

Hazard Literacy Center

Hazard Literacy Education Program

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Why Do Landslides Occur After Heavy Rain?



1. Program Overview

This program helps students understand landslides not simply as natural phenomena caused by heavy rainfall, but as hazards whose impacts and the responses needed can vary depending on surrounding environments and people's living conditions. Students analyze the Umyeonsan landslide case and rainfall data to understand how landslides occur and explore the characteristics of landslide impacts. Through a role-play activity, students experience a landslide situation from different perspectives, including those of local residents, workers, teachers, public officials, and forest managers. They explore how people's circumstances can influence the impacts they experience and the responses they may need. Through these activities, students develop an understanding of disaster vulnerability by considering people and living environments that may be more affected by landslides. They also explore preventive measures and practical actions that individuals and communities can take to reduce landslide risks. The program aims to help students understand landslide impacts from diverse perspectives and develop the capacity to respond safely while considering the needs of others.

Grade Level	Upper Elementary Students	Instructional Methods	Lecture, Role-Play, and Discussion
Learning Environment	Classroom suitable for group activities	Duration	One 40-minute lesson
Required Materials	Role-play scripts, worksheets		

2. Learning Objectives (Hazard Literacy Framework)

① Students will be able to explain the causes and process of landslides through the Umyeonsan landslide case.
② Students will be able to explore how people may have different perspectives and responses depending on their surrounding environments and living conditions through a landslide role-play activity.
③ Students will be able to propose practical actions for safer living by considering people and living environments that may be more affected by landslides.

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			O	O	O						
Objective ③		O			O		O	O	O				O	O	O	

3. Key Concepts

- Causes and Process of Landslides
- Spatial and Environmental Differences in Landslide Impacts
- Disaster Vulnerability and Living Environments
- Landslide Prevention and Response
- Community Roles and Safe Living

4. Program Sequence

	Activity Sequence
Problem Recognition	-Introduce the Umyeonsan landslide case and its impacts to engage students. -Ask the question, "Why can landslide impacts vary from person to person?" to encourage students to think about why landslide impacts can differ.
Understanding the Hazard	-Analyze the Umyeonsan landslide case and rainfall data to understand the causes and process of landslides. -Examine the relationship between rainfall and landslide occurrence and explore factors that can influence landslides.
Exploring and Understanding Disaster Vulnerability	-Through role-play activities involving local residents living below the mountain, workers, teachers, public officials, and forest managers, explore how landslide impacts and the responses needed can vary depending on people's circumstances and living environments. -Consider people who may be more affected by landslides and explore the reasons for these differences to understand disaster vulnerability.
Exploring Responses and Practical Actions	-Explore preventive and response measures by considering people and living environments that may be more affected by landslides. -Propose support and response measures that individuals, families, schools, communities, and the government can take together.

5. Theoretical Background and Activity Design for Disaster Education

Landslides are natural hazards caused by the interaction of various factors, including heavy rainfall, topography, geology, and soil conditions. The 2011 Umyeonsan landslide is a notable landslide event in South Korea. The Korean Geotechnical Society (2011) reported that intense rainfall over a short period, together with topographical and geological conditions, contributed to the landslide. This case shows that landslides are influenced not by rainfall alone, but by multiple environmental conditions.
Landslide impacts can also vary depending on people's locations, mobility, occupations, and 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 consider people and their living environments rather than focusing only on natural phenomena. These perspectives help students understand why people may experience different impacts and need different responses during the same landslide event. 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 examine the Umyeonsan landslide case and rainfall data to explore the factors that contributed to the landslide. Through a role-play activity (Figure 1), they explore the landslide situation from different perspectives and examine how impacts and the responses needed can vary depending on people's circumstances and living environments. Students then consider people who may be more affected by landslides and propose preventive and response measures that individuals, families, schools, communities, and the government can take to reduce landslide risks.

