8 years)
5. with appropriate SDG linkages suitable to the particular strand

What do the lesson plans help achieve?

These lesson plans have been compiled with the intention to enable teachers to guide students systematically and bring about litter and waste related learning and change in schools and the community through meticulous planning, innovative design and action.

Introduction

The lesson plans are composed of:

1. Hands-on experiential and inquiry based learning for students
2. Curriculum linkages with different subjects
3. ESD competencies - critical reflection and systemic future thinking, self awareness, integrated problem solving to name a few (Education for Sustainable Development Goals, Learning Objectives <http://unesdoc.unesco.org/images/0024/002474/247444e.pdf>)
4. Opportunities for building skills, including observation and recording, discussion, expression, explanation, classification, questioning, and analysis
5. Opportunities for building global citizenship by providing ideas for exchange of learning as part of the twinning programme
6. Capacities and leadership qualities
7. Confidence by enabling students to report and take action on issues of immediate concern.
8. Opportunities for international collaboration through the exchange of work - would help strengthen the Eco-Schools twinning opportunities.

The lesson plans' thematic strands begin with a Before you Begin section that provides the teacher with the basic information required to deal with the issue and have meaningful discussions with the students. A teacher might not have all the information required and references have been provided that list resources in print, websites and videos used for developing the lesson plans and can be used to get more details of the issue.

Describes the lesson plan

Introduction - Provides a brief insight into the lesson plan and also mentions the methodology that the particular lesson plan has adopted, for example learning processes could include hands on engagement, classroom interaction, group work, analysis of responses.

Resources Required

Lists various resources including materials, online resources, internet, worksheets, etc. which will be required for conducting the lesson.

Curriculum Linkages

These have been specified in the lesson plans pertaining to the ES programme and mention different subjects such as environmental studies, science etc. to which linkages can be drawn by the teachers.

Programme and Age Group

This indicates the programme for which the lesson plan is recommended. It also mentions the suitable age group.

Objectives

What is intended to be achieved as part of the lesson plan is specified here.

Duration

The Lesson Plans range in duration from a few minutes to a couple of days. Duration has been specified in every lesson plan to help teachers allocate time and plan the same.

Activity

Implementation of the lesson plan has been divided based on the duration of engagement into classroom sessions and/or group assignments.

Classroom session:

These are learning processes within a classroom set-up and have largely looked at duration of 45 min.

Assignment: These are generally longer duration learning process and could be achieved over a few hours to a few weeks. These are learning processes which involve group interactions, mostly based beyond classroom set-up, sometime restricted to work within the school and sometimes beyond the school.

Evaluation

It is important to understand whether students have understood the lesson plan. Different techniques have been suggested in different lesson plans.



What is waste?

Before you begin

Waste is something that we do not need. Unwanted or unusable material. Waste is anything discarded, rejected, abandoned, or otherwise released into the environment in a manner (or quantity) that could have an impact on that environment.

How is waste generated?

Waste is generated in many ways.

1. Give students the example of a Banana peel as to why is it not eaten by most of people and becomes “waste” for us. When we eat a banana, we eat the white part which is inside, but not the peel. We throw the peel away as “Waste”.
2. Ask them about the boxes and packaging of new toys and how the packaging is discarded as “waste”.



Where is waste generated?

Waste is generated in many places: at home, in schools, stores, hospitals, workplaces, markets etc.

Does waste occur in nature?

There is no such thing as waste in nature. Consider a fruit which you do not like. For example, pomegranate. There might be many reasons you do not like the fruit, but if you leave it outside in the garden for a few days, ants and other insects will start appearing around it. Maybe a few birds as well. There will be animals, birds and insects who will feed on that fruit. This way nature takes care of it by itself. Waste for one organism becomes food or a source of energy for the other organism.

Waste - A human-made phenomenon

Humans have made progress in how to use science and technology to develop new products that we can use. New products also need more resources which are extracted from nature or made. Many of the things we use are made in such a way that we can use and then discard them. This means mountains of waste that need to be disposed of.

The more people use things, the more waste they generate. Some people are aware and create very little waste, but many of us like to buy, use and throw away things we no longer find useful. These habits have increased across the world and waste has become a big challenge. While some people manage their waste better than others, it is still a big challenge that continues to grow. Different types of materials create different types of waste. This includes types of waste that are possible to break down and those that are not possible to break down through a natural process.

What is waste management?

The collection, transportation, disposal and processing of waste generated is called waste management. The different types of waste we generate need to be managed according to the material they are made of. Therefore, the waste collection system has to collect them separately to send them off for recycling or landfilling.

The natural balance

Nature breaks down everything and reuses it in the form of food or directly in the form of nutrients. For example, Waste is not a part of the natural cycle and therefore it is hard for nature to treat it on its own. This means that there is a disturbance in the natural balance because of the waste that is produced. The things that are generated by nature are taken back by nature itself, but unwanted things which are a result of human activities, cannot be consumed by nature.



Segregate waste at Source

Lesson Plan 1

Introduction

Segregation at source is critical to its recycling and disposal. Lack of segregation, collection and transportation of unsegregated mixed waste to the landfills has an impact on the environment. When we segregate waste, it reduces the amount of waste that reaches landfills, thereby taking up less space. Pollution of air and water can be considerably reduced when hazardous waste is separated and treated separately. It is essential that waste is put in separate bins so that it can be appropriately dealt with.

Objectives

Students will be able to

- understand the importance of waste segregation.
- learn to categorise and dispose waste correctly.

Eco-School steps: Curriculum Linkages, Audit, Inform & Involve
Curriculum Linkages – Environmental Studies



6-8
Years

Time Required/ Duration

- Classroom session: 20 minutes for introduction of segregation, 10 minutes for segregation activity and 10 minutes for debriefing.
- Evaluation session: 20 minutes.

Resources Required

- Two dustbins: (Blue for dry waste, Green for wet waste)
(*colours of bins may change accordingly to the region/country)
- Pen
- Resource 2 (Paper sheets – one sheet per student)



Activity

Pre activity task for teachers/ facilitators

On a sheet of paper, record the names of different degradable and non-degradable waste types such as: vegetable peels, fruit core, flowers, leaves from garden, plastics, paper, glass, tetrapacks, aluminum foil, pencil shavings, band aid, pins, metal clips, chip packet, chocolate wrapper, polythene bag, plastic water bottle, plastic soft drink bottle, cotton U pins, etc. Add a few more names if required to ensure that each student has one sheet of paper. Some of the names can be repeated. (Resource 1)

Classroom session

1

- Introduce the topic to the class, show them the bins and explain which kind of waste will go into each of the bins.
- After the topic has been introduced, ask each student to pick one sheet of paper from the box.
- Then ask the students to put their papers in the appropriate bins (Blue labelled for Dry Waste and Green labelled for Wet Waste.)
- The students will need to identify the right bins for each product mentioned on the paper and put them accordingly in the bin.

