

Hazard Literacy Center

Hazard Literacy Education Program

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Are All Earthquake Disasters the Same?



1. Program Overview

This program helps students understand floods not simply as natural phenomena caused by heavy rainfall, but as hazards whose impacts can vary depending on place and environment, even under similar rainfall conditions. Students compare past and recent flood cases and conduct a flood simulation experiment to explore how flooding occurs and why flood damage can vary. Students also identify flood-prone areas and evacuation facilities in their local community to explore flood risks in their surroundings. By considering people and living environments that may be more affected by floods, they develop an understanding of disaster vulnerability and explore preventive measures and practical actions. Through these activities, students learn that flood impacts are influenced not only by rainfall but also by living environments and social conditions. The program aims to strengthen students' understanding of disaster vulnerability and their capacity to take action to reduce flood risks and promote safer communities.

Grade Level	Upper Elementary Students	Instructional Methods	Lecture, Inquiry, and Discussion
Learning Environment	Classroom suitable for group activities	Duration	One 40-minute lesson
Required Materials	Worksheets, flood comparison experiment materials (2 water tanks, soil, drainage outlet, modeling clay, water), local flood risk and safety map		

2. Learning Objectives (Hazard Literacy Framework)

① Students will be able to compare past and recent flood cases and rainfall data to understand the characteristics of flood occurrence and impacts.
② Students will be able to identify places and environments that may be more vulnerable to flooding through a flood simulation experiment.
③ Students will be able to identify flood-prone areas and evacuation facilities in their local community and understand how to evacuate safely.
④ Students will be able to understand disaster vulnerability by considering people and living environments that may be more affected by floods and propose practical actions to reduce flood risks.

Learning Objectives	Knowledge & Understanding		Reasoning & Skills					Values & Attitudes			Psychology & Emotion			Behavioral & Practical Engagement		
	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												
Objective ③		O			O					O				O	O	
Objective ④		O				O				O				O	O	

3. Key Concepts

- Characteristics of Flood Occurrence and Impacts
- Spatial and Environmental Differences in Flood Impacts
- Flood-Prone Areas and Safe Evacuation
- Disaster Vulnerability and Living Environments
- Flood Prevention and Community Response

4. Program Sequence

	Activity Sequence
Problem Recognition	-Introduce flood-related videos and cases to engage students. -Ask the question, "Why does the same rain cause different levels of damage?" to encourage students to think about why flood impacts vary.
Understanding the Hazard	-Understand the concept and causes of floods and explore the major causes of floods in South Korea. -Compare past and recent flood cases and rainfall data to understand the characteristics of flood occurrence and impacts.
Exploring and Understanding Disaster Vulnerability	-Conduct a flood simulation experiment to explore how flooding can vary across different places and environments, even under similar rainfall conditions. -Identify flood-prone areas and evacuation facilities in their local community and explore disaster vulnerability in relation to people and living environments.
Exploring Responses and Practical Actions	-Explore safe evacuation and preventive measures by considering people and living environments that may be more affected by floods. -Propose practical actions that individuals and communities can take to reduce flood risks.

5. Theoretical Background and Activity Design for Disaster Education

South Korea has repeatedly experienced flood damage caused by heavy rainfall and typhoons. K-water's historical flood records include major events such as the 1925 Eulchuk Flood and the 1984 Great Flood, as well as more recent events such as heavy rainfall and Typhoon Hinnamnor in 2022. Comparing past and recent flood cases helps students understand how the patterns and impacts of floods have changed over time. Flood impacts, however, are not determined by rainfall alone. Disaster vulnerability helps explain how impacts can vary depending on people and their living environments. Füssel (2006) explains that vulnerability can differ according to exposure, sensitivity, and adaptive capacity, while Kee (2022) emphasizes the need for natural hazard education to move beyond a focus on natural phenomena and responses and to consider the interactions between people and their environments. These perspectives support an approach to flood education that considers not only rainfall but also the characteristics of places, living environments, and social conditions. Based on these perspectives, the program follows four stages: Problem Recognition, Understanding the Hazard, Exploring and Understanding Disaster Vulnerability, and Exploring Responses and Practical Actions. Students compare historical and recent flood cases and rainfall data, conduct a flood simulation experiment (Figure 1) to explore how flooding can vary across different places and environments, and use the SafeKorea Disaster and Safety Portal to identify flood-prone areas and evacuation facilities in their local community. They then consider people and living environments that may be more affected by floods and propose practical actions that individuals and communities can take to reduce flood risks and evacuate safely.



