

Hazard Literacy Center

Hazard Literacy Education Program

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Where Does the Plastic We Throw Away Go?



1. Program Overview

This education program is designed so that learners understand marine plastic pollution not merely as a phenomenon of environmental pollution but as a compound environmental problem in which harm appears differently according to the production-consumption-disposal structure and socio-economic conditions. It focuses in particular on the point that, even when the same amount of plastic is discarded, the pattern and scale of harm can differ according to living environment-coastal lowland residents, those engaged in fishing, residents of island regions, and so on.

Learners explore domestic and overseas cases of marine plastic pollution such as the Great Pacific Garbage Patch (GPGP), carry out an activity that traces the food chain by which microplastics pass through marine ecosystems to reach the human table, and come to view the inequality of marine-pollution harm critically from the perspectives of environmental justice and disaster justice. The program aims to help learners understand marine pollution in an integrated way within the flow of "cause-process-result" and to seek out ways to act in everyday life.

Grade Level	Middle and high school students	Instructional Methods	Lecture, creative activity, exhibition
Learning Environment	Regular classroom (a space that allows group work)	Duration	100 minutes total (50 min × 2 sessions, including the creative activity)
Required Materials	Activity sheets; writing tools; smart devices (phone or tablet); case materials (videos and photos); slides		

2. Learning Objectives (Hazards Literacy Framework)

① Understand and explain the causes and progression of marine plastic pollution (production-distribution-disposal-entry into the sea-fragmentation).

② Compare domestic and overseas cases of marine pollution to analyse how, even in the same pollution situation, harm can appear differently according to a region's geography, livelihood, and socio-economic conditions.

③ Through creative activities such as drawing and letter-writing, express emotional empathy and the will to act regarding marine plastic pollution, and share these with classmates in a class "Small Sea" poetry-and-art exhibition.

④ Understand how marine-pollution harm appears differently according to region, livelihood, and socio-economic conditions from the perspectives of environmental justice and disaster justice, and seek out ways to act in everyday life.

Learning Objectives	Knowledge & Understanding		Reasoning & Skills					Values & Attitudes			Psychology & Emotion			Behavioral & Practical Enagement		
	A1	A2	B1	B2	B3	B4	B5	C1	C2	C3	D1	D2	D3	E1	E2	E3
Objective ①	O	O					O									
Objective ②		O	O	O	O		O	O								
Objective ③									O	O	O	O		O		
Objective ④						O	O	O	O			O			O	O

3. Key Concpets

· The plastic production-distribution-consumption-disposal cycle and its routes into the sea

· How microplastics form and accumulate up the food chain

· Spatial differences in marine-pollution harm (coastal lowlands, island regions, fishing areas)

· Environmental justice and the inequality of pollution harm

· Disaster Justice

· Sustainable consumption and everyday practice

· The link between a global environmental problem and its local impact

4. Program Sequence

Learning Activities	
Introduction	·Present news videos on marine plastic pollution and the Great Pacific Garbage Patch case to spark interest. ·Pose the question: "Are the people who bear responsibility and the people who suffer harm the same?" · Guide learners to see marine pollution as a social and structural problem beyond an environmental one.
Activity1	·Understand the causes of marine plastic (production-consumption-disposal structure, river and sewage inflow, etc.) and how it progresses. ·Explore domestic and overseas cases, examining how harm can appear differently according to region, livelihood, and socio-economic conditions even in the same pollution situation. ·Trace and analyse the food chain by which microplastics pass through marine ecosystems to reach the human table.
Activity2	·View together the picture book Plastic Island (Lee Myung-ae, 2014) and Chris Jordan's Midway photographs (2009-). ·Express "a day in the life of a sea creature" in a single A4 drawing, and write a letter to one of three recipients: a sea turtle, oneself 100 years from now, or the Minister of Environment. ·Make three action-promise cards ("today / within a week / within a month") and curate the group's works on the class board.
Wrap-up	·Understand the social and structural factors that influence marine-pollution harm. ·Understand, from the perspective of environmental justice, that more vulnerable groups should be protected first. ·Recognise that a global environmental problem is connected to everyday consumption and practice.