Conclusion

After the activity has been completed, check the papers thrown into the bins and in case of a mistake, make the students aware of the composition of that particular product and in which bin it should have been thrown into.

Evaluation

The picture in the worksheet shows 2 bins in the center of the circle.

- The outer circle consists of different items of daily use.
- Ask the students to draw a line from each item to the appropriate bin.
- The students can use a pencil of different colour to depict each stream of waste.
(*colours of the bins may change accordingly to the region.)

Resource 1

Segregation Worksheet

Draw a line from each item to the bin



Evaluation

The students would have understood the concept of segregation and the main categories into which different types of waste need to be segregated.

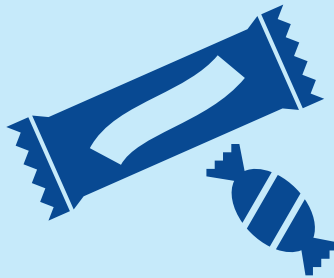
Resource 2

Paper Sheets

Leaves



Chocolate Wrapper



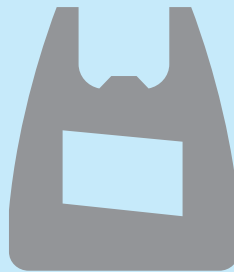
Pencil Shaving



Soft Drink
Bottle



Plastic Bag



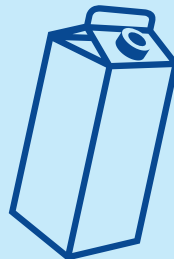
U pins



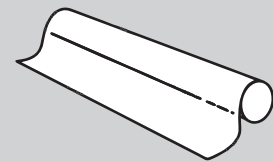
Fruit Core



Tetrapack



Aluminum Foil



Waste game

Lesson 2 Plan

Objectives

Students will be able to:

Reinforce positive and negative messages regarding aspects of reduce, reuse, and recycle

Duration: 45 minutes for conducting game.

Resources Required

- Chalk
- Paint to make a grid on the floor/ ground
- Resource 1 (Grid for waste game)

Eco-Schools steps: Curriculum linkages
Curriculum linkages: Environmental studies



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Classroom session

1

- Use the Grid provided in resource 1. Draw the grid on the floor with chalk or paint in a larger format. Alternately paint it onto a large canvas sheet.
- The game can be played by 2 to 4 students, following the pattern of throwing dice and moving the number of indicated squares along the grid.
- Place large cards with messages on identified squares. As indicated in the sample grid, alternatively place the positive ✓ and negative ✗ message cards. The students who land on such a square pick up the message card and follow instructions. The game continues until one of the students have reached the finish square.



Resource 1

Waste Game Grid

1	2 ✓	3	4	5 ✓
10 x	9	8	7 x	6
11 x	12	13 x	14 ✓	15
20	19 ✓	18	17	16 x
21	22 ✓	23	24 x	25 Finish

Sample message cards

Positive	
✓ I use cloth handkerchiefs instead of tissues.	Move ahead 2 squares
✓ I enjoy shopping with my handmade cloth bag	Move ahead 2 squares
✓ I bring my own water bottle to school.	Move ahead 3 squares
✓ I always take my own spoon and fork.	Take another turn (throw the dice again)
✓ I segregate my dry and wet waste.	Move ahead 3 squares
Negative	
X I buy drinks in cans and tetra packs.	Go back 2 squares
X I carry lunch to school in throw away containers.	Go back 2 squares
X I throw away glass bottles instead of saving them.	Miss a turn
X I do not carry own bag when shopping	Go back 2 squares
X I do not use both sides of paper when writing	Go back 3 squares

Can you find all the Words?

A collection of words related to plastic items are hidden in this puzzle. Try to find as many as you can searching across and down. Answers are given below.

A	D	S	H	U	W	R	A	P	P	E	R	C	Y	Z	X
O	R	Y	U	F	A	B	C	G	H	K	L	M	P	S	D
Y	A	T	A	B	L	E	B	A	O	L	M	C	K	C	U
R	Q	Z	C	X	F	B	D	S	H	U	V	W	H	A	S
A	Y	P	O	K	L	N	L	J	O	L	K	L	K	L	T
R	B	U	I	V	P	L	A	T	E	S	I	O	N	E	B
E	R	K	H	M	E	N	R	O	A	S	L	K	Y	L	I
R	U	X	Y	E	N	O	Q	K	H	A	I	R	R	M	N
O	S	R	F	T	A	B	R	W	F	I	J	K	T	N	T
A	H	T	I	J	F	C	L	I	P	S	M	L	I	O	O
Z	Q	E	E	R	T	H	B	R	P	H	L	M	F	H	R
E	W	K	C	V	B	T	O	Y	S	O	K	J	F	I	A
F	S	C	F	V	B	N	X	G	J	E	J	Y	I	K	N
H	X	U	R	T	Y	U	A	J	H	S	H	T	N	L	G
K	Z	B	O	T	T	L	E	F	Q	Y	V	U	C	H	M
O	B	J	L	K	Y	H	O	B	U	C	K	E	T	O	N

Words hidden in the box
 SHOES, PEN, TIFFIN, WRAPPER, TOYS, BOX, BOTTLE, SCALE
 PLATES, BRUSH, CLIPS, BUCKET, DUSTBIN,

Litter

Before you begin

When you leave an object like a food packet, soft drink can or a plastic bag on the ground and not in a bin, it can be considered as littering. Littering is when you put a piece of trash at a place where it does not belong.

Why do people litter?

There are many reasons why people litter. Sometimes people are just careless whereas sometimes dirty spaces prompt them to throw more garbage. Sometimes they are just lazy or forgetful. Bins may not be available at many places which could also be a reason for people to litter.

Where do people litter the most?

There are places where people litter more. These are places like markets, food stalls, parks, and public spaces.

Littering is a human behavior

Many years ago, there were not many things that could be thrown away. Our grandparents and their parents used and reused whatever they could. There was not much waste that was thrown away. As the world made new products, the earth could no longer manage to break down the material. With new products came materials like plastic and thermocol which cannot be consumed by nature. And so they remain at the same place for a long time. This is littering.

Littering



Ways in which people litter

There are many ways in which people litter. They do it knowingly as well as unknowingly. It could be waste that is spilt on the ground or near the waste bin or under a bench in a park or buried in sand on the beach. People could throw an empty packet of chips they just finished eating on the street instead of putting it in a bin. Littering happens when people do not throw the waste in the bin appropriately.



Litter Scavenger Hunt



Taking positive action help students to engage with the problem and understand its various dimensions including the scale and how individual behaviors contribute to the problem or solutions. In the process of taking such action, they also reflect on their behavior. The Litter Scavenger Hunt will consist of collecting litter, sorting and categorising different types of litter. Through discussion built in as part of the lesson plan, it also encourages students to understand the most commonly found litter and to find some solutions to littering.

