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DepED
DEPARTMENT OF EDUCATION

Lesson Exemplar for Science

Quarter 3
Lesson
5

Lesson Exemplar for Science
Quarter 3: Lesson 5 of 8 (Week 5)
SY 2025-2026

Development Team

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SCIENCE (EARTH AND SPACE) /QUARTER 3 / GRADE 8

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	Typhoon Formation and Impact of Landmasses and Bodies of Water on Typhoons
B. Performance Standards	By the end of the quarter, learners demonstrate precautionary measures before, during, and after a typhoon, including following advisories, storm signals, and calls for evacuation given by government agencies in charge.
C. Learning Competencies and Objectives	***Learning Competencies*** 1. Describe the nature and characteristics of the typhoon. 2. Explain the impact of landmasses and bodies of water on typhoons. *Learning Objectives: At the end of the lesson, learners must be able to:* 1. *Define and differentiate typhoons, hurricanes, and cyclones* 2. *explain how typhoon develops,* 3. *label the parts of a typhoon* 4. *explain the role of each part of typhoon* 5. *identify the different categories of tropical cyclones,* 6. *determine the effects of tropical cyclones,* 7. *discuss the reasons why the Philippines is prone to tropical cyclones,* 8. *investigate the impact of landmasses and bodies of water on typhoons, and* 9. *evaluate how geographic features lessen or worsen the impact of typhoons.*
D. Content	A. Basics of Typhoon • Typhoon Formation • Structure of a Typhoon • Categories of Tropical Cyclones B. Factors Affecting Formation of Typhoon • Impact on Landmasses • Impact on Bodies of Water
E. Integration	Climate Change Impact Stewardship – foster a sense of responsibility for protecting the environment by realizing the importance of sustainable practices to mitigate climate change and its effects on weather patterns.

II. LEARNING RESOURCES
Al Jazeera. (2013, November 10). Pictures: Typhoon aftermath. https://www.aljazeera.com/gallery/2013/11/10/pictures-typhoon-aftermath Philippine Atmospheric, Geophysical and Astronomical Services Administration. (n.d.). *About tropical cyclones*. https://www.pagasa.dost.gov.ph/information/about-tropical-cyclone Philippine Atmospheric, Geophysical and Astronomical Services Administration. (n.d.). *Tropical cyclone wind signal*. https://www.pagasa.dost.gov.ph/learning-tools/tropical-cyclone-wind-signal Rappler. (2022, March 23). PAGASA changes definition of super typhoon, tropical cyclone wind signals. https://www.rappler.com/philippines/weather/pagasa-changes-super-typhoon-definition-tropical-cyclone-wind-signals-march-2022 D. M. Padua. University of Wisconsin-CIMSS. (1998). A graphical illustration & satellite view of a Typhoon showing its parts. https://integsci8rshscar.weebly.com/earth-science/tropical-cyclones National Oceanic and Atmospheric Administration. (n.d.). Tropical cyclone structure. In JetStream - Online School for Weather. https://www.noaa.gov/jetstream/tropical/tropical-cyclone-introduction/tropical-cyclone-structure DOSTv: Science for the People. (2016, April 8). The formation of a typhoon (Video). https://www.youtube.com/watch?v=eSxN7e6uCbo CBS Morning. (2013, November 12) Typhoon Haiyan's aftermath (Video). https://youtu.be/jx7Ni6CoiUo?si=mYIVMRSZmBVwkfMJ

III. TEACHING AND LEARNING PROCEDURE		**NOTES TO TEACHERS**
A. Activating Prior Knowledge	**DAY 1** **1. Short Review** • To reinforce students' understanding of basic weather concepts the teacher can begin the class with an open-ended question, "What do you remember about what causes weather? "What are some factors that can lead to the formation of clouds, and how they contribute to weather changes? • The teacher can write students' responses on the white board by highlighting key terms and concepts to also check students' misconceptions. **2. Feedback (Optional)**	• Teachers take note of students' misconceptions, particularly the distinction between climate and weather. *Weather – refers to short-term atmospheric conditions in a specific time and place* *Example: today's temperature and precipitation*

