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DepED
DEPARTMENT OF EDUCATION

Lesson Exemplar for Science

Quarter 2
Lesson
8

Lesson Exemplar for Science Grade 7
Quarter 2: Lesson 8 (Week 8)
S.Y. 2024-2025

Development Team

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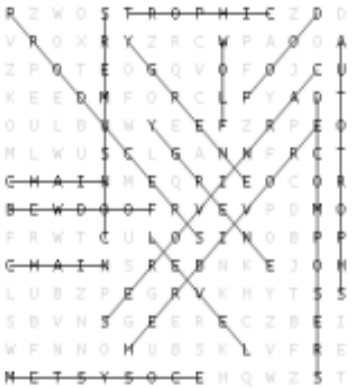
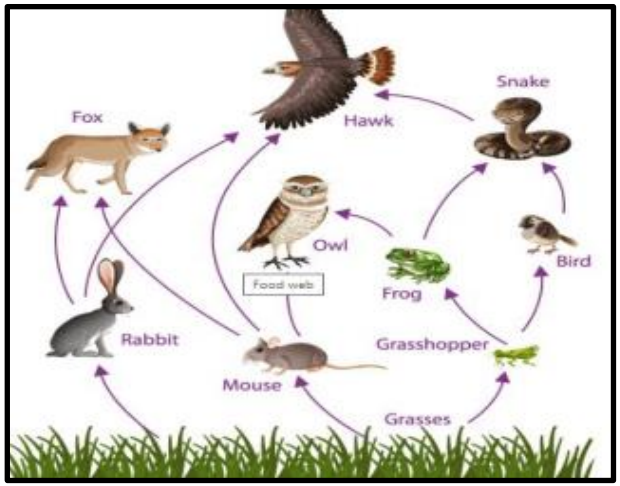
SCIENCE (BIOLOGY) / QUARTER 2 / GRADE 7

I. CURRICULUM CONTENT, STANDARDS, AND LESSON COMPETENCIES	
A. Content Standards	Identifying trophic levels helps understand the transfer of energy from one organism to another, as shown in a food pyramid.
B. Performance Standards	*By the end of the Quarter*, learners will explain the process of energy transfer through trophic levels in food chains.
C. Learning Competencies and Objectives	***Learning Competency*** Describe the trophic levels of an organism as levels of energy in a food pyramid.
D. Content	The Ecosystem: Feel the Energy Flow Food Chain and Food Web
E. Integration	*SDG-3* Good Health and Well-being: Food pyramid as a fundamental guide in understanding the energy intake of an individual *SDG-4* Quality Education: Biology Education and Ecological Research *SDG-13* Climate Action: Conservation of Ecosystem to preserve the ecological community *SDG-14* Life Below Water: Phytoplankton and green algae as a member of biological organization. *SDG-15* Life on Land: Biological Organization for biodiversity conservation, species protection, and understanding ecosystems

