

Hazard Literacy Center

Hazard Literacy Education Program

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Tracking Typhoons: What Drives Their Specific Paths?



1. Program Overview

This program is designed to help students explore how typhoons form and move by using a variety of data and maps. Centered on the question, “Tracking Typhoons: What Drives Their Specific Paths?”, students learn about the concept and characteristics of typhoons, the conditions required for their formation, and their naming and classification. They then examine the actual tracks of typhoons to explore how they move. Through these activities, students move beyond simply understanding typhoons as natural phenomena accompanied by strong winds and heavy rain and learn that their tracks can vary depending on surrounding atmospheric circulation and pressure patterns.

The program consists of four stages: understanding the basic concepts of typhoons, exploring actual typhoon tracks, investigating the factors that influence typhoon movement, and exploring ways to respond safely. Using tablets or computers, students examine typhoon information provided by the Korea Meteorological Administration (KMA) and explore where typhoons form and how they actually move. Students compare all typhoons, typhoons affecting Korea, and typhoons making landfall in Korea using recent typhoon data. They identify patterns in the tracks of different typhoons and consider why many typhoons formed but only a small number affected Korea. Students then explore meteorological factors that influence typhoon movement, such as the North Pacific High and the westerlies, and connect these factors with actual typhoon tracks to understand how typhoons move.

Finally, students use the KMA’s typhoon safety guidelines to examine appropriate safety actions when a typhoon is forecast, during a typhoon warning, and after a typhoon and determine how to respond appropriately in typhoon situations. Through this program, students develop an understanding of the concepts and characteristics of typhoons and the principles behind their formation and movement. They also gain experience in exploring and interpreting actual weather information to understand typhoon movement. Furthermore, by recognizing typhoon-related risks and determining appropriate safety actions for different situations, students can develop the ability to protect themselves and others during disasters.

Grade Level	Upper Elementary or Middle School Students	Instructional Methods	Group project activities
Learning Environment	Classroom with Access to Internet	Duration	4 sessions, 180 minutes
Required Materials	Worksheets, an internet-enabled digital device		

2. Learning Objectives (Hazard Literacy Framework)

① Understand the concept and characteristics of typhoons, the conditions required for their formation, and the major meteorological factors that influence their movement.
② Explore actual typhoon tracks and identify patterns and common features among the tracks of different typhoons.
③ Use weather information based on an understanding of typhoon movement and take appropriate safety and evacuation actions when a typhoon occurs.

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					O								
Objective ②			O	O	O		O								O	
Objective ③		O				O				O	O		O	O	O	O

3. Key Concepts

- Basic concepts and characteristics of typhoons
- Conditions and regions of typhoon formation
- Typhoon naming and classification
- Typhoon tracks and movement patterns
- Atmospheric circulation affecting typhoon movement

4. Program Sequence

	Activity Sequence
Introduction	-Watch recent news reports and videos about typhoon damage. -Take a true-or-false quiz about typhoons. -Introduce the key question: “Why do typhoons move in certain directions?”
Inquiry 1	-Use KMA typhoon information to learn about the concept and characteristics of typhoons. -Explore where typhoons form and the conditions required for their formation. -Understand the relationship between typhoons and tropical cyclones. -Learn how typhoons are named and classified.

	Activity Sequence
Inquiry 2	-Use the KMA's historical typhoon data to examine actual typhoon tracks. -Identify the formation locations and movement directions of different typhoons on a map. -Identify similarities and differences among the tracks of different typhoons.
Inquiry 3	-Discuss the question, "Why do some typhoons move toward Korea while others change direction?" -Explore the winds and pressure patterns that influence typhoon movement. -Understand how atmospheric circulation, including the North Pacific High and the westerlies, influences typhoon movement. -Compare actual typhoon tracks with atmospheric circulation patterns and summarize how typhoons move.
Conclusion	-Learn how to use KMA typhoon information. -Review appropriate safety and evacuation actions during a typhoon. -Think about how to protect yourself and others from typhoon hazards.

5. Theoretical Background and Activity Design for Disaster Education

Typhoons are a type of tropical cyclone that forms over tropical oceans and maintains its intensity as it moves by receiving a continuous supply of water vapor evaporated from the ocean. Over oceans near the equator, solar energy contributes to the formation of convective clouds, which can gather and develop into a large low-pressure system. After a typhoon forms, it does not simply follow a fixed path. Instead, its movement is influenced by factors such as surrounding atmospheric circulation and pressure patterns (Korea Meteorological Administration [KMA], n.d.). Recent typhoon cases have shown that the position and edge of the North Pacific High, the mid-latitude westerlies, and pressure troughs are major factors influencing the direction and tracks of typhoons (Jeong, 2026).