	• As students engage in discussion and review, teachers should take note of some key terms that arise, including temperature, water vapor, precipitation, condensation, etc.	*Climate – refers to the long-term average of weather patterns over a long period.*
B. Establishing Lesson Purpose	**1. Lesson Purpose** **Typhoon-Yolanda "Haiyan" Aftermath** Show a picture or short video clip of a typhoon experienced by the Philippines, including satellite images, damage caused, and maps.  Image Source: aljazeera.com • Ask the students the following questions: 1. How do the images or video clips illustrate the events occurring, and what underlying factors do you believe are causing these events? • Play a short video clip of a weather forecast. https://youtu.be/jx7Ni6CoiUo?si=mYIVMRSZmBVwkfMJ • Remind the students to pay attention to images and events shown in the video. After the video, the students will discuss their observations and insights with the class. 1. Why do typhoons formed in the Pacific often hit the Philippines, and what does this mean for the country? 2. How does being the center of typhoon alley, or typhoon belt, affect typhoons' number and strength in the Philippines? **2. Unlocking Content Vocabulary** Unscramble the letters to complete the definition of terms (5 minutes)	• Provide guide questions to students before the video to help them focus on key points and important details. • Students will engage in learning about the formation of typhoons by examining the underlying factors behind the pictures of typhoon aftermath. • The short video clip will help students understand the geographical factors involved in the formation of typhoons, as well as their causes and effects.

	<table><tr><th>Terms</th><th>Definition</th></tr><tr><td>OPNHTOY</td><td>It has a wind speed of 118-184 km/h (previously 171 to 220 km/h), a significant to severe threat to life and property.</td></tr><tr><td>EALWLEY</td><td>this part is around the eye. It has the strongest winds and rains. The winds may blow 200 miles per hour.</td></tr><tr><td>EGRUS MROTS</td><td>temporary rise in sea level along the coast caused by strong winds and low atmospheric pressure associated with a tropical cyclone, leading to flooding of coastal areas.</td></tr><tr><td>AES ECAFRUS ERUTAREPMET</td><td>It refers to the temperature of the water at the ocean's surface.</td></tr><tr><td>YEE</td><td>The center part of the storm which is the calm part.</td></tr><tr><td>CALIPORT SSIONERPED</td><td>It has a wind speed of 39-61 km/h (previously 30 to 60 km/h), minimal to minor threat to life and property.</td></tr><tr><td>ONECYC CALIPORT</td><td>The general term for a cyclone that originates over the tropical oceans.</td></tr><tr><td>OPNHTOY REPSU</td><td>It has a wind speed of 185 km/h or higher (previously more than 220 km/h), extreme threat to life and property.</td></tr><tr><td>MROTS CALITROP</td><td>It has a wind speed of 62-88 km/h (previously 61 to 120 km/h), minor to moderate threat to life and property.</td></tr><tr><td>SDNABNIAR RETUO</td><td>It features occasional light to moderate rainfall with winds up to 62 kph. Heavy squalls lasting up to 5 minutes occur every 3 to 6 hours, with 50% cloud cover allowing some sunlight.</td></tr></table>	Unlocking vocabulary is essential for students' understanding prior discussion on typhoon formation including its factors causing typhoon. ***Answer Key:*** ***Unlocking Vocabulary*** • TYPHOON • EYE WALL • STORM SURGE • SEA SURFACE TEMPERATURE • EYE • TROPICAL DEPRESSION • TROPICAL CYCLONE • SUPER TYPHOON • TROPICAL STORM • OUTER RAINBANDS
C. Developing and Deepening Understanding	**SUB-TOPIC 1: TYPHOON FORMATION** **1. Explication** • The teacher can start the activity by prompting students to share their understanding of typhoons or tropical cyclones. • Students will then discuss their prior knowledge and perceptions of typhoons before exploring the detailed explanation of the step-by-step formation process. ***Activity 1: The Birth of a Typhoon*** *Objective:* To provide the students with the opportunity to explain how typhoons are formed. *Materials needed:* Manila paper – Markers - Printout Pictures	The teacher may use this sequencing of events activity to further understand the formation of typhoon. List the steps in the formation of a typhoon out of order. Have students number them in the correct sequence. See Learning Activity Sheet: *Activity #1: The Birth of a Typhoon*