Objectives

Students will be able to

- describe and identify “litter”
- describe effects of litter on animals and surroundings
- give ideas for reducing litter

Eco-Schools steps: Audit, Action plan, inform and involve, Curriculum linkages, Ecocode

Curriculum Linkages: Environmental studies



Time required/ Duration

Classroom session 1: 50 minutes (10 minutes for background information and grouping)

Assignment: 30 minutes for litter collection

Classroom session 2: 10 minutes for classroom interaction

Home assignment: 1 hour for discussion with parents and writing down their solutions which can be displayed on the Eco-Schools noticeboard.

Resources Required

- Gloves (1 pair per student)
- Garbage bags (1 bag per group of students)
- A grabber (optional)
- Pen or pencil for each treasure hunter
- Hand sanitizer



Classroom Session 1

Ask students the following questions

- Where have you seen litter around the school or near where you live?
- What types of litter do you find outside? List possibilities (include newspaper, food wrappings, soda cans, bottles, plastic straws, cigarette butts, etc.)
- What types of material is this litter made of? List possibilities (include plastic, paper, cardboard, rubber and metal, etc.).

Explain that this activity involves an outdoor litter pick activity and close examination of the types of items and materials that are collected.

Group Assignment 1

- Divide the students into groups (3 – 6 children per group, depending on class size. Also have at least one adult with each group) Take students outside to a playground, a park or near the school.
- Discuss safety, boundaries and rules before going outside (set boundaries, no running, stay with group and adults, avoid sharp or heavy objects, do not go near roads, etc.).
- Distribute individual gloves and one garbage bag to groups. Demonstrate how to carefully pick up, examine and calculate pieces of litter.
- After the litter-pick, ask the groups to empty out their bags into piles on the floor back in the classroom and note down all collected items in a notebook.

Classroom Session 2

Ask students to answer the following questions:

- What are the things you found? Discuss findings and compare their litter with items that were discussed and listed at the beginning of class.
- What is the reason for littering?
- Ask the groups to count the total number of pieces of litter that was found.
- Then list the totals on the chalkboard/smart board

- Have the groups separate the materials they found into two categories in response to each of the questions below. (Once they have finished putting their pieces of litter into two categories, have them determine if the number of pieces of litter in both groups are equal or if the # number of pieces in one group is greater or less than the # of pieces in the other group.)
- 1) Which materials can be blown away by wind? Which won't move easily by wind?
 - 2) Which materials can be carried by water when it rains? Which won't move easily?
 - 3) Which materials will fall apart outdoors? Which may remain intact for a long time?
 - 4) Which materials seem new and which seem old?
 - 5) Which items could be harmful to people, animals or nature?
 - 6) Which seem harmless?
 - 7) Which items can be reused, if any, and which cannot?
 - 8) Which items can be recycled, if any, and which cannot?

Home Assignment **1**

- Have students draw and write about one way that littering can be prevented or reduced on the site that was cleaned up by the class.
- Encourage students to discuss their ideas with their parents and write down their solutions which can be displayed on the Eco-Schools noticeboard.



Litter... Why does it Matter?



Introduction

Littering is one of the biggest environmental as well as a social challenges faced today. It is important to address this issue which calls for behavior change at a young age when habits are forming. This activity will help students understand how litter contributes to the problem of pollution.

Objective

To make students understand:.

- The impact of littering.
- The co-relation of pollution with littering

Eco-Schools steps: inform and involve, Curriculum linkages

Curriculum Linkages: Environmental studies

Time Required/Duration

Classroom Session 1: Total 40 Minutes (10 minutes for background introduction and screening a film, 30 minutes to discuss the problem of littering and how it contributes to one major pollution issue).

Resources required

- <https://www.youtube.com/watch?v=sjU5i98nx74> *(ocean of the future Greenpeace)
- an award winning short film on the impact of litter*- Khat Aaya Hai(<https://www.youtube.com/watch?v=6SZ-ZWjdrO8&t=93s>)
- Notebooks, writing material
- Computer/laptop
- LCD projector
- access to Internet

Pre-activity task for teachers/ facilitators

Show a short video about littering and the impact of pollution mainly on wildlife and marine organisms. Briefly discuss about how littering contributes to plastic pollution.



Classroom Session 1

- Facilitate a discussion with students about the problems associated with littering and how it leads to plastic pollution.
- Ask the students to monitor littering behavior of people. They could choose to monitor littering in the play area or a park they visit. Ensure that there is adult supervision when they are going to a public place. This could also be a class outing to a nearby public park.
- Guide students to observe people's behaviour of littering at that spot. Some indicators for observation could include:
 - 1) Are there waste bins in this spot?
 - 2) Do people throw waste in the waste bins?.
 - 3) The type of material littered most frequently
 - 4) Was the littered material consumed by any animals?
- Discuss the observations with the students. Why do they think people littered on the street? Ask them to write a short paragraph about their experience in the park.

Conclusion

The students will be able to remember the importance of not littering and how litter can cause harm to living beings.

Evaluation

Discuss the impacts of littering and what one should do to avoid littering.

*This film is about plastic pollution. As a teacher, you can show other films regarding littering behavior.



Classroom session by Our Incredible caretakers



Introduction

Caretakers/Maintenance Men are directly related to the handling of waste and possess a better picture of the characteristics of waste generated by a school. An immersion session on how a school's various activities contribute to waste generation would sensitize kids and prompt them to make changes to the current practice of handling waste.

Objectives

Students will be able to:

- know about challenges faced by caretakers due to littering.
- strengthen the knowledge regarding techniques to reduce litter in the campus.

Eco School Steps – Curriculum Linkages, Audit, Inform & Involve
Curriculum Linkages – Environmental Studies

Time required/ Duration

Classroom session 1: 45 minutes to discuss and analyse students' observations of people's "littering behavior".