This program is designed to help students understand the basic concepts and characteristics of typhoons, explore actual typhoon tracks, and investigate the factors that influence typhoon movement. Students use typhoon information from the KMA Weather Nuri to learn about the regions where typhoons form and their characteristics. They then use historical typhoon data to explore actual formation locations and tracks. The KMA's historical typhoon database allows users to search by period and distinguish among all typhoons, typhoons affecting Korea, and typhoons making landfall in Korea, enabling students to compare actual typhoon tracks and their impacts on Korea (KMA, n.d.).

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Finally, the program goes beyond understanding the principles of typhoon movement by using the KMA's typhoon safety guidelines to help students explore appropriate safety actions when a typhoon is forecast, during a typhoon warning, and after a typhoon, and determine how to respond appropriately in real-world situations. Through these activities, students move beyond viewing typhoons simply as natural phenomena. Instead, they develop hazard and disaster response competencies by exploring and interpreting typhoon-related information, assessing risks, and responding appropriately.

6. Instructional Considerations

When teaching this program, avoid describing typhoons simply as "natural phenomena with heavy rain and strong winds." Guide students to understand that various meteorological factors influence both the formation and movement of typhoons. Students should not assume that "typhoons always move in the same direction." By examining a variety of actual typhoon tracks, help them understand that typhoon tracks can vary depending on surrounding atmospheric circulation and pressure patterns.
When exploring typhoon tracks, it is important to encourage students to identify similarities and differences among actual typhoon cases rather than simply memorizing particular tracks. Cases in which typhoons changed direction without affecting Korea can also be used to help students understand that the formation of a typhoon does not necessarily mean that it will affect Korea.
During activities using typhoon information, guide students in how to check a typhoon's current location, track, forecast track, and potential impacts. Emphasize that, in an actual disaster situation, it is important to continue checking the latest weather information. Finally, review appropriate safety and evacuation actions during typhoons so that students can apply what they have learned to real-life situations.

7. References

- Korea Meteorological Administration. (n.d.-a). What is a typhoon? KMA Weather Nuri. https://www.weather.go.kr/w/hazard/typhoon/basic/info1.do
- Korea Meteorological Administration. (n.d.-b). Historical typhoons. KMA Weather Nuri.
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- Korea Meteorological Administration. (n.d.-c). Safety guidelines: Typhoons. KMA Weather Nuri. https://www.weather.go.kr/w/hazard/safety-guide/typhoon.do
- Jeong, Y. B. (2026, August 27). Twenty-one typhoons formed, but none made landfall on the Korean Peninsula: Why didn't the "route to Korea" open? Financial News https://www.fnnews.com/news/202608270909185757

Session 1: What Is a Typhoon?

Topic	Understanding the Concept and Characteristics of Typhoons
What Will We Learn?	① Understand the concept and characteristics of typhoons using typhoon information from the Korea Meteorological Administration (KMA). ② Explore where typhoons form and the conditions needed for their formation. ③ Learn how typhoons are named and classified and explain basic facts about typhoons.

1 Think About It

- Write down anything you already know about typhoons.
- What words or images come to mind when you think of a typhoon?

- When do typhoons usually affect Korea?

- What would you like to know about typhoons?

2 What Is a Typhoon?

- Visit the KMA Weather Nuri website(https://www.weather.go.kr/w/index.do) and find the answers to the following questions.
- Go to Weather Hazards → Typhoon

1) What kind of natural phenomenon is a typhoon?

2) Where Do Typhoons Usually Form?

Look at the map below and examine the regions where typhoons usually form.



<Regions Where Typhoons Usually Form>

Use the map to complete the table for regions ①–⑤.

No.	Main Formation Region	Main Season
①	West of (_____), near the West Indies	Jul. – Oct.
②	Eastern North Pacific, off the coast of (_____)	Jul. – Oct.
③	Western North Pacific, west of 180°E to (_____)	Jul. – Oct.
④	South of (_____) *(from Madagascar to 90°E and northwestern Australia)*	Apr. – Jun., Sep. – Dec.
⑤	(_____) and the Arabian Sea	Apr. – Jun., Sep. – Dec.

3) Do typhoons usually form over land or over the ocean?

☐ Land ☐ Ocean

4) Write one thing that the main typhoon formation regions have in common.

5) How Do Typhoons Form?

3 How Are Typhoons Named?

- Tropical cyclones are called different names depending on the region. They are called typhoons in the northwestern Pacific, hurricanes in North and Central America, and cyclones in the Indian Ocean and the Southern Hemisphere.

1) Countries in the northwestern Pacific each submit ten names for typhoons, which are then used in sequence. What are some typhoon names submitted by Korea?

2) Why are typhoons given names?