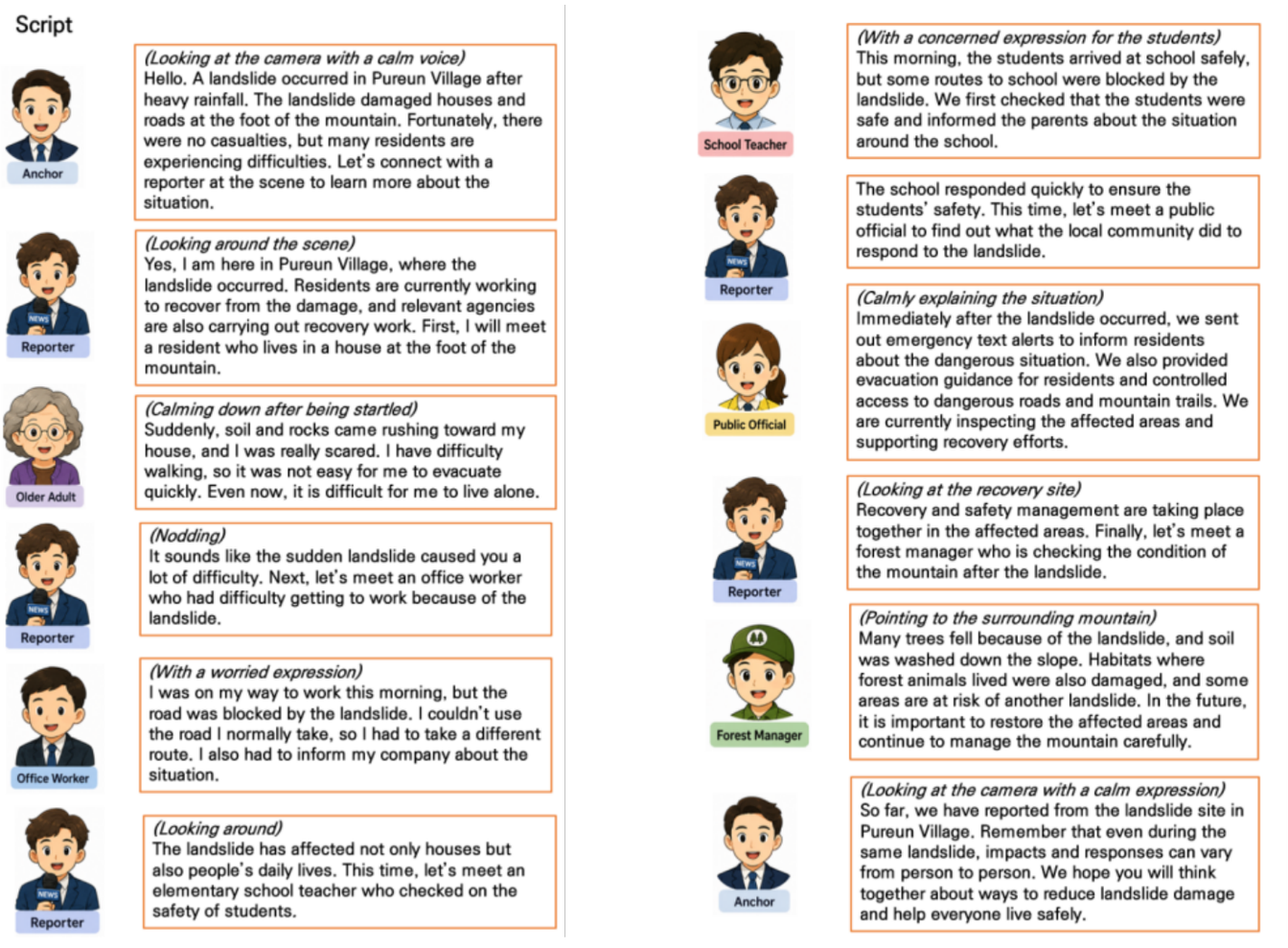


Figure 1. Role-Play Script

6. Instructional Considerations

Guide students to understand landslides not simply as natural phenomena caused by heavy rainfall, but as hazards whose impacts are influenced by both environmental conditions and people's living environments. During the role-play activity, encourage students to focus on understanding each person's perspective and circumstances rather than finding a single correct answer, while respecting different opinions and expressing their own ideas freely. Emphasize that reducing landslide risks requires not only individual efforts but also collective preparedness and response by families, schools, and communities.