1. The teacher will prepare a printout of pictures of the step-by-step formation of a typhoon. The teacher can ask volunteers to arrange the pictures according to the correct sequence of events

Discussion Points:

- The teacher can ask the students what they remember from Activity #1. birth of a typhoon.
- Tropical cyclones are major weather disturbances and are considered one of the most destructive natural disasters.
- Oceans and seas have a great influence on the weather of continental masses. A large portion of the solar energy reaching the sea surface is expended in the process of evaporation.
- Water evaporated from the sea/ocean is carried up into the atmosphere and condenses, forming clouds from which all forms of precipitation result. Sometimes, intense cyclonic circulations occur which is what we call the tropical cyclones (PAGASA).
- The teacher may ask the following questions:
  1. What essential conditions must be present for a typhoon to form?
  2. In what ways does warm ocean water aid in the development of a typhoon?
  3. Can you explain the stages of a typhoon, from its initial formation to its mature state?

DAY 2

1. Worked Example

- The teacher can also play a short video to have a visualization of typhoon formation.
- Birth of a Typhoon: https://www.youtube.com/watch?v=eSxN7e6uCbo

Guide Questions:

1. How are typhoons formed?
2. What is the distinction between typhoons, cyclones, and hurricanes? Are they the same?
3. What is the role of the Inter Tropical Convergence Zone (ITCZ) in typhoon formation?
4. What are the key ingredients to the birth of typhoons?

The sequence of events of typhoon formation is important for the students to understand the cause-and-effect relationships that drive typhoon formation.

Answer Key:
Activity 1: The Birth of a Typhoon

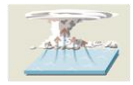
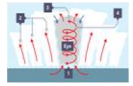
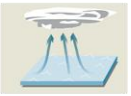
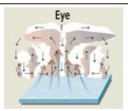
Picture	Events	Sequence
	The moisture turned into heat by the thunderstorms draws more air to the storm's center leading to evaporation.	2
	The Earth's rotation causes the storm to start spinning.	4
	Tropical thunderstorms serve as the initial stage for the formation of typhoons as they harness moisture from the oceans through the force of strong winds.	1
	Heat and airflow towards the eye, forming the typhoon.	3

Image Sources:
theglobeandmail.com

bbc.co.uk

5. What are the conditions needed to form a typhoon?

2. Lesson Activity
Activity 2.
Objective: To identify and explain the different parts of a typhoon and their respective functions.

- The teacher will begin reviewing the concepts of typhoon formation covered in Activity 1 and will emphasize the importance of identifying the parts of a typhoon.
- The teacher will display a diagram or picture of a typhoon to the students, either using a printed version or a projector.
- The students will study the diagrams and images of typhoons to familiarize themselves with the various parts.
- Ask the students to label the parts of the typhoon such as the eye, eyewall, inner rainbands, and outer rainbands.

Instructions. Identify and label the parts of a typhoon, then describe each part's location, typical wind speeds, and air pressure characteristics.

Discussion Points:

- The teacher will discuss the different parts of a typhoon, including the characteristics and significance of the eye, eyewall, outer rainbands, and inner rainbands. The following can be asked to the students:
- Discuss why the eye is calm and its significance in the storm's structure.
- Explain why the eyewall has the highest speed and intense weather conditions.
- Discuss how the outer rainbands affect areas far from the storm's center and contribute to widespread rainfall.
- Analyze the role of inner rainbands in the overall system and its impact compared to outer rainbands.