4 Are All Typhoons the Same?

- The Korea Meteorological Administration classifies tropical cyclones into different categories based on their maximum sustained wind speed near the center.
- Use KMA information to complete the table below

Maximum Wind Speed Near the Center	World Meteorological Organization (WMO)	Korea/Japan
Less than 17㎧		Tropical Depression
17㎧-24㎧		Typhoon
25㎧-32㎧		
33㎧ or higher		

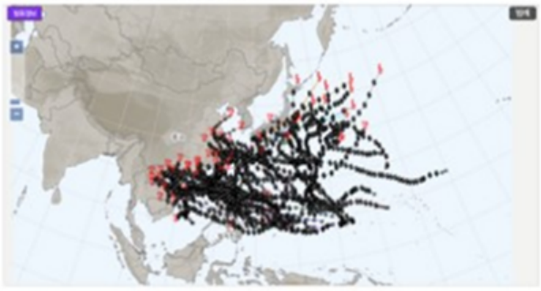
1) What differences can you find between the WMO classification and the classification used in Korea and Japan?

Session 2: Where Do Typhoons Go?

Topic	Exploring Typhoon Tracks
What Will We Learn?	① Use historical typhoon data from the KMA to explore where typhoons form and how they move. ② Compare the tracks of different typhoons and identify similarities and differences. ③ Understand that typhoons can follow different tracks.

1 How Many Typhoons Formed, and Where Did They Go?

- Go to KMA Weather Nuri → Weather Hazards → Typhoon → Past Typhoons.
- Set the period to the most recent one to two years (e.g., September 2024–August 2026).
- Select All Typhoons → Typhoons Affecting Korea → Typhoons Making Landfall in order and compare the results.





All Typhoons	Typhoons Affecting Korea	Typhoons Making Landfall

1) Looking at the tracks of all typhoons, in which direction did most typhoons move?

2) What did you notice when you compared all typhoons, typhoons affecting Korea, and typhoons making landfall?

3) Many typhoons formed during this period. Why do you think only a small number affected Korea?

Session 3: Why Do Typhoons Follow Certain Paths?

Topic	Understanding the Weather Factors That Influence Typhoon Tracks
What Will We Learn?	① Understand how pressure patterns and atmospheric circulation influence the movement of typhoons. ② Explore how the North Pacific High and the westerlies influence typhoon tracks. ③ Explain why typhoon tracks can vary by examining recent typhoon cases..

1 What Determines a Typhoon's Track?

- Read the passage below and identify the factors that influence a typhoon's track.

According to the Korea Meteorological Administration, a "typhoon affecting Korea" does not necessarily mean a typhoon that makes landfall on the Korean Peninsula. Since 2011, a typhoon has been classified as affecting Korea based on whether a typhoon warning was issued for one of Korea's typhoon warning areas. (omitted)

The reasons why many typhoons form and the reasons why they do not move toward the Korean Peninsula need to be considered separately. Typhoon formation is influenced by factors such as sea surface temperature, heat stored in the ocean, and atmospheric convection. (omitted) Once a typhoon forms, however, its movement is largely determined by the surrounding pressure systems. One major factor is the North Pacific High. Rather than moving directly through the center of this large high-pressure system, typhoons often move along the winds around its edge. Together with the mid-latitude westerlies and the position of troughs, this helps determine whether a typhoon moves westward, northward, or turns toward the east of Japan. (omitted) Interestingly, typhoon tracks and heat waves on the Korean Peninsula are connected to the same summer pressure systems.

– *"21 Typhoons Formed but None Made Landfall on the Korean Peninsula: Why Didn't the 'Route to Korea' Open?"* (August 27, 2026)

1) What weather factors influence the movement of typhoons?

2) How does the North Pacific High affect typhoon tracks?

3) Using the typhoon tracks you examined in Session 2 and the information above, explain why only a small number of typhoons affected Korea.

Session 4: How Should We Prepare for a Typhoon?

Topic	Using Typhoon Information and Learning How to Stay Safe
What Will We Learn?	① Identify important information in a typhoon forecast, such as its track and intensity. ② Assess possible typhoon hazards depending on the situation. ③ Explain appropriate safety actions before, during, and after a typhoon.

1 What Should We Do When a Typhoon Is Approaching?

- Go to KMA Weather Nuri → Weather Hazards → Natural Disaster Safety Guidelines → Typhoon.
- Review the typhoon safety guidelines and choose three important actions for each stage.

Stage	Safety Guidelines
When a Typhoon is Forecast	· · ·
During a Typhoon Warning	· · ·
After a Typhoon	· · ·

2 What Should You Do in This Situation?

- Think about how you could respond safely in the following situation.

> A typhoon is approaching Korea. The KMA forecasts that our area will be affected by the typhoon starting tomorrow afternoon. Heavy rain and strong winds are also expected.

1) What information should you check in the typhoon forecast?

2) What should you do before the typhoon arrives? Explain why.