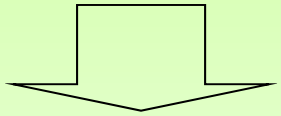
The Significance of Environmental Learning Classes

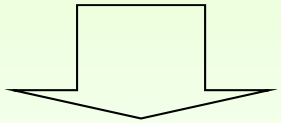
NPO Environmental Study Institute

Why is environmental learning necessary?

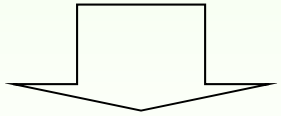
- To balance sensibility (right brain) and rationality (left brain).



- To study the connection between the natural environment and human beings.



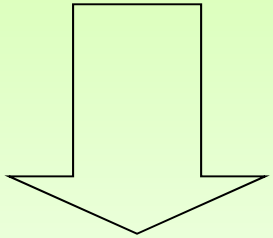
- To realize that nature is the source of human life.



- To grow as a person who values nature

Environmental Learning - Point 1

- The interaction of knowledge and experience is important.



- Link between academic learning and environmental learning.

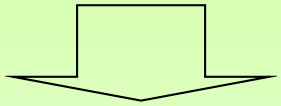
(Academic learning provides the base for environmental learning.)

Environmental Learning – Point 2

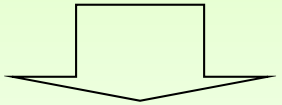
- Methods that stimulate an awareness of problems as our own.
- Conducted with the local area as the stage.
- Conducted in our daily lives.
- Spreads to the home and local community.
- Shared experiences/cooperation, discussions, leadership, consideration for others.
- Growth and emotional inspiration gained from interacting with various people.
- Building a “hometown” awareness.

Hands-on Learning – Town Exploration

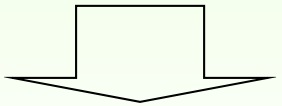
① Looking at the local community. (area exploration)



② Becoming aware. (discovering issues)



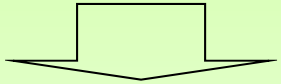
③ Think, discuss, act. (repeat ① ~ ③)



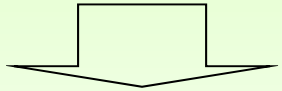
④ Convey. (presentation or individually)

Hands-on Learning – Nature Exploration

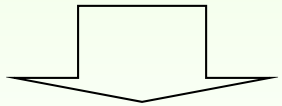
① Becoming familiar with the nature nearby.
(school grounds, parks, neighborhood)



② Discovering the mystery and fun of nature.



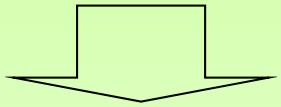
③ Think, discuss, act. (repeat① ~ ③)



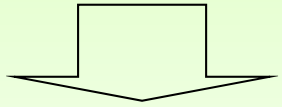
④ Developing an emotional sense for valuing nature.

Hands-on Learning
– Learning from a Guest Teacher

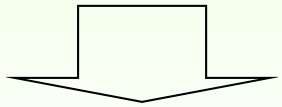
① Specialized lectures and hands-on learning.



② Understanding of efforts made in society.



③ Respect and admiration for adults.



④ Developing a sense of making an effort themself.

Becoming a Professor of Garbage
– Street interviews

Becoming a Professor of Garbage
– Listening to guest teacher presentation

Becoming a Professor of Garbage – Hanging posters

Becoming a Professor of Garbage
– Picking up trash around town

Eco-Study
“Becoming a Professor of Garbage”

- **Program Objective:**
  Through hands-on activities to learn about the various garbage that is generated in our lives, it allows participants to think about what they can do to protect the environment.

- **Target grade level:** Elementary school – 4th grade

- **Related subject:** 4th grade social studies – “Making life comfortable”

- **Program summary:** Hands-on program to think about trash in our daily lives.

Program Preparations

■ Summary

This programs allows children to investigate and evaluate the trash situation in the community and daily lives through observation and interviews. Cleaning activities can also be incorporated. Their studies about trash in social studies classes can be deepened through hand-on activities.

■ Preparation

1. Request assistance from helpers
   Cooperation from teachers, parents, and members of the community is necessary so that children can safely conduct activities outside of school grounds. Although this may vary depending on the community environment, assistance should be requested so that there is one adult per five children.

2. Investigate trash separation methods
   Trash separation and disposal methods differ by region. These methods should be investigated in advance.