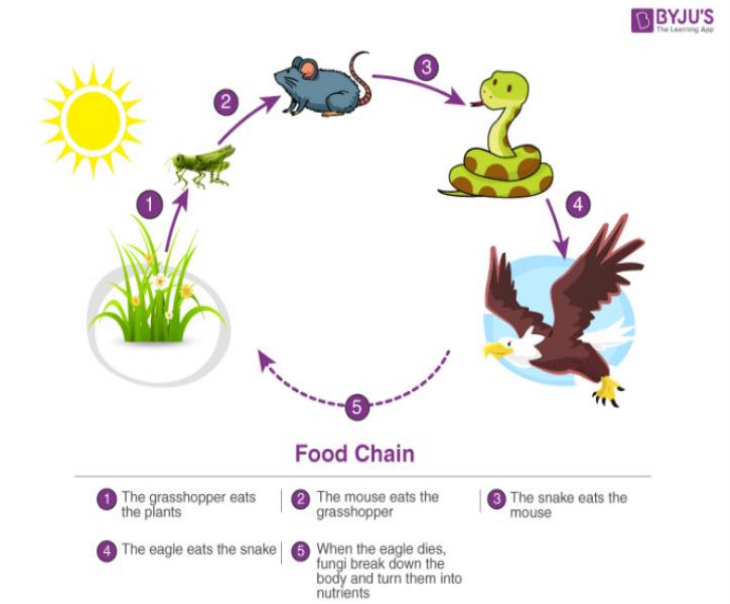
II. LEARNING RESOURCES

- Laurente, J. A., Garcia, R. J., Ole, F. C., Torio, V. A., & Osabel, A. (2015). Science for the 21st Century Learner 7. Makati City: DIWA LEARNING SYSTEM.
- Papa, E. C., Pineda, M. G., & Santos, M. (2018). Practical Science 8 Textbook. Makati City: DIWA LEARNING SYSTEM.
- MooMooMath and Science. (2023). Levels of Organization in Biology – Grade 7 Science. https://www.youtube.com/watch?v=3G4aNOcTjbg.com
- An Overview of Food Chain. (n.d.). https://byjus.com/biology/overview-of-food-chain/

III. TEACHING AND LEARNING PROCEDURE		NOTES TO TEACHERS
A. Activating Prior Knowledge	**1. Short Review (DAY 1)** **Word Hunting** Find the words related to the lesson in the word puzzle. Use the given clues to identify the words. P Z W O S T R O P H I C Z D D V R O X R Y Z R C W P A O O A Z P O T E O G Q V O F O J C U K E E D M F O R C L F Y A D T O U L B U W Y E E F Z R P E O M L W U S C L G A N N F R C T C H A I N M E Q R I E O C O R B E W D O O F R V E V P D M O F R W T C U L O S I N O B P P C H A I N S R E B N K E J O H L U B Z P E G R V K H Y T S S S B V N S G E E R E C Z B E I W F N N O H U B S K L V F R E M E T S Y S O C E H Q W Z S T A A V U Q O Z M H X O Q A D S autotrophs chain ecosystem flow herbivore trophic carnivores consumers energy food level chain decomposers energy foodweb producers	Write this word puzzle on the board or provide answer sheets for each group. Group the students and let them answer the activity. The group that can have a greater number of identified words in the puzzle will be the winner. Key to Correction:  https://puzzlemaker.discoveryeducation.com/word search/result.com

B. Establishing Lesson Purpose	**1. Lesson Purpose** You can present these videos for discussion. 1. https://www.youtube.com/watch?v=YuO4WB4SwCg 2. https://www.youtube.com/watch?v=CZhE2p46vJk **Guide questions:** 1. Can you describe what a food chain is and provide an example from the forest ecosystem we discussed earlier? 2. How does energy flow through a food chain, starting from producers and ending with top predators? What role do consumers play in this flow of energy? 3. Now, let's think beyond individual food chains. How do multiple food chains connect to form a complex network known as a food web? Can you explain why food webs are more realistic representations of energy flow in ecosystems compared to simple food chains?	Discussion proper
C. Developing and Deepening Understanding	**SUB-TOPIC 1: Identifying Food Chains Within a Food Web** **I. Worked Example** Among the most common relationships in any ecosystem is the prey-predator relationship. The food chain shows the eating sequence or energy transfer among several organism. In simple terms, the food chain shows what eats what.  *Figure 1. Food Web* *https://byjus.com/biology/overview-of-food-chain/* **Guide Questions:** 1.What organisms are considered producers in the food chain? What organisms are consumers in the food chain? 2. In your everyday meal, do you prefer more meat or more vegetables? Why?	Discuss the difference between a food chain and a food web and the different components of organism category within a food chain.

3.What do you think is the advantage of having a meal that is mainly composed of vegetables?
4.How much did you know about the food web before you started this activity?
5.Did you answer the activity the way other students answered it? In what way(s) did you answer it differently or similarly?



Big Idea: *The ultimate source of energy on Earth is the sun. The end of all energy in ecosystem is to be lost as heat.*

II. Lesson Activity (Day 2)

Why Taking Hurts So Bad

Materials: rice grains (about a tablespoon), one toothpick, one sheet of bond paper, ruler, and a pencil.

Procedure:

1. Get a clean sheet of bond paper and create a 17 x 22 grid on the paper.
2. Spread the rice grains over the grid. The paper represents the forest, the grids represent the part of the forest from which the Philippine eagle feeds, and the rice grain represents the eagle's food.
3. A Philippine eagle will catch an average of two animals per hour during daylight. Close your eyes and lower the end of the toothpick, slow down onto the grid, and imagine the eagle hunting for food.
4. Remove the grains in the square that have been touched by the toothpick. Count the grains you have removed.
5. Rearrange the remaining grains on the grid and repeat steps 2 and 3 five more times and reenact one day's worth of feeding for the Philippine eagle. Count the number of total grains removed and record them in Table 5.3.
6. Repeat steps 2 to 4 two more times to represent three days of feeding by the Philippine eagle.