Additional explanation on the discussion points:

- **Eye** – this is the center. It is the calm part of the storm.
  - The eye of the storm is calm because the now strong surface winds that converge towards the center never reach it.

See Learning Activity Sheet:
Activity #2: Typhoon Anatomy

Answer Key:

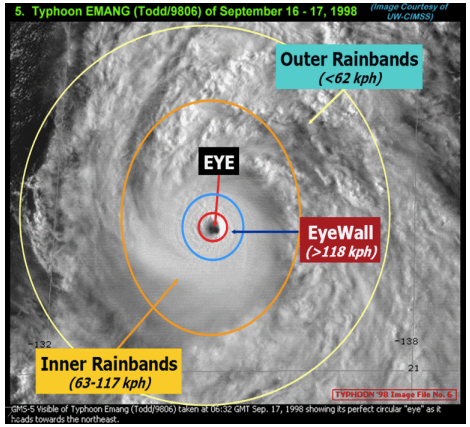


Image Source:
integsci8rshscar.weebly.com

Parts of Typhoon	Location	Wind Speed	Air Pressure
1. eye	The center of the typhoon	Calm winds, typically under 15 mph	Lowest air pressure in the typhoon
2. eyewall	Surrounds the eye	Highest wind speeds, often exceeding 150 mph	Very low air pressure, slightly higher than the eye
3. outer rainbands	Outer edges of the typhoon	Decreasing wind speeds as distance from the center increases	Gradually increasing air pressure
4. inner rainbands	Between the eyewall and outer bands	Moderate to high wind speeds	Lower air pressure than outer bands, but higher than the eyewall

- **Eye wall** - this part is around the eye. It has the strongest winds and rains. The winds may blow 200 miles per hour.
  - The eyewall has strongest winds within the storm are concentrated. As the storm's rotation intensifies, these winds accelerate rapidly towards the center, creating a powerful vortex.
- **Outer rainbands** - It features occasional light to moderate rainfall with winds up to 62 kph. Heavy squalls lasting up to 5 minutes occur every 3 to 6 hours, with 50% cloud cover allowing some sunlight.
  - The outer rainbands can extend outward from the center of the storm and can span hundreds of miles, influencing regions well beyond the immediate vicinity of the storm.
- **Inner rainbands** - organized spiral bands moving towards the center. They bring moderate, intermittent rain and winds of 63 to 117 kph. Heavy squalls lasting up to 5 minutes occur every hour, with 90% of the sky covered by high to mid-level clouds.
  - The inner rainbands, situated closer to the storm's center, are characterized by intense convective activity, producing heavy rainfall and strong winds. They play a crucial role in the storm's intensity and structure, often contributing to rapid intensification and the eyewall replacement cycle.

DAY 3
SUBTOPIC: CATEGORIES OF TROPICAL CYCLONE
2. Worked Example
Activity 3.

Teacher can use this YouTube video on tropical cyclone warning signals to further understand its categories:
https://youtu.be/SzlthRj9xbo?si=QNDBSKyZmawzBBEP

Poster Rubrics:

Criteria	Excellent (4 points)	Good (3 points)	Fair (2 points)	Needs Improvement (1 point)
Content	Accurately presents comprehensive information on the characteristics and impacts of the assigned category of tropical cyclone.	Presents mostly accurate information on the characteristics and impacts of the assigned category of tropical cyclone.	Presents some accurate information on the characteristics and impacts of the assigned category of tropical cyclone, but with some gaps or inaccuracies.	Presents limited or inaccurate information on the characteristics and impacts of the assigned category of tropical cyclone.