Resources Required

- Notebook
- Pencil/pen
- Resource 1 (Take the old shoe through the maze and put it in the garbage can.)
- Resource 2 (Spot the litter in the picture)

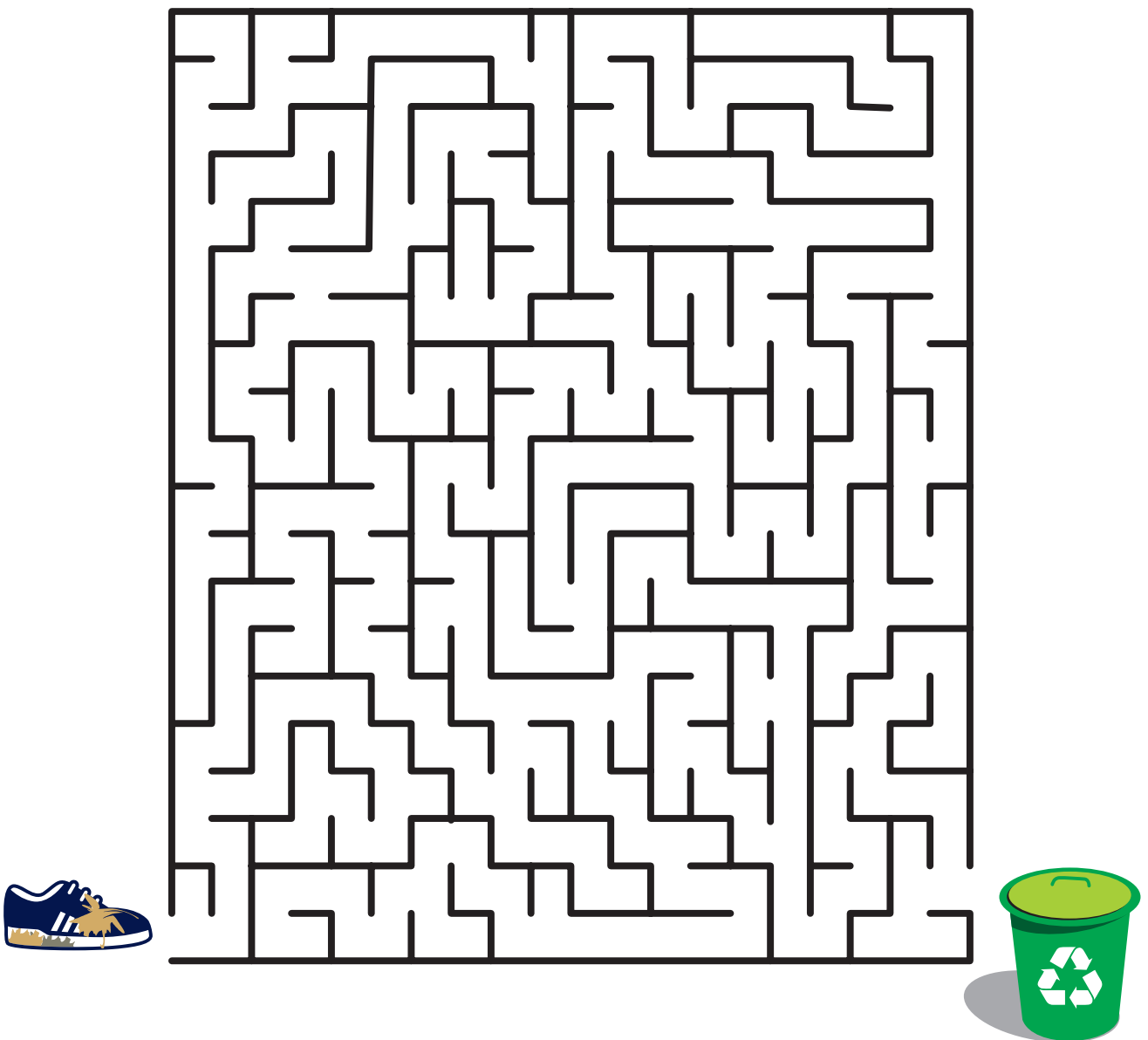
Classroom Session 1

- Plan a session with the caretakers working at the school.
- Ask them to tell the kids about the common products found in the waste bin. Also, discuss what items are littered in the campus.
- The caretakers can take the students on a round of the school and tell them about their daily work.
- Have a discussion once they are back, about the spots they found littered and how they could help the caretakers by reducing littering.



Resource 1

Take the old shoe through the maze and put it in the garbage can.



Resource 2

Colour me

- Can you spot the litter in the picture?
- Colour all litter in one colour so it stands out!



Poetry Contest



This lesson plan encourages students to identify which words are associated with litter and to express themselves in writing.

Objectives

Students will be able to:

- Understand which words are associated with litter.
- Present their opinion in a structured manner.
- Build a sense of confidence about their writing abilities.

Eco School Steps – Curriculum Linkages, Inform & Involve, Ecocode
Curriculum Linkages – Environmental Studies, language

Time required/ Duration

Classroom session 1: 20 minutes for introducing students to poem styles and classroom discussion and 20 minutes for creating poem of their own.

Resources Required

- Paper
- Pencil/pen
- Resource 1 (structuring poem) *

Classroom Session 1

- Ask each student to write a list of words associated with litter.
- For example Litter, Garbage, Trash, Prevention, Junk, Scrap, Reduce, Reuse, Recycle, Environment, Pitch in, Clean up.
- Students may then be asked to explain how the chosen word reflects their personality.
- Let the students then take up their papers and pencils and

1) in the first line, write the name of the chosen word (Subject/Noun)



- 2) in the second line, write two words describing its qualities (adjectives)
- 3) in the third line, write three words of action about the element i.e. what the object does (Verbs)
- 4) in the fourth line, write four words describing how they feel about the element (Phrase, sentence, expression)
- 5) in the fifth line, write one word which is synonyms of the first word.

- Now let each student read out what she has written like a poem. Ask them to display their poetry on the walls.
- Invite people to see and judge the poetry contest.

*The exercise can be done in any language.

Here is an examples:

Litter

Filthy, Dirty

Smell, Stinks, Irritates

It makes me sad

Waste

Butterfly

Colourful, Happy

Flits, Rests, Flies

Fills me with wonder

The Butterfly



Decomposition

Before you Begin

What is decomposition?

It is a process by which natural/organic material are broken down into a more simple organic matter. After a living organism dies, the body of the organism begins to decay and becomes a source of food for smaller organisms such as insects, animals and birds. This natural process is called “decomposition”.

Importance of decomposition in nature

Decomposition is an essential process in nature, playing an important part in the breaking down of natural matter, recycling it and making it available for the other organisms to gain nutrients from. In nature, plants and animals decompose, or break down into their principal nutrients with the help of insects, bacteria, and other microorganisms. These decomposers play an extremely important role in nature and without them the Earth would be piled high with dead things. Once decomposition occurs, the nutrients are absorbed back into the soil where they play an important part in soil health. This nutrient-rich soil is then available to nourish new plants, which in turn nourish animals along the food chain.

How do things decompose?

Decomposition begins after an organism dies. The prime decomposers (those organisms who help decompose matter) are bacteria and fungi. There are many birds like crows and vultures who are also decomposers. The large-sized decomposers are also called scavengers. Insects and worms like mites, flies, worms, etc. also help decompose organic matter. This decomposed matter turns into a nutrient rich material boosting soil health.