3. Decide checkpoints and form groups
   Decide the places to be investigated such as parks, train stations, beaches/rivers, trash collection stations, supermarkets, and convenience stores. Assign helpers to each group.

4. Create evaluation sheet
   Create a sheet for children to write down what they have investigated about the trash at each point and to record their evaluations (See p. 4)

Trash collection point →
Example checkpoint:
Has the trash been separated? Have crows or cats gotten into the bags?

↑Recycling box
Example checkpoint:
What kinds of items are collected?

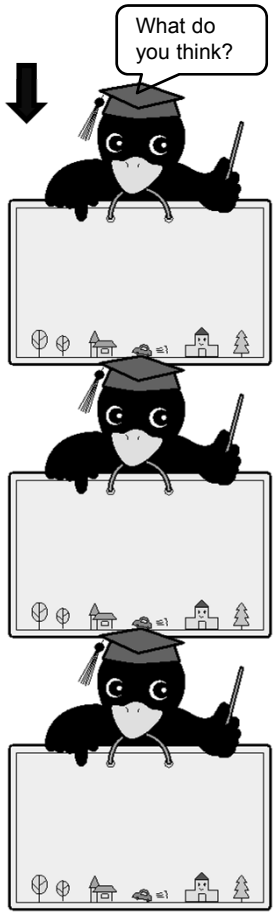
←Park
Example checkpoint:
Has there been littering?

5. Clipboards, writing instruments, *digital camera
   Used for filling in evaluation sheets. Recording the conditions at each point with a digital camera is useful for summarizing or presenting their findings.
6. Cleaning tools
   If incorporating cleaning activities, trash bags, gloves, and tongs, etc. should be made available. Additionally, if a sheet for recording cleaning activities is created (see p. 5), increased awareness can be expected.

★ Professor of Garbage Checksheet ★

Places investigated: _____

☆Write down what you investigated and what you discovered about trash.
☆If you think the things you found are bad for the environment, write ☹ .
If you think they are good for the environment, write ☺.



Littering Sheet

Places investigated: _____

When you find or pick up trash, draw one vertical line for each piece of trash in the Amount column.
If you group the lines by five, it's easier to count later!

Type of Trash	Amount of Trash	Total
Burnable		
Non-burnable		
Bottles		
Cans		
PET bottles		
Plastic		
Paper		
Other		

Program Process

■ Process steps

[Preparations]
Distribute Evaluation Sheets, Littering Sheets, clipboards, and digital cameras to each person or group.
*If cleaning activities are to be conducted, distribute cleaning tools.

1. Introduction (example)
•While looking back on the investigations done on household trash in social studies class, explain the content of this activity.
•Designate the places that each group will investigate.

2. Explanation of process
•The things that are seen, heard, and discovered are written on the Evaluation Sheet. They are evaluated in terms of whether they are good or bad for the environment, which is indicated with symbols.
•If there has been littering, the types and amount of trash are written on the Littering Sheet.

3. Introduction of helpers and words of caution
•Helpers are introduced.
•Cautionary notes regarding the activities are given.
- Etiquette to be following during interviews is explained.
  *If conducted, precautions to be taken during cleaning activities are given. (p.4)