5. Theoretical Background and Activity Design for Disaster Education

Millions of tons of plastic are estimated to enter the world's oceans each year, and vast marine-debris accumulation zones such as the Great Pacific Garbage Patch have formed. Plastic that enters the sea is broken into small fragments by ultraviolet light and waves, forming microplastics that pass through marine ecosystems to reach the human table (Eriksen et al., 2014; Jambeck et al., 2015).

Marine plastic pollution is a compound phenomenon that, beyond environmental pollution, is bound up with the social and structural system running from the production to the distribution, consumption, and disposal of plastic. Even when the same amount of plastic enters the sea, the pattern and scale of harm can appear differently according to living environment-coastal lowland residents, those engaged in fishing, residents of island regions, and so on. Moreover, the regions that consume the most plastic and the regions where the resulting pollution harm is concentrated are often different, giving rise to a mismatch between responsibility and harm.

Such inequality of harm has long been discussed from the perspective of environmental justice (Bullard, 1990; Mohai, Pellow, & Roberts, 2009), and it can also be interpreted through a "social-justice framework" perspective (Lukasiewicz & Baldwin, 2014) in that the harm, risk, and opportunities for recovery from a disaster appear differently among members of society. Disaster justice is a concept for understanding the inequality of disaster harm, protecting more vulnerable groups first, and seeking fair alternatives; it can be explained in distributive, procedural, and interactional terms.

This program organises the understanding of marine plastic pollution into two broad stages. ① Session 1 is an "understanding and analysis" stage that traces the causes of pollution and the food chain and compares domestic and overseas cases to examine how harm appears differently according to region, livelihood, and socio-economic conditions, moving toward emotional empathy through appreciation of the picture book Plastic Island (Lee Myung-ae, 2014) and Chris Jordan's Midway (2009-). ② Session 2 is an "expression and practice" stage that expresses this understanding and emotion through a "day in the life of a sea creature" drawing, a letter or poem, and time-unit action-promise cards, sharing them in a "Small Sea" poetry-and-art exhibition. Students put their feelings and thoughts into words as artists-emotional communicators through letters. In this way, they become aware that marine plastic pollution is not a distant, abstract environmental problem but one connected to their own daily lives and emotions, and they give concrete form to the problem of dispersed responsibility shown by the data of Eriksen et al. (2014) and Jambeck et al. (2015) through unit-by-unit action promises.

6. Instructional Considerations

- Avoid reducing the cause of marine plastic pollution to "the carelessness of individual consumers," and guide learners to understand that various natural and social factors-production structures, waste-management systems, policy, and so on-operate together.
- In the creative activities, avoid placing a burden of "having to draw well," and exhibit all works with equal weight to respect the diversity of expression and emotional authenticity. Also help learners write action promises in small, time-unit, executable forms so that feelings of helplessness or guilt about environmental problems do not become excessive.
- When dealing with cases, guide learners to recognise the inequality of harm as a problem related to social structures rather than "individual carelessness," from the perspectives of environmental justice and disaster justice. When students express their thoughts, guide them to respect diverse opinions and to organise their views on the basis of evidence.

7. References

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- Bullard, R. D. (1990). Dumping in Dixie: Race, class, and environmental quality. Westview Press.
- Lukasiewicz, A., & Baldwin, C. (2014). Voice, power, and history: Ensuring social justice for all stakeholders in water decision-making. Local Environment: The International Journal of Justice and Sustainability, DOI: 10.1080/13549839.2014.942261
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Session 1: Where Does the Plastic We Throw Away Go?



Topic	Differences in marine plastic pollution and their causes
What will we learn?	① Understand and explain the causes and progression of marine plastic pollution. ② Compare domestic and overseas cases to analyze how, even in the same pollution situation, damage differs with geography, livelihood, and socioeconomic conditions.