Plant decomposition

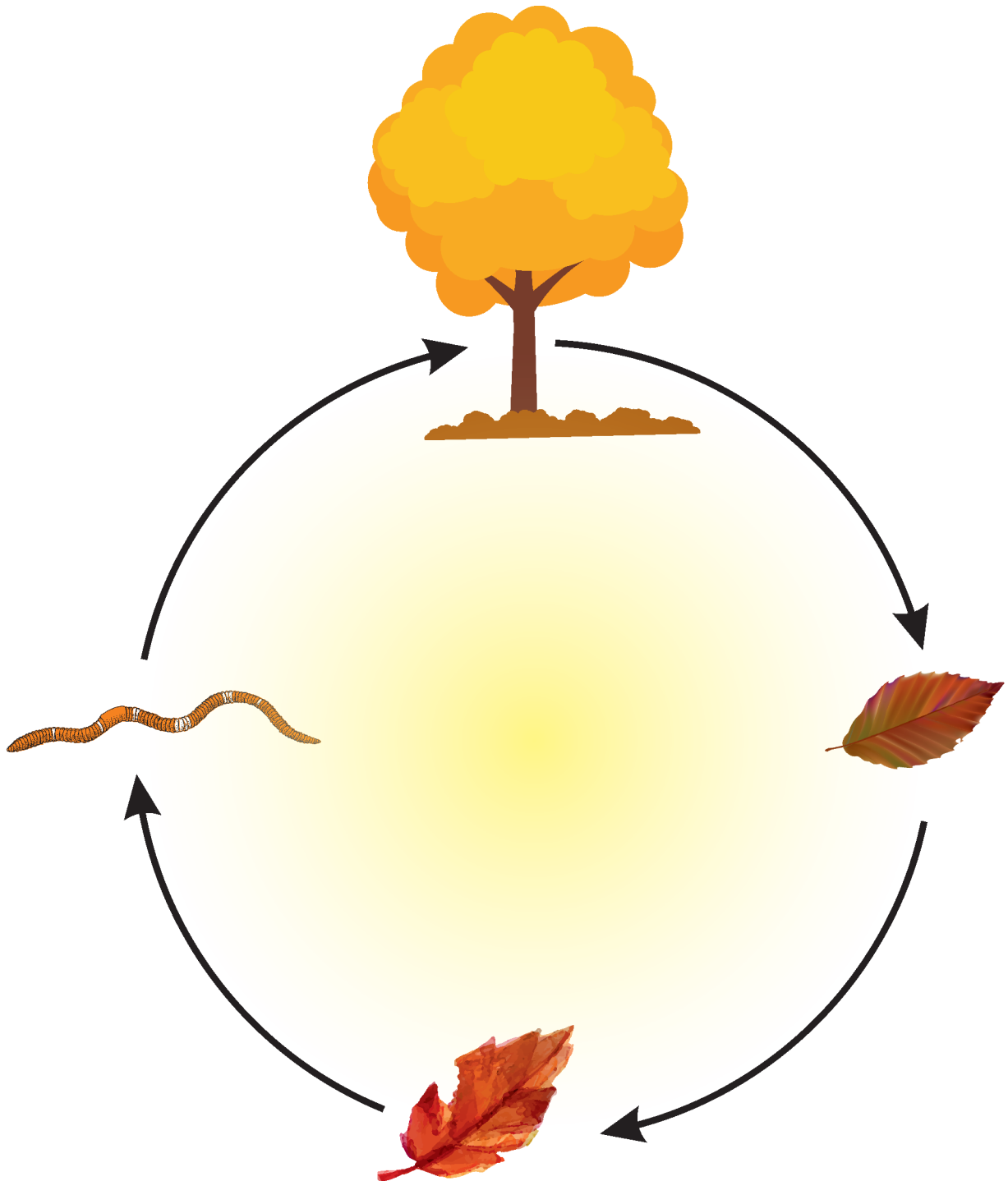
Decomposition of plants occurs in various stages. In the first stage, the plant starts losing water. During this phase, bacteria and fungi absorb most of the energy nutrients from the plant. Whatever is left of the plant is then decomposed by other insects and organisms.

Food decomposition

Food is also decomposed in a very similar manner to that of plants. Spoiled or wasted cooked food starts decomposing faster than the food. The decomposition of cooked food starts a few hours after preparation.

Decomposition in animals

Fungi play a secondary role in the decomposition of animals. Other animals and birds play a primary role in decomposing the body of a dead animal. These include bacteria, scavengers such as crows, vultures and carrion feeders like dung beetles who bury the animal excreta into the soil enriching it with nutrients.



Where Did My Stuff Go?

Lesson 1 Plan

Introduction

There are two main types of waste materials that humans generate: organic and inorganic. Organic waste comprises of plant and animal material, such as food waste, fallen leaves, grass etc. This type of waste can be decomposed in nature. This is the same type of waste that is generated in natural ecosystems when plants and animals die and can be completely recycled, contributing to new life.

Inorganic waste is composed of items that are not derived from plant and animal sources. Examples of inorganic waste are plastic, glass and metal. These types of waste are not biodegradable and microorganisms do not consume these. Therefore they do not decompose like organic waste does. Plastic, glass and metal will spend thousands of years in a landfill, and although they may break down into smaller pieces over time, with the help of sun and water, they will not provide nourishment for new life to grow.

In this inquiry-based hands-on activity, teachers can teach students how different kinds of materials decompose.

Objectives

Students will be able to

- differentiate two types of waste: organic and inorganic
- understand how organic waste goes back to nature and inorganic does not
- understand why decomposers are important for the process of composting
- know some examples of decomposers including fungi, microorganisms, and insects

Eco-School Steps – Curriculum linkages, Audit, Inform & Involve
Curriculum Linkages – Environmental Studies

Time required/Duration:

Classroom session 1: 20 minutes for a briefing of the activity
(Introduction and creating of groups)

Outdoor session 1: 10 minutes at school (once every week) for 12 weeks (the groups can do this activity during recess time) so 120 minutes in total and 10 minutes for debriefing



Resources Required

- Flags/Markers or indicators
- Gloves
- Garden trowel
- Water
- Spray bottle
- Magnifying lens
- At least one “set” of waste: (waste can consist of daily household items)
 - an apple core/banana peel/fruit peel
 - a piece of plastic
 - one or two leaves or flowers (fallen)
 - a piece of bread
 - a piece of tin or aluminium foil
 - a piece of paper
- Each student will need a notebook for marking observations.
- Resource 1 (Decomposer reference chart with information)
- Magnifying glass



Classroom Session 1

- Show the objects (leaves, paper, apple core, bread, plastic, foil) to the students. Allow students to carefully observe, touch, and pick up the objects.
- Ask them what do they notice about these objects? They could describe the size-length, width, and height, color, shape. They could also say where the objects come from.
- Then ask them which and how many objects they find in the classroom waste bin?
- Let students record their observation. The teacher can now ask the students about their experience and what they think will happen to those objects.

Outdoor Session 1

- Divide the class into six groups. Select a patch of land in the garden, (usually off-limits for other students to ensure that the waste put there would remain untouched for at least 2 weeks). The teacher would help students select a patch in the garden.
- Dig a few centimeters of soil using a garden trowel and place each waste item in the patch. Each group of students is entitled to one pit of their own and one type of waste material.
- Cover the item with the dugout soil. Ensure that every item is underneath the surface and is fully covered with soil.
- Add a few glasses of water to induce moisture into the soil. Make sure the water content is just enough to moisten the soil and not to soak the item (a spray bottle works well for this job).