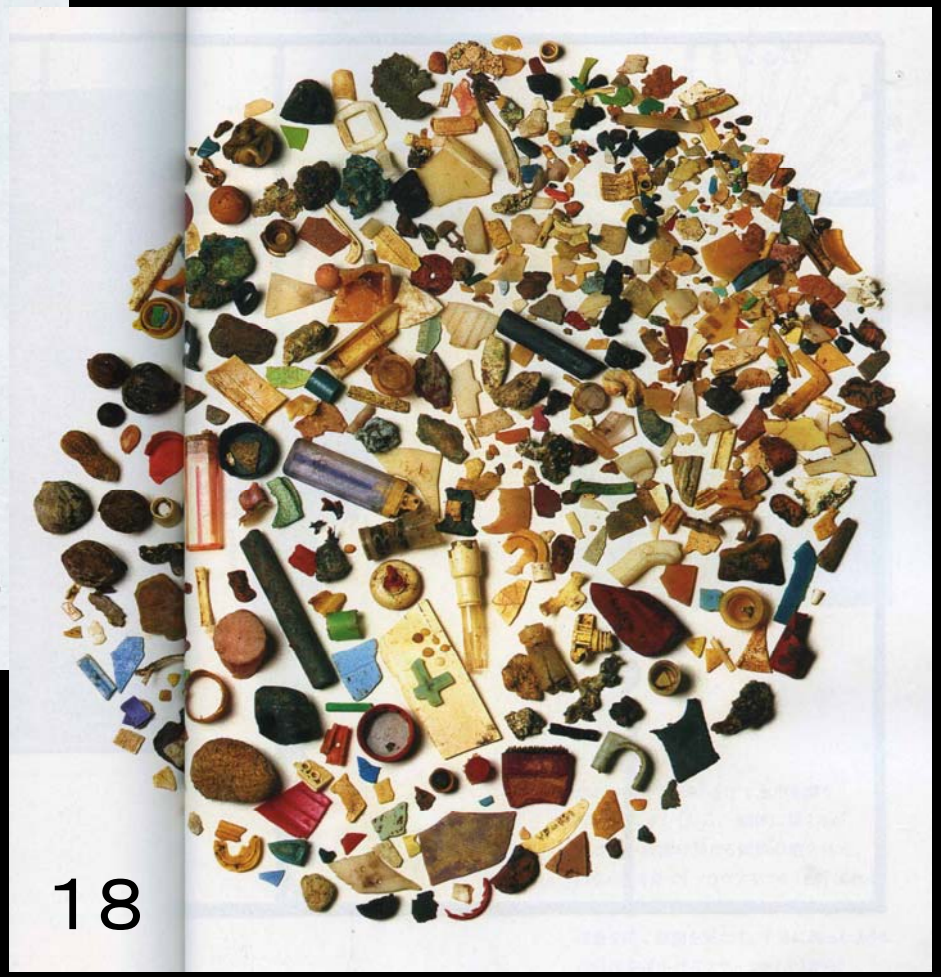
4. Implementation
- Chaperones will guide children to designated checkpoint.
- Chaperones will assist in interviews.
  *If cleaning activities are conducted, they will be limited to the area immediately surrounding the designated point.

5. Summary
The following should be summarized by each group.
- Things discovered
- Evaluation of how those things affect the environment and the reasons.
- Opinions on what can be done to improve items that were judged as bad for the environment.

6. Presentation
- Each group will make a presentation to share what they have learned.
- Question and answer session. (This leads to expanded learning and the discovery of new issues.)

Summary:
As a result of the activities, what were the trash conditions like around town? Was the environment considered when trash was thrown away? These types of questions are answered. In addition, the program allows children to think about what they can do to reduce the amount of things that become trash, eliminate the wasteful use of resources and energy, reduce trash, and create a comfortable community that is also environmentally friendly.

Related Information (Impact on Wild Animals)



Eco-Study
“Mastering the 3Rs!”

- Program Objective

  An understanding of the 3Rs (reduce, reuse, recycle) will be gained using familiar drink containers. The program teaches a sense of using things carefully while allowing participants to think about their future activities as consumers.

- Target grade level: Elementary school – 4th grade
- Related subject: 4th grade social studies “Investigating where trash goes”
- Program summary: Learning about the 3Rs using drink containers.

Program Preparations

■ Summary

In our modern consumption habits, we unconsciously use a large amount of goods and then throw them away. Recycling awareness has taken root in recent years, with people recycling items after using them. However, as long as mass production and mass consumption continues, this will not become a fundamental solution. Using familiar drink containers (PET bottles, cans, glass bottles), this program aims to devise ways to reduce trash and foster of sense of valuing the items we use.

■ Preparation

1. Prepare the equipment

① 3 types of empty drink containers (PET bottles, cans, glass bottles)
Cans: aluminum and steel
Glass bottles: one-way and returnable

② Products made of recycled PET bottles
Choose and prepare appropriate items such as clothing, ball-point pens, work gloves, etc.

③Sorting quiz for the three types of containers shown above. (Using pictures.)

④ PET bottles → Fiber experiment kit (one for each group)
Empty drink cans
Metal pipe (brass)
Nails
Motor
Disposal chopsticks
Tacks
Batteries
PET chips
Aluminum foil
Alcohol lamps
Cardboard

⑤ The experiment kits should be prepared in advance.

3R Recording Sheet

Types of drink container	Which of the 3Rs?
PET bottles	
Cans	
Glass bottles	

Write down the things you have noticed about the 3Rs, including those other than drink containers.