This YouTube video can visually reinforce key concepts, enhance engagement and aids retention of the students in learning the process of typhoon formation: https://www.youtube.com/watch?v=eSxN7e6uCbo

See Learning Activity Sheet: *Activity #3: Categories of Typhoon*

The teacher can ask the students to create a poster regarding the categories of tropical cyclones. Students should explain the key characteristics and impacts of

Clarity and Organization	Information is clearly organized and presented in a logical manner. Text is easy to read and understand.	Information is mostly organized and presented in a logical manner. Text is mostly clear and easy to read.	Information is somewhat organized, but may be difficult to follow in some areas. Text may be somewhat unclear or difficult to read.	Information is poorly organized and presented in a confusing manner. Text is unclear and difficult to read.
Visual Appeal	Poster includes engaging and visually appealing illustrations, diagrams, and/or images that enhance understanding of the topic.	Poster includes some visually appealing illustrations, diagrams, and/or images, but may lack variety or creativity.	Poster includes limited visual elements that enhance understanding of the topic. Illustrations, diagrams, and/or images may be sparse or unengaging.	Poster lacks visual appeal and includes few or no illustrations, diagrams, or images.
Creativity and Originality	Demonstrates creativity and originality in presenting information. Poster design and content display innovative approaches or unique perspectives.	Demonstrates some creativity and originality in presenting information. Poster design and content display some innovative approaches or unique perspectives.	Demonstrates limited creativity and originality. Poster design and content may lack variety or fail to engage the viewer.	Demonstrates little to no creativity or originality. Poster design and content are generic or uninspired.
Collaboration and Teamwork	Group members effectively collaborated and contributed to the creation of the poster. All group members participated actively and worked together to complete the task.	Group members collaborated and contributed to the creation of the poster, but there may be some uneven participation or minor conflicts.	Group members made some effort to collaborate and contribute to the creation of the poster, but there may be significant uneven participation or conflicts within the group.	Group members did not effectively collaborate or contribute to the creation of the poster. There may be little to no evidence of teamwork.

Discussion Points:

- Conclude the learning activity by asking students to reflect on what they learned about the different categories of tropical cyclones.

Guide Questions:

1. How are tropical cyclones categorized?
2. What are the wind speed ranges for each category of the modified tropical cyclone warning system?

their assigned category of tropical cyclone.

Poster Example:

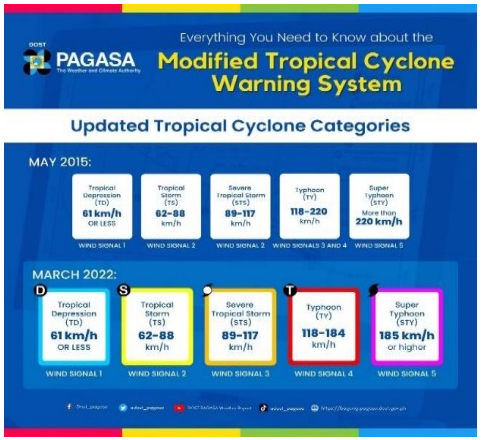


Image Source: pagasa.dost.gov.ph

	DAY 4 **3. Lesson Activity** **SUBTOPIC:** Factors Affecting Formation of Typhoon ***Activity 4.*** **Discussion points:** • Factors such as landmasses and bodies of water impact the formation and behavior of typhoons. • *Effects of landmasses on typhoons* - Landmasses weaken typhoons. - Mountain ranges can impede or slow down the wind speed and strength of typhoons. - Orthographic lifting can weaken the impact of a typhoon in an area. - Typhoons need a large amount of water vapor from a vast area of water, but since landmasses have a relatively low amount of water, typhoons landing on landmasses usually become weaker. - Mountains serve as a barrier against strong winds and heavy precipitation. The cold air on top of a mountain prevents the building of a typhoon, which needs warmer air. - Orthographic lifting refers to the flow of air from oceans to mountains causing orthographic precipitation. This causes the area at the seaside to become wetter and has great vegetation and those on the leeside become drier and less prone to typhoons. • *Effects of Bodies on Water* - It provides the water necessary for evaporation to produce warm, moist air that fuels a typhoon. - These bodies of water determine the humidity and temperature which are important in the formation of typhoons. - Bodies of water like oceans strengthen a typhoon. - This abundant amount of water is absent from landmasses. Ocean water with a temperature of 25.6 degrees Celsius. - Warm bodies of water are the main factors in the formation of typhoons.	See Learning Activity Sheet: *Activity #4: Land-Water Interaction on Typhoon Formation* For *Typhoon Yolanda/Haiyan's Scenario*, teachers can search the internet for video or article resources about the following: o Yolanda's impact on coastal communities o Interaction between warm ocean waters and coastal geography o The Impact of typhoon in the Philippines

D. Making Generalizations	**1. Learners' Takeaways** • Students will choose concepts from the lesson and provide explanations for their chosen concepts. **2. Reflection on Learning** • The learners will write a reflection journal documenting their thoughts, questions, and insights on typhoon formation and influences of landmasses and bodies of water.	Writing journals about the lesson will provide teachers with the ideas that students learn from the lesson on typhoon formation including its factors.

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		**NOTES TO TEACHERS**
A. Evaluating Learning	**1. Formative Assessment** Choose the letter of your answer. 1. Which of the following factors contributes most significantly to the formation and intensification of typhoons? a) Atmospheric pressure b) Wind direction c) Ocean surface temperature d) Cloud cover 2. Why are coastal areas more vulnerable to the impacts of typhoons compared to inland regions? a) Coastal areas have higher wind speeds b) Coastal areas experience stronger storm surges c) Coastal areas have lower atmospheric pressure d) Coastal areas receive less precipitation 3. How do warm ocean waters contribute to the formation and intensification of typhoons? a) They increase atmospheric pressure b) They decrease wind speed	**ANSWER KEY** 1. c 2. b 3. c 4. d 5. a

	c) They provide energy for evaporation and condensation d) They cause clouds to scatter 4. What role do landmasses play in influencing the path of a typhoon? a) Landmasses absorb heat from the atmosphere b) Landmasses disrupt the flow of atmospheric pressure c) Landmasses provide friction, causing typhoons to weaken d) Landmasses deflect the direction of typhoon movement 5. What is the primary reason why typhoons tend to weaken as they move over land? a) Decreased moisture availability b) Increased atmospheric pressure c) Higher wind speeds d) Warmer air temperatures **2. Homework (Optional)**			The teacher may give homework for extended deliberate practice.
B. Teacher's Remarks	*Note observations on any of the following areas:*	**Effective Practices**	**Problems Encountered**	This lesson design component prompts the teacher to record relevant observations and/or critical teaching events that he/she can reflect on to assess the achievement of objectives. The documenting of experiences is guided by possible areas for observation including teaching strategies employed, instructional materials used, learners' engagement in the tasks, and
	strategies explored			
	materials used			
	learner engagement/ interaction			

				other notable instructional areas. Notes here can also be on tasks that will be continued the next day or additional activities needed.
	Others			
C. Teacher's Reflection	*Reflection guide or prompt can be on:* ▪ *<u>principles behind the teaching</u>* *What principles and beliefs informed my lesson?* *Why did I teach the lesson the way I did?* ▪ *<u>students</u>* *What roles did my students play in my lesson?* *What did my students learn? How did they learn?* ▪ *<u>ways forward</u>* *What could I have done differently?* *What can I explore in the next lesson?*			This lesson design component guides the teacher in reflecting on and for practice. Entries on this component will serve as inputs for the LAC sessions, which can center on sharing the best practices discussing problems encountered and actions to be taken; and identifying anticipated challenges and intended solutions. Guide questions or prompts may be provided here.