- Place a flag or some marker near each item representing the item and the place where it is buried.
- After two weeks, the students should observe what has happened to the objects they had buried. They will see a tremendous difference in the different materials between the first and the last week.
- Ask the students what else they observe using a magnifying lens for better observations. Why did some waste change and some did not? Prepare an observation table based on their experience.
- Discuss about decomposition and the time it takes for different materials to decompose. Show the illustrated chart (Resource 1)

Conclusion

Students understand that Decomposition is a natural process and different materials take different periods of time to degrade.

Evaluation

Discuss which types of material decompose based on the experiment.

Resource 1: Decomposers

Compost Critters Information Page: <http://cemarin.ucanr.edu/files/30638.pdf>

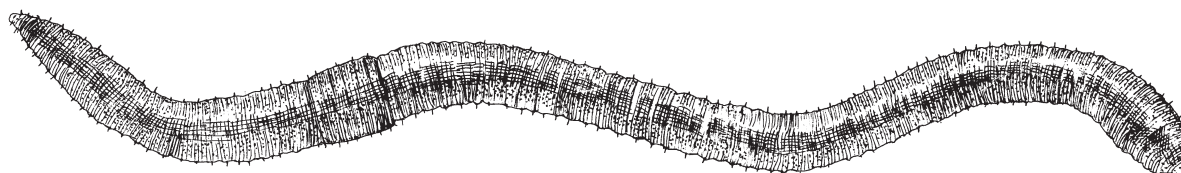
Beetle

I am an insect with shiny black, tough wings and am about 1/2 inch long. I am a predator and eat slugs, snails and soft insects such as caterpillars. I live beneath stones, boards and other moist places.



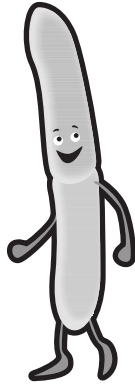
Earthworm

I am a long, thin soft-bodied animal. My body is made up of little segments. I do not have legs or eyes. I sense light, and I breathe through my skin. I eat bacteria, fungi, and other decaying materials. I like dark, moist places.



Bacteria

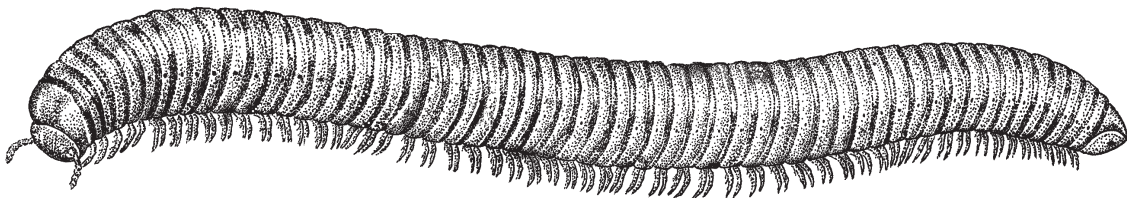
We are so tiny that you can't even see us. We are everywhere. We are colorless and can eat almost anything. Some of us live together in groups and others don't.



Millipede

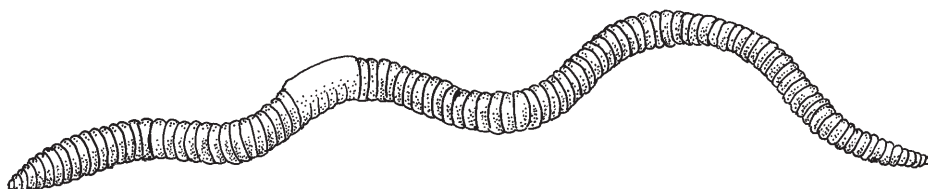
I have so many legs, you would have a hard time counting them.

My name means “thousand legs,” but I don't have that many. I am very shy and I roll up into a ball to avoid danger. I am a vegetarian and eat soft, moist, decaying plants. I am dark-red in color and am 1 to 3 inches long.



Mite

I am tiny. It would take 25 of us to cover an inch-long line. My body is round and fat so it's hard to see my 8 legs. I eat plant materials such as mold and soft tissues of leaves. Some of us eat the manure of other organisms. I am usually white or brown.



Compost in a bucket



Introduction

Soil is one of the earth's most precious natural resources. It is composed of rocks, minerals, living organisms, and organic matter. Organic matter in soil comes from the decomposition of plants and animals. Minerals in soil are needed for plant growth. The nutrient cycle, which converts dead plants or animal tissue into a form that can be absorbed by new plants and animals, is essential to all life on earth. Tiny microscopic animals in the soil eat and transform the dead tissues of plants and animals into nutrients easily absorbed by plants. These bacteria are the most numerous creatures in the world. One handful of soil can contain five billion creatures, as many as all the people in the world. Composting is the process people use to convert organic materials to a rich soil amendment. It happens anywhere there is sufficient organic matter, moisture, and air to nurture the microscopic bacteria, fungi, and other organisms that decompose organic matter.

Objectives

Students will be able to

- make compost in a bucket in the home/classroom
- record their observations over 2–4 weeks
- gain an understanding of life cycles, decomposition, and organic materials
- identify various decomposer animals in their bucket

Eco-School Steps – Curriculum linkages, Audit, Inform and Involve
Curriculum Linkages – Environmental Studies



Eco-Schools



Time required/Duration

Classroom session 1: 30 minutes for introducing the concept

Resources required

- Vegetable and fruit scraps
- Used tea leaves
- Leftover or spoiled food
- Large bucket with lid
- Trowel
- Leaves or cut grass





Home assignment

- Save your vegetable scraps, such as banana peels, potato skins, and rotten tomatoes, in a bucket. Don't save meat, bones, fat, cheese, milk, or any other animal products. Don't save plastics, glass, or paper either—these are recycled in other ways.
- Select an appropriate place to age the vegetable material in your bucket. Look for a shaded, sheltered area to place the bucket.
- When the bucket is about half full, take it out to your selected compost area. Spread out a thin layer of kitchen waste, then top with leaves or grass.
- Build up your compost pile by adding a new layer of waste each time your bucket of vegetable scraps is half full. Be sure to always top the pile with leaves or grass.
- Sprinkle the compost lightly with water every few days. Don't soak the pile, just dampen it.
- Turn the contents of the bucket every 15 days.
- The compost will be ready in 3-4 months.
- Take it out and spread in your garden.

Follow up questions

1. Ask the students how much time did it take for the wet waste to turn into compost?
2. Ask the students about other things that can be composted?