Program Process

■ Process steps

[Preparations]

- ・Arrange equipment from numbers ① & ② on the table
- ・ Prepare experiment kits in a corner of the classroom
- ・ Recording sheets

1. Introduction (example)

- ・Explain that although they have learned about trash before, today they will study about ways to reduce trash (3Rs) using drink containers they are familiar with. The meanings of each should be reconfirmed.
- ・Ask what the children do with PET bottles, cans, and bottles after they are done drinking from them to confirm what they know.

2. Sorting quiz on recycling

- ・Have children answer questions on PET bottles, cans, and glass bottles, in that order.
- ・Reveal the correct answers and explain that the more pictures (cards) there are, the more energy and effort is required.

2. Explanation on reusing glass bottles

- ・There are certain types of bottles that can be used many times called “returnable bottles.” Explain that this is a way to reuse things.
- ・Make them understand that since items that we have finished using will be used once again as they are, “reusing” is better for the environment than recycling.

3. Reducing

- ・Confirm the meaning of “reduce” and discuss what constitutes reducing in the case of drink containers.
- ・Example: Decreasing the frequency of drink purchases, carrying your own water bottle, choosing drinks in cans and glass instead of PET bottles as much as possible, etc.

4. Experiment on PET recycling

- ・ Just saying that PET bottles can become clothing is difficult to comprehend. Therefore, this will be actually verified using an experiment.
- ・ Explain the procedure and then implement for each group.

Summary

On the 3R Recording Sheet, the children should summarize and write down what they have learned. If there is time, examples other than drink containers (writing utensils, clothing, furniture, paper products, items purchased the supermarket, etc.) can be given for discussion about the ways that trash can be reduced.

Eco-Study
“Water Pollution Reduction Squad”

■ Program objective:

Approaching the subject from many directions on how water, air, and other living beings pertain to human lives, this program teaches participants about their relationship with nature and allows them to think about what they can do to protect the environment.

■ Target grade level: Elementary school – 5th and 6th grade

■ Related subjects: 5th grade social studies “ My life and the environment”
6th grade science “Living beings and the environment”

■ Program summary: A hands-on program to think about devising ways to keep water from being polluted.

Program Preparations

■ Summary

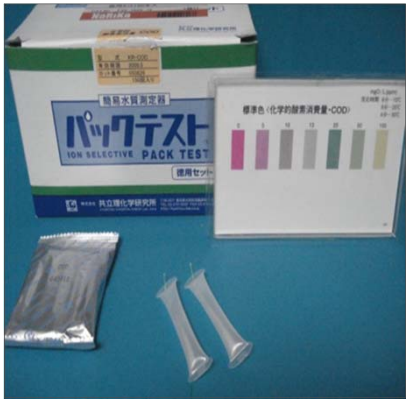
Contamination from leftover food, etc. in water from kitchen drains will be investigated using COD Pack Tests (water inspection tests) to learn about the effects of household wastewater on the environment. This hands-on program also allows children to think about their daily living behaviors and how they can reduce the amount of pollution in water.

■ Preparation

1. Prepare equipment

① COD (Chemical Oxygen Demand) Pack Test
The COD Pack Test is a method for measuring water quality. For the test, an oxidizing agent (room temperature alkaline potassium permanganate) is added to the water to be tested to investigate the amount of organic matter in the water by determining the amount of oxygen consumed. Depending on the scope of testing, tests for low concentrations, normal concentrations, and high concentrations can be used, but for this program, the test for normal concentrations will be used. The quantity needed also depends on the number of water types to be tested, but enough tests should be prepared for each team or group.

(Reference)
・ZAK Type (10/box)
1,400 yen
・KR Type (15/box)
9,600 yen



Kyoritsu Chemical Check Lab Corp.
TEL: 03-3721-9207

②Cups – Approx. 3 per team/group
③ Buckets – 2
④ Plates – 2
⑤ Sauce or mayonnaise
⑥ Rice (not pre-washed type) and thinly sliced cabbage
⑦ Old newspaper, rags, empty milk cartons

2. For each team/group, make copies of the color chart for water quality measurement included in the Pack Test set.

3. Make copies of the Water Pollution Recording Sheet on p. 3 for each team/group.

4. Investigate the sewerage (related information on p.7) and treatment methods for household wastewater within the school district by inquiring at the local government.

5. Measure the air temperature of the room.

Water Pollution Recording Sheet

☆ Record the COD values for the water investigated. Was the water contaminated?