Table 5.3

Day	Number of foods caught
1	
2	
3	

7. The logging of trees causes some animals to leave their habitat and look for another place to stay. Now return all the removed rice grains to the grid. Remove 150 grains from the grid. Repeat steps 2 and 5. Record your data in Table 5.4.

Table 5.4

Day	Number of foods caught
1	
2	
3	

Group the class into several teams, promote small discussion, and let them present their data on the front and provide follow-up questions for the evaluation.

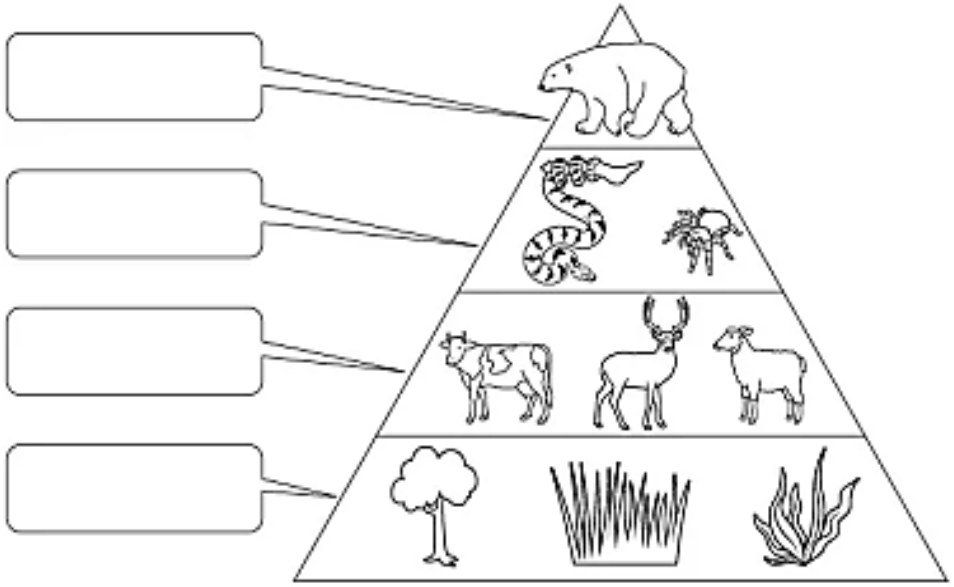
Guide questions:

1. How does the amount of food caught by a Philippine eagle relate to the changes in biotic and abiotic factors?
2. How does the presence of large amounts of food allow Philippine eagles to reproduce more often?
3. How would the population of other animals be affected if the amount of food remained low for a very long time?

Activity: The Ecosystem: Feel the Energy Flow

I. Worked Example

The diagram below is an example of an energy pyramid. Label the different trophic levels of the energy pyramid using the word bank provided.



This activity allows the students to identify the hierarchy of the different roles in the energy flow and organisms present in each tropic level.

Word Bank

Producers	Tertiary Consumers
Secondary Consumers	Primary Consumers

SUB-TOPIC 2 (Day 3): Brain Review

1. **Explicitation**
   Identify the diagram below, based on their role in the ecosystem.

1

2

3

4

5

2. **Worked Example:** Ecosystem Explorer: Uncovering Food Chains in Nature
   Objective: To observe and identify food chains within a local ecosystem.
   Materials Needed: field notebooks or paper, pencils or pens, magnifying glasses (optional), binoculars (optional), field guidebooks or smartphone apps for identifying plants and animals

Guide questions:

1. How do you think these organisms are connected to each other in terms of who eats whom? Can you identify any potential predator-prey relationships?
2. How do you think energy flows through this ecosystem? Can you trace the transfer of energy from producers to consumers and eventually to decomposers?
3. How do you think energy flows through this ecosystem? Can you trace the transfer of energy from producers to consumers and eventually to decomposers?

Answers:

1. Producers
2. Consumer
3. Secondary Consumer
4. Tertiary Consumer
5. Decomposers

See attached worksheet and prepare student for an outdoor activity.

