

Hazard Literacy Center

Hazard Literacy Education Program

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How Does an Ecosystem Change After a Wildfire?



1. Program Overview

This program helps students understand how wildfires occur and spread, how ecosystems change and recover over time after a wildfire, and how these changes can affect people and communities. Students examine wildfire cases in South Korea to explore the causes and spread of wildfires and their impacts on the natural environment and ecosystems. Through a board game, students explore different stages of ecosystem recovery after a wildfire and examine how plants, animals, and soil interact and change over time. Mission card activities allow students to explore how environmental and social factors can influence ecosystem recovery. Students also consider how the impacts of wildfires can vary across living organisms, people, and living environments, as well as how different conditions can affect ecosystem recovery. Through these activities, students develop an understanding of disaster vulnerability by considering living organisms, people, and living environments that may be more affected by wildfires. They also explore practical actions that individuals and communities can take to support ecosystem recovery and understand the importance of ecosystem conservation.

Grade Level	Upper Elementary Students	Instructional Methods	Lecture, Game, and Discussion
Learning Environment	Classroom suitable for group activities	Duration	One 40-minute lesson
Required Materials	Wildfire case materials (PPT), Bringing a Forest Back After a Wildfire board game (game board, horse tokens, dice, mission cards), worksheets, writing materials		

2. Learning Objectives (Hazard Literacy Framework)

① Students will be able to explain how wildfires start and spread.
② Students will be able to explain how ecosystems change and recover after a wildfire through a board game activity.
③ Students will be able to understand disaster vulnerability by considering living organisms, people, and living environments that may be more affected by wildfires and propose practical actions to support ecosystem recovery

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														
Objective ②	O	O	O													
Objective ③		O								O					O	

3. Key Concepts

- Causes and Spread of Wildfires
- Ecosystem Change and Recovery After a Wildfire
- Spatial and Environmental Differences in Wildfire Impacts
- Disaster Vulnerability and Living Environments
- Ecosystem Recovery and Conservation

4. Program Sequence

	Activity Sequence
Problem Recognition	-Introduce wildfire-related videos and cases to engage students. -Ask questions such as “Why do wildfires spread?” and “How does a forest change after a wildfire?”
Understanding the Hazard	-Understand the causes and spread of wildfires. -Explore how ecosystems change and recover after a wildfire. -Explore the stages of ecosystem recovery through the Bringing a Forest Back After a Wildfire board game and mission card activities.
Exploring and Understanding Disaster Vulnerability	-Compare the impacts of wildfires on plants, animals, people, and living environments, and explore differences in wildfire impacts and ecosystem recovery. -Understand the connections between ecosystem change and people’s living environments, and explore how different environmental and social conditions can influence disaster vulnerability.
Exploring Responses and Practical Actions	-Consider living organisms and people that may be more affected by wildfires and propose ways to support ecosystem recovery. -Explore practical actions that individuals, families, and communities can take to reduce wildfire impacts and support ecosystem recovery.

5. Theoretical Background and Activity Design for Disaster Education

Wildfires can cause significant changes in forest ecosystems, and ecosystem recovery can take place over a long period of time. Different components of the ecosystem, including aquatic insects, ants, birds, vegetation, trees, wildlife, and soil, recover at different rates after a wildfire (Figure 1). Because these long-term changes are difficult for students to observe directly, this program uses educational activities that allow them to explore ecosystem recovery over time. Natural hazard education should consider not only natural phenomena and their impacts but also vulnerability, resilience, and interactions between nature and people (Kee, 2022). Disaster vulnerability also helps explain how impacts can vary depending on differences in exposure, sensitivity, and capacity to respond and adapt (Füssel, 2006). Based on these perspectives, the program connects the ecological characteristics of wildfires with people’s lives and living environments. The program follows four stages: Problem Recognition, Understanding the Hazard, Exploring and Understanding Disaster Vulnerability, and Exploring Responses and Practical Actions. Students examine wildfire cases in South Korea and explore ecosystem recovery using the Bringing a Forest Back After a Wildfire board game (Figure 2), which is based on data on forest ecosystem recovery periods. Mission cards (Figure 3) introduce different situations that can influence ecosystem recovery. Students then consider living organisms, people, and living environments that may be more affected by wildfires and explore practical actions that individuals and communities can take to reduce wildfire impacts and support ecosystem recovery.