Investigated water (What kind of water did you check?)	COD value (mg/ℓ)	Assessment (What kind of fish can live?)
Tap water		Since chlorine, etc. is used to disinfect tap water, fish cannot live in it.

The following types of fish can live in water with these COD values.

Approx. 1mg/ℓ = masu salmon, mountain trout 3 mg/ℓ or less = sweetfish, salmon 5 mg/ℓ or less = carp

Program Process

■ Process steps

[Preparation]

・Have children wash their hands well using tap water.

・Fill two thoroughly cleaned buckets with tap water.

・ COD Pack Tests, color charts, Water Pollution Recording Sheet

1. Introduction (example)

・While looking back on what they studied in science class about the pollution in rivers and oceans caused by household wastewater, explain that this will be tested via experiment for this program.

2. Explanation of Pack Test usage (See p.4 photo)

・Place the tube above the yellow pin and then pull out the pin.

・Remove the air from the tube by pressing down on it with your finger.

・In that state, place it in the water and loosen your grasp so that the tube is filled about halfway with water.

・ Shake lightly to mix and compare with color sample.

* The color chart is used to estimate the reaction time according to the temperature of the room.

Clean water ← → Dirty water

3. Implementation

① Tap water is checked to be used a the standard.

・ Have each group fill cups with tap water and investigate.

*If the water does not turn pink, there may have been contaminants in the cup or on hands, or the reagents in the tube may have leaked out.

② Imagining meal preparation, have the children investigate the water used to wash rice and the juice emitted from sliced cabbage.

・Place the water used to wash rice and cabbage juice into buckets and have each group take measurements.

③ Imagining cleaning up after a meal, have them investigate the water left after washing dishes.

・ Pour sauce (or mayonnaise) on a plate, and spread it around to emulate a finished meal.

・Wash the plate well using the tap water in the bucket.

④ Have them investigate the water after washing a dish that has been wiped after a meal. (See p.4 photo)

・Thoroughly wash the bucket and refill with clean tap water.

・Pour sauce (or mayonnaise) on the plate as was done in number ③.

・Use a rag (or spatula made from a milk carton) to remove all of the sauce (or mayonnaise).

・ Wash the plate in the bucket and investigate the used water.

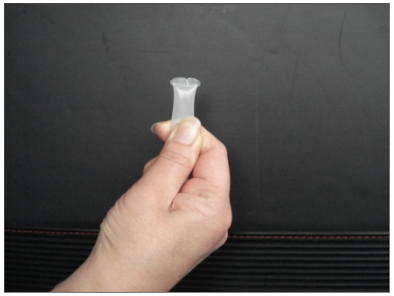
⑤ Review the results using values on the Water Pollution Recording Sheets.

■**Summary:**
Through this experiment, make the children understand that we are also polluting water with our own mealtimes. In order to minimize water contamination, we should first make sure we use water carefully, without wasting it. As was learned in the plate experiment, the children should be aware that they should not leave food on their plate or use too much sauce, etc.
If one bowl of miso soup is poured down the drain, it takes the amount of water equivalent to 4.5 baths to dilute it enough that fish are able to live. It takes 11 baths for just one cup of milk. Using these types of examples to explain may help children understand better. We should remember that what is food for humans can also become a source of water contamination in nature and for other living beings.
*Children believe that clean water = drinking water. However, even though humans can drink water mixed with juice, this causes a high COD level in which fish cannot live. Conversely, water from streams have a low COD level, but since this water may carry bacteria, it may be undrinkable for humans. In this way, it should be made clear that clean water does not necessary equal drinking water.

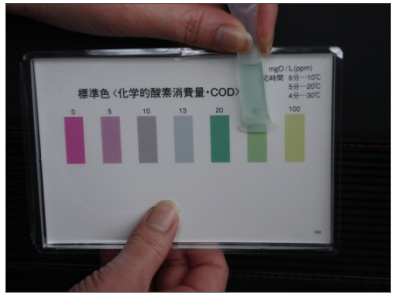
How to use the Pack Test

Hold the tube with the yellow pin at the top and pull out the pin.

Press down on the tube to remove the air inside.



Let the tube draw in water to the halfway point, lightly shake to mix, and compare to color chart.



Wiping dishes before washing

Water Investigation Squad
Testing river water quality

Water Investigation Squad
Testing clarity level of rivers
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