1 Picture Book + Sea Turtle — Listening to the Voice of the Sea

Resources: the picture book Plastic Island (Lee Myung-ae, 2014) · Chris Jordan's Midway photographs (2009–) · News videos of a released sea turtle (SBS · YTN)

- After reading Plastic Island together and watching the sea-turtle video, imagine the turtle could say one thing to humans. Write it in the speech bubble.

2 Bioaccumulation Model — Seeing the Food Chain with Cups

- Set out cups for the stages 'plankton → small fish → big fish → human,' and move 'plastic beads' from cup to cup to see bioaccumulation with your own eyes. ① As you go up each stage, how does the number of beads change? How many end up in the human cup? ② In one sentence, why does the 'top' accumulate the most?

3 Same Sea, Different Damage — Comparing Cases

- Suppose the same typhoon washes the same amount of plastic waste onto three places. Write in the table how the three places differ, and in what ways.

Place	How do people mainly make a living? (livelihood & environment)	Are there enough people and budget to clean it up?	What is the biggest hardship they will face?
Urban beach (near a large city)			
Small island village (a sparsely populated island)			
Fishing village (makes its living from the sea)			

1) With the same amount, which place struggles the longest and hardest? Give the reason in one sentence.

2) Were 'the place that uses the most plastic' and 'the place that suffers the most damage' the same, or different? What does that tell us?

4 My Day, Seen Through Plastic

- Draw a 'picture timeline' of the plastic you have touched since waking up, in time order. How much of the day did you spend without plastic? Put a star on the one scene that would be easiest to change.

5 Two Seas — A Midway and Our-Coast Collage

- Look at Chris Jordan's Midway photographs and materials on our own coast, and express 'a letter from the sea to us' as a collage of images and words. (planning notes)

6 A Letter or Poem to a Sea Creature

- Write a short letter, or a poem of up to six lines, to a sea turtle or an albatross. (This leads into the Session 2 'Little Sea' poem-and-art exhibition.)

Session 2: The ‘Little Sea’ Exhibition — Painting Our Sea from the Heart

Topic	Creating a class exhibition of feeling, creativity, and action
What will we learn?	① Express your feelings and thoughts about marine plastic pollution through creative work such as letters and drawings. ② Make time-based action pledges concrete and share them with peers through the class exhibition.

1 Sharing My Day — What the Timeline Revealed

- Open up your Session 1 ‘My Day, Seen Through Plastic’ timeline and compare it with your group. ① The most surprising fact ② Something from a groupmate’s record that stayed with you ③ Compare the ‘easiest scene to change’ that each of you starred.

2 Expressing It in a Drawing — ‘A Day in a Sea Creature’s Life’

- Express ‘a day in a sea creature’s life’ as a single A4 drawing. It doesn’t need to be skillful — color, line, and arrangement are enough. Write a one-line caption beneath the drawing. (planning & caption notes)

3 Writing a Poem or Letter — Putting Your Heart into Words

- Choose one of (a) a letter to a sea turtle / (b) a poem to yourself 100 years from now / (c) a letter to the Minister of Environment, and write a short poem (6 lines) or letter (10 lines).

The option I chose (a/b/c) and the recipient:

4 Three Action-Pledge Cards — By Time Frame

- Make three pledge cards for what you will change 'starting today / within a week / within a month.' On each card, write 'the pledge in one line' and 'the help or tools you need to keep it.'

Time frame	Pledge in one line	Help or tools needed
① Starting today		
② Within a week		
③ Within a month		

5 Curating the ‘Little Sea’ Exhibition

- Gather your group’s drawings, poems, letters, and pledge cards and curate a ‘Little Sea’ exhibition for the class board or hallway. The exhibition is not one person’s work — the whole group creates a single ‘little sea’ together.

Item	Our group’s curation
① Exhibition title (your group’s own name for its ‘little sea’)	
② Exhibition location (where in the classroom, and how to arrange it)	
③ One message you want to give visitors	
④ A one-line greeting inviting friends and younger students	