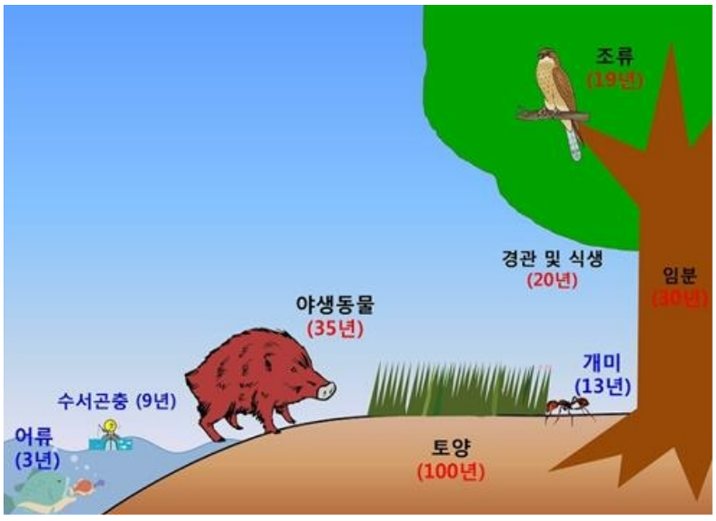


Figure 1. Time Required for Forest Ecosystem Recovery After a Wildfire
Source: Yonhap News Agency (2015)