Figure 1. Flood Simulation Experiment Across Different Places and Environments Under the Same Rainfall Conditions

6. Instructional Considerations

Guide students to understand that flood impacts are influenced not only by rainfall, but also by the characteristics of places and environmental conditions. During the flood simulation experiment, encourage students to use their observations to explain why flood impacts can vary, rather than presenting the experimental results as a single correct answer. Help students connect flood-prone areas and evacuation facilities in their local community to their daily lives and consider how to evacuate safely. Emphasize that reducing flood risks requires not only individual actions but also collective preparedness and response within the community.

7. References

- Füssel, H.-M. (2007). Vulnerability: A generally applicable conceptual framework for climate change research. Global Environmental Change, 17(2), 155–167.
- Kee, K. D. (2022). Natural hazards as the subject of geography education. The Journal of the Korean Association of Geographic and Environmental Education, 30(1), 105–122. https://doi.org/10.17279/jkagee.2022.30.1.105
- Korea Water Resources Corporation (K-water). (n.d.). Flood damage by period. MyWater Water Information Portal. MyWater Water Information Portal
- Ministry of the Interior and Safety. (n.d.). SafeKorea Disaster and Safety Portal. SafeKorea Disaster and Safety Portal

	Why Does the Same Rain Cause Different Levels of Damage?
What Will We Learn?	① Students will be able to compare past and recent flood cases and rainfall data to understand the characteristics of flood occurrence and impacts. ② Students will be able to identify places and environments that may be more vulnerable to flooding through a flood simulation experiment. ③ Students will be able to identify flood-prone areas and evacuation facilities in their local community and understand how to evacuate safely. ④ Students will be able to understand disaster vulnerability by considering people and living environments that may be more affected by floods and propose practical actions to reduce flood risks.

1 How Have Floods Changed from the Past to the Present?

1) Look at the data and compare flood damage across different time periods.

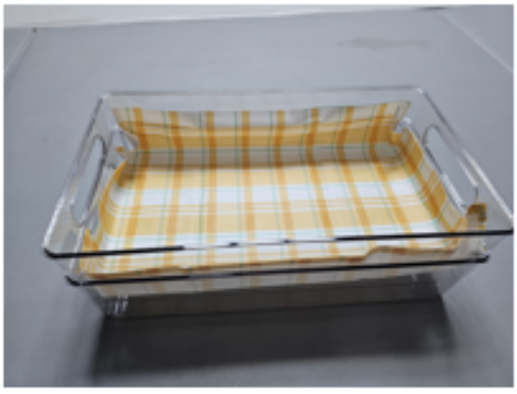
	1925	1984	2022
Maximum Rainfall			
Affected Areas			
Casualties			
Property Damage			

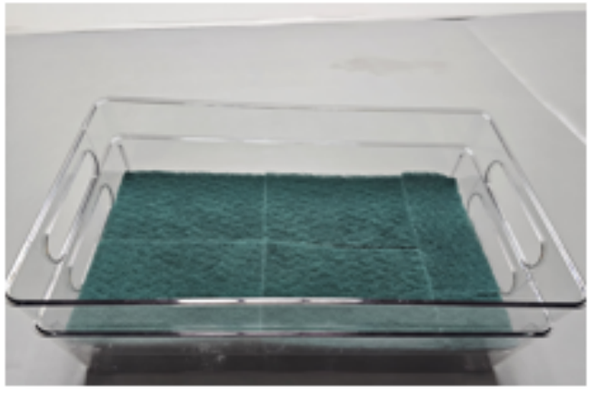
2) What remained the same across the floods in the three time periods?

3) Besides the amount of rainfall, what do you think made the flood damage more severe?

2 How Can Flood Damage Differ Even with the Same Amount of Rainfall?

- Observe the experiment in which the same amount of water is poured into Areas A and B, and compare the flooding in the two areas.





1) Observe the results of the experiment and complete the table.

	Area A	Area B
Water level in the upper reservoir (cm)		
Water level in the lower reservoir (cm)		

2) Which area do you think is more vulnerable to flooding? Explain why.

3) Based on the results, describe the characteristics of places and environments that affect flood damage.

3 How Can We Evacuate Safely in Our Community?

1) Let's look at flood-prone areas and evacuation facilities together.



2) Which places around our school do you think are likely to be flooded?

3) Where should we evacuate if a flood occurs?

4 Let's Review

- Even with the same amount of rainfall, the level of impact can vary depending on the place, time, and living environment.

1) Even with the same amount of rainfall, the level of impact can vary depending on the place, time, and living environment.

① _____

Reason:

② _____

Reason:

2) What efforts are needed to help people who may be more affected by floods stay safe?

① What can you do?

② What can people around you (family, friends, teachers, and neighbors) do to help?

③ What can the local community do to help?

④ What can the government do to help?