Refuse, Reduce, Reuse, Recycle and Repair

Before you begin

Refuse, Reduce, Reuse, Recycle and Repair are also known as “the most important 5R’s” of waste management. The concept of 5R’s is to decrease the amount of things we use and simultaneously also decrease the amount of things we throw away. Since we have limited space on earth to dispose all the waste, it is important to use the resources efficiently and create less waste. The 5Rs play an important role in solving the problems which can arise out of wrong waste management habits.

The 5R’s

Refuse

Refuse whenever and wherever possible. Choose items that are not packaged in plastic, and carry your own bags, containers and utensils. Refusing will eliminate most of your waste/ trash. Ask the question, “Why are we purchasing this item?” or, “Why do we need this?” For instance, make a personal commitment to say “no” to plastic straws. Whenever ordering a drink, politely request “no straw, please.” as such plastics are not recyclable and are harmful for the environment. So refusing such things which are not necessary will not end up harming us and nature.

Reduce

Reduce/Reduction: To make something smaller or use less, resulting in a smaller amount of waste. Waste reduction simply means reducing the things that we use and only consume what is necessary. This way the amount of waste that is created in the end is reduced and avoids going to the dump. This also reduces the pressure on natural resources which are utilized in treating the waste as well as natural resources which are required to manufacture new things. Reducing things that we use can also save a lot of money since we stop buying the product entirely. For instance, we can reduce the consumption of bottled water and instead carry a steel bottle to avoid sending the used bottles to landfill/recycling plant. Also, avoid buying new toys frequently, rather, build toys to play with.

Reuse

Reuse is a method or a practice of using something again. This can be done to use the product for its original purpose or to fulfil a different function. Reusing a product more than one time benefits us as well as the environment. Reusing also helps in saving time, money, energy and resources. For example, there are glass jars at home in the kitchen. These jars are used multiple times after being empty. Old books can be used by other people after being used once. The book can be used for reading or the paper of the book can be used for other purposes if it is a notebook. Use cloth gift bags and stop ripping the paper off gifts . If you remove the wrapping paper carefully, you can use it again.

Recycle

Recycling is one of the key components in the waste management system. It is the process of converting waste materials into new materials and objects. It is the practice of reprocessing and reusing the items in the same or a different form which otherwise could have been discarded as waste. This process saves a lot of time, energy and resources and money. It also reduces the consumption of natural raw material used to produce things. It is thus important to buy recycled as well as recyclable products in order to reduce the pressure on the environment. For example, your old notebooks can be recycled into recycled paper and then used again to bind notebooks.

These are some things that can be recycled: • Aluminium Cans • Building Materials • Cardboard • Electronic Equipment • Glass (particularly bottles and jars) • Lead • Magazines • Metal • Newspapers • Paint • Paper • Plastic Bags • Plastic Bottles • Steel Cans • Tyres • Writing/Copy Paper • Garden Waste

Repair

These days, we find it easier to buy a new product than to repair and use an existing product. This is true of especially electronic goods like mobile phones and domestic appliances, which can last a long time if repaired when necessary. Reducing, reusing and recycling, decrease both the demands on natural resources, as well as the rate at which they are consumed. Fewer resources are used and supplies that are limited are conserved. In addition, less waste is generated, thereby reducing the amount of trash that must be landfilled or incinerated. As the amount of trash buried or burned decreases, so too does the potential for water and air pollution which can occur as a result of burning or improper disposal of waste. Our world has a limited supply of natural resources, including land used for landfills. All these techniques help us conserve such natural resources.

Importance of 5R's

Waste has become a big challenge for the environment and humans in modern times. Our water bodies, our grasslands, our fields, our public spaces; all of them are being affected by the waste we discard. It is important to take steps for Refusing, Reducing, Reusing and knowing about Recycling at a young age. It is important to know what we actually need and what we just want.



Consumption – Reduce, Reuse & Refuse



Introduction

This lesson plan focuses on how consumption can be reduced and how things can be reused. Many children are not familiar with the concept of reduce, reuse and recycle. This is because they are unaware of the environmental impact of the things they observe around them and things they buy. Milk in pouches, use and throw pens, polythene carry bags to bring purchases in, are a part of how they have seen it happening around them.

It can be often a discovery for children when they come to know that this was not the case during their parents' and grandparents' time. Plastics, because of their very nature, have over the years become an intrinsic part of life. Students need to understand why people have shifted to consumptive lifestyles which have made them more dependent on 'use and throw' products.

Objectives

Students will be able to

- Understand the importance of reducing consumption and also prompt them to reuse and refuse things.

Eco School Steps – Curriculum Linkages, Audit, Inform and Involve
Curriculum Linkages – Environmental Studies



Time Required

Classroom session 1: 20 minutes to set the context and brainstorm with students

Home assignment 1: 1 hour for Home survey worksheet

Classroom session 2: 20 minutes for discussion with students

Resources Required

- Blackboard
- Chalk
- Survey sheet
- List of different products
- Resource 1: Home survey worksheet



Classroom Session 1

- Write the names of commonly used items at home on the blackboard. Each student should be asked to give one name and once everyone has contributed, anyone can add more names if needed.
- Share the Home Survey worksheet with the students and explain how they should use it.

Home Assignment 1

- The students should fill the survey sheet after discussion with their grandparents and parents.
- The list they made in the class can be used as a reference to discuss with the respondents to understand whether the items in it were the same in each generation or a different item was used for the same purpose.

Classroom Session 2

- Discuss the products which are mentioned in the survey sheet with the class.
- Ask when the use of a disposable replacement of an item began and in which generation.
- Discuss in groups the possible reasons for why disposable items replaced natural products.

Conclusion

At the end of this activity, the students will be able to understand that plastic use is a relatively new phenomenon and many of the naturally degradable products used earlier can still be used instead of plastics.

Evaluation

Discuss the alternatives and check which ones students think can be either reduced or easily reused.

Resource 1

Survey Sheet

(answer Yes or No and if No, describe the alternatives used)

Discuss the alternatives and check which ones students think can be easily reduced and reused.

Name of the products	Did your parents use this product in their childhood?	Did your grandparents use this product in their childhood?	Do you use this product?	Can it be reduced?	Can it be reused?	Can it be refused?
Polythene Bags						
Chips & Snack Pouches						
Diapers						
Plastic Cups						
Soft Drink						
Bottles						
Shampoo bottles						
Soap Packets						
Toothbrush						
Band-Aid						
Styrofoam						
Toys						
Disposable plates						
Platic Straws						
Tetra-Pack						

Recyclingo !

Lesson 2 Plan

Introduction

Since the students are now familiar with the concept of Reduce, Reuse, Refuse , Recycle & Repair, it is time for them to learn about the difference between the materials. It is also important for them to know which items can be recycled and which items cannot.

Objectives

Students will be able to:

- Understand how some daily-use items stay in nature for a long time.