4. How do you think disruptions to one part of a food chain might affect the rest of the ecosystem? Can you think of any examples of this occurring in nature?
5. How does understanding food chains help us appreciate the interconnectedness of life in ecosystems? What implications does this have for conservation and ecosystem management?

3. Worked Example (Day 4): A Comparative Journey through Aquatic and Terrestrial Worlds

Instructions: You are a volunteer lecturer from an international organization advocating wildlife conservation. You have been invited to conduct a free seminar for public high school students about the flow of energy in an ecosystem. Your task is to create two energy pyramids: one in an aquatic ecosystem and the other in a terrestrial ecosystem. Your visual aid will be evaluated by a master teacher at a public high school based on creativity, proper labeling, organization, and accuracy of content.

Criteria	4 points	3 points	2 points	1 point
Creativity	Visual aid demonstrates exceptional creativity, incorporating innovative design elements and engaging visuals.	Visual aid is creative and visually appealing, with some originality in design and presentation.	Visual aid shows limited creativity, with minimal variation in design and presentation.	Visual aid lacks creativity and appears dull or uninspired.
Proper Labeling	All components of the energy pyramid are clearly and accurately labeled, including producers, primary consumers, secondary consumers, etc.	Most components of the energy pyramid are labeled accurately, with only minor errors or omissions.	Some components of the energy pyramid are labeled, but there are significant errors or omissions in labeling.	Few or no components of the energy pyramid are labeled, making it difficult to understand the diagram.
Organization	Visual aid is well-organized, with a clear structure that guides the viewer's understanding of the flow of energy in the ecosystem.	Visual aid is organized, but the structure may be slightly confusing or could be improved for clarity.	Organization of the visual aid is somewhat unclear, making it challenging to follow the flow of energy in the ecosystem.	Visual aid lacks organization, making it difficult to understand the relationship between different components of the energy pyramid.

	Accuracy of Content	Information presented in the visual aid is highly accurate, demonstrating a deep understanding of energy flow in both aquatic and terrestrial ecosystems.	Information presented in the visual aid is mostly accurate, with few minor inaccuracies or oversights.	Some inaccuracies or inconsistencies are present in the information presented in the visual aid, detracting from overall understanding.	Visual aid contains significant inaccuracies or misinformation that undermines its usefulness as an educational tool.	

D. Making Generalizations

1. Learners' Takeaways

Answer the reflection table below:

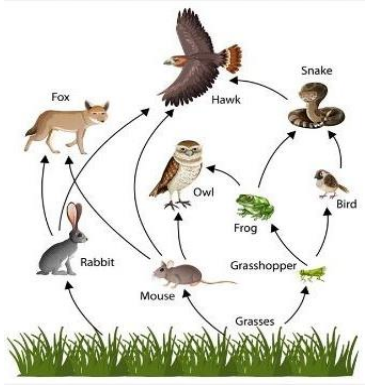
1. What are the key concepts that you learned about the biological levels of the ecosystem?	
2. What are the concepts that you feel hard the most in comprehending?	
3. How do you think this concept plays a vital role in your daily life?	
4. What are the activities that you find enjoyable?	
5. What are the important things that you learned from our recent topic?	

IV. EVALUATING LEARNING: FORMATIVE ASSESSMENT AND TEACHER'S REFLECTION		**NOTES TO TEACHERS**
A. Evaluating Learning	**1. Formative Assessment** **Test I. Multiple choice:** Read each statement below and choose the best letter of the correct answer. 1. Which of the following groups of organisms is responsible for the breaking down of bodies of dead organisms? a. autotrophs b. bacteria c. carnivores d. consumer	**Key to Correction:** **Multiple Choice:** 1. b. bacteria 2. b. carnivores 3. d. They convert solar energy into chemical energy in the form of