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
- Korean Geotechnical Society. (2011). Final report on the investigation of the causes of the Umyeonsan landslide and the development of recovery measures.

	Why Do Landslides Occur After Heavy Rain?
What Will We Learn?	① Students will be able to explain the causes and process of landslides through the Umyeonsan landslide case. ② Students will be able to explore how people may have different perspectives and responses depending on their surrounding environments and living conditions through a landslide role-play activity. ③ Students will be able to propose practical actions for safer living by considering people and living environments that may be more affected by landslides.

1 Let's Learn About the Umyeonsan Landslide

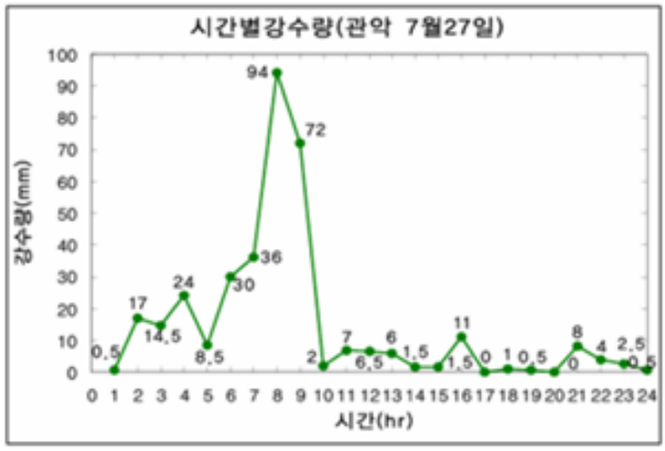
- On July 27, 2011, a large amount of rain fell in a short period of time in the Umyeonsan area of Seoul. As a result, landslides occurred in several parts of the mountain, causing damage to nearby roads and residential areas. The Umyeonsan landslide is one of the major landslide cases in South Korea. Look at the map below and answer the questions.



1) Where did landslides mainly occur around Umyeonsan?

2) What types of damage were caused by the landslides?

- Landslides are more likely to occur when a large amount of rain falls within a short period of time. Heavy rainfall can saturate the soil on a slope, making it heavier and weaker. The soil and rocks can then move downslope, causing a landslide. Look at the graph below showing the hourly rainfall on the day of the Umyeonsan landslide and examine the characteristics of the rainfall.



1) When did the most rain fall?

2) Did the rain fall evenly throughout the day, or did a large amount of rain fall within a short period of time?

3) How might this rainfall have affected the occurrence of the Umyeonsan landslide?

4In addition to rainfall, landslides can occur due to the interaction of various conditions. What other conditions do you think can contribute to landslides?

2 How Did Landslide Impacts Affect Different People?

- Participate in the Umyeonsan Landslide News role-play activity and explore how landslide impacts and responses can vary from person to person.



1) Describe the situation experienced by each person in the role-play.

Role	Situation
Older Adult Living Below the Mountain	
Worker	
School Teacher	
Public Official	
Forest Manager	

2) Think about how each person could respond to reduce landslide damage and write your ideas.

Role	Response
Older Adult Living Below the Mountain	
Worker	
School Teacher	
Public Official	
Forest Manager	

3) Write why the impacts and responses were different for each person even though they experienced the same landslide.

3 Let's Review

- Even during the same landslide, the level of impact can vary depending on place, time, and living environment.

  1) Think of two people who may be more affected by landslides and explain why they may be more affected.

① _____

Reason:

② _____

Reason:

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