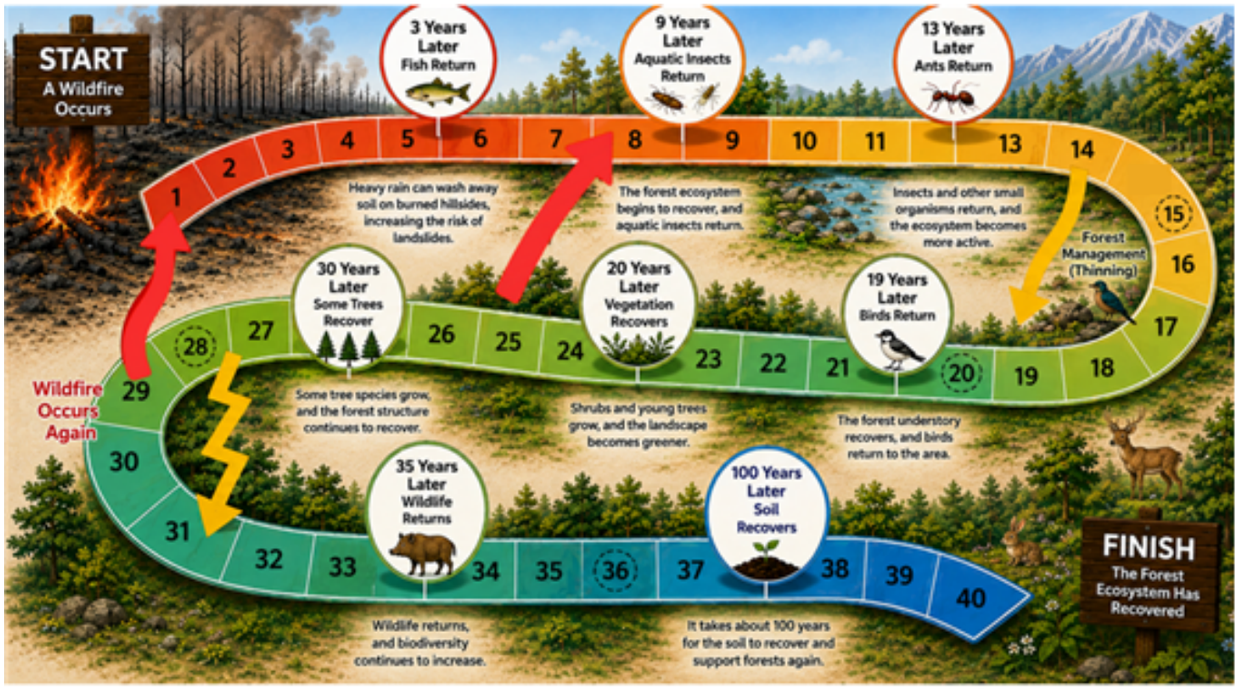


Figure 2. Bringing a Forest Back After a Wildfire Board Game



Figure 3. Bringing a Forest Back After a Wildfire Mission Cards

6. Instructional Considerations

Guide students to understand that ecosystem recovery after a wildfire is not simply a matter of changes in individual organisms, but a process in which living organisms and their environments interact and influence one another. Help students recognize that ecosystem recovery can take a long time and that different organisms may recover at different rates. Emphasize that wildfire prevention and ecosystem recovery require not only individual efforts but also the collective efforts of 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
- Yonhap News Agency. (2015, October 15). Wildlife recovery in wildfire-affected areas takes more than 30 years. Yonhap News Agency article

	How Does an Ecosystem Change After a Wildfire?
What Will We Learn?	① Students will be able to explain how wildfires start and spread. ② Students will be able to explain how ecosystems change and recover after a wildfire through a board game activity. ③ Students will be able to understand disaster vulnerability by considering living organisms, people, and living environments that may be more affected by wildfires and propose practical actions to support ecosystem recovery

1 Think About It

- What causes wildfires in South Korea?

- When are wildfires more likely to spread?

- How does a forest change after a wildfire?

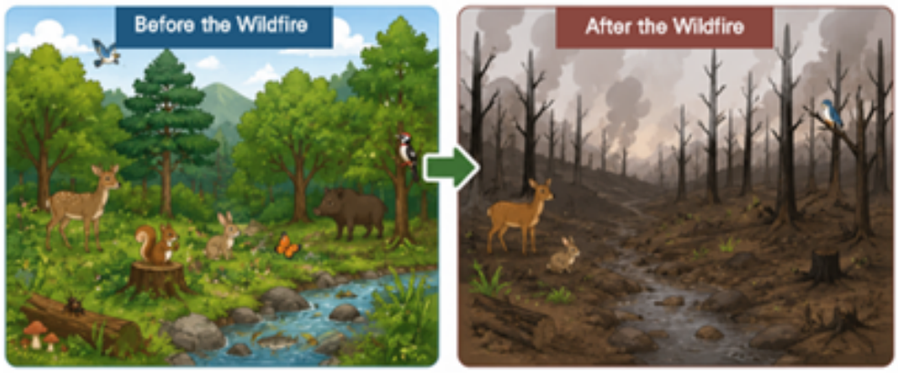
2 Bring the Forest Back After a Wildfire!

- Read the situation below.

🟢 Before the wildfire, various plants and animals lived together in the forest. Trees and grass grew, and living organisms were connected with one another.

🔥 Then one day, a wildfire occurred. After the wildfire, some plant and animal populations decreased, and the forest changed.

🎲 Using the board game, you will explore how the forest ecosystem changes over time after a wildfire and help the forest recover.



1) Use the board game to organize the process of ecosystem recovery after a wildfire.

Recovery Period	How Did the Ecosystem Change?
3 years	
9 years	
13 years	
19–20 years	
30–35 years	
100 years or more	

2) Write down the mission card that you remember most from the board game and explain how that card affected ecosystem recovery.

3 How Do Ecosystems and People's Lives Change After a Wildfire?

1) What difficulties might plants, animals, and people experience after a wildfire? Complete the table below.

	What Difficulties Might They Experience?
Plants	
Animals	
People	

2) Connect the changes in the ecosystem after a wildfire with their possible impacts on people's lives.

Changes in the Ecosystem	Impacts on People's Lives
The number of trees in the forest decreases.	
Animal habitats decrease.	
Stream ecosystems are damaged.	
Soil is damaged.	

4 Let's Review

- When a wildfire occurs, living organisms and people may be affected differently depending on their environments and living conditions. Also, changes in the forest ecosystem can affect people's lives. To reduce wildfire damage and support ecosystem recovery, people need to work together to restore and protect the forest.

1) Think of two living organisms or people who may be more affected by wildfires and explain why.

① _____

Reason:

② _____

Reason:

2) What efforts are needed to help living organisms and people who may be more affected by wildfires recover together?

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?