Eco School Steps – Curriculum Linkages

Curriculum Linkages – Environmental Studies



7-8
Years

Time required/Duration

Classroom session 1: 40 minutes (10 minutes for background information and introducing the rules for the game 30 minutes for conducting the game)

Resources Required

- List of 25 recyclable items and all the items mentioned in the list
- List of 25 non-recyclable items and all the items mentioned in the list
- 2 small boxes per kid
- Pen/pencil
- Resource 1: Non-recyclable material
- Resource 2: Recyclable material
- (5X5 matrix sheet)



Classroom Session

1

- Prepare a list of 25 recyclable and 25 non-recyclable items each which are used daily. (Tip: Include those items which the students come across daily, for them to connect better).
- Represent the items in a 5X5 matrix .
- Create randomized versions of each list and circulate it among the students.
- Call out a random item, one item at a time. The sequence will be spontaneous. Instruct the students to tick the respective item off their list and mark R for Recyclable and NR for Non-recyclable.

- Whoever ticks off 5 rows (vertical, horizontal or diagonal) is encouraged to come forward and share his/her list and the explanation for placing them under any of the categories.
- Further, all the students are encouraged to share their thoughts on the exercise.
- Ask them to address:
 - o What is recyclable and non-recyclable material?
 - o What are the common products that fall under each category?
 - o Where they can be deposited the recyclable material?
 - o Tell them to collect information on where does the non-recyclable product end up?

Resource 1 List of Non-recyclable items

Flip Flops	Tin can	Toothpaste tube	Pendrive	Juice box
Cell Phones	Computer Printer	Books	Glass bottle	Plastic buckets
Food waste	Metal	Soft Drink Bottles	Batteries	CD's
Steel	Jeans	Magazines	Toothbrush	Plastic Chair
Phone book	Earphones	Clean cardboard	Crayons	Milk carton

Resource 2 List of Recyclable items

Candy Wrappers	Plastic hangers	Rubber bands	Tissues	Plastic wrapping on vegetables
Photographs	Cigarette butts	Plastic toys	Crisp packets	sponges
Dirt	Styrofoam plates	Mirrors	Wooden pencils	Spoilt Pizza boxes
Ceramic mugs	Carbon paper	Flex banners	Plastic straws	Spoilt food foil
Rock	Incandescent Bulbs	Plastic spiral from books	Beauty Products	Carpet

Resource 3 : 5 X 5 matrix

Computer Printer R/NR	Candy Wrappers R/NR	Cigarette butts R/NR	Food waste R/NR	Juice box R/NR
Computer R/NR	CD's R/NR	Soft Drink Bottles	Glass bottle R/NR	Milk carton R/NR
Books R/NR	Plastic toys R/NR	Clean cardboard R/NR	Rubber bands R/NR	Batteries R/NR
Styrofoam plates R/NR	Carbon paper R/NR	Tissues R/NR	Books R/NR	Pendrive R/NR
Flex banners R/NR	Milk carton R/NR	Earphones R/NR	Magazines R/NR	Plastic straws R/NR

Recycled Art Mosaic for school wall



Introduction

This lesson plan will help students with memory and attention span as they go through different processes including processing, creative thinking and problem-solving abilities.

The different types of wastes collected by children could be transformed into a creative craft form. A mural would be a good idea as it could help brighten up the school wall. This would also be a very creative way to show how waste could be best utilized. The caps of plastic bottle come in the varieties of colors and sizes. These caps can be used creatively in art and craft activity in the school.

Eco-Schools Steps: Curriculum linkages, inform and involve

Curriculum linkages: Art and design, language, Environmental science

Objectives:

- To inspire children to create an art form out of recycled waste
- Explore their perception of waste
- Identify creative and fun ways to reuse rubbish

Resources Required:

- Different types of wastes: Bottle caps, CDs, plastic pins
- Bubble Wrap
- An empty wall of classroom/ campus wall/corridor wall
- Paint/watercolours
- Paper
- Scissors
- Sponge



Time required/Duration:

Classroom session 1: 20 minutes for conceptualizing the idea and 30 minutes for execution of the idea (this could be distributed across the school calendar year)

Classroom session 2: 30 minutes for the execution of the idea using bubble wrap and paint

Classroom session 1

- Conceptualise a creative art form together with the students which they would like to put together.
- Select different types of waste collected to create the art. The size of the art could vary depending on the amount of waste the school has been able to collect and the availability of space in the school, or the number of students and their age.
- The completed mural can then become a permanent exhibit at the school.
- Refer to resources 1-3

Extension and Variation:

Students from the South Street Elementary School , Newark, New Jersey, USA collected over 5,000 bottle caps from their local community and arranged these caps into an eco-friendly 8-foot by 12-foot mural (Resource 2). The project was displayed for sometime at the Newark Museum. The project provided students with hands-on knowledge about conservation and encouraged them to become responsible global citizens.

Classroom session 2

- Encourage the students to color a particular piece of bubble wrap using a sponge.
- Once they are done with painting, flip the bubble wrap over a piece of paper and press it down to create an interesting design.

Evaluation

Evaluate the students on their creativity and their understanding of the importance of reusing waste.

Resource 1: Recycled mosaic art wall



Resource 2 : Project done by South Street Elementary School



Resource 3: Marine animal from bubble wrap



Recycling is music to my ears!



Introduction

This lesson plan is designed to make music instruments from recycled materials.

Objectives

Students will be able to

- learn about recycling and its impact on the environment.
- research various instruments and explore the artistic skills employed when creating instruments.
- understand how others have used recycled materials to develop instruments.
- construct an instrument using recycled materials.
- paint and decorate instrument.
- identify the angles in their completed instrument.

Time required/Duration

Classroom session 1: 45 minutes to explain this activity and discuss with students the process of making musical instruments.

Resources Required

- recycled containers such as plastic soda bottles, coffee cups, small cardboard boxes, other things?
- crayons,
- colored pencils
- markers
- adhesive tape
- glue
- rice
- pasta
- coins
- bottle caps
- Resource 1 (Drum)

Pre-activity task for teachers/facilitators

- Teach the students what a band is and how each member of a band plays different instruments.

Classroom session **1**

- Divide students into groups of 3 to 4.
- Distribute material among the groups, including glue, scissors, and white paper.
- Students will bring materials that can be recycled to make musical instruments that they find at home or around the school campus. Clean them and cover them with white paper. (Some materials can include coffee cans, Soup cans, Glass jars with different levels of water, boxes, old pieces of copper piping, gift wrapping tubes, plastic packaging, string, plastic jugs, or any other items you can find around your house.)
- Students must develop their own musical instrument from recycled items.
- Ask students to decorate their musical instruments with crayons, markers and decorations.
- After the decorations students, can test the different sounds by putting materials inside the containers ex. pasta, rice, coins etc.
- Have a group of the students share what their musical instrument sounds like.

Evaluation:

Ask students which type of instruments we can make from recyclable materials?

Resource 1:



References

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