	2. Which of the following groups of organisms obtain their food and energy by feeding on other animals? a. herbivores b. carnivores c. producers d. omnivores 3. Why are plants considered producers? a. They produce fruits that are consumed by animals. b. They produce root crops that supply carbohydrates to animals. c. They provide vegetables for animals and humans. d. They convert solar energy into chemical energy in the form of food. 4. Which of these animals is a first-order consumer? a. hawk eating a mouse b. bird eating a worm c. worm eating a leaf d. snake, swallowing a frog 5. Which of the following food chains is in its correct order? a. rice plant (leaf)--- grasshopper-----worm---- hawk b. rice plant(leaf)----grasshopper-----snake---frog---hawk c. rice plant(grain)--- mouse-----snake--- hawk d. rice plant (grain)----- mouse--- crocodile 6. Which among the following levels of ecological organization is arranged from the lowest level to the highest level? a. individual, community, population, ecosystem b. population, individual, community, ecosystem c. individual, population, community, ecosystem d. population, community, individual, ecosystem 7. Which abiotic factor has the greatest influence on the productivity of plants? a. light b. water c. temperature d. soil nutrient 8. What do you call the environment wherein there is interaction between and among living and non-living things? a. ecology b. abiotic c. ecosystem d. biotic	food. 4. c. worm eating a leaf 5. b. rice plant(leaf)----grasshopper-----snake---frog---hawk 6. c. individual, population, community, ecosystem 7. a. light 8. c. ecosystem 9. b. food web 10. b. first order consumers 11. c. eagle 12. a. first trophic level 13. b. second order 14. d. fungus 15. d. They convert energy from the sun into chemical energy in the form of glucose. **Test III. Sample answers** 1. Abiotic factors used to classify major terrestrial biomes include climate (temperature and precipitation), soil type, topography, and sunlight availability. 2. An ecosystem would still exist if detritivores were absent, but it would lead to a buildup of dead organic matter and

9. What do you call an interaction of food chains?
   a. food pyramid c. food nutrients
   b. food web d. food supplement

10. Examine the diagram, which type of consumer are rats?
   a. producers
   b. first-order consumers
   c. second-order consumers
   d. third-order consumers



11. Which of the animals in the diagram is the top predator?
   a. rat
   b. snake
   c. eagle
   d. plant

12. Which trophic level has the greatest stored energy?
   a. first trophic level c. third trophic level
   b. second trophic level d. fourth trophic level

3. Examine the food web diagram. Which type of consumers are small birds?
   a. first order
   b. second order
   c. third order
   d. fourth order

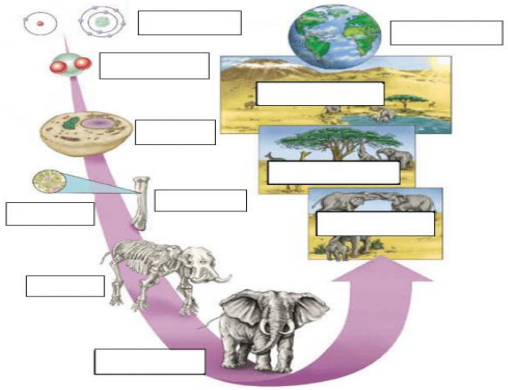
14. Which of the following organisms belongs to the decomposers group?
   a. shrub b. cabbage c. grass d. fungus

15. Why are grass and shrubs considered producers?
   a. They can be eaten by animals.
   b. They produce root crops that supply carbohydrates to animals.
   c. They provide vegetables for animals and humans.
   d. They convert energy from the sun into chemical energy in the form of glucose.

slower nutrient cycling. Detritivores play a crucial role in breaking down dead organic material into simpler forms, releasing nutrients back into the ecosystem for use by other organisms. Without detritivores, the decomposition process would be significantly impaired.

3. Autotrophs are organisms that produce their food through photosynthesis or chemosynthesis, utilizing energy from the environment. Examples include plants and certain bacteria. Heterotrophs, on the other hand, obtain their food by consuming other organisms. They cannot produce their food and include animals and most fungi.

Test II: Label the Biological Organization of Life.



Test III: Essay

1. What are the abiotic factors that are used to classify major terrestrial biomes?
2. Would an ecosystem exist if detritivores were absent? Why?
3. Explain the main difference between autotrophs and heterotrophs.

B. Teacher's Remarks	*Note observations on any of the following areas:*	**Effective Practices**	**Problems Encountered**
	strategies explored		
	materials used		
	learner engagement/ interaction		
	Others		

C. Teacher's Reflection	*Reflection guide or prompt can be on:* ▪ *principles behind the teaching* *What principles and beliefs informed my lesson?* *Why did I teach the lesson the way I did?* ▪ *students* *What roles did my students play in my lesson?* *What did my students learn? How did they learn?* ▪ *ways forward* *What could I have done differently?* *What can I explore in the next lesson?*	